

No Quarter: This painting by Ivan Berryman depicts Lt. William Rob-
inson attacking Zeppelin SL-11. It
was the first airship brought down
over Britain.

For almost two years, British airmen were unable to stop the German airships as they bombed England with impunity.

IVAN BERRYMAN '07

The Scourge of the Zeppelins

Even before World War I began in August 1914, the British were alarmed by the huge dirigibles built for the German armed forces by Ferdinand von Zeppelin. These massive airships had plenty of room to carry bombs and were easily capable of crossing the English Channel from bases in Europe.

The British were accustomed to fighting their wars abroad. It had been more than 200 years since England was last successfully invaded by a foreign enemy, but the British isles were newly vulnerable to

what prewar headlines called “The Airship Menace” and “The Peril of the Air.” The anxiety was fed by a futuristic H. G. Wells novel, *The War in the Air*, in which giant airships destroyed New York.

Other nations had dirigibles—as steerable airships were called—but nothing to compare with the Zeppelins: cigar-shaped, barn-sized, and much advanced from the pouchy balloon-and-basket rigs that preceded them. What made them unique was their rigid structure, a skeleton of lightweight aluminum rings and girders with gas bags of hydrogen inside. The

outer covering was of tough fabric, treated with dope for tightness and waterproofing.

Crew and weapons rode in gondolas slung on the keel underneath. Engines for forward propulsion were mounted to the hull by struts and wires. To rise, the Zeppelin released some of its water ballast; to descend, it released some of the hydrogen.

The Germans were enormously proud of their Zeppelins, which had been in passenger service before the war. Some of the big airships were made by other firms, such as Schutte-Lanz, which used



Painting by Ivan Berryman, courtesy of Cranston Fine Arts

By John T. Correll

laminated plywood rather than aluminum for the framework, but in common usage, all of them were Zeppelins.

When the war began, the popular expectation was expressed in a German children's song:

*Zeppelin, fly,
Help us in the war,
Fly to England,
England shall be destroyed by fire,
Zeppelin fly!*

Powered flight was still new in 1914, and the course of military aviation was not yet determined. The airplane seemed

likely to prevail, but airships had the advantage in size, load, altitude, and range.

German expectations and British concerns were premature. Although it was not generally known, the Germans had lost six of their Zeppelins since summer and had only three in service in late August. Sent on low-level reconnaissance in broad daylight over the front lines, they were promptly shot down by the big field guns in the first weeks of the war. However, more were coming off the production line, and for almost two years, German airships would bomb Great Britain with impunity.

Kaiser Wilhelm II was hesitant in employing the Zeppelins against English cities. He may have thought about the personal safety of his relatives in the royal family—both he and King George V were grandsons of Queen Victoria—but the main consideration was world opinion, especially in the United States, which was thus far neutral. In January 1915, the Kaiser approved attacks on Britain but excluded London as a target. The authority was expanded somewhat in May, and unrestricted bombing to include London was authorized in July.

The first Zeppelin attack on Britain came Jan. 19. Two airships of the prewar class—518 feet long, each carrying 21 bombs and a crew of 16—were blown off course and dropped their bombs in Norfolk on the eastern coast, killing four people. Compared to the staggering toll of the land war in France, the Zeppelin attacks were a drop in the bucket, but they caused great alarm and consternation.

The Army's Royal Flying Corps preferred to concentrate on the Western Front, and home defense was left to the Royal Naval Air Service. This arrangement continued until February 1916, when Army participation was ordered. Afterward, Navy responsibility ended when the Zeppelins crossed the coastline, where the Army's responsibility began.

The Germans had their own interservice shuffle. At the beginning of the war, the Army had most of the airships and conducted the first attacks on London. Primacy soon shifted to the Naval Airship Division, led by Cmdr. Peter Strasser whose ability, commitment, and strength of personality soon pushed the Army to the side.

"Through 1915 and 1916, the Zeppelin raids became a regular feature of life in towns along Britain's eastern coast and in London," the *Daily Mail* said in a historical retrospective. "The airships would loom out of the night sky, some as big as battleships, a terrifying sight. Houses were blasted, people left dead and injured. On the ground, there was no civil defense and

little warning. No sirens wailed. Instead, boy scouts blew bugles and policemen on bicycles blew whistles and whirled rattles. In the absence of public shelters, people were told to go indoors and hide under a table or in the cellar. For some, however, the threat from the air was so new and fascinating that their curiosity got the better of them, and they went out into the streets to watch."

Between January 1915 and January 1916, the Zeppelins struck Britain 21 times.

The Danger of Fire

At first, British airplanes had no good weapons to fight the Zeppelins. Ordinary bullets penetrated the gas cells, but depending on the location of the hole and the ambient air pressure, the puncture might not have much effect. The first Zeppelin destroyed in an aerial engagement was brought down by bombs, not bullets.

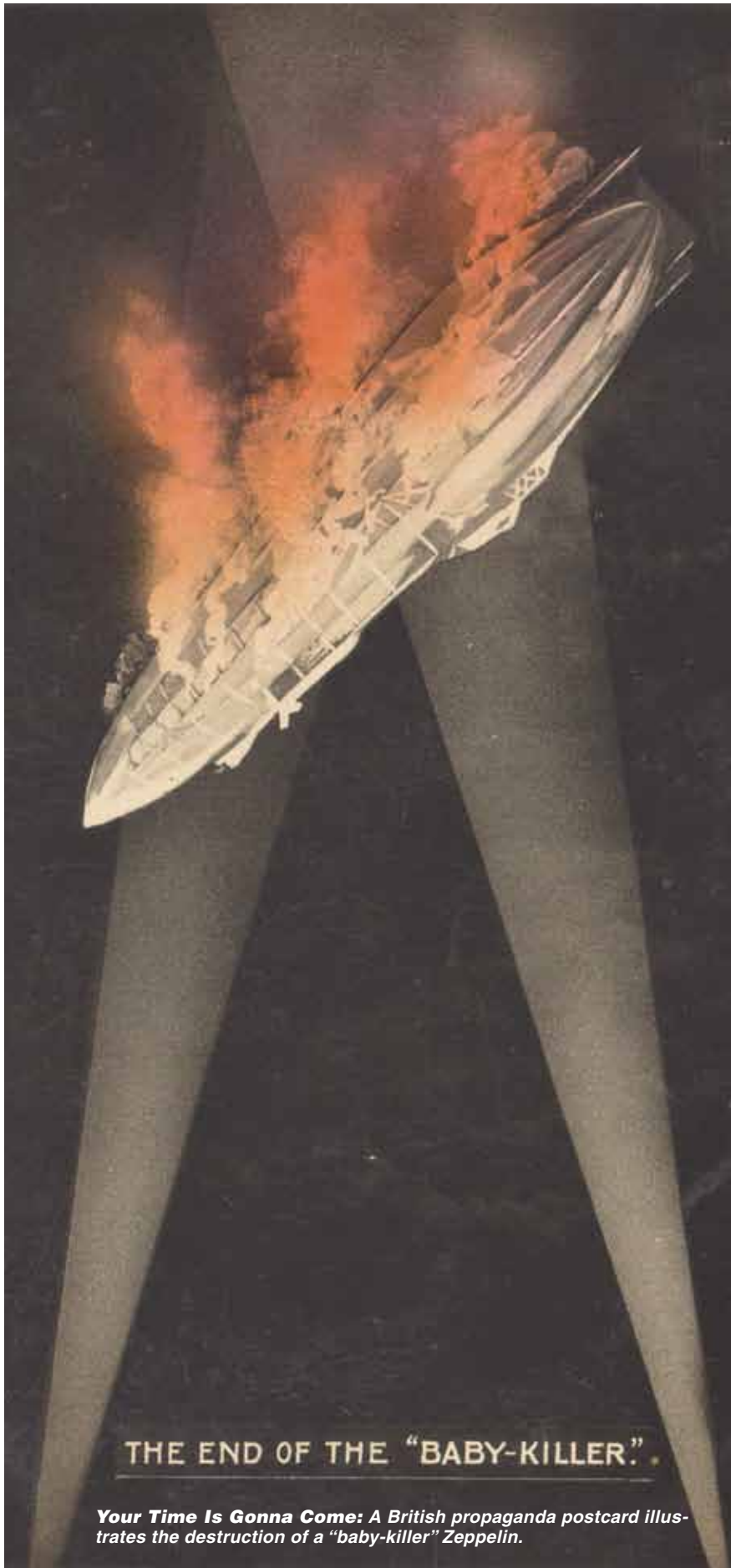
On June 6, 1915, Zeppelin LZ-37 was returning to its base in occupied Belgium when intercepted near Ostende by Lt. R.A.J. Warnerford, flying a Morane-Saulnier monoplane. He first tried shooting at it with his carbine, then took up pursuit, gradually climbing until he was above the airship. He dropped six bombs on its top and watched it erupt in flames. Warnerford was awarded the Victoria Cross for this action.

The real danger to the Zeppelins was fire. Inside the airship were 18 gas bags filled with more than a million cubic feet of highly combustible hydrogen. If the hydrogen ignited, the entire airship would be engulfed in moments. The most likely sources of fire were aboard the airship itself. Crews were forbidden to carry matches and wore special shoes to avoid sparks. The sailmaker braced himself between gas cells like a mountain climber, his glue pot kept nearby to seal any leaks.

A shaft between gas cells rose 50 feet up to the gunner's platform on the top of the airship. The gunner, minimally screened from the frigid airstream, could not shoot without orders. A burst from the machine gun would be disastrous if the airship was discharging hydrogen.

The only alternative to the hydrogen as a lifting medium was helium, which was not flammable. However, helium was newly discovered and the total supply was not enough to fill a single airship. Nearly all of the helium reserves were on the Great Plains of the United States, which was not inclined to sell strategic goods to the Germans.

The British sought a means of attacking the Zeppelins in the air. A large projectile, the Rankin Dart, dropped from above to



Your Time Is Gonna Come: A British propaganda postcard illustrates the destruction of a “baby-killer” Zeppelin.

pierce the gas bag before igniting, did not work well. Among other things, it was difficult to fly high enough to employ it effectively. More successful were variants of .303-caliber explosive and incendiary bullets, named for their inventors: Pomeroy, Brock, and Buckingham. The lethal combination, which would not be available until late 1916, was to intersperse explosive and incendiary bullets in the ammunition drum to tear open the fabric and set the hydrogen afire.

The mainstay of the British air defenses was the plucky Bleriot BE2c. Slow and steady, it was no match for the nimble German fighters on the Western Front but it was excellent against the Zeppelins. The interceptor version of the BE2c was a single seater, with a Lewis gun mounted to fire upward through a notch in the biplane’s top wing.

Even with explosive bullets, the Zeppelins were not that easy to shoot down. It usually took repeated passes and more than one drum of ammunition, but once the fire caught, the results were spectacular.

Targeting London

The Zeppelin raids followed a standard mission profile. The airships took off in late morning, reached the British coast at dusk, conducted their attacks during the night, and were well on their way home before dawn. They seldom raided during the long days of summer.

The German airships also bombed Paris, but London was an easier target although it was twice the distance. The Zeppelins had to fly over land to Paris, which attracted the attention of the defenses. The route to London was mostly over water. The Zeppelins attacked Belgium, France, Poland, Rumania, and Russia, but England got the worst of it and London was the favorite target.

The most successful attack on London of the entire war was Sept. 8, 1915, conducted by a single Zeppelin, L-13, commanded by Lt. Cmdr. Heinrich Mathy, regarded as the best captain in the Naval Airship Division. Two other Zeppelins flying with him turned back short of the target but Mathy reached central London, where his raid killed 22, injured 87, and accounted for a sixth of the total air raid damage to Britain during the war.

New R-type airships, known in Britain as “Super Zeppelins,” reached the front in May 1916. They had six engines, were 650 feet long, and had an operational ceiling of 11,000 to 13,000 feet, higher than most British fighters could go. They carried 10 machine guns and five tons of bombs.



Dazed and Confused: A policeman and two young women stand beside the wreckage of London homes destroyed by bombs dropped from a Zeppelin in 1915.

The airships seldom used their full range but in April 1916 Zeppelin L-14 bombed Edinburgh and the nearby port of Leith in Scotland, destroying a whiskey warehouse and some other buildings. Scotland was bombed again in May.

The free run of the Zeppelins was almost over. During the summer of 1916, the British added more airplanes to the defense and completed testing of the explosive bullets. Airship commander Mathy had one more night of glory, Aug. 25, when his L-31 Super Zeppelin bombed London and inflicted considerable damage.

The turning point was Sept. 2-3, when the Zeppelins mounted their largest raid of the war, 12 airships from the Navy and four from the Army. The task force was scattered by storms over the North Sea, but SL-11, a new Army airship on its first mission, pressed on to London.

Lt. William Leefe Robinson, flying a BE2c, intercepted SL-11 over the northern suburbs. Failing to bring down the airship on his first two passes, Robinson took a position 500 feet below and just behind and concentrated an entire drum of ammunition, alternating Pomeroy and Brock bullets, on a selected spot on the hull.

The conflagration lit up the night sky and cheering crowds in London watched SL-11 fall 30 miles away, in the village of Cuffley. It was the first German airship brought down over Britain. Robinson was an instant hero, awarded the Victoria Cross by King George.

The entire 16-member crew of SL-11 died, compared to four people killed on the raid, and the total damage done was less than a fourth of what Germany had paid for the airship. More important, confidence of the high command was shaken. The German Army Airship Service did not attack England again and was disbanded the following year, its assets transferred to the Navy and Strasser.

Further misfortune followed. Three Navy Super Zeppelins were shot down Sept. 23. The much-admired Mathy was again bombing London in L-31 on Oct. 1 when a BE2c flown by Lt. Wulstan Tempest caught up with him and set the airship ablaze. Rather than be burned alive, Mathy and several of the crew jumped to their deaths. More losses followed in November and December and

only the personal persuasive power of the indefatigable Strasser kept the Zeppelin operation going.

The Bomber Blitz

In February 1917, the Germans fielded the S Class of Zeppelins, called "Height Climbers" by the British because their operational ceiling was 16,500 feet and they could go as high as 21,000 feet, beyond reach of defending guns and airplanes.

The altitude was gained at a price. Oxygen deficiency hampered both crews and engines. Sustained flight above 16,000 feet caused severe pains, vomiting, and exhaustion. Airframes and oil lines became brittle in the cold, and compasses went awry. High winds and cloud cover made navigation difficult.

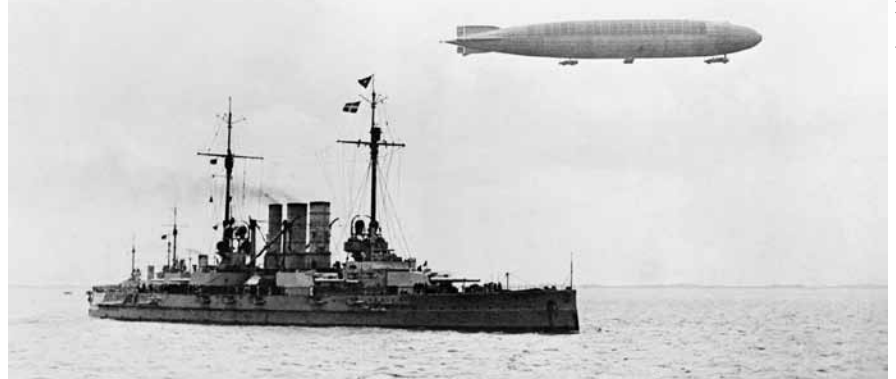
The high command had lost faith in the Zeppelins, though, and transition to bomber aircraft had already begun. The first of the new Gotha IVs arrived at their bases in Belgium in March, and the "England Squadron" assumed the leading role in the air war against Britain.

Fourteen Gothas struck central London in a daylight raid June 13 with devastating effect, killing 162 and injuring 426. Among the dead were 46 children whose kindergarten was bombed. A month later, the royal family changed its name from Saxe-Coburg-Gotha to Windsor.

In September, the Germans introduced the R-type bomber, a huge four-engine aircraft almost twice the size of the Gotha and carrying a variety of bombs, some of them larger than 2,000 pounds. The British met them with high-performance Sopwith Camel and Bristol fighters and forced the Germans to resort to night attacks.

Meanwhile, Strasser kept pressing. A strike against London in October 1917 was known as "the Silent Raid" because the Zeppelins flew so high they were unseen and unheard. Five of the airships that began that mission did not return

Bring It On Home: The German Zeppelin L-31 flies over Ostfriesland during the war. This Zeppelin, piloted by Lt. Cmdr. Heinrich Mathy, would be shot down near London in 1916.



home. The French defenses brought down two, one was lost at sea, and two crash-landed. The airships made only three raids in Britain in 1918, none of them against London.

Zeppelins “ultimately failed in the strategic assault as aircraft and anti-aircraft defenses drove them so high that they became vulnerable to gale force winds that would blow returning dirigibles all over the European continent and occasionally further,” said historian John H. Morrow. “The airplane became the primary aerial vehicle of the war.”

Strasser was promoted to admiral second class, but he did not survive the war. On Aug. 5, 1918, five airships set out to bomb England, led personally by Strasser aboard L-70, a modified Height Climber 693 feet long and powered by seven engines. It was the fastest airship yet, with a top speed of 81 mph. Three British DeHavillands spotted the big Zeppelin over the North Sea and attacked head on with explosive bullets. L-70 erupted in flames and the wreckage went down in the water.

The remaining Zeppelins were confiscated by the victorious Allies at the Armistice in November 1918, although the crews managed to destroy some of them rather than give them up. Of the 115 Zeppelins built and employed by the German forces, 53 were destroyed and another 24 were damaged beyond operational use. There were 51 Zeppelin raids on Britain, killing 557 and injuring 1,358. Twenty-six of the raids targeted London. The cost of the Zeppelins was about five times that of the damage they inflicted.

Neither the Zeppelins nor the bombers succeeded in crushing British morale, but they tied down resources that might otherwise have been used at the fighting front. Their most important effect was to convince Britain of the significance of airpower. The British Air Ministry was formed in January 1918, and in April, the Royal Air Force became the world’s first independent air arm.

The British were imprinted with the seeming invincibility of the bomber. In 1932, British Prime Minister Stanley Baldwin predicted that, in the next war, there would be no defense against air attack and that “the bomber will always get through.” That proposition would be tested when the Germans came again, in the Battle of Britain in 1940.

Twilight of the Zeppelins

There was a resurgence of interest in dirigibles for exploration and carrying passengers in the 1920s, and the Zeppelin company at Friedrichshafen, which had



Nobody's Fault But Mine: German Cmdr. Peter Strasser was an indefatigable proponent of the huge airships.

reverted to civilian enterprises, was in the thick of it.

The majestic Graf Zeppelin entered international passenger service in 1928. Larger than any dirigible built before, it was 10 stories high and more than two city blocks long. The passenger gondola was outfitted with carpeting and draperies and the dining room could seat 16 for dinner. A midnight supper of lamb

chops and caviar was served. The Graf made 590 flights before its retirement in 1937.

The Zeppelin Company was virtually taken over by the Nazi regime in Germany by the time the greatest Zeppelin of them all, the Hindenburg, entered service in March 1936. The Hindenburg was 803 feet long and carried 50 passengers.

Like the Graf and the wartime Zeppelins, it used hydrogen rather than helium. Helium would have removed the risk of fire, but it was heavier, had less lifting capacity, and was far more expensive. Even if the United States had not refused to sell helium to the Germans, the cost would probably have been prohibitive. The Hindenburg required seven million cubic feet of gas.

The Hindenburg came to a dramatic ending. As it was landing at Lakehurst, N.J., May 6, 1937, a spark of unknown origin ignited one of the hydrogen cells and within seconds, the entire airship—including the swastikas on its vertical fins—was in flames. Some of the passengers managed to escape when it crashed to the ground, but before the gathered crowd and the newsreel cameras, the Hindenburg burned to a charred framework of girders.

There were a few more airship initiatives after that, but for all practical purposes, the age of the Zeppelins was over. ■



Gallows Pole: The Hindenburg goes up in flames at Lakehurst, N.J., in May 1937. A spark of unknown origin set the airship alight within seconds, as onlookers watched in horror. Though World War I was long over, the tragedy illustrated the risks inherent in hydrogen-filled airships.

John T. Correll was editor in chief of *Air Force Magazine* for 18 years and is now a contributor. His most recent article, “Encounters in the Tonkin Gulf,” appeared in the January issue.