



**Meet Edgar Gorrell, author of what may be the “earliest, clearest, and least known statement” of US strategic bombing concepts.**

# Airpower Genesis

By Rebecca Grant

**H**e was a young Army officer, keen on flying. Within five years of exiting West Point, he had learned to pilot an aircraft, chased Mexican bandits south of the border, and acquired an MIT degree in aeronautical engineering. More importantly, this airman was the first US military man to produce a comprehensive and detailed plan for strategic bombing.

Who was it? Billy Mitchell? Benny Foulois? Hap Arnold? No, Edgar Staley Gorrell.

Few today have even heard of Gorrell, much less know anything about his foundational role in development of long-range airpower. Yet it was his straightforward exposition of potential targets, mission profiles, and objectives that gave a conceptual form to most aspects of World War II's vast Combined Bomber Offensive.

And he did it 25 years earlier—during World War I.

Gorrell's signature piece was a US Air Service paper entitled “Strategical Bombardment,” which he penned in France in November 1917. It was an action plan for what Gorrell called “a new policy of attacking the enemy” with sustained, strategic bombardment, day and night. This was the first official, stand-alone exposition of strategic bombardment an airman ever produced.

The “earliest, clearest, and least known statement of the American conception of the employment of airpower” was the way it was described, years later, by Laurence S. Kuter, a senior World War II planner who retired as a general in 1962.

“Nap” Gorrell was born in Baltimore in 1891 and graduated from West Point in 1912. He served two years in



*Lt. Herbert Dargue and Lt. Edgar Gorrell, photographed in Mexico during the Punitive Expedition in 1916.*

Alaska, then entered pilot training at North Island, in San Diego, in 1915. It was the next year, though, that he experienced the gritty side of airpower, up close and personal, in Mexico.

He was part of a small group of airmen selected for the first Army air operation, the so-called Punitive Expedition into Mexico. It was mounted after Mexican revolutionary Francisco



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**Mitchell (l) and Pershing in France during World War I. Mitchell and Pershing built on Gorrell's targeting plans and a desire for American-only units.**

“Pancho” Villa and 500 gunmen on March 9, 1916 crossed the border and attacked the US Army’s 13th Cavalry Regiment based in Columbus, N.M. Ten US soldiers and eight civilians were killed.

President Woodrow Wilson responded on March 15 by ordering Brig. Gen. John J. “Black Jack” Pershing to lead an expedition to track down Villa. The Mexican Expedition began the next day, March 16, 1916. Because Villa had scattered his forces, Pershing brought along some of the aviation section’s new airplanes to provide the needed reconnaissance. Deployment of the 1st Aero Squadron thus became the first expeditionary operation by America’s airmen.

And a modest beginning it was. On March 13, 1916, 11 junior officers and 82 enlisted men departed Ft. Sam Houston, Tex., for Columbus. They set out with a force of eight Curtiss JN-3 two-place biplanes, 10 trucks, and one automobile. Reconnaissance flights got under way on March 16. Within days, the number of operational aircraft was whittled down by accidents and weather, while operations constantly ran afoul of mountains and stone-throwing Mexican mobs.

Gorrell and his squadron mates persevered through rain, hail, and forced

landings. The venture gave Gorrell a firsthand look at operations and the limits of equipment and organization. They stuck it out until Aug. 15, 1916. For Gorrell and his fellow aviators, it was a good introduction to the vastly bigger challenge to be faced when the US entered the World War in April 1917.

### **Bombing Day and Night**

Within a year of leaving the heat and dust of Mexico, Gorrell was in Paris, serving as chief of the Technical Section, Air Service, American Expeditionary Forces. It was a frenetic period as the American aviators struggled to work out a plan for expansion and for procuring Allied aircraft for Air Service use.

Strategic bombing was a fact of life by 1917. British Handley Page bombers began action in France that spring, and a solo Handley Page bombed the Ottoman Empire capital of Constantinople from a base in Greece.

On the German side, the Gotha bomber was replacing the Zeppelins, which had been bombing London since 1915 but were now vulnerable to pursuit aircraft. The Gothas made their presence felt, bombing London in broad daylight on June 13, 1917. They followed it up with a bigger raid by 22 Gothas on July

7, 1917 and commenced night bombing of London that August.

By fall, the new Gotha GV was in the air. It had a range of more than 500 miles and carried two to three machine guns and bombs. At 40 feet long, with a 77-foot wingspan and a height of 14 feet, the Gotha GV was an aerial monster.

What would the fledgling American air service do in this changing environment? Among other things, it contributed mightily to the conceptualization of long-range attack. Richard J. Overy, a noted historian of airpower, wrote that “if any have claim as the originator of American strategic bombardment,” it would have to be either Maj. Raynal C. Bolling, a corporate lawyer-National Guardsman who headed the aeronautical mission to Europe, or Gorrell.

Bolling in August 1917 backed more bomber production on the grounds that night bombing on a sufficiently great scale might “determine the whole outcome of military operations.” Gorrell had his own ideas.

Gorrell and Bolling needed to deliver detailed recommendations. This led Gorrell methodically to lay out a clear strategic, operational, and tactical rationale for building up a bomber force.

What worried Gorrell most were reports that Germany was ramping up its bomber production with a view to raiding not only cities, but Allied lines when offensives resumed in spring 1918. At least 25 German airplane factories had extended output. Even portions of the Zeppelin Works were preparing to build bombers, especially the four-engine Zeppelin Staaken, which could operate for eight hours and could carry more than 5,000 pounds of bombs.

Gorrell felt both sides had come to the same conclusion. It was, “that to affect the armies in the fields, it is necessary to affect the manufacturing output of the countries.”

He anticipated that, by spring 1918, the Allies would be “visited by bomb-dropping airplanes, both by day and by night, and will be confronted with the enemy’s superiority in the air.” To Gorrell, the best answer was to strike first. He called for a capability to “wreck Germany’s manufacturing centers, but wreck them more completely than she will wreck ours next year.”

Gorrell’s plan covered every aspect of strategic bombing in a logical pro-



**Gorrell (back row, center) served on the Baker Board, a committee formed in 1934 to examine Army Air Corps problems. Other luminaries included Maj. Gen. Benjamin Foulois (seated, far left), Jimmy Doolittle (standing, second from left), and Maj. Gen. Hugh Drum, Army deputy chief of staff (seated, third from right).**

gression, from overall objectives and target lists to a formula for rail transport of ordnance. Gorrell did not discount tactical bombing of troops by the faster, shorter-range day bombers. He wrote that the value of tactical bombing in support of Army operations was self-evident, and he expected it to increase.

However, “strategical” bombing (as the language of the day often phrased it) was going to take more thought, preparation, and training.

Gorrell was not writing for some historical record but for immediate action. He presented a detailed plan that started with the logic of attacking industry. Artillery shells and airplane manufacturing were top priorities. Gorrell wrote that, in Stuttgart, the Mercedes engine factory (which supplied engines for the Gotha) was near the Bosch magneto factory. If bombers could “inflict damage on one or both of these plants, the output of German airplanes will cease in proportion to the damage done.”

Based on British and American analysis, Gorrell concluded—as others would later do—that there were “a few certain indispensable targets without which Germany cannot carry on the war.” He divided them as being within four geographical groups: Dusseldorf, Cologne, Mannheim, and the Saar Valley. The Saar Valley targets would be especially good when weather blocked attacks on the Rhine Valley cities. Gorrell then provided a meticulous analysis of why bombers

should be based in the Toul region to achieve the shortest go-and-return distances to the targets.

Most of all, Gorrell saw an opening for an American bombing campaign. Though the targets and plans he proposed were similar to those of Britain, there was room for America to make its mark—an important theme for most of the top Army officers who arrived with Pershing.

### **Success at St. Mihiel**

America had come to France to make its military debut with the continental powers, and they hungered for a way to show the Europeans a thing or two. Such drive animated Pershing’s plans for attacks with American-only units, and would propel Brig. Gen. Billy Mitchell to success at St. Mihiel in the fall of 1918.

About the only thing missing from Gorrell’s plan was a sustained discussion of bomber survivability. Attribute that, perhaps, to the inexperience with combat and to the technologies of the day. It was not until summer 1918 that American fliers began to experience firsthand the vulnerability of slower bombers to faster fighters and the growing lethality of anti-aircraft fire.

Aside from that, the Gorrell plan was striking for how its logic carved the enduring features of a bombing campaign. Questions raised by Gorrell would surface again and again for commanders, aviators, and analysts alike.

At the time, however, Gorrell’s visionary plan had nowhere to go. It was eclipsed in part by the February 1918 debut of the first fully trained combat Air Service units on the Western Front. Gorrell himself moved on quickly to other work for the Air Service.

The problem was not lack of vision but lack of production. American airmen in France had few US-built airplanes and could do no more than wait for the production of their Spads, Breguets, and de Havillands. In fact, when Mitchell led the air campaign at St. Mihiel in September 1918, Britain gave him temporary use of their bombers for the preliminary night strategic attacks.

Gorrell’s work at headquarters earned him promotion to colonel in October 1918, at the age of 27. His contributions continued—Gorrell was determined not to let America enter another war unprepared to fight in the air.

Step 1 was to determine solid requirements for the Air Service based on hard analysis of the extensive operations in 1918, plus lessons from the Allies.

Gorrell had seen a “hot wash” history by the First Army Air Service—the organization that had been directly under Mitchell’s command at St. Mihiel. It was Gorrell’s idea to get the new Air Service Chief, Gen. Mason M. Patrick, to sign off on a bigger project. Done right, it would capture tactical lessons and lay the basis for future planning and appropriations as airpower expanded within the US Army. The AEF was writing a full war history under the direction of Pershing’s operations chief, Brig. Gen. Fox Conner. A top-notch report from the Air Service was indicated.

During the first weeks of 1919, Gorrell’s researchers gathered reams of information ranging from firsthand pilot reports to a full-fledged bombing survey. Rumor had it that aircrews took to filling out a standard form stating “no significant lessons learned” in order to get Gorrell’s team off their backs.

But the result was impressive both in scope and in the way it foreshadowed so many of the challenges of World War II.

The final product ran to more than 280 volumes and required two volumes just to contain its index. Copious though it was, the plain-speaking and detailed work—and many photographs—brought to life the everyday operations and the longer-term vision of the Air Service.

Not surprisingly, “Gorrell’s History” became the lead source for the Air Service’s final report and for subsequent World War I Air Service histories.

Gorrell was not yet 30 years old when he wrote the history, and he had high hopes for it. He anticipated it would “be made available to the air officers under the American flag everywhere so they could take it home to their quarters and study it, perhaps pipe in mouth and carpet-slipped feet on the desk, learning now of one event and later of another, and calmly and gradually profiting by the lessons learned and the mistakes made by those who had pioneered.”

Nor had he forgotten strategical bombing. Gorrell got the Air Intelligence Section to produce a strategic bombing assessment using a combination of site photographs, interviews, and estimations of financial impact on bombed factories, towns, and railroads. Gorrell did not just survey US efforts. He had the team take into account all results of Allied bombing to which they had access.

### A Massive Undertaking

The First Army G-2 rustled up the manpower for the survey “to secure as complete and reliable information as possible upon which the Air Service may base its future bombing plans.”

The result was a compendium of material damage recorded in 66 of 140 bombed cities that the team was able to visit. The survey counted casualties, took pictures, and tabulated damage costs in German marks, giving at least a sense of how sustained bombing might alter warfare in the future.

The report also looked into the costs of protection against air raids, such as paying for air defense guns and dedicated pursuit airplanes.

The final result was astonishing in detail. It concluded the overall night bombing effort inflicted a monetary cost on Germany that more than justified what the Allies spent for its bombing forces during the war.

The survey also delivered some trenchant criticisms. Specifically, it was better to bomb “some definite objective of military value in [a] town,” not just to bomb the town itself. The major exception was when a pattern of bombs over cities such as Cologne, Frankfurt, Bonn, or Wiesbaden shuttered factories.

Gorrell’s survey warned against taking the theory of morale effects too far. “This investigation has decidedly shown that the enemy’s morale was not sufficiently affected to handicap the



*Colonel Gorrell receives a Companion of the Distinguished Service Order decoration from British General David Henderson in France in April 1919.*

enemy’s fighting forces in the field,” it said. The occasional practice of bombing a target just once or twice was also found “erroneous.”

What is most striking today is how the challenges documented in Gorrell’s history outlined the major doctrinal elements of air warfare.

The suggestions for future campaigns outlined directly the big issues that would emerge 20 years later in World War II.

Targets, in order, should be war industries, railroad lines, and enemy troops in the field. Above all, the report recommended: “The operations of a bombardment aviation must be an integral part of the mission of the entire air force and consequently of the ground forces and the army as a whole.”

Gorrell resigned his commission in 1920 and led a glamorous business career. He was a leader in the automotive and aviation industries and lectured on manufacturing, civil aeronautics, and the lack of war preparedness. One of his lectures in these years was pointedly titled: “What! No Airplanes?”

Several times, he testified before Congress.

Still in his 40s, Gorrell lived to see the German Air Force rearm and Japan launch its opening conquests in Asia. He thought the US was just about as unprepared as it had been for World War I. In 1940, Gorrell regretfully noted that his history was languishing “in the vaults of the War Department in Washington, some of the pages torn, some yellowing.”

Gorrell died in 1945, but not before his work found its audience. Young aviators had access to his strategic bombing plan, the Air Service report, and the bombing survey in the library of the Air Corps Tactical School.

The influence of Gorrell’s work is seen in Air War Planning Document 1, prepared by airmen of the Air Corps Tactical School. In 1941, AWPDP-1 boldly called for more than 100,000 aircraft and two million airmen to defeat the Axis powers. The lessons of strategy, tactics, training, basing, and production had been overlooked for more than a decade, but an inspired new generation relearned them just in time for World War II. ■

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