CHAPTER 2

FIGURE 14 Balloon "busting", World War I; 1914–1918

DEVELOPMENTS FOR MILITARY APPLICATIONS

Unfortunate as it is, we must recognize the fact that war, including offensive and defensive preparations, has been one of the main factors in the rapid development of aircraft and rockets. Looking on the brighter side, we can see that the effect has been to advance technology. Without the aeronautical advances brought about by the military application of aircraft, it is possible that we could today be flying airplanes not much improved over the Wright Flyer.

WORLD WAR I

During the early months of World War I, balloons, dirigibles, and airplanes were in the air over France. As the war continued, new and better aircraft came from the drawing boards and factories of the principal adversaries, and tactics changed as hardware changed.

At first, both the lighter-than-air aircraft and airplanes were used for observation. Balloons had been used as early as the Civil War for observation, but, by 1914, refinements had brought them into much wider use.

Lighter-than-air aircraft were constructed in three different types: the "flexible or non-rigid," the "semi-rigid," and the "rigid." The balloons used were not steerable, and were tethered to the ground by a cable assembly. They were raised or lowered by cable, and their main use, as we have indicated, was as observation platforms at the front lines. They carried an observer who rode in a basket suspended several feet below the gas bag, or envelope. With a "sausage" configuration, extensions tailward in the shape of fins, and the angle of incidence caused by the tethering arrangement, these balloons "flew" in a manner similar to kites—hence they were dubbed "kite balloons."

The flexible dirigibles took their shape strictly from the design of the gas bag and the pressure of the gas filling them. Their cars, suspended by a cable system, contained space for the pilot and crew. Some of the earlier models used cars that looked very much like the fuselage of an airplane, complete with engine, but their control surfaces consisted of horizontal and vertical rudders which guided the craft up or down or to the right or left. Being maneuverable and small, the *blimps,* as they were dubbed by the British, took to the air to patrol coastlines, looking for enemy warships and mines.

The semi-rigid dirigibles were similar to the blimp in that their shape was mainly derived from the envelope design and gas pressure. The important difference was that they had a keel to which the pro-

pulsion system and car were attached. Semi-rigids also were used as patrol craft.

The rigids, as we know already, were much more sophisticated. They were larger (huge!), and took their shape from a rigid framework. In honor of their inventor, they kept the name Zeppelin. Zeppelins were used by naval forces as patrol craft, and used by the Germans to bomb England.

Like the balloons and dirigibles, airplanes in the early months of World War I were observational devices. Airplanes demonstrated their ability to fly quickly (relatively speaking) over the enemy's lines and return with fresh information on the tactical situation (reconnaissance). The airplanes were much more efficient than the lighter-than-air aircraft, and both sides used various types of airplanes for reconnaissance.

German pilots and French pilots waved to each other as they passed on their way to and from missions. Neither side had yet thought of using an airborne weapon to defeat the other. The first "aggressive" attempts were not long in coming, however, and they spurred necessary refinements in the design and construction of airplanes.

On August 29, 1914, German Lieutenant Hermann Dressler, in a *Rumpler Taube,* dropped four bombs on the outskirts of Paris. Germany formed the first bomber squadron soon thereafter (November 1914), and conducted the first bomber squadron raid, using Dunkirk as the target. After the success at Dunkirk, the Germans began concentrating on aerodromes as targets for their new weapon.

In the meantime, pilots of both sides had stopped waving (we can assume) and started shooting. They used pistols and rifles at first, but soon graduated to swivel-mounted machine guns fired by the observer. None of the weapons techniques worked very well. French ace Roland Garros (the same who first flew across the Mediterranean) reasoned that if a machine gun could be mounted on the airplane fuselage and fired through the whirling propeller, it would be much more efficient,

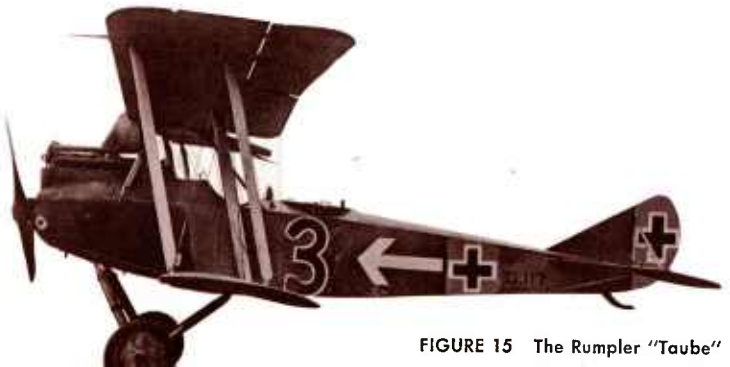

FIGURE 15 The Rumpler "Taube"