

European Aviation in the First World War

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ABSTRACT

The Great War obviously was a period of growing hatred and total confrontation. But there can be made a case for the existence of fields of common ground within the “seminal catastrophe of the 20th century” in Europe. A case in point is the development of weapons systems during wartime, and, more specific, the technology, tactics and culture of European flying. There was not only lethal competition but also exchange and common accelerated innovation of airplanes, their deployment and military usage. The war accelerated, shaped and vectorized change in this field.



Monoplane Morane-Saulnier, « parasol », type L (1913), whose rotary engine Gnome 80 CV was a model for the German aeroplane “German Taube”. Source : www.britmodeller.com

Airplane technology and culture developed very fast before and after 1914. From the “aeronautics year” 1909 onwards, international “air meets”, transnational competitions, striving for international records, shows and sports with pilots from other countries, these events not only pushed performance, set new records and stimulated technological information by reviews and descriptions of aeroplanes, but also led to contacts between pilots, designers and engineers, thus building a European aeronautical culture. A common market for airplanes – French Bleriot XI sold well in Germany –, common “airmindedness”, a common cult of aviators, and converging technologies evolved within a few years. At first sight, this informal European cultural-technological community

working on “aeronautical progress” was broken up by the war. But actually forms of exchange as well as common technological and cultural vectors continued during the war. Obviously, competition became very different by air fighting. It figured as an ultimate, dangerous and lethal proving ground, promoting innovative, up-to-date technological and tactical developments. The cultural pattern figured air warfare to be “the ultimate sport”. This did not describe the historic reality, but there were links to the peaceful but already nationalistically charged pre-war competitions. The symbolic field of air fighting as “tournaments”, “duels in the air” or “hunting” was well established before 1914 and was activated by the warring nations.

On the field of plane technology, too, exchange did not cease. Downed hostile aircraft were closely examined, sometimes reverse engineered, and test-flown. British and French authorities and airplane companies were primarily interested in German fuselage and wing construction, especially airframes, whereas the Germans were curious to know more about Entente engine construction in a phase of stagnating German engine development. Enemy aircraft captured more or less intact were taken into the air not only to check out their tactical advantages or weak points in order to help their own pilots to develop skills to defeat them, but also to find out about handling characteristics in relation to design and airframe engineering. These assembled knowledge bases were disseminated in several ways: designers and engineers were familiarized with the construction, pilots with the strength and weaknesses of their adversaries’ planes; articles in technical journals – for instance the periodical “Flight” in Britain – were published and widely read. The exhibition of enemy aircraft in “Kriegsausstellungen” invited the public to look at enemy airplane construction and aesthetics. Thus, new design and production methods as well as technical innovations became transnational knowledge. Paradoxically, air fighting fostered a permanent and intense information exchange between the warring air forces, leading to a further technological homogenization and convergence of aviation of the European powers and their generations of airplanes which had begun before 1914 and continued during the war. There was a constant pressure to evaluate, learn, transfer and adapt to new steps of the technological art of airplanes. If one side failed to do so, the balance of power in the air shifted, even to the point of disaster. This happened in 1915 with the appearance of the Fokker single seater EIII with synchronized machine gun, which wrought havoc among Allied planes, especially of the ultra-stable designs favoured by British manufacturers. These were introduced to facilitate control for inexperienced pilots. The standard BE2c of 1914-16, a typical stable British airplane, was no design failure, but this kind of plane proved to be helpless against the Fokker monoplanes, thus nicknamed “Fokker fodder”. Forced to abandon the ultra-stable construction, Britain’s airplane builders learned to adapt and to converge with the mainstream of European plane design the hard way. A similar case in point is the “pusher” configuration with engines behind the nacelle, favoured in the first half of the war by some French and British manufacturers, for instance the models Caudron, DeHavilland2, or RE8. Having high drag and lacking structural stability, this layout was abandoned in favour of the transnational mainstream configuration whereas the few surviving planes were relegated to training roles. These developments during the war were an important element in the process of “closure” of technologies, according to Thomas P. Hughes, eliminating side paths and leading to a standard layout. This process was an almost exclusive European development. When the United States entered the war, they mass-produced licensed British planes, e.g. the DeHavilland4.

Imitation did play a role, too. Ironically, the successful Fokker EIII was imitating an adversary’s model. With its rotary engine which was licensed by Gnome-Rhone to a German manufacturer, Oberursel, in August 1913, it was a German adaptation of the pre-war Morane Saulnier, a representative of the “French school” of rather fast and manoeuvrable monoplanes, quite unlike the sluggish two-seater monoplanes like the German Taube of 1914. Fokker took the French airframe, imitating and altering the construction by tubular steel. Another case in point is the development of Fokker’s Dri which took inspiration from the new technological configuration of the British Sopwith Triplane. This points to a widespread, multi-pronged, many-layered and complex exchange of construction and production ideas across the fronts. Of course, there were national engineering styles, traditions, preferences for materials or preferred design features, but the tendency to converge was obvious.

Air warfare itself developed with a common European vector. There was a rather similar diversification of specialized fields of aerial warfare. Common needs of reconnaissance, artillery spotting, close ground support, day and night bombing, led to rather similar developments of specialized planes, as well as doctrines, organizational solutions or tactical approaches. If the evolving pattern of air power in the Great War was a “revolution in military affairs”, as Max Boot claimed, it was, notwithstanding national solutions for military functions and operations, a common development within the air forces of the European warring states. This homogenization was not only a technological or military phenomenon. The cultural framing of air activity, the symbolic and iconographic representations which had appeared before the war were strikingly similar in Germany, France, Britain or Italy. Generally, aerial fighting was perceived within symbolic fields of sport, duel, or tournament which was outlined before 1914 in national flight competitions and sharpened during the deadly fighting in the air. A hero cult of the “Flying Ace” and the ritual counting of his victories which followed the admiration of aviators developed into a transnational symbolic culture.

European technological homogenization processes proved to be far-reaching and momentous. In the last phase of the war, some German companies began to produce advanced designs, for instance all-metal airframes with stressed skin, low-wing configuration, thick wing profiles, or no wire bracing, exemplified by Junkers and Dornier models. These features mostly came too late to influence actual fighting but were closely observed by the victorious powers, setting trends for post-war developments by European airplane manufacturers. Thus, the devastating war helped to homogenize aviation trends and fostered a European aircraft tradition which spilled over to other countries. When a European aviation developed across the fronts, putting the aviation industries of the main warring states far ahead of any extra-European manufacturers, it proved to be influential. For instance, the US airplane construction lagged far behind, having to buy planes or licenses from France or Britain after entering the war in 1917. Even so, American plane builders still lacked expertise to mass-produce airframes.

Thus, a somewhat paradoxical result of the Great War in the air was a push of development of aeronautics as well as a European lead fostered by intense exchange of technology, and the formation of a common cultural framework with common iconography and practice.

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