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Memorandum

To: Superintendent, Fort Frederica National Monument

From: Supervisory Historian Bearss, Historic Preservation-East, Denver Service Center

Subject: Southeast Forts Manuscript

Enclosed you will find the subject manuscript which we have prepared at your request. It has been reviewed by Messrs. Bob Ferris and Jim Charleton, the capable and perceptive editors of the National Survey of Historic Sites and Buildings Series, and by Dr. Ray Lewis, author of the monumental work Seacoast Fortifications and their suggestions and comments have been incorporated.

The manuscript may be longer than you contemplated, but we fail to see how it can be cut and still cover the subject.

Edwin C. Bearss

Enclosure

COASTAL FORTS OF THE

SOUTHEASTERN UNITED STATES

Bastions of History: 12 Forts in the National Park System That Illuminate Four Centuries of our Heritage

By: Edwin C. Bearss

Coastal fortifications have fascinated people for centuries. A vital and intriguing part of the American scene from the time the first European colonists landed until the present, they lure the visitor with the aura of romance from a bygone era and rich sense of history. These forts, in their architecture, weaponry, and use reflect many facets of our history from the 16th century until the atomic age.

Scattered along the seacoast of the Southeastern United States, from Baltimore's Fort McHenry to Mississippi's Ship Island, are numerous forts, batteries, and associated structures and sites. Those that the National Park Service interprets, protects, and preserves are splendid examples, and visits to them whet historical interest and stimulate the intellect.

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Upon landing in the New World, French, Spanish, and British colonists gave first priority to their protection. Arriving as they did by ship, their first settlements were always on sheltered bays, coves, inlets, or estuaries. Although the Indians were a threat to be reckoned with, the newcomers were much more concerned about defense against rival colonial powers and pirates. Stoking these fears were the religious wars that convulsed 17th-century Europe.

These first forts, because of limited resources and time, were hurriedly erected of earth and wood and were soon ravaged by weather and time. Unless rebuilt periodically, they disappeared, As population grew, a viable economy was developed, and boundaries were defined, the Spanish and British, the two nations that persevered, constructed masonry defenses at key ports and harbors.

Visitors interested in the two-century struggle between France, Spain, and Great Britain for dominance of the present Southeastern United States will want to visit certain National Park areas: Fort Frederica Fort Caroline, Castillo de San Marcos, Fort Matanzas, Fort Raleigh, Jamestown Island, Gulf Islands, and Cumberland Island. There they will find the coastal defenses and sites that provided the colonists a haven of refuge and furnished the military a base from which to strike the foe.

Britain finally prevailed over her rivals, but before long her colonists sought their independence. Upon gaining control of the provincial governments in Maryland, Virginia, the Carolinas, and Georgia, the Whigs lost no time in repairing and strengthening existing coastal defenses and throwing up new ones. These fortifications, because time and money were restricted, were temporary and positioned to guard the sea approaches to population and governmental centers. For these reasons, they did not long survive the Revolution. Sites occupied by these forts are the following Park Service areas: Fort McHenry, Fort Sumter, Fort Pulaski, and Gulf Islands.

Once independence was won, the Confederation Congress (1781-89) promptly dismantled the new Nation's military establishment. Coastal defenses, receiving little or no maintenance, rapidly fell into disrepair. Some works and their armament entirely disappeared. Upon adoption of the Constitution and the inauguration of George Washington as first President in 1789, the Federal Government became responsible for the country's defense. But, until confronted by foreign aggression at sea in the mid-1790s, it paid no more attention to coastal defense than had its predecessor.

To meet the challenge from abroad, an emergency program, in which the States participated, resulted in construction of what were to become known as the Nation's First System of coastal defense. Once the danger had passed, nearly all these forts and batteries, whose construction had been hurried and temporary, were permitted to decay. This represented a continuation of the policy of ignoring national defense except when threatened by attack.

By 1807 the United States was again embroiled in international difficulties, and American blood had been shed at sea. Again, Congress responded to the danger by authorizing and funding a coastal defense program. Fortifications, many of masonry, were built, armed, and manned. These Second System defenses, along with several late First System works, were tested in combat during the War of 1812 with Britain.

During the next half century, coastal fortifications played a major role in the Nation's defense posture, as well as in the local economies. The American people, suspicious of a large standing army and believing in the militiaman concept, embarked on well-planned programs. Massive masonry fortifications were erected for protection of important ports and harbors. These works were expensive and required large annual appropriations. Construction was time-consuming. At times international disputes resulted in an acceleration of the program, while cyclic depressions caused stoppages and cut backs. A weaponry revolution that occurred during the Civil War made the masonry forts of the American Third System as well as those of the earlier two systems obsolete.

Coastal defenses belonging to these three systems and that illustrate their evolution are found at these Park Service areas: Fort McHenry, the Forts Washington and Hunt units of the National Capital Parks, Fort Sumter, Fort Pulaski, Fort Jefferson, and Gulf Islands.

In the years right after the Civil War (1861-65), the Army, which had studied and evaluated the wartime lessons, sought to modify its masonry coastal defenses. In 1876 Congress, spurred by the continuing revolution in weaponry, put a stop to this useless expenditure of public funds. By the late 1880s, however, the situation had seemingly stabilized. On land, powerful new guns and carriages had been developed, tested, and placed in production. At sea, formidable new warships were being launched by the naval powers.

It was time that the United States again improve her coastal fortifications. Beginning in 1891, the massive reinforced-concrete batteries and emplacements of the Endicott System were constructed. These costly works and their equally expensive and complex armaments were sited to protect key harbors, ports, and naval bases. Their erection sometimes resulted in the modification of existing earlier system masonry complexes.

The emergence of the United States as a world power after the Spanish-American War (1898) caused an expansion of the Endicott program as recommended by the Taft Board. During and immediately after World War I, the increased firepower of naval armament resulted in construction at selected harbors of new emplacements mounting long-range 12- and 16-inch guns. The increasing effectiveness of airpower beginning in the mid-1930s dictated a major change in emplacement design. To protect personnel and armament from aerial attack, many existing batteries were modified and new ones built to provide protection from air raids.

Fortifications that guarded the Nation's shores from the 1890s through World War II are found at these National Park Service areas: the Forts Washington and Hunt units of the National Capital Parks, Fort Sumter, Fort Pulaski, and Gulf Islands.

THE COLONIAL ERA: INITIAL SETTLEMENT AND THE EUROPEAN POWER STRUGGLE

Early French Probing and the Spanish Response

France was the first European nation to establish forts in the present Southeastern United States. To escape persecution in a nation wracked by bitter religious and civil wars, many Huguenots (Protestants) emigrated to neighboring countries or sought refuge in the New World.

To establish such a haven, Huguenot leader Admiral Gaspard de Coligny dispatched an expedition under Jean Ribaut in 1562 to Florida. The party landed on Parris Island, in present South Carolina. Because the area was claimed by Spain by right of discovery and exploration and the Spanish monarch considered the Huguenots heretics and interlopers, the colonists immediately erected a fortification. It was a small earth-and-log post called Charlesfort. Ribaut headed back to France, but he left volunteers to hold it. They quarreled, abandoned the fort, and returned to their homeland.

The Huguenots were undaunted by this reverse. A second expedition, led by René de Laudonnière, who had accompanied Ribaut to Parris Island, arrived off Florida in 1564. Entering the St. Johns River, the 300 colonists landed 5 miles from the river's mouth, on a broad flat knoll. With Indian help, they built Fort Caroline. The fort was triangular, a bastion being at each angle. A ditch fronted the two land faces, one of which was pierced by a sally port. Commanding the ditch and rising 9 feet above it were sand-and-sod parapets. The interior slopes of the parapets were revetted with fagots.

The gorge and faces of the bastions fronting on the St. Johns were protected by a palisade of timber planks. A magazine, screened by one of the bastions, and several palm-thatched structures were built within.

This French challenge to Spanish hegemony in the New World could not be ignored. Fort Caroline commanded the inshore route navigated by Spanish merchantmen and treasure galleons returning to Spain from the Caribbean. To counter the French menace, King Philip II directed Pedro Menéndez de Avilés, one of Spain's great captains, to establish a settlement in Florida and expel the heretics.

On August 28, 1565, Ribaut arrived with reinforcements for Fort Caroline. That same day, Menéndez made a landfall at Cape Canaveral. He sailed up the coast, looking for the French. On arriving off the mouth of the St. Johns, he sighted Ribaut's ships. Unable because of adverse winds to engage the foe, Menéndez dropped down the coast 30 miles to the mouth of the Matanzas River and established a base that grew into St. Augustine.

When Ribaut learned that the Spanish were fortifying, he left a small garrison at Fort Caroline, and sailed to the attack. A hurricane roared in, scattering his fleet. His ships were driven down the coast, and a number were wrecked.

Menéndez seized the initiative, and marched against Fort Caroline. At dawn in a driving rain, his men captured the fort, and executed most of the defenders. After renaming the work Fort San Mateo and garrisoning it, Menéndez returned to St. Augustine. He learned from Indians that two groups of survivors from the Ribaut party were straggling up the coast, and moved to intercept them. At Matanzas Inlet, 14 miles south of St. Augustine, the Spanish encountered the French. Ribaut and most of his men were captured and massacred.

The French crushed, Menéndez turned his attention to securing the Spanish position. Satisfied with the site of St. Augustine, he had his men construct a fort to guard the approaches to the settlement from both land and sea. Known as Fort San Juan de Pinos, it consisted of a palisade of pine logs, without a ditch.

Spain pressed ahead to consolidate her grip on Florida. Additional sub-posts were established, while missionaries pushed out to the north and west to convert the Indians. In 1568 vengeful Frenchmen, who sailed from Bordeaux, returned briefly to the region, seized and burned Fort San Mateo, but the Spanish grip on the area remained secure. Then in 1586 Francis Drake and his English freebooters captured St. Augustine and burned Fort San Juan de Pinos. Upon the hurried departure of Drake, the Spanish returned and rebuilt the town and the fort. Once again, the fort was of wood and, like seven successors, soon fell a victim to either fires, humidity, or shoddy construction.

Early English Settlement Attempts

Up the coast, 600 miles away, England soon moved to cement her claim to mainland America. In 1584, a year after his half-brother, Sir Humphrey Gilbert, had died in a attempt to settle Newfoundland, Sir Walter Raleigh obtained a charter from Queen Elizabeth to explore and found a colony in the New World. He dispatched Captains Philip Amandas and Arthur Barlowe across the Atlantic to reconnoiter the coast north of Florida. They returned with stories of a fruitful land, and marveled at the rich soil and mild climate, which yielded the Indians three crops of corn a season. Two of the natives were brought back to England. The land that had been explored was subsequently named "Virginia" for Elizabeth, the "Virgin Queen."

In 1585, excited by what he had heard, Raleigh at once dispatched Sir Richard Grenville with seven ships and 108 colonists to "this paradise of the world." They reached Roanoke Island, where it was determined to settle on "a most pleasant and fertile ground." On the northern end of the island, they built a fort under the direction of Ralph Lane and called it "the new forte in Virginia." Nearby the colonists raised dwellings and cleared the fields.

Fort Raleigh, like Fort Caroline, was of triangular configuration and featured three bastions. A ditch fronted the earth-and-sod parapets. A sally port in its gorge provided entry. The two bastions, commanding approaches to the fort from Roanoke Sound, were embrasured and mounted cannon on their terrepleins.

Grenville soon returned to England for supplies and reinforcements. Lane remained as governor. Under his leadership, the area was explored and searched for gold, copper, and pearls. Within a year, the colonists were at war with the Indians and food was in short supply. Taking advantage of the chance arrival of Francis Drake in June 1586, the discouraged Lane and his followers abandoned the colony and took passage with Drake back to their homeland. Shortly afterwards, Grenville arrived with a relief ship. To protect England's interest, he settled 15 men on the island and provided them with supplies for 2 years.

Raleigh did not discourage easily. He promptly outfitted a second expedition, numbering more than 150 men, women, and children. John White was named governor, and ordered to settle on Chesapeake Bay. His pilot refused to take them there, and in July 1587 they stopped at Roanoke Island to look for the men left by Grenville. All they found were whitening bones and the fort, whose parapets were gullied by erosion.

Governor White determined to reoccupy the site. After 6 weeks spent in repairing the fortifications and erecting houses, he and his sailors returned to England to secure supplies and reinforcements for his colony. Because war with Spain had erupted, he was unable to return until the summer of 1590. When he disembarked, no one greeted him. The dwellings had been razed and the settlement area enclosed within a high palisade. Unable to locate the settlers, White returned to England. The fate of his "Lost Colony" remains a mystery to this day, just like the men left by Grenville 4 years earlier.

James Fort and the Founding of Virginia

In 1607 the English came to the New World to stay. That year, three small vessels and 105 adventurers sent by the London Company to settle in Virginia reached Chesapeake Bay. After landing at Cape Henry, they sailed up the James River, and on May 13 the ships dropped anchor at what seemed to be an ideal site on the north side of the river. It was a level peninsula, nearly 3 miles long. The only route to the mainland was a narrow isthmus, which flooded at high tide. On the river side the water was deep enough to allow seamen to moor their vessels close inshore. The area thus possessed natural prerequisites for defense against the Spanish and the Indians.

The colonists selected a site and built James Fort, or Jamestown (named for the ruling monarch James I), as it came to be called. The fort was triangular, with bastions at each angle. The faces--the 420-foot river front and the other two of 300 feet--consisted of sharpened logs firmly set in a trench. The exterior slope of the bastions, each of which mounted several cannon, were faced with logs, inclined at a steep angle. There were no embrasures, and ramps provided access to the bastions' terrepleins. A sally port pierced the palisade of the river face. Fronting the fort was a shallow ditch.

Within the 1-acre enclosure, the settlers built a church, dug a well, and raised two storehouses. Paralleling the 3-sided palisade and a short distance inside it, they built crude daub and wattle thatched huts.

By 1614 a growing sense of security, with an increase in population, had resulted in construction of "two faire rowes" of houses and the opening of a street outside, adjacent to the fort's southeast front. Farms had been cleared and occupied all the high ground on the peninsula. The failure of the Indians led by Opechancanough to destroy the colony in 1622 led to a counterattack and savage reprisals by the whites that eliminated the Indian threat to the colony.

Despite the trials and tribulations of the early James River years, a plantation-small farm economy spread along the coasts and rivers of Tidewater Virginia. Settlers from the Chesapeake Bay area, lured by the prospect of cheaper and better lands, began moving south into the Carolinas. In 1670 "Charles Towne" was established by the Carolina proprietors on the Ashley River about 8 miles above its confluence with the Cooper. Because Spain also claimed this area, the colonists first task was to fortify. By November 1670 cannons were mounted and the town "well fortified soe as not to feare all the Spaniards can doe." When Charleston, 10 years later, was relocated to Oyster Point at the confluence of the two rivers, construction of fortifications continued to occupy much time and energy.

Castillo de San Marcos: Key to Florida

The Spanish had watched the English with growing apprehension since the establishment of Jamestown. An English pirate attack on St. Augustine in 1665 caused Queen Regent Mariana to order construction of Castillo de San Marcos. In 1670, the year the English arrived at Charleston and trespassed on land claimed by Spain, the Viceroy of Mexico determined to provide 12,600 pesos for St. Augustine immediately and 10,000 pesos annually for completion of the Castillo.

Unlike the temporary earth, sand, and log fortifications built earlier by the Europeans in today's continental United States, the Castillo was designed as a permanent defense. Ground was broken in 1672. During the next 23 years, Spanish artisans and Indian laborers erected substantial walls, 30 feet high and up to 12 feet thick, of the native shellstone called coquina, with mortar made from shell lime. A symmetrical work, the Castillo had four bastions, a wet moat, watch towers, sally port, and casemate quarters. Mounted on the terreplein, protected by an embrasured parapet, were many cannon.

During the years the Castillo was under construction, uneasy peace prevailed between Spain and England. In a futile effort to normalize relations, a treaty had been signed in 1670 by which each nation promised to recognize the territory of the other. Black Carolina slaves soon learned that if they escaped to Florida and became Catholics, they were freemen. The English at the same time encouraged their Indian allies to harass the Spanish. This all honed the deep-seated hostility between the rival powers.

Dynastic Struggles and Gulf Coast Fortifications

While the English encroached on land claimed by Spain on the Atlantic seaboard, France, beginning in the 1680s, moved aggressively to secure the lower Mississippi Valley. To counter this threat to her other flank in Florida, Spain in 1698 occupied Pensacola Bay. Fort San Carlos de Austria, a redoubt, was erected on the Barrancas, a bluff commanding the entrance to the bay. Bastions were located at each angle, and parapets were faced on their exterior and interior slopes with logs. There was no ditch.

In 1699 two Frenchmen, the Le Moyne brothers came to the Gulf Coast to fortify and settle. After establishing a base on Ship Island, in present Mississippi, they built Fort Maurepas on Biloxi Bay and then advanced eastward to occupy and fortify Mobile Bay.

In 1702 events in Europe triggered the War of Spanish Succession, or Queen Anne's War as it was referred to by the English colonists, and allied temporarily Spain and France against England. Boldly taking the offensive, Governor James Moore of Carolina, in 1702, moved against St. Augustine by land and sea with more than 1,200 men, half of whom were Indians. They captured the town, but the Castillo and its garrison held firm during a 50-day siege. Moore, learning of the approach of a Spanish relief force, withdrew. Before doing so, his men burned the town, which the Spanish promptly rebuilt. On doing so, they erected a line of earthworks extending west from the Castillo to the San Sebastian River.

The Spanish now struck back, aided by their French allies. Forewarned, the English had strengthened the defenses of Charleston, and had constructed Fort Johnson on James Island. The attack, which came in 1706, failed to capture the city, though the invaders landed and ravaged the countryside. In 1713 the Treaty of Utrecht ended the War of Spanish Succession.

Spain and France did not remain allies once peace returned. In May 1719 the French attacked the Spanish settlement on Pensacola Bay. Fort San Carlos was captured, as well as a recently completed bastioned stockade at Sigüenza on Santa Rosa Island. Four months later, in August, the Spanish recovered the two forts, only to see them fall to a reinforced French force in September. The French razed the fortifications.

The War of the Quadruple Alliance ended in 1721 by treaty, and in November 1722 the Spanish returned to Pensacola Bay. They erected a fort and town on Santa Rosa Island, three-quarters of a mile east of Sigüenza. In November 1753 a hurricane destroyed the fort and town, known as Santa Rosa Punta de Sigüenza. Four years later, on the mainland, the Spanish established a fortified presidio that became Pensacola.

Establishment of Georgia by Oglethorpe and Southward Expansion

The Treaty of Utrecht had failed to define a boundary between Carolina and Florida. Nor did a cease-fire in Europe put a stop to wars on colonial frontiers. Urged on by the Spanish, the Yamassee Indians attacked the Carolinians in 1715. After a savage 13-year struggle the Indians' power was broken and the survivors withdrew into Florida.

Then in 1732 Colonel James Oglethorpe obtained a charter authorizing establishment of the Colony of Georgia between the Savannah and Altamaha Rivers, as a refuge for oppressed debtors from English prisons. When Oglethorpe reached the Savannah in February 1733, he erected a small fort on the south bank of the river and laid out a town that became Savannah.

Oglethorpe's colony provided a buffer between South Carolina and Florida, and it received a warm welcome in Charleston, especially when it became evident that Oglethorpe was an aggressive leader, keenly interested in expansion of British power and construction of coastal fortifications. The Spanish had withdrawn from the region north of the St. Johns, and Oglethorpe moved aggressively to secure the coastal area south of the Altamaha.

In February 1736, 116 settlers landed on St. Simons Island, about midway between Savannah and St. Augustine. Fearing a Spanish response, they quickly built Fort Frederica on a bluff overlooking a sharp bend on the inland passage. Much of the fort was of tabby, a masonry made of lime mixed with stones and sea shells. The work's trace was a half-hexagon, with two bastions and two demi-bastions. The earthen curtains, faced with timber, varied from 10 to 13 feet in height. A ravelin (a detached work with 2 faces forming a salient), mounting several 18-pounders, fronted the waterway, and a wet moat surrounded the fort.

East of, and behind the fort, the settlers laid out a town, which in 1739 was enclosed on its landward approaches by an earthen rampart and moat. On the southern end of the island, 7 miles from Fort Frederica, Oglethorpe's men laid out Fort Simons, a small work. It, with another battery on Jekyll Island, commanded St. Simons Sound.

Meanwhile, Oglethorpe had reconnoitered the inland passage south to the mouth of the St. Johns. On the northwest point of Cumberland Island, he built and garrisoned Fort St. Andrews. Its wood and earth parapet was fronted to the landward by a ditch. There was a ravelin and "a palisade round the bottom" of the bluff.

Concerned that his aggressive expansion into a Spanish sphere of interest would lead to war, Oglethorpe sought reinforcements. In 1738 a 650-man regiment arrived from Europe. Besides reinforcing the garrisons at Forts Frederica and St. Andrews, the troops in 1740 erected and manned Fort Prince William at the southern point of Cumberland Island, commanding the entrance to Amelia Channel. It was strongly palisaded with flankers and armed with 18-pounder cannon.

The advance of the British had alarmed the Spanish. Governor Manuel de Montiano, on his arrival at St. Augustine in 1735, found the defenses of Castillo de San Marcos dilapidated and its armament unserviceable. Three years, however, passed before plans were perfected, and workmen began raising the ramparts and modifying the terreplein. War quickly put a stop to these improvements.

The British soon capitalized on Spain's declining power by declaring war. The outbreak of the War of Jenkins' Ear in 1739 found most of the British forts "run to ruin, being mostly of earth." Lacking the means to repair them, Oglethorpe decided that the best way to keep the Spanish off balance was to take the offensive. In May 1740 he invaded Florida with a force of more than 2,000 whites and Indians. Fort Diego, on the coast 20 miles north of St. Augustine, surrendered and then nearby Fort Moosa. Oglethorpe now invested the town.

To cut off Cuban supplies and reinforcements from Governor Montiano and his beleaguered garrison, the British blockaded Matanzas Inlet. Landing and emplacing cannon on Anastasia Island, they began a bombardment of the Castillo and St. Augustine. The light caliber of their guns and the strength of the defenses nullified the effectiveness of the shelling. Then in mid-July the Spanish succeeded in slipping five small supply-laden vessels through Matanzas Inlet. Because the hurricane season was at hand, Oglethorpe raised the siege on July 20 and retired.

The ire of the Spanish aroused, they prepared to carry the war to the British. Before doing so, Governor Montiano employed a force of craftsmen and convicts to construct a coquina tower on Rattlesnake Island. Guns mounted behind the parapet of Fort Matanzas commanded the inlet.

In June 1742 the Spaniards moved to the attack. On the 21st a dozen vessels attacked Fort Prince William. British gunners more than held their own. Satisfied that Fort Prince William was stronger than

Fort St. Andrews, General Oglethorpe evacuated it and rushed the garrison and cannon to reinforce Fort Prince William.

The Spanish, realizing the British on Cumberland Island would be doomed if Fort Frederica were captured, continued up the coast. On July 5 the armada crossed the bar and engaged Fort St. Simons. After 4 hours, the defenders spiked the guns and withdrew to Fort Frederica. The Spanish landed and took possession of the fort. Montiano then sent a column up the Fort Frederica road. On the 7th outnumbered British ambushed and defeated the Spanish at Bloody Marsh. Unable to reach Fort Frederica overland, Montiano now proceeded up the inland passage with his galleys. Encountering a well-directed fire from the fort, the vessels withdrew.

Re-embarking the soldiers, the Spanish fleet dropped down the coast. On July 18 Montiano and part of his invasion fleet again dropped anchor off Fort Prince William. The demand for surrender was again refused, the commander replying that neither would he yield the fort nor could they take it. A 3-hour bombardment ensued. When two of their vessels were damaged, the Spanish retired to St. Augustine.

In late 1742 an uneasy peace returned to the region. The forts erected by Oglethorpe, following his 1743 departure from Georgia for Britain, were permitted because of lack of maintenance to erode and decay. By 1755 Georgia was virtually defenseless for "there was not a good fortification in the province." In 1752 Spain resumed the construction program that had been interrupted by the War of Jenkins' Ear (and was) designed

to bolster the defenses of Castillo de San Marcos. This was completed in 1756.

In 1762 Spain entered the French and Indian War as an ally of France. This decision was disastrous. As a part of the 1763 peace settlement ending the war, Spain ceded Florida to Great Britain. Before Spain entered the war, the British had taken action to strengthen their coastal defenses. Fort George on Cockspur Island and Fort Halifax were erected to protect Savannah.

Coastal Defenses and the American Revolution

Between 1763 and 1774, as the political and economic difficulties between Great Britain and the 13 colonies became irreconcilable, the coastal fortifications from Virginia south to Florida rapidly deteriorated. Fort Frederica, without a garrison since 1763, became a ruin; "scarce a vestige" remained of Forts St. Andrews and Prince William; and Fort George, though garrisoned by four men, was "almost in ruins." In the Carolinas only Fort Johnson at Charleston and Fort Johnston on the Cape Fear River were in a defensible condition.

Patriot forces in the four southern colonies during the weeks following Lexington and Concord compelled their royal governors to seek safety aboard His Majesty's ships. The coastal forts were seized, garrisoned, and strengthened, by the Patriots. Additional earth-and-log defenses were laid out for protection of key cities and harbors against anticipated British counterattacks from the sea. There was no uniformity

as to plan or armament, the type of materials most readily available dictating the former, while any serviceable cannons or mortars sufficed for the latter. The fort on Sullivan's Island, South Carolina, subsequently designated Fort Moultrie, was typical. A square redoubt, with bastions at each angle, it commanded the ship channel into Charleston Harbor. It was of temporary construction, the parapets consisting of parallel rows of palmetto logs, forming cribs 16 feet apart, filled with sand. The fort, though uncompleted, repulsed an attack by a formidable British fleet on June 28, 1776.

When the British returned to the South in strength in 1780, the army, ignoring the coastal defenses, landed on Johns Island and advanced overland to invest Charleston. Taking advantage of a fair wind, the fleet passed Fort Moultrie. Charleston soon surrendered. Earlier in the war, a British amphibious force, supported by a column advancing north from St. Augustine, had subdued Georgia.

The tide of war in the South turned dramatically at Yorktown in 1781, and by December the British were confined to their Charleston and Savannah enclaves. In West Florida, Spain, having entered the conflict, besieged and captured Pensacola and its fortifications. In 1782 the British evacuated Savannah in July and Charleston in December. By the Treaty of Paris (1783), Britain acknowledged the independence of the United States. The new Nation was bounded on the west by the Mississippi, on the north by roughly the present boundary, and on the south by Florida, which His Majesty's government returned to Spain as part of the peace restoration.

COASTAL DEFENSES 1783 - 1946

The First Program

The United States found itself in possession of a large number of coastal fortifications. But, because these defenses were of earth and wood, they required continual maintenance and protection against vandalism. Neither the individual States under the Articles of Confederation nor the Federal Government after 1789 possessed the resources or interest to maintain them. By the mid-1790s, when the threat of foreign aggression made the Nation look to its defense, the southern coastal forts had been wrecked by weather and man.

By 1794 relations with Great Britain had deteriorated to the point that war threatened. There were remonstrances from the people to Congress, while President George Washington urged the legislators to appropriate funds for coastal defense. On February 28 Secretary of War Henry Knox transmitted to the House of Representatives a report on such "ports and harbors of the United States as require to be put in a state of defence." He recommended that: the fortifications "ought to be of a nature to defend the several ports and harbors against surprise" by a hostile naval force, and"the parapets of the batteries and redoubts should be formed of earth," where possible; and the points to be fortified be garrisoned by troops in pay of the United States.

Based on the Knox Study, Congress passed an act providing for defenses of key ports and harbors from Maine to Georgia. When completed, these defenses became known as the First American System of Fortifications.

To oversee their siting and construction, Secretary Knox engaged eight French military engineers. They were to prepare plans, submit them to the respective governors for approval, and when given, they were to construct the works, "with all vigor and dispatch." They were cautioned that, in view of limited resources and the national emergency, the parapets were to be of earth. Where batteries were erected "on points of land, islands, or other places," some distance from the site to be defended, they were to be covered by an enclosed work in which "a garrison should reside constantly, either in a barracks or a strong block house." Magazines and shot furnaces were to be built at each fort.

From the head of Chesapeake Bay south to Florida, the French engineers, in cooperation with State and local authorities, selected ports or harbors to be fortified. In Maryland these were Baltimore and Annapolis, in Virginia Norfolk and Alexandria, in North Carolina Ocracoke Inlet and Cape Fear River, in South Carolina Charleston and Georgetown, and in Georgia Savannah and St. Marys. Work was commenced and pushed at the militarily most important sites: Baltimore, Norfolk, the Cape Fear River, Charleston, Savannah, and St. Marys.

The Jay Treaty of 1795 normalized relations with Great Britain, but aroused the ire of Revolutionary France. While the diplomats talked, construction slowed and then ceased as Congress cut appropriations for defense. By June 1797 the international situation had again deteriorated, and Congress voted more than $100,000 to resume work on the coastal defenses. The situation became increasingly critical, and in the spring of 1798

as a result of the XYZ Affair, exploded into undeclared war at sea with France. Congress, in what was to become a pattern in times of crisis, appropriated additional funds for "more complete defence" of the principal seaports by fortifications, the casting of 1,300 cannon, and an increase in the military establishment. Additional money was made available by State legislatures and public subscriptions.

The public expressed tremendous enthusiasm for the undertaking, and forts or batteries were completed and armed at St. Marys, Savannah, Charleston, the Cape Fear River, Norfolk, and Baltimore. The conflict was settled by diplomacy in 1800, and with the return of peace military expenditures were slashed. Within a few years, because of the temporary nature of the construction materials, hurricanes, and lack of funds for maintenance, most of the coastal defenses in the Southern States became ruins.

One exception was Fort McHenry. In 1794 Major John J. V. Rivardi one of the French engineers, had prepared plans for the authorized Baltimore defense at the site of Fort Whetstone, a old Revolutionary War defense. Construction proceeded fitfully until 1798. By then a battery and a barracks had been built and some guns mounted. Increased funds became available by that year and work was expedited. By 1802 the five-bastioned, pentagonal fort was essentially finished. Its parapets were faced with masonry, and the armament mounted en barbette. Located on the parade were two brick barracks, two brick officers' quarters, and a magazine. Outside the fort were two water batteries, a frame hospital, and a frame barracks.

Establishment of a Permanent Spanish Fort on the Gulf

Spain promptly joined the First Coalition of European monarchies in the war against the French Republic. To protect Gulf Coast Florida, plans were made for construction of formidable defenses to guard the entrance to Pensacola Bay. Only one of these, a sand parapet-shielded battery at Siguenza, on Santa Rosa Island, was completed by 1795, when the Treaty of Basle ended a war that had been a series of Spanish disasters.

Spain then allied herself with France in war against Great Britain. To defend strategic Pensacola Bay against the British navy, the Spanish military in 1796-98 again fortified the Barrancas. A brick semicircular work, mounting 11 guns en barbette, was built at the foot of the bluff. Designated Bateria de San Antonio, the fort contained a masonry bombproof with three casemates, and was fronted by a ditch.

On the commanding ground behind this water battery, a temporary work, Fuente de San Carlos, was thrown up. Mounted behind its sand-and-sod parapets were 23 cannon and 2 mortars. A ditch and palisade fronted four of the five faces.

The Threat of War and the Second System Forts

The Jay Treaty expired in 1806, and the Nation's commerce was again exposed to harassment by the British. Although Secretary of War Henry M. Dearborn called attention to the need to finish or repair forts of the First System, Congress during the winter of 1806-07 refused appropriations. The country was aroused from its lethargy in June 1807 by

the Chesapeake Affair, and predictably attention was again focused on coastal defense. When Congress convened in December, national defense received first priority. Congress voted the funds desired by Secretary Dearborn and work commenced on the Second System of coastal defense. During the next 5 years, about $3,000,000 in Federal money was poured into the undertaking.

The Second System defenses--which included batteries, masonry-faced forts, and all-masonry works--were more elaborate than the First System. But, as fortification expert Dr. Emanuel R. Lewis has written, these works "revealed a less than complete coordination with regard to plans and specifications, for neither the armament nor architectural style conformed to any clear standards of uniformity." Unlike the First System defenses constructed under supervision of French-born and trained engineers, the Second System was planned and directed by American-born engineers, many educated at the new U.S. Military Academy.

Frequently, Second System defenses were constructed on the site of, or adjacent to, ruined First System works. Protection was extended to several localities not fortified in the 1790s: the Potomac and James Rivers; Beaufort, North Carolina; and Beaufort, South Carolina.

An excellent example of a Second System work is the third Fort Moultrie, which guarded the Sullivan's Island approach to Charleston Harbor. In the summer of 1808, the Army began constructing this masonry fort behind storm-battered and eroded Fort Moultrie II, a First System defense. Workmen razed the earlier fort, though they salvaged many building materials.

The new work, the third to stand on the site, was completed and garrisioned in December 1809. Irregular in form, it presented three faces to the channel and two bastions to the landward. Emplaced on the terreplein, protected by an embrasured parapet, were 40 smoothbore cannon. A free-standing brick magazine held 500 barrels of powder. The two barracks and an officers' quarters, also of brick and slate, fronted on the parade and could accommodate three companies.

On Shutes Folly, near the Charleston Battery, the Army erected a casemated masonry fort, Castle Pinckney. It represented a major advance in technology, providing as it did a multiple tier of armament. Without increasing the frontage, this greatly augmented the firepower. Another benefit was the increased protection afforded by the embrasured casemates to personnel and weaponry.

Only a limited number of Second System defenses were casemated in this manner. A majority of these defenses were masonry-faced works, similar to many of those, such as Fort McHenry, constructed in the late 1790s. One of these was Fort Warburton, on the Potomac 9 miles below Washington. It was an enclosed work of masonry, and had a semi-ellipical face with circular flanks enclosed by a perpendicular wall suitable for defense by small-arms. The height of the rampart wall was about 14 feet above the bottom of the ditch. The main work was commanded by a tower of masonry calculated to contain one company and six cannon.

The Coastal Forts in the War of 1812

The United States declared war on Great Britain in June 1812. This time the coastal forts guarding Chesapeake Bay ports and harbors were severely tested by the world's greatest seapower. On August 19, 1814, a British amphibious force landed on the Patuxent River and marched on Washington, bypassing Fort Warburton on the Potomac. The Americans were defeated at Bladensburg on August 24, and the British occupied Washington. Their fleet now ascended the Potomac, and Fort Warburton's garrision, its commander fearing an attack by land and river, evacuated and destroyed the fort.

The British then withdrew from the area and advanced to attack Baltimore. Once again, a strong landing force went ashore from the fleet and advanced on the city. In fighting, on September 12, the Americans were compelled to give ground and retire into their earthworks, but the British general leading the attack was killed. The British next attacked Fort McHenry, which had become the key to the Americans' position. The British fleet (16 warships and 5 bomb ketches) advanced on the 13th and opened fire. The duel between fort and ships lasted 25 hours and, when the warships hoisted anchor and dropped down the Patapsco River, the "Star-Spangled Banner" sill flew defiantly. The troops were recalled and the attack on Baltimore ended in frustration and failure for His Majesty's forces.

In August 1814, preparatory to carrying the war to the Americans on the Gulf Frontier, a small British force had been permitted by the

Spanish to land and establish a base at Pensacola. An attack by British ships and a landing force of Royal Marines and Indians on Fort Bowyer, guarding the entrance to Mobile Bay, was repulsed. General Andrew Jackson struck back with a vengence. Invading West Florida, he overawed the Spanish, compelled the British to evacuate Pensacola Bay, and briefly occupied the protecting forts.

The Treaty of Ghent brought peace between the United States and Britain in 1815.

Apogee of the Masonry Forts

Lessons learned during the war caused a revolution in planning and construction of coastal defenses. Earlier fortification building had been undertaken as a crash program in response to the threat of aggression. Consequently, there had been little system or similarity among the works of the First and Second Systems. It would be different under the first permanent program, subsequently known as the Third System.

To oversee the program, the War Department in 1816 organized a Board of Engineers for Fortifications. Heading the four-man board until the early 1830s was one of Napoleon's former engineers, General Simon Bernard. Other members of the board were a naval officer and two Army engineers, the member of the Corps of Engineers who would superintendent the project, and the influential and capable Colonel Joseph G. Totten. After his succession to the position of Chief Engineer in 1838, not a brick was laid or a block of granite set without his knowledge and approval.

In the years before it submitted its final report to Congress in 1821 the board traveled extensively, conferred with local Navy and Army officers, and made detailed studies of a great number of sites. The initial Bernard report paid little attention to existing First and Second System defenses. Frequently, these were positioned in the inner harbors and, because warships were being armed with heavier and longer-range guns, the new defenses were to be sited to protect the outer harbors. But, as time passed, a number of these older works were incorporated into the new system, and some modified in the process. Among defenses in the National Park System falling into this class are Forts McHenry and Moultrie, and Castillo de San Marcos and Bateria de San Antonio. The latter two had been occupied by the Army in 1821 following the cession of Florida to the United States.

A number of major new works, among "the most spectacular harbor defense structures to come out of any era of military architecture," were erected. "From the technical standpoint," Dr. Lewis has written, "this large group of massive, vertical-walled forts represented the general embodiment and the fullest development of features which had previously appeared in only a few isolated, i.e., structural durability, a high concentration of armament, and enormous overall firepower."

A number of these Third System Forts are found in National Park Service areas. Immediately upon the British evacuation of the Washington area in the late summer of 1814, the Army had commenced construction of Fort Washington, at the site of ill-fated Fort Warburton. This was 2 years before organization of the Bernard Board. Unlike most of the

coastal forts in the southeast, which are at or near sea level, Fort Washington is on a height overlooking the Potomac. It is an enclosed masonry work, entered by a drawbridge, while its two half bastions face the river. The fronts commanding the Potomac mounted two tiers of guns, the lower level in casemates and the upper en barbette. A short distance below the fort, and linked with it by a gallery, was a detached water battery. Facing on the parade are the officers' quarters and soldiers' barracks. Fort Washington was completed in 1824.

The best known Third System defense, because of its Civil War significance, is Fort Sumter. The site selected was on the Middleground flanking the channel leading into Charleston's inner harbor. Beginning in 1829, thousands of tons of New England and New York stone were positioned to raise the Middleground above sea level and provide a solid foundation. A five-sided, non-bastioned defense, Fort Sumter was positioned to compliment Fort Moultrie and Castle Pinckney. It consisted of three tiers, two of casemates and a barbette. The casemates on the four channel fronts were embrasured. Piercing the gorge was a sally port, which opened onto an esplanade and wharf. Abutting on the parados of the gorge and the right and left flanks, facing the parade, were an officers' quarters and two barracks.

Although Fort Sumter was essentially completed by 1860, no guns had been mounted. Maj. Robert Anderson of the 1st Artillery and his garrison moved from Fort Moultrie to Fort Sumter on December 26 of that year. By April 12, 1861, when Confederate batteries opened fire, they had 60 guns positioned. Thirty-four hours later Fort Sumter surrendered,

triggering the Civil War. During the prolonged 22-month Union attack on Charleston, major sections of the fort above the lower tier, along with the quarters and barracks, were reduced to rubble.

Fort Pulaski, at the entrance to the Savannah River, is another magnificent Third System fort. It is the third defense to stand on Cockspur Island. Beginning in 1829 the United States spent more than $1,000,000 to complete this fort. Before the first of its 25,000,000 bricks was laid, it was necessary for Army engineers to build an extensive dike and drainage system to protect the site. A five-sided, two bastioned work, Fort Pulaski had two tiers of guns, a casemate and barbette. It was surrounded by a wet moat and the approach to the gorge and sally port protected by a demilune (a bastion-like outwork, with a crescent-shaped gorge). A drawbridge crossed the moat and provided access to the sally port. Officers and men of the garrison were housed in the gorge's casemates.

Early in January 1861 Georgia troops seized and occupied this fort. Federal forces returned in November 1861. Nearby Tybee Island was occupied. Batteries were erected there, and on April 10, 1862, Union guns began a long-range bombardment of Fort Pulaski that was to have fundamental technical repercussions. Recently developed rifled guns quickly breeched the masonry of the fort's southeast salient and compelled the Confederate garrison to surrender. This revolution in weaponry, in its long-term ramifications, doomed the masonry Third System forts, and their counterparts throughout the world.

Farther south, in 1846, to protect the western approach to the Straits of Florida, Army engineers began construction of Fort Jefferson on Garden Key, in the Dry Tortugas. Although its one-half mile perimeter is less than that of Fort Monroe, Virginia, this massive brick work was designed to mount more and heavier armament than any other Third System fort. Enclosing the hexagonal, six-bastioned work is a water-filled moat. The fort's three tiers (two casemate and one barbette) were designed to mount 450 guns. Handsome three-story quarters and barracks and a barrel-roofed magazine faced on the expansive parade.

Fort Jefferson was strongly garrisoned by Federal forces throughout the Civil War. Although partially armed, it was never completed. Both during and subsequent to the war, Fort Jefferson served as a military prison. Among those sent there in 1865 were several of the men involved, directly or indirectly, in the plot that resulted in the assassination of President Abraham Lincoln.

The Bernard Board during the mid-1820s, after Florida was ceded to the United States, made a study of the territory's harbors. Because Pensacola Bay had been selected as a site for the Nation's navy depot on the Gulf Frontier, major fortifications were programmed for its protection. Three formidable masonry works would close the channel into the bay to enemy warships by converging fire from their guns.

In 1829 ground was broken for Fort Pickens, the first of these, at the western end of Santa Rosa Island. An irregular-shaped pentagonal work of five bastions, it was fronted by a moat. The casemates of the two fronts and three bastions bearing on the channel were armed, while the other casemates were used as quarters, storerooms, and magazines. A large number of guns were mounted on the barbette tier. The gorge and northeast and southwest bastions were shielded to the landward by a casemated counterscarp.

In 1835, upon completion of Fort Pickens, work began on Fort McRee, on the opposite side of the channel. A semicircular defense, it mounted guns in the two casemate tiers fronting on the water, while those in the gorge were furnished as quarters and kitchens. Cannons were also positioned on the barbette tier.

Next, the Engineers, in 1839, turned their attention to the Barrancas. The ramparts and terreplein of Bateria de San Antonio, now known as the Spanish Fort, were rebuilt and enlarged to mount heavier armament. The exterior of the bombproof, with its distinctive Spanish architectural features, was retained. Obsolete Fuente de San Carlos was obliterated. By 1844 on its site the Americans had raised Fort Barrancas. A single-tiered structure, two of its four fronts commanded the channel. Access to the fort was via a drawbridge. The two land fronts were shielded by a masonry counterscarp, with flanking howitzers emplaced in its casesmates to sweep the ditch.

Following the Mexican War, construction started on the Redoubt, about 1,000 yards north of Fort Barrancas. Its guns, in conjunction with those mounted en barbette on the land fronts of Fort Barrancas, were sighted to control the land approaches to the navy yard. By December 1860 this rectangular bastioned work, and its counterscarp, was essentially finished.

The casemates of Forts Pickens and McRee were uncomfortable and unhealthy quarters. This led to the construction of a commodious three-story brick barracks for the garrisons on the high ground between Fort Barrancas and the navy yard. By the outbreak of the Civil War, Pensacola was one of the few harbors where all elements of a Third System complex had been completed.

On the night of January 9, 1861, Alabama and Florida forces seized the mainland works, the navy yard, and Fort McRee. Lt. Adam Slemmer transferred his regulars from Barrancas Barracks to Santa Rosa Island and frustrated the secessionists' efforts to take possession of Fort Pickens. Pensacola Bay quickly became a danger point as both the Confederates and Federals rushed in reinforcements. In November 1861 and again in January 1862, as the belligerents' passions erupted, terrible bombardments occurred. In the first of these, as a precursor of what was to come, the fire of Union warships and Fort Pickens seriously damaged Fort McRee. In May 1862 the Confederates evacuated the area and Federal forces occupied Fort McRee and the mainland defenses.

In the 1870s and 80s, the sea battered and finally claimed Fort McRee. Fort Pickens from 1886 to 1888 was used as a military prison for confinement of Geronimo and other Apache leaders.

The last Third System defense to be completed was the fort on Ship Island, popularly known as Fort Massachusetts. Construction commenced on this two-tier semicircular work in 1859. Mississippi forces, in January 1861, occupied Ship Island and found the scarp barely 6 feet high. Confederate troops abandoned the strategic island guarding the intracoastal waterway that autumn. United States engineers in the years between 1862 and 1867 completed and partially armed the fort. They mounted giant 15-inch Rodman smoothbore guns on the barbette tier of the two bastions. The embrasures of the Fort Massachusetts casemates, like those at Forts Jefferson and Sumter, were protected by iron throats and shutters.

Modernization of the Masonry Forts

The technical revolution wrought by the Civil War in weaponry (rifled guns and giant smoothbore shellguns) and in warships (the widespread use of steam for propulsion and the perfection of ironclad vessels with revolving turrets) made the Third System fortifications obsolete. During the early 1870s, the Army sought to cope with this situation by mounting huge shell-and rifled-guns in barbette batteries.

At Forts McHenry and Washington the engineers threw up massive earthen parapets, their interior slopes faced with masonry. Gun platforms for the huge 15-inch Rodmans and similar pieces were of granite or concrete. There were concrete and earth-protected magazines. Repairing Forts Moultrie

and Sumter, workmen first cleared away tons of rubble. At the former, portions of the parapets were rebuilt, the width of the terreplein increased, and 12 platforms for the heavier new armament positioned. A principal and several service magazines were built, along with two bombproofs. Both Charleston forts were rearmed.

It was soon apparent that these limited measures were not the answer. Until a new family of weapons incorporating breech-loading mechanisms, compound tubes, and disappearing carriages could be developed, fortification construction came to a stop in the United States. From 1876 until 1888, Congress refused to vote any funds for modernization of seacoast defenses.

By the late 1880s this new weaponry was in an advance stage of development. Black powder would soon be replaced by nitrocellulose and nitroglycerine-based powders. The effect on heavy ordnance of this technological revolution cannot be exaggerated. From the introduction of artillery in the 14th century until the deployment of the atomic cannon in the 1950s, the only other comparable advance in weaponry was the perfection of rifled cannon in the 1850s and 60s.

During the 1870s and 80s, European naval powers had forged ahead and the battleship had appeared. News of the development of what was believed to be the ultimate weapon afloat caused much of the American public, as well as many Army and Navy officers, to worry over the failure by Congress to make any major appropriations for coast defense for years.

Pressure built up for the government to take affirmative action to correct a situation that had allowed the coastal fortifications to deteriorate to a degree where national security was jeopardized.

The Endicott Defense System

Accordingly, in 1885, President Grover Cleveland set up a board, headed by Secretary of War William C. Endicott, to review coastal defenses and to make recommendations for a program to update them and to take advantage of the revolution in weaponry. The Endicott Board called for massive new fortifications at 26 key coastal points, plus three on the Great Lakes. These would be armed with powerful rifled guns and mortars. The new Endicott Defense System would also include floating batteries, torpedo boats, and submarine mines. Although the program, as outlined by the board, was too complex and expensive to be implemented in its entirety, it constituted the frame for the modern seacoast defenses erected and armed by the United States during the 1890s and the early years of the 20th century.

Among localities at which Endicott System defenses were proposed were Baltimore, the Potomac River, Hampton Roads, Cape Fear River, Charleston, Port Royal Sound, Savannah, Key West, Tampa, and Pensacola.

Submarine mines, which the Confederates had perfected and employed with considerable success against Union naval power, were given high priority by the Endicott planners. These were controlled devices, and once positioned in ship channels they remained inert until detonated by an electrical impulse from casemates ashore. Submarine mines, except

during emergencies and training periods, were stored along with their miles of control cables.

Beginning in 1890 the Corps of Engineers began work on the Endicott defenses. At Fort Pickens, guarding Pensacola Bay, a gun casemate in the northeast bastion and at Charleston's Fort Moultrie the 1809 magazine were converted into mining casemates. Brick torpedo storehouses were erected, concrete cable tanks poured, and yawls for laying and taking up mines and cables purchased. In the hectic days immediately before the United States declared war on Spain, in April 1898, these submarine mine defenses, along with those at other Atlantic and Gulf Coast harbors, were activated.

Following the Spanish-American War it was found by the military that the excessive humidity of the brick casemates damaged the batteries and wiring. Better ventilated structures were built nearby to house the mining casemates.

Because the 12-inch mortars and their carriages were perfected first, priority was given in the 1890s to construction of their huge earth and reinforced-concrete emplacements. A squat, high-trajectory weapon, the mortars were positioned in groups of four within steep-walled pits. The mortar batteries at Forts Moultrie and Pickens each have four pits, while the Fort Washington emplacement has two. Mortars were clustered to loft their 700-pound projectiles simultaneously into the air so they would crash down nearly vertically on the thinly armored decks of warships. A number of these emplacements were ready and armed by April 1898.

Next, attention focused on the massive reinforced concrete emplacements for the major armament of the Endicott era: 8-, 10-and 12-inch seacoast guns. Army engineers selected the parades of masonry Forts Sumter and Pickens as sites for two new batteries (Huger and Pensacola), each mounting a pair of 12-inch guns. Thousands of cubic yards of concrete were poured, and the area between the new emplacements' exterior slopes and the intervening parades of the Third System forts filled with earth.

On Sullivan's Island northeast of Fort Moultrie, on Santa Rosa Island southwest of Fort Pickens and on Foster's Bank near where Fort McRee had been swallowed by the sea, on Cockspur Island north of Fort Pulaski, and on the Potomac near Fort Washington, emplacements were laid out by the engineers, built by the Army or private contractors, and armed by the Ordnance Department. The guns were flat-trajectory weapons, having a range equal to or greater than the main battery of contemporary battleships.

Most of these battery's 12-, 10-,and 8-inch guns were mounted on disappearing carriages, utilizing the recoil energy to lower the piece into the emplacement, where it was loaded and serviced. A few of these large-caliber weapons, such as one of the guns of Fort Sumter's Battery Huger, were mounted on new model barbette carriages.

Protection of the harbor minefields to prevent penetration by destroyers and minesweepers called for light guns that could be pointed, loaded, and fired rapidly. Less emphasis was given by the military to this program, and no such guns were mounted at the outbreak of the Spanish-American War. This situation was soon corrected. Large numbers

of smaller reinforced concrete emplacements were erected and armed during the next 8 years. At Fort Moultrie, three rapid-fire batteries were constructed on the terreplein of the Second System masonry work; at Fort Washington a battery for two 4-inch guns was superimposed on the V-shaped 1815 water battery. Scattered about the reservations were other emplacements of this type. They mounted guns (from two to six weapons each) ranging from 3- to 6-inch.

The Taft Board

In 1905 a board, chaired by Secretary of War William H. Taft, was convened to review and update recommendations of the Endicott Board. The Taft Board's principal contribution to the coastal defense system in the continental United States was to accelerate existing programs for illuminating the harbor entrances with searchlights, general electrification of all coastal defense facilities (including the barracks and quarters), and fire control and an indirect aiming system for the mortars and large-caliber guns.

Increased Naval Armament and New Batteries Ashore

The launching in 1907 by the British of H.M.S. Dreadnaught began a decade of rapid development of heavily gunned vessels, during which the battleship achieved relative ascendence over coastal defenses. With guns of increased caliber mounted in turrets of improved design, new battleships, besides having the advantage in range, could now deliver a plunging fire. The latter largely canceled the protective advantage to

gun and personnel afforded by the disappearing carriage. Following the 1915 sinking of Lusitania and the ensuing war scare, Ordnance experts, knowing that Germany had a number of battleships and battle cruisers of the most advanced class, perfected a barbette carriage for high-angle fire. This increased the range of the 12-inch guns from 9 to 17 miles.

Construction started on a number of emplacements for the new weaponry in 1917. Each consisted of a pair of guns, with a protected magazine complex between and slightly to their rear. The guns to permit a 360-degree field of fire had neither parapets nor overhead cover. Fort Pickens' Battery Landgon dates to this era.

The Growth of Airpower and the Revamping of Defenses

In the early 1920s Forts Washington and Hunt, the defenses of the Chesapeake now centered on Hampton Roads, were phased out as coast defense installations.

By the 1930s the Army recognized that measures were needed to bolster the American coastal defenses against long-range bombers and the strikes of carrier-based aircraft. Soon after Pearl Harbor (1941), a number of 90mm antiaircraft guns were added to the defenses of Forts Moultrie, Sumter, and Pickens.

During World War II, highly standardized batteries were constructed for the big coast defense guns in which all the features--armament, magazines, shellrooms, etc.--were provided with overhead cover of reinforced concrete and earth. One battery (No. 520) of this type was

constructed at Fort Moultrie and armed with two 12-inch casemated breech-loading rifles. Emplacements for non-casemated 6-inch guns were built at Forts Moultrie, Pickens, and McRee. Each of these batteries had its magazines, shellrooms, and electric power generator protected by a reinforced concrete and earth emplacement. When received and mounted, the guns were positioned about 200 feet apart and flanked the battery. The guns, which had a range of 15 miles, were nearly enveloped by huge cast-steel shields. A pair of these formidable weapons were emplaced in Fort Pickens' Construction 234.

Battery Langdon at Fort Pickens and similar post-World War I emplacements were modernized. To protect the two 12-inch guns from aerial attack, they were casemated in reinforced concrete bunkers.

The Obsolescence of Coastal Fortifications

By 1940 the War Department had determined that many of the Endicott Batteries were obsolete and were to be abandoned on completion of new emplacements. Most of these batteries, however, were retained until about 1943, by which time the tide of war had shifted in favor of the Allies on all fronts. Victory in World War II was followed by rapid demobilization of the Nation's armed forces and drastic reductions in defense spending.

Lessons learned during the conflict dictated a change in military thinking that made coastal defense fortifications obsolete. Amphibious invasions had demonstrated that armies could be landed over hostile

beaches, after the defenses had been softened by aerial and naval bombardments, without having to storm and occupy fortified port facilities. The airplane had proved master of the battleship, and so long as U.S. carrier task forces ruled the waves, there was no risk of the Nation's seacoasts being exposed to hostile naval bombardment. In the summer of 1944, Germany launched its V-1 and V-2 rockets against Great Britain. They were crude, but their intercontinental successors revolutionized warfare.

In the post-World War II years, the Army placed on inactive status or disposed of most of its harbor defense installations. A number of these were transferred to the National Park Service for preservation and protection. These sites, along with those such as Castillo de San Marcos, Fort Matanzas, Fort Pulaski, Fort Raleigh, Fort McHenry, that had previously been established as National Park Service areas, enable visitors to understand the evolution of coastal fortifications during four centuries.