The Fall of Fort Eben Emael:

Harbinger of Blitzkrieg

by James Lee Laughbridge

On May 10th 1940, near a small town in Belgium, the war in the west was nearly decided. Fort Eben Emael, the world's largest and most impressive fortress was neutralized forever in a spectacular surprise attack by a small contingent of German Special Forces. The battle demonstrated to the world that earlier German military accomplishments were not a fluke and showed the Belgians the fallacy of their strict policy of neutrality. Was it superior German tactics and weaponry, or Belgian deficiencies which resulted in the fall of Europe's most impressive fortress and the opening of Western Europe to German domination for the next five years?

The village of Eben Emael was an unlikely participant in history until completion of the Albert Canal in May of 1930. The extension allowed the waterway an outlet from the Meuse River through Belgium, thus avoiding a path through Dutch territory (Dunstan 12). The Belgians who had suffered much in the opening of the Great War were resolved not to have a repeat of the Schlieffen Plan of 1914 (Dunstan 4-8). Geographically, Belgium was the logical starting point of any future German and French hostilities. Belgium determination to hold the line against any future aggressors prompted the construction of massive fortifications similar in structure to the largest fortifications of the Maginot Line (Kaufman and Jurga 106-107). The juncture between the Albert Canal and the Meuse River near the village of Eben Emael resulted in an excellent site for such a fortification (Mrazek 25-27). The fortress became operational in 1935, with work continuing on through 1940 (Dunstan 16).

Fort Eben Emael was situated at the edge of the Albert Canal water line adjacent to Mount Saint Peter. The fortress was shaped like a diamond and extended over nine hundred meters from North to South and was seven hundred meters wide (Ellis 25). The top of the fortress extended forty meters above the surrounding countryside. From this vantage point the fort could observe any activity for miles in every direction (Ellis 25). This location ideally suited the fortress in its' primary roles of protecting local bridges and providing fire support to neighboring forces (Saunders 17).

Eben Emael was constructed as part of the Position Fortifie de Liege 2, a system of mutually supporting artillery fortifications (Dunstan 10). The defensive systems were divided into groups one and two. Group one was situated along the Belgian frontlines and would bear the initial brunt of any conventional attack. The forts of group two were positioned further from the border with Germany and were responsible for providing fire support to the neighboring forts of both groups (Saunders 23). This idea was contrary to the French idea of a thin continuous line of strong, defensive fortifications as exemplified by the Maginot Line. However, the Belgian theories were closer to the French model of static defense than the German model. The Germans, particularly with their Siegfried line, believed in a defense in depth. Fortifications were built that were mutually supporting and of increasing strength. The German plan drew attacking forces into open "killing fields" between smaller and more numerous fortifications (Short 21-25).

The armaments of Fort Eben Emael were divided into two batteries, 1st 'Offensive Battery', and 2nd 'Defensive Battery' (Saunders 25). Each battery was commanded by a different officer and served very different roles. The second of these batteries was concerned with the defense of the fortress itself. The steep sides of the Albert Canal combined with a water filled anti-tank ditch, barbed wire entanglements, obstacles, and heavily armed blockhouses to protect the fortress from all ground approaches. The heavily armored blockhouses had interlocking fields of fire and were located around the entire perimeter of the fort including at the base of the canal. Each blockhouse mounted at least one anti-tank gun, multiple machine guns, and searchlights. All blockhouses were manned by a complement of around twenty men (Dunstan 23). The roof defenses included several anti-aircraft machine gun positions (MICA), twenty infantry foxholes, and two armored triple machine gun casemates. The turret mounted twin 75mm howitzers and triple 75mm howitzer casemates could also direct fire canister rounds against attacking infantry if necessary. Six diesel generators, an extensive filtered ventilation system, and ample food and ammunition supplies combined with these armaments to ensure that the fort could continue to fight through any attempted assault (Mrazek 28-30).

The first, 'Offensive Battery', was concerned with the various offensive roles of the fort (Saunders 25). The primary armaments of the Fort, were the twin 120mm howitzers of 'cubola' 120'(Saunders 16). These guns were of sufficient caliber as to reach the border, but not so large as to compromise Belgium’s image as a neutral nation (Greatest Raids: The Fall of Fort Eben Emael). Twelve 75mm howitzers protected the nearby bridges and fired in support of nearby forces. Armored observation domes, or “cubolas”, were fitted atop many of the structures and...
The Germans created two variants for use against Eben Emael, the 25kg and 50kg concrete which maimed or killed the defenders (Dunstan 35). The device worked by concentrating the destructive forces of the hollow charge explosive worked on a principle called the 'Munroe effect' (Dunstan 35). Named after an American, Harris Class APA's design that was carried and assembled by a team of four (Whiting 32). This was exactly what Adolf Hitler wanted. He and his staff envisioned a plan to draw the Allies into Belgium and then thrust through the Ardennes Forest around the Maginot Line towards the Channel (Orlow 207-208). This was the famous 'Fall Sicheisicht' or Plan Sickle (Veranov 103-104). Developed primarily by Lieutenant General Erich von Manstein and Major General Heinz Guderian, the plan was to split the allied forces and make the French evacuate the Maginot Line, or be left behind to sit in it (Messinger 61). For this plan to work it was imperative that the Germans capture the major bridges over the Meuse River and to do this the Germans had to knock out the major fortification covering these bridges, Fort Eben Emael (Lucas 35-37).

Student began organizing the assault forces and gathering pilots immediately (Alsbey 46-47). Forbidden by the Versailles Treaty to have an Air Force, the Germans had trained many pilots in un-powered flight which was not banned. Therefore, Germany had many expert glider pilots from which to call assault pilots from (Mrazek 40-42). The development of small ten to twelve man combat gliders progressed into the 'DFS 230' design. The DFS 230 glider could be towed by a single bomber or transport aircraft. Landing by glider solved the problem of how to deliver a concentration of troops, to a pinpoint location, ready to fight, and with all of the necessary gear to mount an effective assault (Mrazek 42-46).

Training began in earnest. Student's assault groups practiced assaulting Czech fortifications in the Sudetenland which resembled the target fortifications (Ellis 24-25). The men trained with objects of a similar size and weight as the new secret weapon. None of the men had witnessed the effects of the weapon and the secret explosive remained untied in combat until the mission was executed in May of 1940 (Dunstan 35-36). Student and his men maintained the utmost secrecy. The assault group was frequently moved and did not wear any identifiable insignia. The men were under threat of death if they spoke anything of their purpose (Dunstan 36-37). The Assault force trained constantly. Little did they know that their mission would be to attack the World's most formidable fortress?

The secret weapon Hitler revealed to Student was the 'Hohlladung' or hollow charge explosive. The shaped or hollow charge explosive worked on a principle called the 'Munroe effect' (Dunstan 35). Named after an American, Charled Edward Munroe, the hollow charge explosive was discovered in 1888 and subsequently improved by a German named Egon Neumann (Dunstan 35). The device worked by concentrating the destructive forces of the blast into a small area under the hollow portion of the device. A thin sheet of metal within the device was liquefied and forced like a stream of lava through up to a half meter of armor plating. However, the device did not need to penetrate the armor plating fully to be effective, as the resultant shockwave would create splinters of metal and concrete which maimed or killed the defenders (Dunstan 35).

The Germans created two variants for use against Eben Emael, the 25kg and 50kg 'Hohladungswaffe' (Saunders 74-76). The latter was a two piece design that was carried and assembled by a team of four (Whiting 32). This tremendous weapon when employed by the Germans against Eben Emael resulted in the disamlement of nine fortifications within the first ten minutes of battle (Whiting 32). One by one the Belgian positions had been knocked out until virtually the entire garrison present was trapped underground (Whiting 32-33). From the German perspective, the assault went fantastically. With the element of surprise, the German 'pioneer', or combat engineers, stormed the rooftop of the fortress and disabled virtually all of the offensive capabilities of the fortress in the first few moments (Whiting 32). The German 'pioneers' were elite infantry first and engineers
The Belgians sat in the most modern and impressive fortification that the World had ever seen. Engineered to resist all attackers, the Fort at Eben Emael was the one defensive position that the Belgians were supposed to hold, or so they thought. Many deficiencies contributed to her downfall and ultimate Belgian capitulation.

For example, garrison duty was a rather unglamorous position for officers and enlisted as well. Life in the fortress was dull and dreary. Morale suffered due to repeated alerts and poor leadership. Good leaders were required to keep the Fort in top form. However, because the best officers and men were sent to the Field Artillery, the inexperienced and reservists were generally assigned to garrison duty (Saunders 23-27).

Other deficiencies in personnel are demonstrated by the fact that the fort had no infantry billeted in the garrison. This was contrary to previous Belgian doctrine from the Great War. This proved a serious flaw during the attack as all of the fighting men of Eben Emael were artillerymen, untrained in infantry tactics (Saunders 23-27). Infantry from the surrounding countryside were tasked with coming to the aid of the Fort once under attack. Many of the fighting men of the Fort were billeted in houses up to four miles away. A large number of the Garrison were caught outside of the fortress and were not participants in the battle (Greatest Raids: The Fall of Eben Emael).

Many technical problems occurred during the battle which adversely impacted the defense of the Fort. These included: firing pins missing from guns, ammunition lifts and hoists not operating, periscopes not installed, guns not cleaned and ready to fire, among others (Greatest Raids: The Fall of Fort Eben Emael).

Perhaps the greatest of the deficiencies were the poor Command and Control systems that the Belgians had to operate under. The Belgians at the Fort were not encouraged to act upon their own initiative. This was contrary to German military doctrine that encouraged men to act upon their own initiative based on the situation presented them. Therefore, when the gliders began landing the artillerymen were waiting around for orders to fire, with the ammunition still in their crates. While the Germans mounted their impressive attack in the absence of their commanding officer, the garrison commander, Major Jottrand, did not even have the authority to fire the main guns in defense of the Fort. Belgian Command and Control doctrine stated that for the guns to fire, fire missions had to be called in from commanders outside of the Fort (Greatest Raids: The Fall of Fort Eben Emael). Thus, the Germans quickly demolished their objectives with minimal losses. The 'MICA' position, which was designed to interdict attacking aircraft, only got off fifty rounds before being silenced (Dunstan 38).

To his credit, the Major attempted to follow standard operating procedures in a time of battle. He believed there was some time before any forces were to cross the border into Belgium, so he sent many of the Garrison from their posts to dismantle the administrative buildings outside. This action left most of the defenses undermanned and left one of the main 'cupolas' empty. The Major also ordered the one bridge blown that he was responsible for before the Germans could take it. Despite all of his efforts and the heroic efforts of many of his men, the Major would be the one primarily held responsible by the Belgians for the loss of the Fort.

The Major, was a victim of unimaginative commanders who had little vision. Belgian defensive strategy still held the belief in the static defenses of the Great War (Kaufman and Jurga 106-107). The unconventional weapons and tactics deployed by the Germans caught them completely by surprise. The strict policy of neutrality prevented the Fort's guns to fire against German troops massing in Holland and also ensured that the 120mm guns were the largest caliber to be mounted at the Fort. Their lack of longer range prevented any pre-emptive strikes, even if called for (Kaufman and Jurga 106-107).

What did this all mean? To the Germans, the assault was a tremendous success, exceeding every expectation. The assault group had taken a force over ten times their number garrisoned in the world's strongest fortress in a day with minimal losses (Dunstan 56). Just as Hitler expected, this resulted in the execution of 'Allied Plan D' (Dunstan 33). Allied forces were drawn northward to defend Belgium, and the main armored thrust of the German forces easily pushed through the Ardennes and to the coast, causing the fall of France in just forty two days (Dunstan 33). To the Belgians the fall of Eben Emael meant the end of the war for them.

In conclusion, the brilliant glider assault of Eben Emael was a harbinger of blitzkrieg for Western Europe. Belgium's strict policy of neutrality resulted in her military's failure for the second time in twenty five years. While many deficiencies of the famed Belgian fortification and its' forces contributed to her demise. The superior training, unconventional tactics and weaponry of the Germans can not be underestimated. These tactics, training, and weaponry combined with the element of complete surprise, and were the primary reasons for the phenomenal successes that day.
About the author:
James Lee Laughridge is married with two toddlers. He attends school full time at the University of Alabama at Birmingham while also working full time as an Optical General Manager. He has a BA degree in History and currently is pursuing a BS degree in Biology. He would like to practice medicine in the Army or Army Reserves. He enjoys History -- particularly military history. He is military brat and has traveled and lived in several foreign countries including Japan, South Korea, Turkey, Egypt, Greece, Italy, Spain, Portugal, England, West Germany (FRG), Thailand, Vatican City, Mexico...others. Primary hobby is finding time to spend with his wife and two children.

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Recommended Reading

Fort Eben Emael: The Key to Hitler's Victory in the West

Fort Eben Emael 1940
Belgian Fort Eben Emael was as close to impregnable as modern defense works could be—or so it seemed. The installation was new, for one thing, just completed in 1935. The Eben Emael landing would go in with the first dim light of morning—“Student had insisted on that so the pilots would have a reasonable chance to see and hit their targets. Even so, the pilots had to be perfect. They would have just one chance to do it right, and a lot of lives depended on their skill. Germany was jubilant at the fall of the fortress. The rest of Western Europe was shocked, especially since official German accounts, even newsreels, said nothing about either gliders or hollow charges, so that the world concluded the German success had been an ordinary ground attack.