

Introduction

The Corps of Engineers' Role in Coast Defense

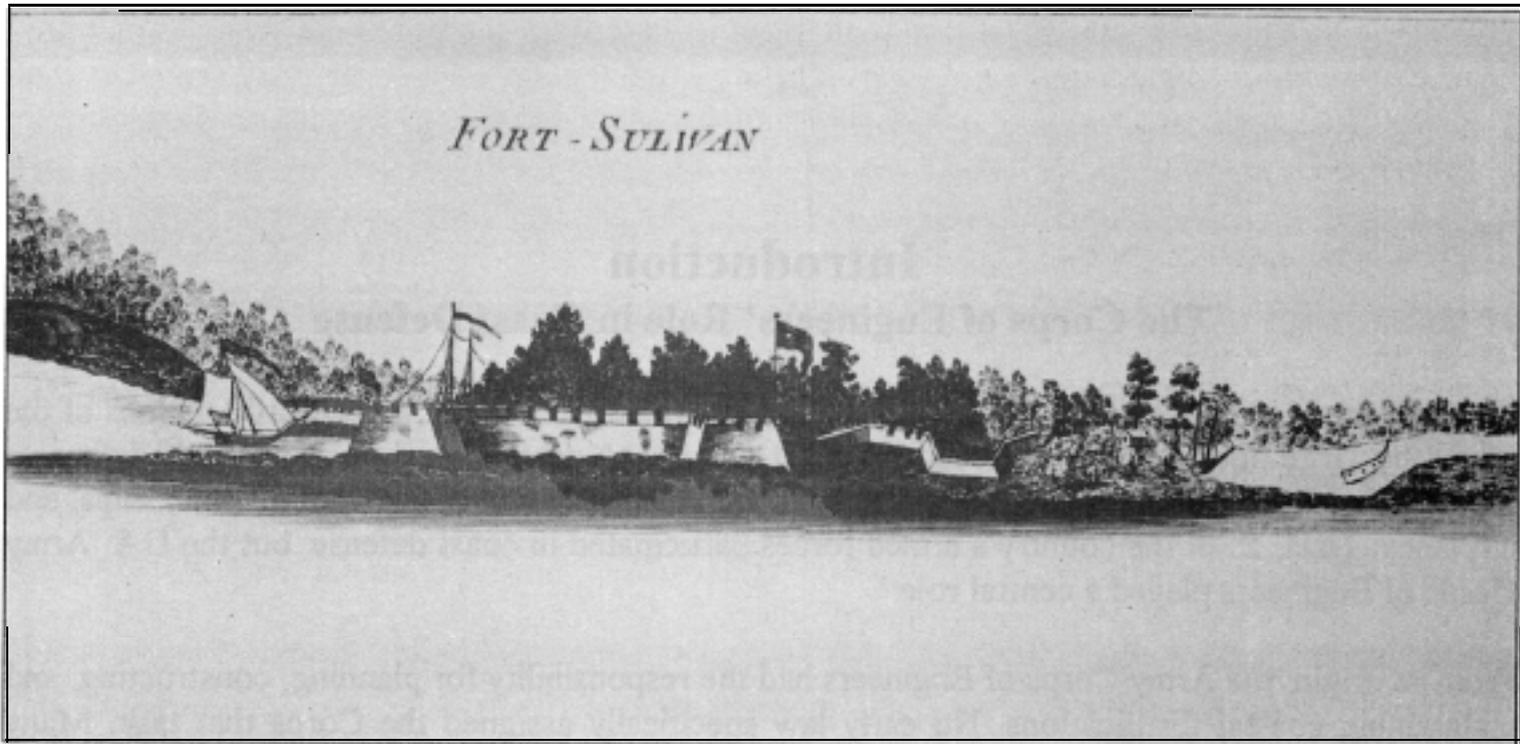
Throughout most of its history, the United States, separated from the other powerful nations of the world by large bodies of water, relied on coast defense to deter enemy invasion. This defensive measure depended on fortifications but also included submarine mines, nets, and booms; ships; and airplanes. Thus, all of the country's armed forces participated in coast defense, but the U.S. Army Corps of Engineers played a central role.¹

From its origin, the Army Corps of Engineers had the responsibility for planning, constructing, and maintaining coastal fortifications. No early law specifically assigned the Corps that task. Many 18th-century Americans, numerous Army officers among them, believed that engineers should undertake the responsibility. Most likely, this belief stemmed from an awareness of the duties of foreign military engineers, especially the French. Colonial experience also taught that engineers were the obvious fort **builders**.²

Initially, the Continental Army had no military engineers. In June 1775, it received authorization to appoint some engineers, and in March 1779, the Continental Congress approved their formation into a "Corps of Engineers." Besides overseeing coastal fortification construction, these engineers placed obstructions in channels and harbors and stretched chains across rivers to prevent the passage of enemy ships. They also experimented with submarine mines, which they called **torpedoes**.³

When the American Revolution began in 1775, many coastal fortifications already dotted the Atlantic coast. Local communities, colonies, and military engineers constructed these defenses, usually earthworks, as protection from pirate raids and foreign incursions. Although seldom used, the forts were a **deterrent**.⁴

Much additional **fortification** construction occurred during the American Revolution. Many of the defenses were simple earthworks, usually erected to meet specific threats. The British built a few more elaborate structures including Mud Fort, later Fort **Mifflin**, at Philadelphia. Similarly, the Americans constructed Fort Sullivan, later Fort Moultrie, at Charleston, South Carolina; Fort Whetstone, on the present site of Fort **McHenry**, at Baltimore; Fort **Mercer**, New Jersey, on the Delaware River; and Fort Washington at New York **City**.⁵



Fort Sullivan (later Moultrie), Charleston, South Carolina, during the American Revolution.

Library of Congress, Rochambeau Collection. U5Z62-46298

After the war, the government abolished the Corps of Engineers and allowed the forts to deteriorate. In 1794, under the threat of war with England, Congress passed its **first** fortification construction bill, which authorized work at 20 locations on the Atlantic coast. A few months later, it added one more harbor-Annapolis, Maryland-to the list of **sites**.⁶

The Secretary of War instructed that these defenses consist of earthen or timber batteries, blockhouses, barracks, and magazines. To garrison them and eventually to direct construction and repair, in 1794 Congress created a Corps of Artillerists and Engineers consisting of 1,000 **officers** and men. The Corps' **officers** lacked experience in managing construction. Therefore, the War Department hired "temporary engineers," mostly Frenchmen, to plan the structures and "agents of fortification" to purchase construction materials, employ laborers, and, at times, supervise the work.' This program was not entirely a federal project. The temporary engineers had to consult with state governors and obtain their approval of plans and sites for fortifications. The government encouraged the states to cede sites for defenses. Some states also furnished the armament for the forts and, at certain locations, appointed representatives to supervise construction.*

The temporary engineers, including men like Stephen Roche-Fontaine and Charles l'Enfant, who had served as engineers in the Continental Army, and the agents of fortification concluded most of their work in 1795. The defenses were a scaled down version of the War Department's original plan. War hysteria had dissipated and Congress was unwilling to pass large appropriations for further **construction**.⁹

Once again the country briefly all but forgot its **fortifications**. The Quasi-War with France **stimulated a** new construction program in 1798 to rehabilitate and complete existing works and erect new ones. Departing **from** their earlier work, the temporary engineers, still mostly foreign, directed the erection of some masonry structures, including Baltimore's Fort McHenry and Philadelphia's Fort Mifflin.”

The next few years brought major organizational changes. In 1799, Congress created the position of Inspector of Fortifications to report on the state of the works. The War Department appointed Major Jonathan Williams to the post two years later. Williams, an officer in the Corps of Artillerists and Engineers, had already published a treatise on fortifications. In 1802, Congress enacted an even more important law establishing a Corps of Engineers. The legislation assigned the Corps to West Point, New York, and stipulated that it would constitute a military academy!

In October 1802, the new Corps of Engineers reached its authorized initial complement of seven officers, all assigned to West Point. Soon, though, the Secretary of War began ordering Corps **officers** to fortification duty. Although Congress appropriated only paltry sums for this work until 1807, the engineers did accomplish some construction at Norfolk, Virginia; New York Harbor; Portsmouth, New Hampshire; Smithville, North Carolina; and New Orleans, Louisiana!¹²

Following the Chesapeake affair in 1807, Congress, fearing a second war with England, passed a large appropriation bill for fortifications. Thanks to the Military Academy, which then provided a rudimentary military engineering education, the United States had American military engineers available to plan and supervise fortification construction. Therefore, the Secretary of War ordered Williams to Washington to prepare a system of defenses. Soon afterward, Williams dispatched Corps **officers** to various areas where they would direct fortification rehabilitation and construction.¹³

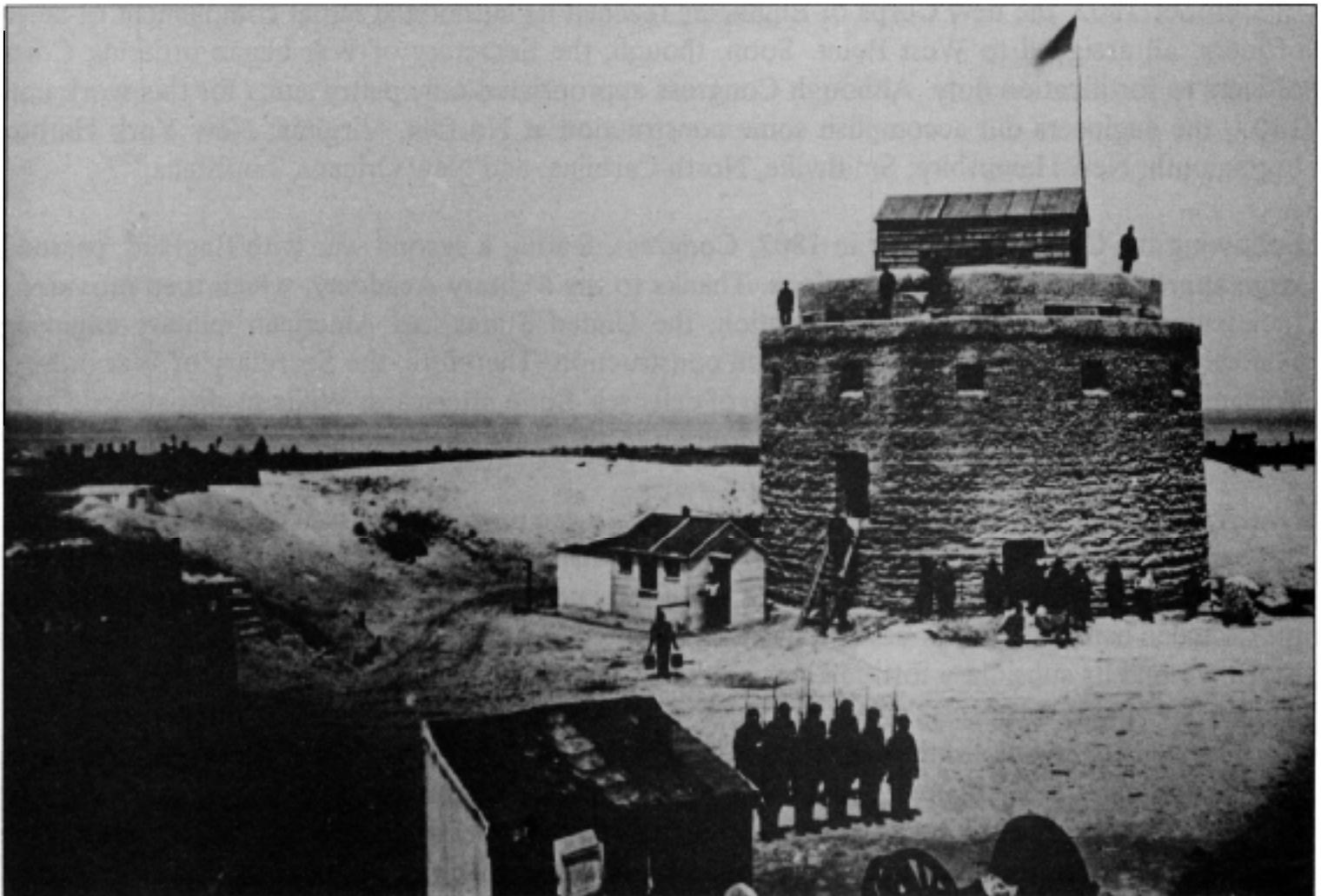
Differing considerably from earlier coastal defenses, these new works consisted of “**open** batteries, masonry-faced earth forts,” and more permanent “**all-masonry ones**.”¹⁴ During the second war with England, in 1812-15, the mere existence of these forts generally deterred the British from attacking the defended harbors. In a few cases, the British did assault the defenses. At Baltimore, in 1814, Fort McHenry and its subsidiary fortifications halted a determined landing attempt?

The War of 1812 stimulated the construction of fortifications. At New York City, Brigadier General Joseph G. Swift, Chief Engineer, used volunteer laborers in the construction of an extensive system of batteries, towers, and redoubts that supplemented the more permanent works. Other construction occurred at various localities such as Portsmouth, New Hampshire, and New Orleans, Louisiana?

In 1816, the War Department created a Board of Engineers to study coastal defenses and recommend changes. Simon Bernard, a former officer in Napoleon's army with vast experience and knowledge, accepted a commission in the United States Army as an assistant engineer and served as head of the board. Composed of one **officer** from the Navy and three from the Corps of Engineers, the Bernard

Board visited numerous sites and developed plans for new fortifications. Its first substantive report, released in 1821, established an ambitious construction program that remained the basis of the coastal defense system until the Civil War.”

With site surveys conducted by the Army’s Topographical Engineers, the Bernard Board designed fortifications based on the needs of specific locations. These defenses included large masonry structures such as Fort Adams, Rhode Island; Fort Monroe, Virginia; and Fort Pulaski, Georgia. Elsewhere, engineers erected smaller forts, for example, the martellos-masonry towers mounting one or two guns and manned by small forces-on Tybee Island, Georgia, and Lake Borgne, Louisiana. The board intended that the new fortifications, large and small, would provide adequate, permanent security for the entire country.”



Martello Tower, Tybee Island, Georgia, during the Civil War. Spaniards built it in 1557.

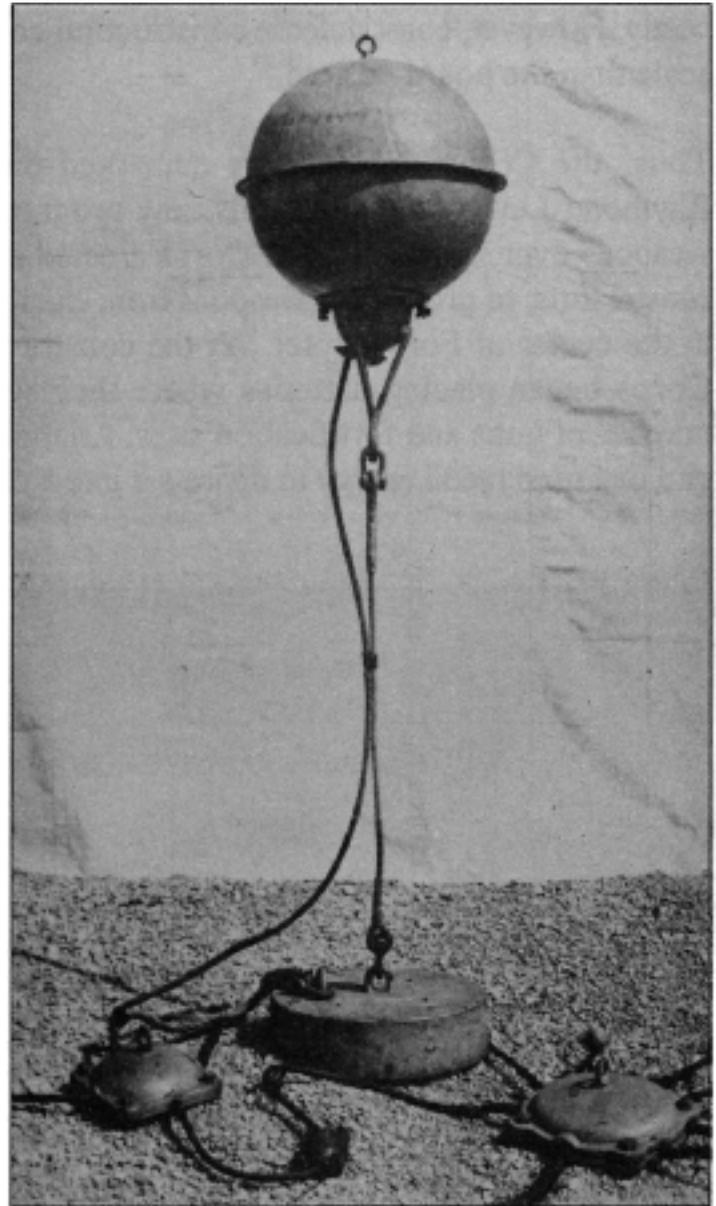
Massachusetts Commandery, Military Order of the Loyal Legion,
and the U.S. Army Military History Institute, 21-1043

Meanwhile, weapons technology was rendering these fortifications obsolete. During the Civil War, heavy rifled guns with newly developed ammunition partially reduced Fort Sumter, South Carolina, and Fort Pulaski, Georgia, to rubble. At Fort Sumter, the Confederate defenders piled earth and sand before and behind the masonry walls, making the fort impervious to enemy shelling. As a result, both Union and Confederate engineers began erecting earthen coastal forts and batteries, generally forsaking the old masonry structures.¹⁹

In addition, the Civil War saw the use of the underwater mine as a supplementary coast defense measure. The Confederacy, without a large navy to protect its harbors and rivers, used submarine mines—often called torpedoes—to protect its waters from attacks by Union ships. Matthew Fontaine Maury, first chief of the Confederate Torpedo Bureau, used mostly contact mines, which exploded upon impact with a vessel, but experimented with other types. This defensive measure inspired David G. Farragut's often-quoted statement, "Damn the torpedoes, full steam ahead," uttered during his attack at Mobile Bay.²⁰

Although the Corps of Engineers maintained many of the masonry forts after the Civil War, it constructed a number of earthen batteries as primary structures in the 1870s. Actually, in light of Civil War experience, the Engineers were in a quandary over the kind of defenses needed. They were sure, however, of the need for a practical submarine mine.²¹

In 1866, Congress abrogated the Corps of Engineers' supervision of the U.S. Military Academy at West Point. The Corps established its new home at Fort Totten in New York Harbor, where it created an Engineer School of Application. Some of the school's staff, especially Major Henry Larcom Abbot, began experimenting with submarine mines. Disregarding contact mines, they attempted to develop a reliable electrically detonated device. As an outgrowth of this work, the War Department established the School of



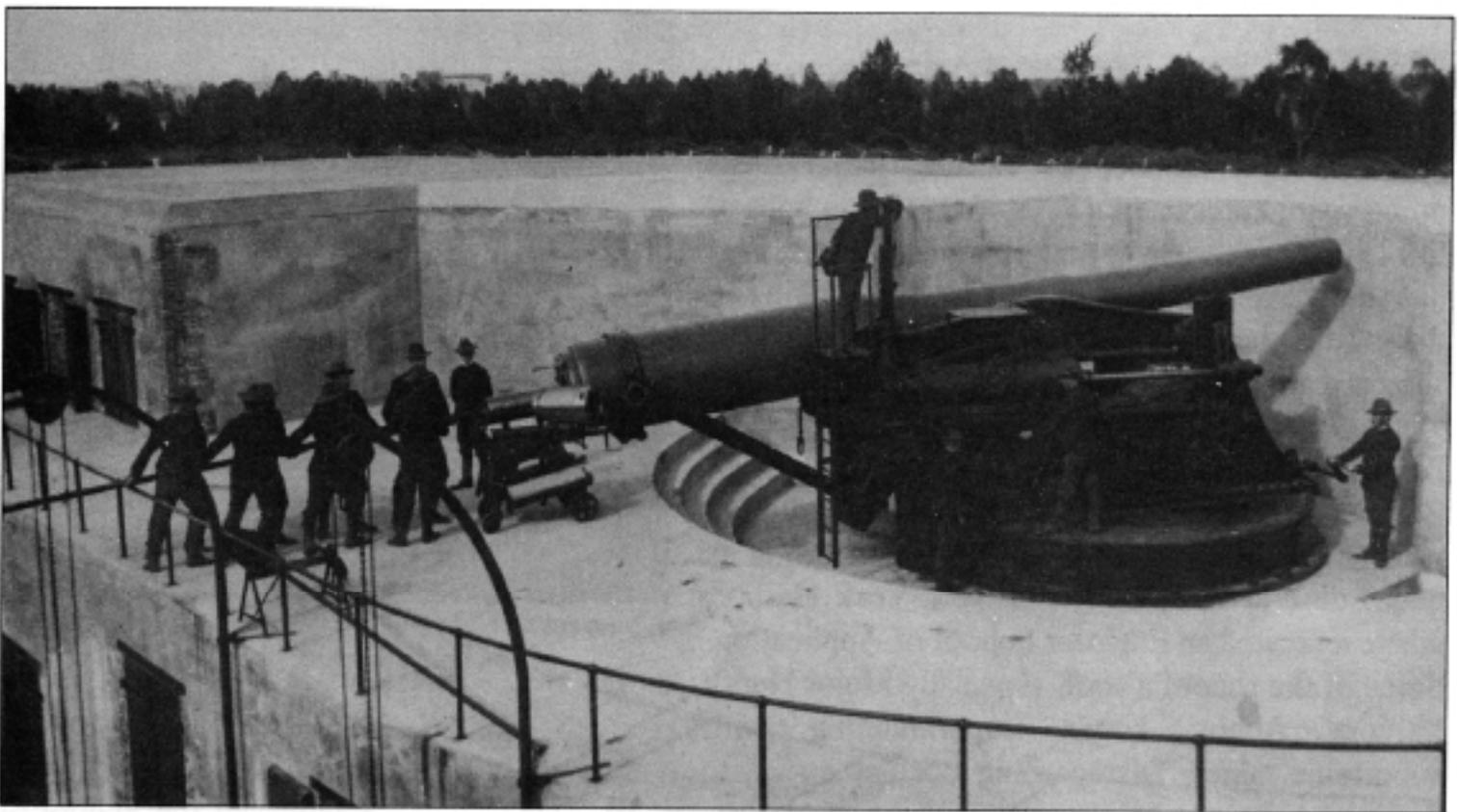
A buoyant torpedo (submarine mine) and connections.
National Archives, 77-F-179-39-61

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Submarine Defense and Torpedo School at Fort Totten in 1901 when it transferred responsibility for submarine mines to the Coast Artillery Corps.²²

Meanwhile, President Grover Cleveland established a new board to study coast defenses and make recommendations. Under the chairmanship of Secretary of War William Endicott, the board's combined Army, Navy, and civilian membership analyzed the coast defense situation and released its findings in 1886 with proposals. Congress considered the Endicott Board's ambitious program too costly. However, coast defense construction conformed to the recommendations, albeit on a smaller scale than the board desired.=

Thus, the Corps of Engineers embarked on another large construction program. As Emanuel Raymond Lewis has noted, this new program departed from earlier ones because it emphasized weapons over structures. The Corps erected numerous concrete batteries, at first in or near former coastal forts, to protect the weapons from enemy fire. For example, the Engineers built Battery Huger in the center of Fort Sumter. As the construction continued and the range of guns increased, the Corps began placing batteries where their weapons could best cover the harbor, decreasing the number of guns and fortification sites. An important aspect of these batteries was the disappearing gun that used recoil energy to depress it into a covered position where crews could reload in safety.²⁴



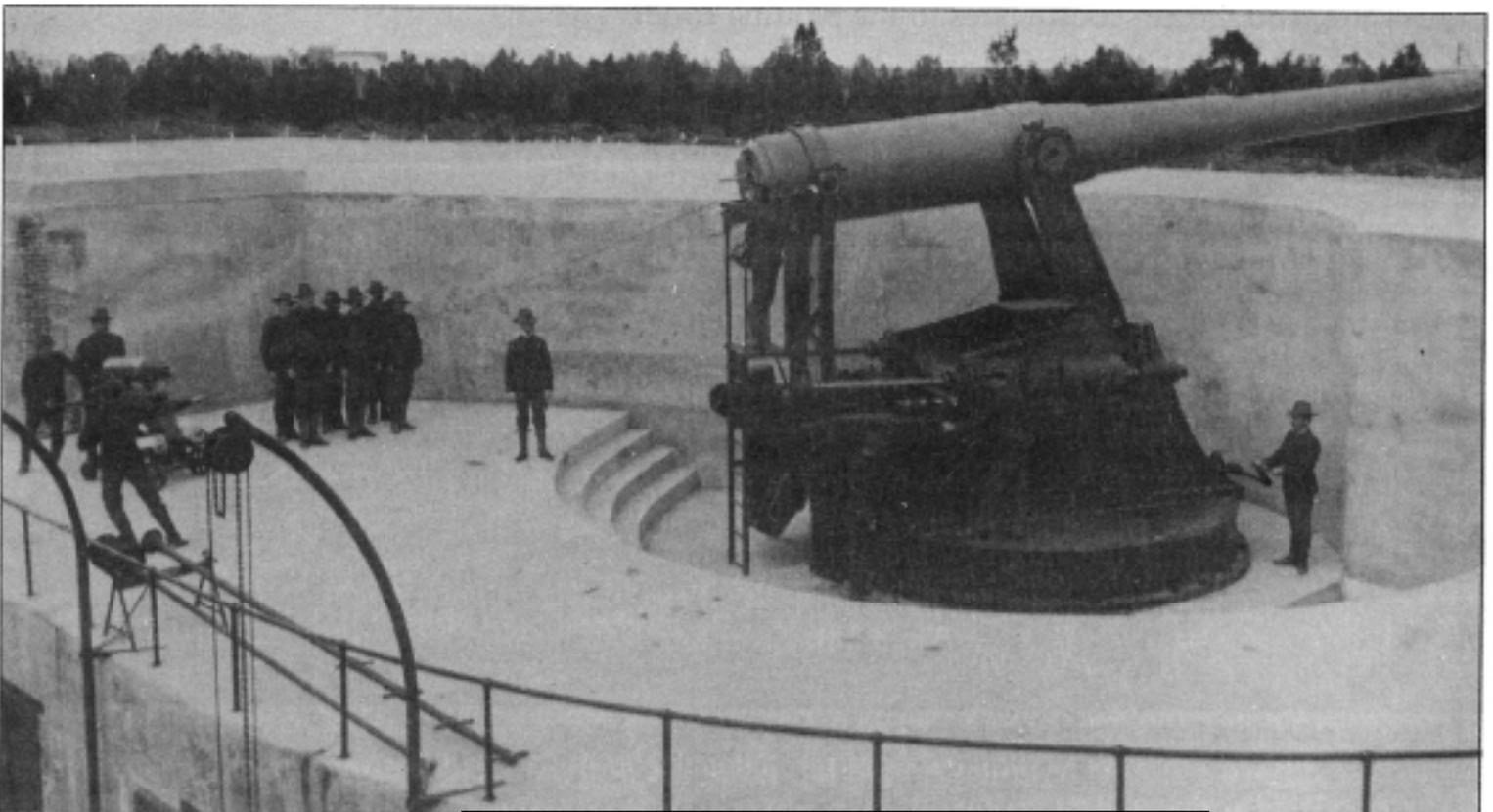
Loading position of a 10-inch disappearing gun, "Sandy" Hook, New Jersey.

National Archives, 77-F-45-113-1

Appropriations for coast defense after 1886 were minimal at first, but the Spanish-American War influenced Congress to release much more money. Increased funding continued after the war, causing the Corps of Engineers to step up its construction program. Then, in 1905, President William Howard Taft convened a new board to consider the Endicott defenses and the effect of new technology. This Taft board did not substantially change the battery structures and weapons but stimulated the addition of accessories that the Endicott Board had recommended. These consisted of searchlights; electrification of lighting, communications, and projectile handling; and more sophisticated aiming systems.²⁵

In addition, the acquisition of new territories during the period required batteries at overseas sites. Therefore, the Corps of Engineers began fortifying the Panama Canal as well as Hawaii, Cuba, and the Philippines. In the Philippines, it built Fort Drum, a unique “concrete battleship,” on El Fraile, a large rock in the entrance to Manila Bay. This two-story, self-contained structure had two armored turrets, each with a pair of 14-inch guns.²⁶

When World War I began, some Americans felt insecure about United States coast defense. Many weapons were outdated, guns on European naval vessels outranged those of the U.S. Coast Artillery Corps, and submarines could enter harbors undetected. To remedy this situation, the Navy and Army installed submarine nets in various harbors, the Coast Artillery Corps laid submarine mines, the Corps



Firing position of a 10-inch disappearing gun, Sandy Hook, New Jersey.

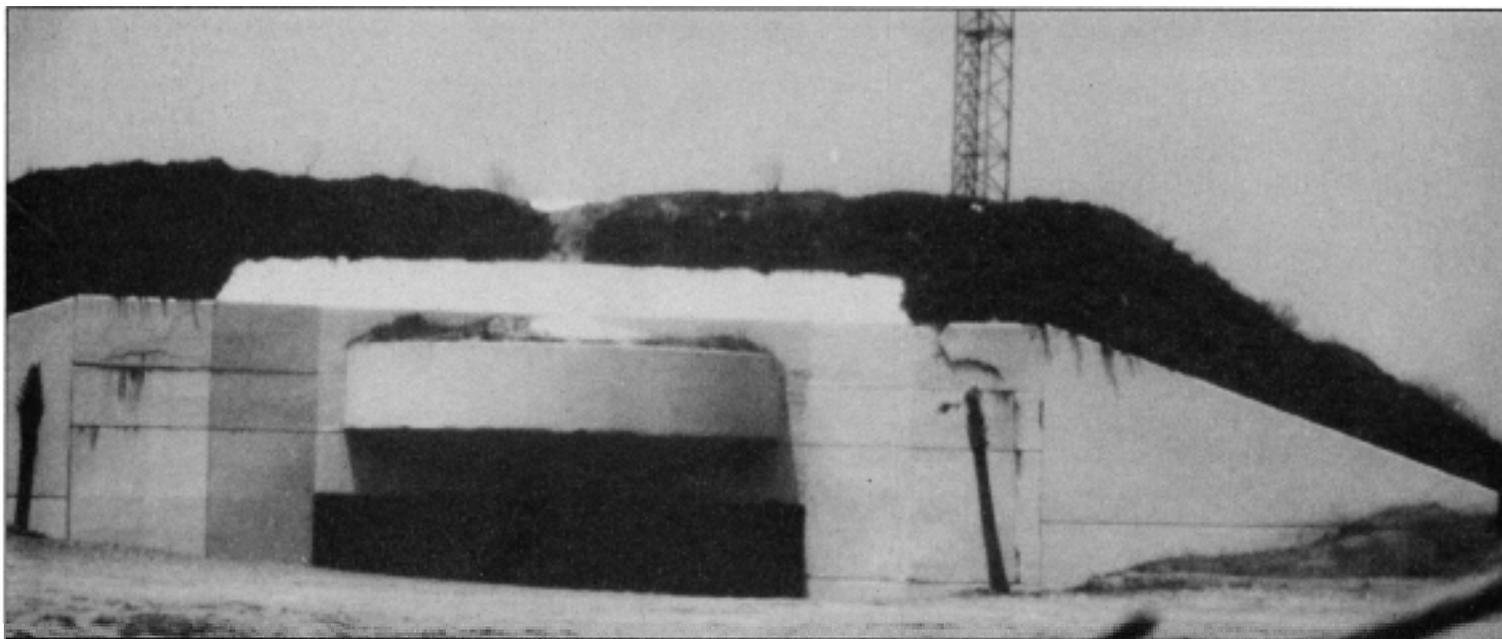
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of Engineers erected new batteries, and Congress provided for an increase in the armed forces. As more and more men embarked for Europe and the enemy threat to American shores abated, personnel and funds for coast defense declined.”

Major changes occurred after the war. The Coast Artillery Corps accelerated its conversion to less costly mobile artillery, drawn by rail or tractor. Also, the War Department began mounting large guns on fixed defense, high-angle, barbette carriages that allowed 360-degree rotation. The Corps of Engineers scattered these uncovered guns, usually in batteries of two, over a coastal site to keep enemy ships and aircraft from finding and destroying them. Such protective dispersion was their only security.²⁸

As World War II approached, Congress provided larger appropriations for fortification construction. Fixed positions once again became the primary defense, relegating mobile artillery to a secondary role. Except for a few variations in design and gun sizes and experimentation with turrets, the Corps of Engineers began erecting a standard two-gun concrete battery. Between the guns, the battery encased the magazine and power plant and sometimes the plotting room and quarters under a reinforced concrete shield covered by many feet of earth. The big guns, 16- and 12-inch, were in casemates with only part of their tubes protruding. Mounted outside the battery, the smaller 6-inch guns had an armored shield. At various distances from the batteries were base-end stations-observation towers-where personnel could watch enemy movements, assess the effect of artillery fire, and furnish coordinates to the plotting room.²⁹



A 12-inch gun casemate from World War II, Fort Crockett, Galveston, Texas.

Photograph by Dale E. Floyd

The increased range of military airplanes, aided by the aircraft carrier, influenced the Army to undertake a passive defense program for the concealment of military installations and ammunition and assembly plants in the United States. In the summer of 1940, the Corps of Engineers, which had been responsible for camouflage operations in the American Expeditionary Force during World War I, received the passive defense mission in the United States and overseas. It conducted research, established a camouflage school at Fort Belvoir, and trained other Army personnel in its Districts. Army Engineers devised various methods to conceal coastal batteries, including using camouflage nets and paint, planting trees and shrubs around the emplacements or erecting fake ones, and constructing dummy emplacements and houses. Immediately after Pearl Harbor, such activity was intense but, as the attack and invasion hysteria subsided, the program waned.³⁰

Corps of Engineers construction at coast defense sites diversified during World War II. The Corps built numerous antiaircraft emplacements at various installations. Then, in 1941, the Engineers took over the Army Quartermaster construction duties, including erecting and maintaining barracks, quarters, and administration buildings at the posts.³¹



Camouflage Battery Jasper, Fort Moultrie, Charleston, South Carolina, in World War II.

Fort Sumter National Monument

After the war, the Corps of Engineers completed some of the batteries begun in wartime, halting construction in 1948. The country, however, scrapped most of the coast defense guns by 1949, and the Army discontinued the last of the harbor defense commands in 1950. In that same year, the Coast Artillery Corps disappeared, consolidated with the Field Artillery into an Artillery branch. Coastal fortifications had no place in the missile age.³²

Notes

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