The Maginot Line

It is known as a great military blunder, but in fact this stout network of ingenious bunkers did what it was designed to do

By Rudolph Chelminski

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The Ossuary of Douaumont, situated on a wooden bluff overlooking the city of Verdun in northeastern France, is a huge, cruciform vault: 150 yards of white limestone surmounted by a 150-foot tower resembling an artillery shell. The monument honors the 700,000 French and German soldiers who were killed in the scarcely believable carnage of the 1916 Battle of Verdun, the pivotal engagement of World War I. The interior is an echoing, cave-like cloister punctuated by 18 alcoves standing over as many burial chambers. It is only when the visitor quits the oppressive cavern and emerges into daylight that he notices the little windows running along the outside walls. Something grayish-white catches the eye, and it requires a few seconds to realize that it is human bones: endless stacks of anonymous human bones, 500 cubic feet of them under each alcove, the remains of 130,000 unidentified men collected after the 1918 armistice. More eloquently than any speech, position paper or strategic concept, the Douaumont Ossuary explains why the French built the Maginot Line.

A network of fortifications conceived as an obstacle to any future German invasion, the Maginot Line is notorious as a universal metaphor for bungling. But in fact it was not quite the abject blunder it has been made out to be. In many ways, it was a model of ingenious engineering and technological accomplishment. It was designed to do certain things and in those succeeded admirably. Its shortcomings derived not from failures of execution but from the inability of its proponents to anticipate how much warfare would change in a mere two decades.

Certainly no one could blame the French for trying. *La Der' des Der'* (The Last of the Last) they called World War I, when the nightmare finally ended. France was bled white, its finances a shambles, its northern provinces devastated. From the president of the republic to the lowliest peasant, the same appalled determination gripped the French as the nation headed into the 1920s: *plus jamais ça.* Never again. Less than two years after the armistice, a Superior Council of War directed by French president Alexander Millerand was already considering the best design for a fortified wall. Germany had invaded twice in the previous 50 years. Now, Millerand and his experts saw it coming again.

They were right, but there was something of the self-fulfilling prophecy in their mind-set. French foreign policy and the draconian strictures of the Treaty of Versailles, which Germany was obliged to sign, must share some of the blame for the rise to power of a revanchist firebrand named Adolf Hitler. It is an indication of the state of European relations in those pre-Common Market days that France's Teutonic neighbor was known as the "beast that sleeps on the other side of the Rhine."

It was not until January 1930 that appropriations for the anti-German frontier fortress came to a vote in the Chamber of Deputies. The minister of war, a veteran who had been seriously wounded in 1914, was the session's main speaker. His name was André Maginot. "Whatever form a new war may take," he warned, "whatever part is taken in it by aviation, by gas, by the different destructive processes of modern warfare, there is one imperious necessity, and that is to prevent the violation of our territory by enemy armies. We all know the cost of invasion, with its sad procession of material ruin and moral desolation."

It was settled then: France would protect future generations behind a wall of high technology. The deputies gave Maginot a huge budget for a five-year building program. Inevitably, there were cost overruns and revisions, and it was necessary to extend the ambitious project year by year. Final touches on the Maginot Line, the so-called Great Wall of France, were still being completed in 1939 when war was declared.

Predictably, the Line turned out to be a bigger bite to chew than most of the enthusiastic legislators had anticipated. There were 471 miles to cover opposite Germany, Luxembourg and Belgium to the North Sea—not even counting the border with Switzerland or, worse, Italy, where Benito Mussolini was making bellicose noises. Army engineers faced a daunting challenge.

The plan was to defend five great swaths of territory: the Italian frontier, from the Mediterranean to Switzerland; the border along Switzerland itself; the Franco-German separation along the

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Rhine, from Basel to Wissembourg, a small city at France's northeastern point north of Strasbourg; from there westward to the Ardennes Forest; and thence along Belgium's southern frontier westward to the English Channel.

Some sections were relatively simple. The border with Italy, already fortified in the 19th century, was extremely mountainous. The old forts would be updated, and modern, reinforced-concrete ones would be added. The border with Switzerland was considered safe, the country being a little porcupine of a fortress all by itself.

The long section along the Rhine looked secure to the Maginot planners because the river itself was a wonderful barrier, needing only to be reinforced with mines, barbed wire, riverbank machine-gun bunkers, infantry and, a few kilometers back, a series of small, cheap "generic" forts and bunkers, each manned by no more than 20 to 30 soldiers. French military experts calculated that their steel-domed, concrete machine-gun bunkers would withstand any light weapons, while cannon heavy enough to subdue them would breach dikes in the area and create a flood that would only make matters even tougher for the invader.

Above and west of the Rhine, two crucial areas where French soil met German soil received the most exquisite attention and the lion's share of funds: the Lauter River valley near Wissembourg and the region around the industrial city of Metz. This, in other words, was Alsace and Lorraine, that ancient Franco-German bone of contention. In these two *régions fortifiées,* French engineers poured a debauch of energy and inventiveness into some 50 *ouvrages,* or large fortifications. In the gaps between they strewed a seemingly impenetrable swarm of smaller blockhouses.

Each ouvrage lay within cannon reach of another one, allowing commanders to call on a neighbor to lay a barrage of antipersonnel fire directly on top of their fortifications if enemy troops appeared, an operation known as "delousing." The same cannon could, of course, free the smaller blockhouses of their "lice" with friendly fire. Every eventuality seemed to be covered.

The ouvrages were of an entirely new type, as revolutionary, and as hyped in the press, as such later French technical innovations as the air-suspended Citroën automobile and the Concorde supersonic plane. Buried 100 feet and more under hills and ridges, they all followed a similar design based around a long central tunnel of stone and reinforced concrete with a "life zone" at one end and fighting zone at the other, reached by secondary tunnels, stairways and elevators. The largest of the ouvrages, manned by 1,000 or more soldiers, had five miles or so of tunnels through which men, equipment and munitions were transported by trolley—dubbed the *métro*—a photogenic novelty that repeatedly adorned the front pages of prewar newspapers.

Powered entirely by electricity and equipped with everything from wine-storage areas by the kitchen to a dentist's chair, jail cell and morgue, each ouvrage was a self-sufficient unit, a little underground city with its own wells, food supply and power generator, capable of up to three months of total autonomy, like a submarine underwater. The World War I obsession with gas attacks was parried by a ventilation-filtration system that created a slight overpressure within the fortifications, and as in naval warfare, the cannon crews fired blind, guided by ground-level observers telephoning to subterranean fire-control command posts.

The typical ouvrage took the shape of a gigantic tree sprawling underground. The command and living areas were the roots, from which a long trunk tunnel led to branch tunnels, which led to individual bunkers armed with cannon, mortar and machine guns—up to 17 of them in the biggest fortifications. The cannon (mostly paired sets of the venerable, but still deadly accurate, French 75s) were housed in steel "pop-up turrets" set inside circular shafts of reinforced concrete. With nothing but the easy arc of a rounded steel dome protruding aboveground, the weapon was practically invulnerable when retraced. When the orders to fire were given, the dome rose about two feet to expose the twin barrels within the rotating shaft.

Inside each cannon turret, a diorama of the surrounding countryside was drawn (and often prettified and colored by bored gunners) along the circular wall, allowing artillery crews to visualize the targets corresponding to the numbered coordinates sent up to them by fire control. And naturally, the French—being a mathematically inclined people—had previously calculated every square yard within each cannon's range and assigned its coordinate.

The ouvrage of Simserhof at Bitche, a pretty little city near the western edge of the Lauter fortified region, is nicely representative of the clever defensive ideas poured with such prodigality into the Line. One of the half-dozen Maginot ouvrages that have been tidied up and opened to the public, Simserhof's gloomy netherworld is so replete with tricks that visitors are tempted to conclude that French military engineers must have actually had fun imagining the perfect modern fortress: take that — and that!

The main entrance is reached via a retractable steel drawbridge over an antitank ditch, after which a seven-ton steel door set into the hillside gives onto nearly three miles of concrete passageways, lying at an average depth of 118 feet under Alsatian sandstone. During combat, 812 men worked three eight-hour shifts, "hot-bedding" it like submarine crews. The main entrance, a theoretical weak point despite the tank ditch and the seven-ton door, was protected by a 47-millimeter antitank gun, but in case the defenders preferred shooting men rather than panzers, they could retract the 47 by means of an overhead rail and, presto! slot a heavy machine gun into its place. Many of the Line's machine guns were mounted on cams that raised or lowered the barrels as the guns swept the terrain around them, maintaining their hail of bullets at about a foot above the ground.

Might some of the Germans infiltrate through the machine-gun fire and approach the outside walls, crawling where no one could see them? No problem: a little hand-operated launcher rather like a mail chute would deliver grenades out to the other side, *ploop-bang.*

Harold Smelcer

Arrows show how the Germans went around the Maginot Line, through the Ardennes Forest and across the Rhine. The Line itself stood firm.

Might the enemy somehow get past the door into the passageway? Then they would be mowed down by machine guns in a bunker—a bunker within a fortress!—set into the wall a few meters farther back.

Might they pass the bunker? If worst came to worst, the passageway was mined so the push of a button could collapse the tunnel with a single explosion.

Might they still come on, in spite of it all? Well, the men could evacuate through the secret emergency exit, a special little tunnel leading to a vertical escape shaft.

It is a jewel of ingenuity, this emergency exit, the perfect symbol for the cunning attention to detail that went into the conception of the Maginot Line. Every ouvrage had such an exit, as much as 130 feet of ladder straight up through the protective earth, ending in a well-disguised manhole at ground level. But what if the German discovered the manhole early on? They could attack down through it, couldn't they? The planners had taken that into account: if attackers lifted the cover, they would find nothing but gravel.

The trick was simple. The evacuation shaft was twice as deep as necessary, with the top half being entirely filled with gravel stoppered by a steel gate. The little exit tunnel from the ouvrage debouched at exactly that midpoint. The officer in charge activated a lever, the steel gate opened, the gravel clattered down into the bottom half of the shaft, and the men climbed out.

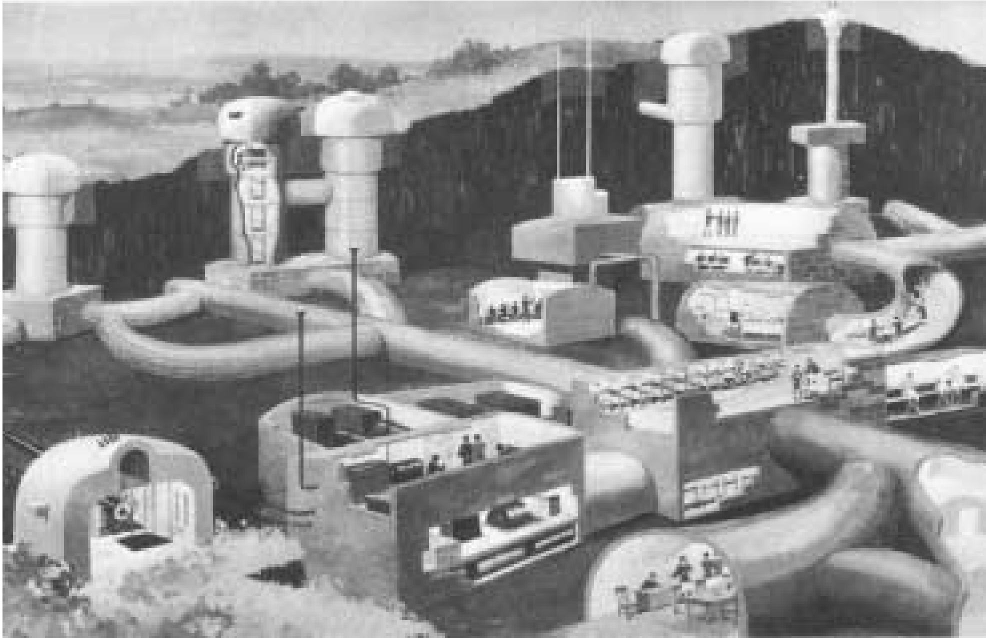
Two thousand laborers worked around the clock from 1929 to 1933 just to dig Simserhof. After that, endless brigades of specialists moved in to equip it.

The problem was that neither time nor budget permitted the French to protect their entire frontier with such formidable defenses. There were gaps, big ones, and the Germans knew it. For all intents and purposes, the Maginot Line ended just east of the city of Sedan, directly under the great forest of the Belgian Ardennes, a natural barrier that the French general staff calmly asserted to be as secure as the Rhine. "With special modifications, the Ardennes Forest is impenetrable," said Marshal Pétain in 1934 as he and other top French brass were overseeing the Line's construction. "Therefore, this sector is not dangerous."

Beyond the Ardennes and along the Belgian border to the English Channel, there was no serious effort at fortification. After all, the French reasoned, their ally Belgium was itself a fine barrier to the Germans, a buffer state whose resistance would offer the French an eight-day delay for organizing their defenses. That reasoning was calculated on the walking speed of foot soldiers. But by then the Germans were motorized and mechanized.

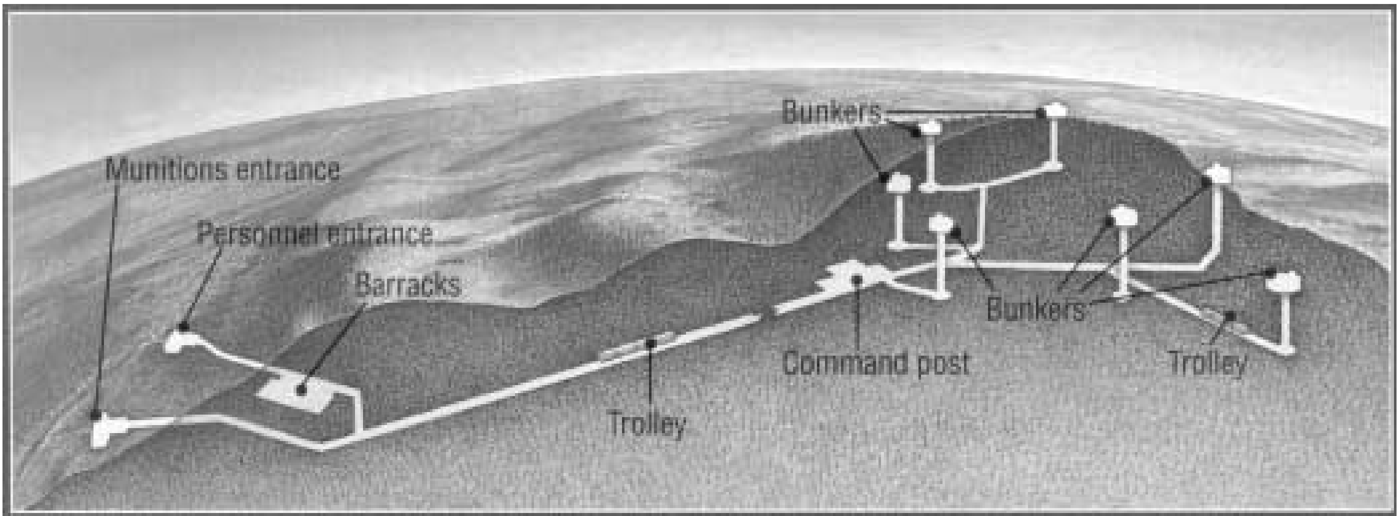
As the crises that led up to the outbreak of war followed one upon another—Germany's reoccupation of the Rhineland and annexation of Austria (the *Anschluss*), the surrendering of the Sudetenland to Hitler under the Munich Pact appeasement policy, Germany's subsequent invasion of Poland—local infantry division commanders in the exposed border regions were allowed to fortify ad hoc, more or less as they pleased, where they pleased. This long stretch soon became decorated with thousands of mismatched little artisanal pillboxes. "*Une misère,*" wrote one commentator, "*une illusion.*"

Pétain's glib assurances about the Ardennes returned to haunt him in May 1940 when the tanks of Gen. Heinz Guderian, the architect of the German Army's revolutionary *Blitzkrieg* (lightning war) tactics, punched an enormous hole in Belgian and French defenses and flooded down through the Ardennes to encircle the home armies and isolate the Maginot Line. Close behind Guderian's tanks, the Germans struck through the Ardennes with 44 divisions. They simply followed the normal civilian roads down through the forest. The Belgians had never carried out the program of modifications—barriers, traps, road destruction—that Pétain had so confidently anticipated. Facing the swift-moving invaders, some 40 French divisions were immobilized within the Maginot Line or as "interval" troops protecting it from without, while an-



Bowring Cartographic

Before World War II, the layouts of the Line's *ouvrages,* or large underground fortifications, were a military secret. Illustrators surmised that they were compact, like battleships (left), when in fact they were elongated and spread out (below). Barracks complete with a wine cellar, a chapel, a dentist's chair and a morgue could house a thousand men. Trolleys carried troops, arms and munitions to combat bunkers through tunnels often more than five miles long.



other 30 or so divisions were stretched out along the border from Montmédy, where the Line ended, to the Channel.

The Germans came with modern tanks, fighters, Stuka dive-bombers and fast-firing cannon, especially the dreaded high-velocity 88s, among the most devilishly effective weapons of World War II. The French had few antiaircraft guns, a scarcity of planes to protect their heads and only outdated tanks on the ground. Out in the open where armies clashed, it was a wipeout. Out-maneuvered, outgunned and outflanked, French field forces suffered a humiliating rout.

The myth of the natural barrier of the Rhine fell quickly. French planners, reasoning that their riverside pillboxes would be immune to attack because heavy artillery would breach dikes in the area, had failed to take into account the flat-trajectory 88s. Small enough to pose no danger to the dikes, their shells nonetheless blasted bunkers to smithereens. The combination of the terrible 88s, Stuka dive-bombers and troops with hand-carried charges then subdued the small forts behind the river, sometimes within minutes.

German gunners developed a simple but deadly tactic for dealing with the exposed machine-gun and observation turrets of smaller fortifications. Repeatedly firing shells from their 88s at exactly the same spot, they burrowed holes, jackhammer-like, through the turrets' 12 full inches of solid steel. Eight shots were generally enough to do the trick, each hit showing in a spectacular spray of sparks and "ringing the bell" by sending massive, head-splitting reverberations through the turrets.

The invaders had enjoyed an earlier measure of success by overpowering the small ouvrage of La Ferté, the Maginot Line's westernmost fortification, located just a few kilometers from Sedan. One lucky shot scored a direct hit into the observation slit of a turret, killing the three men inside. Under cover of an artillery barrage and smoke screen, infantrymen then shoved grenades, smoke bombs and explosive charges into the opening. Over the next 24 hours, those among La Ferté's 106-man crew who survived the initial assault asphyxiated in their spent gas masks. Smoke and

Signal Corps Photo

Troops from an American cavalry unit used a badly scarred Maginot fortification as a shield. Americans fired on such bunkers to see how they would hold up under heavy punishment. They were very impressed.

toxic fumes from the explosions above had filled the tunnels, but the men would not leave. The commander of the ouvrage had written earlier to his wife: “We know that our mission requires us to die on the spot.”

The Germans made heavy propaganda from that victory, but La Ferté was not a true “battleship” of the Line. Built late, when time and funds were running out, it was only a glorified blockhouse, bereft of artillery. Indeed, during the early stages of the invasion, the Germans dealt with the Maginot Line mainly by avoiding it. Then, in mid-June, on the same day Wehrmacht troops entered Paris, they launched Operation Tiger, a direct offensive on the Line ordered by Hitler himself. They attacked in the area of the Sarre River, east of Metz, bringing to bear an incredible variety of weapons that included everything from 88s to an array of cannon that fired comfortably from beyond the range of the Line’s short-barreled 75s. As Stukas swarmed unopposed overhead to add their 250-kilo bombs to the concert, the ouvrages underwent a hellish deluge of fire that impressively plowed the surrounding landscape and occasionally killed lookouts when shells scored direct hits on observation turrets. But deep within their concrete carapaces, the crews went about their business as safely as the Line’s early visionaries had predicted.

In other respects, too, the Maginot Line proved to be every bit as formidable as its builders had hoped. It has often been said that the Germans had an easy time taking the Line from behind because its cannon were “pointing the other way.” In fact, the big guns in turrets were able to rotate 360 degrees, blasting away in every direction. “German officers told me they felt like rabbits trying to run from shotguns,” said Roger Bruge, the author of several books on the Line and France’s leading authority on the subject. Those 75s followed them from step to step, and if ever any vehicle was unlucky enough to get within range, it just got blasted.

It is an incontrovertible fact that the Maginot Line failed to foil a German invasion. Within the space of six weeks, France’s military collapse was total. The most galling irony of all for Frenchman, though, was that the Maginot Line itself never was taken. The fierce German attacks against it failed. The ouvrages held out: not a single artillery piece was neutralized. When the Line was handed over to the enemy, it was still intact.

With the signing of an armistice in June, the fighting was suspended (except for the subsequent resistance of the French underground) until the Allied invasion of Normandy four years later. Unwilling to believe it, still aching for a fight and still operational, the large ouvrages held out until July 1 when, on direct orders from the French commander in chief, the Maginot Line’s forces marched out to be taken prisoner. Resisting further would have been useless vainglory. Now, goggle-eyed like rustics at a county fair, German troops could enter the legendary fortresses and wonder at all the tricks their clever enemy had prepared for them.

During the rest of the war, the Germans made occasional use of the Line for storage, training and field hospitals, and, briefly, against the Americans during the Ardennes offensives. The French Army repossessed it after the war, but modern warfare had rendered it useless. The soldiers padlocked the big steel doors and walked away with a moue of disgust.

A curious mixture of pride and embarrassment still pervades talk of the Maginot Line today in French military and government circles. No one quite knows what to do with it. It won't go away, and it is far too big and ponderously ubiquitous to get rid of. Then, too, there is an abiding fascination with it throughout the world. Today the Maginot Line is associated with France scarcely less indelibly than the Eiffel Tower.

An obvious thought springs to mind: Why not exploit that recognition for tourism? In the Alsatian city of Haguenau, 7½ miles from the German border, Claude Damm struggled with the government for years to get access to the dilapidated and unused ouvrage of Schoenenbourg, near the picture-postcard village of Hunspach. Damm is the president of the Association of Friends of the Maginot Line in Alsace. "So you want to play soldier," grumbled the colonel in charge in Strasbourg, impervious to Damm's argument that, like it or not, the Line had become an important part of France's national heritage and as such ought to be opened to the public. In 1982 Damm finally wrested a key from the Ministry of Defense—there was something comical about undoing a padlock to enter the Maginot Line—and he and his friends and volunteers have been at work ever since, fixing elevators, replacing lights and generally making the ouvrage ready for tourists. Damm's association bred cousin groupings in several different localities throughout Alsace and Lorraine, and today at least six fortifications—Schoenenbourg, Simserhof, Four à Chaux, Hackenberg, Fermont, Marckolsheim—are open for visits under the authority of local townships, and staffed by volunteers.

The military establishment still largely acts as if the Line does not exist, and over the years the government has sold off many of the smaller forts and blockhouses or simply ceded bunkers to farmers whose fields were encumbered with cold concrete. The largest ouvrages are far too vast for civilian use, and although there have been desultory attempts at commercialization—a disco here, a mushroom farm there—such enterprises have usually lasted no more than a few months, as the inherent inadaptability of the military-specific design became apparent. There are said to be a few private houses built atop some of the 30-man blockhouses, which, if nothing else, assures the lords of these curious manors some of the best and most burglar-proof wine cellars anywhere in creation. And, yes, a number of today's happy owners of André Maginot's fortifications are German.