8 End of the Big Guns: Mission and Branch Identity Crisis in the Coast Artillery, 1919-1939

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CHAPTER 8

End of the Big Guns

*Mission and Branch Identity Crisis in the Coast Artillery, 1919–1939*

Of the four major combat branches in the interwar army, the coast artillery proved to be, by far, the best able to respond to the challenges created by the enormous changes in warfare. It did so chiefly by all but reinventing itself from a service devoted to the defense of harbor cities to one devoted to antiaircraft defense. In doing so it demonstrated both the surprising degree of elasticity in the interwar army as well as the final limitations on that elasticity.

As the United States entered the world war, the coast artillery was still the preeminent branch in the Regular Army. Throughout the nineteenth century, its fortifications defending major seaports were the backbone of America’s defense strategy so that its mission was well regarded by the American public. While field and coastal units were partners in a general artillery branch during the 1800s, coastal units began to develop a sense of separate identity early in the century. This development began with the founding of a special school for coastal artillery at Fort Monroe, Virginia, in 1824. In the post–Civil War era, in which an interest in a new professionalism based on education was rapidly developing, the school at Fort Monroe flourished. Under the leadership of Emory Upton, it developed a more educationally respectable curriculum by replacing some highly technical courses with courses on military law, history, and strategy. But it remained focused particularly on mathematics and engineering.¹

The fact that American military policy in the nineteenth century rested on the defense of harbors by large, rifled artillery located in major forts made service at these posts preeminent in the army. Although those who served the big guns did not see themselves as a special branch originally, the nature of the guns and the forts began shaping the character of the military units that served them. The major problem with the big guns was fire control, so those who served them
and the school that taught them soon became preoccupied with this issue. This preoccupation created the perception that serving the big guns was essentially a scientific endeavor. The soldiers who served the guns thus began to fashion the character of their growing branch identity and their professional self-image along scientific and engineering lines. This developing mentality was reflected in the *Journal of the United States Artillery*, which students at the Artillery School at Fort Monroe began to publish in 1892.

The preeminence given to harbor defense in national policy and the distinction gained by the Artillery School and by the *Journal* led those who served the big guns to develop a professional identification tied to this specialization. This, in turn, led these units to gain recognition as a separate branch, a move that was partially achieved in the Army Reorganization Act of 1901, which recognized the coast artillery as a distinct entity while creating a new office headed by a chief of artillery that was responsible for the further development of the big guns. The movement toward creating the coast artillery as a distinct branch culminated in the Artillery Act of 1907. The act split artillery into two branches, field artillery and coast artillery, and made the coast artillery the only branch in the army with its own chief. By 1911, that chief was a member of the General Staff, giving the coast artillery a decided political advantage over the other combat arms. At the same time, its preeminence was indicated by the fact that 19,321 of the 69,525 officers and men allocated to the army were assigned to coast artillery.

Hence, in the years immediately prior to World War I the coast artillery had emerged as a distinct branch in the army, albeit an unusual one. It had little of a distinctly military tradition upon which it could draw to develop an identity. While technically a combat arm, it identified far more with the civilian world of the scientist and engineer than with the bloody world of battlefield combat. Finally, preeminence, and the isolated nature in the service of the guns, gave the new branch an elitist sense of aloofness from the rest of the army.

The world war, however, was a disaster for the branch. With its mission based almost solely on the defense of major U.S. harbors, the coast artillery was ill prepared to play any sort of significant role in a European land war. Instead, it participated in the conflict chiefly by taking responsibility for developing railroad-and tractor-drawn heavy artillery and antiaircraft artillery. At the same time, there was a widespread feeling in both the army and the public that the war had demonstrated that the days of the fort had passed. In short, the coast artillery now faced a “mission crisis,” as its very reason for existence was seriously called into question.

After the war, a widespread feeling developed in U.S. public opinion, in the army, and even in the coast artillery itself that the days of heavy artillery permanently
placed within fixed fortifications had passed. Coast-artillery observers were impressed with the power of the new 16-inch naval gun. The power and weight of its projectile and the nearly vertical trajectory of its fall on any target meant that all current coastal fortifications in the United States were obsolete. Moreover, the fact that it could be fired by a ship from over the horizon seemed to present shore gunners with a nearly impossible fire-control problem, indicating to many that the new gun had given ships a permanent advantage over fortifications. Finally, some noted that an attack on the United States could be made on almost any beach and a major port taken by the flank with just such an invasion.

Moreover, as confidence in the forts and big guns was disappearing, both the navy and the new air service began to claim that they were better able to carry out the mission of coastal and harbor defense than was the coast artillery. Indeed, Brigadier General William Mitchell used the spectacular bombing of the Ostfriesland in 1921 to demonstrate the ability of the nascent air service to defend the nation from both seaborne and airborne threats. If accepted, this doctrine would give the air service a mission that could justify its elevation to an independent force alongside the army and navy. The navy repeatedly urged its claim to sole responsibility for coastal defense all during the interwar period.

The seriousness of this mission crisis was further demonstrated by the fate of the coast artillery after the war. The National Defense Act of 1920 shifted the focus of defense policy from the coastal forts to the mobile army. As a result, the size of the branch was reduced dramatically. While two of every seven soldiers in 1907 were in the coast artillery, fewer than one in ten was so assigned by the mid-1920s. Moreover, as Brian Linn notes, as a final manifestation of the coast artillery’s mission crisis, the topic of harbor defense was not even mentioned in the army’s service regulations for 1923.

Finally, coast artillerymen sensed that the neglect of the branch and its mission as stated in the National Defense Act of 1920 was also reflected in public opinion and even in the army. As one officer complained in 1923, “our service schools fail to emphasize the importance of Coast Artillery personnel and armament in coast defense problems.” As a result, there was a sense of discouragement within the ranks related to the diminished position of the branch that stood out even within the general discouragement prevailing in the army in the early 1920s. As the editor of the Journal of the United States Artillery claimed in 1921, “No one can deny that there is some justification for a feeling of discouragement among Coast Artillery officers.”

The coast artillery, however, began responding to this mission crisis immediately and continued to do so during the twenty years of the interwar period.
Its approaches were varied. First, as with the other branches, there was some degree of turning inward and building a cohesive sense of branch identity among its members. More important, however, the branch attempted to redefine its mission in ways that took advantage of its “big gun” heritage and scientific expertise. Moreover, the coast artillery also forsook completely its earlier elitist sense of aloofness from other branches of the army. Instead, it sought to define its mission in ways that stressed its integration and its cooperative relationship with other branches. Apparently feeling that its seriously exposed position made cooperation with other branches a better strategy than competing with them, officers sometimes went to great lengths to emphasize the degree to which its role lay in supporting other branches and arms.

As did most of the other major branches in the army, the coast artillery made major efforts to develop a sense of professional identity and solidarity that would lead to the creation of a cohesive branch identity. In doing so, it largely followed the approaches taken by the others. At the beginning of 1923, the name of the venerable Journal of the United States Artillery, a holdover from the time when both field-and coast-artillery units were part of the same branch, was changed to the more branch-specific Coast Artillery Journal. In addition, its officers followed the lead of those in other branches by forming their own separate professional association, the United States Coast Artillery Association, in 1930. The association, however, did very little outside of holding an annual convention; giving awards to outstanding Regular Army, National Guard, and Organized Reserve units; and promoting subscriptions to the Journal. Even so, the association and its local branches remained popular, possibly due to the opportunities it gave to coast artillerymen to get together.18

The truly important forces in developing a sense of professional branch identity in the coast artillery were the special services school at Fort Monroe and the Coast Artillery Journal. The Journal not only changed its name it also broadened its editorial policy so that while it continued to publish the highly technical articles that had characterized the older journal, it also published articles on history and issues regarding the branch itself. At the same time, it was careful to maintain its traditional policy of remaining open to all opinions so that it could be considered as the voice of the officers of the coast artillery. In the early 1930s, the chief of the coast artillery, Major General John W. Gulick, had an open letter published in the Journal reaffirming that it was not the official organ of the office of Chief of Coast Artillery but “the organ of the entire Coast Artillery personnel—Regular Army, National Guard, and Organized Reserve.”19
Still, the major socialization force in the coast artillery, as in other branches, was the special service school at Fort Monroe. Although not every coast-artillery officer attended, enough did so that the school was able to provide the model of professional identity in the branch. Most graduating officers left convinced that coast-artillery activities were based on the principles of a professionally respectable science that they had successfully mastered. They also took with them a set of bonding experiences shared with colleagues from other year groups. Finally, they emerged accepting, by and large, the professional identity and self-image of the engineer-soldier amalgam that had been traditional within the coast artillery since the late nineteenth century. The school was successful in this regard for largely the same reasons that the army’s other special service schools were successful: it offered what seemed to be a rigorous but still accessible educational program, an attractive lifestyle, and a sense of community that led graduates to accept the values and outlooks of the branch. Like the others, the Artillery School’s main offerings were a battery officers’ course for junior officers and an advanced course for more senior officers. Both were small, with forty to fifty students in the battery officers’ course and twenty-five to thirty in the advanced course. With a faculty of around twenty, the school enjoyed a rich student–teacher ratio and allowed the students a chance to bond in a small community.\(^{20}\)

The curriculum, with a heavy dose of mathematics and science and an unabashedly competitive grading system, gave the school the appearance of intellectual rigor. This was reinforced by an associated school for advanced engineering and the research-oriented Coast Artillery Board as adjuncts to the Artillery School. But, as with the case of other special service schools, instruction aimed at student success, with courses presupposing no advanced knowledge. And while classes moved along rapidly; most were centered on acquiring technical knowledge rather than dealing with theoretical issues. Moreover, the map problems that so bedeviled students at the Fort Leavenworth schools were not a problem at Fort Monroe.\(^{21}\) Finally, as was the case in the other service schools, students were encouraged to accept the school solutions to problems rather than think for themselves.\(^{22}\)

At the same time, the Artillery School offered several bonding and life experiences in a community characterized by a common set of values and outlooks. In early years, housing was inadequate and old. The most notorious was the bachelor officers’ quarters, referred to with humor as Old Sherwood, which was in an old frame nineteenth-century hotel.\(^{23}\) In the early 1930s, most of the older housing, including Old Sherwood, was replaced by rather spacious brick apartments with modern amenities.\(^{24}\)
In addition, ample provision was made for an active social and recreational life. The curriculum did not require work on the weekends, and efforts were made to give Fort Monroe an attractive set of recreational facilities. While athletics were encouraged, there was nowhere near the emphasis placed on them as was found at the Infantry School. In line with the more sedate image of the engineer-soldier, athletics at Fort Monroe were purely recreational and not part of the more macho image initially being sought at Fort Benning. Hence, while the focus of athletic interest at Benning was Doughboy Stadium, at Monroe it was the beach house, with its modern dance floor, that was most popular with officers.

While the coast artillery was successful in building a branch structure, its chief concern by far was to resolve its mission crisis in a way that would ensure its continued existence. This was a difficult challenge since any redesigned mission would have to be seen as clearly relevant to the nation’s defense needs in a drastically new environment while still one that depended on utilization of the traditional expertise of the coast artillery. Given these objectives, the branch’s initial responses tended to be evolutionary rather than revolutionary.

The most immediate response was to propose a new tactical approach to the old problem of harbor defense. Given the fact that most coast artillerymen who had seen active service in the world war were connected with heavy artillery outside of fixed emplacements, the idea that permanent fortifications had become obsolete was already widely accepted in the branch. Even Major General Frank W. Coe, the chief of coast artillery at the time, noted in 1920, “The tactical undesirability of the fixed mount has always been recognized.” The assumed obsolescence of masonry forts, however, did not mean that coast-artillery officers abandoned the mission of harbor defense. For a few years, the branch sought to form a collaborative relationship with the air service to develop a joint defense strategy in which aircraft would join a coastal-defense effort by both attacking incoming fleets and providing radio spotting for gunfire from shore batteries manned by the coast artillery. But this approach died out after a few years.

At the same time, many officers were also captivated by the idea of the mobile defense of ports using the railway-and tractor-drawn guns with which they had become familiar in the world war. Port fortification was now to be modeled on the dispersed field fortifications seen in Europe, with the heavy artillery now being mobile rather than fixed. This mobility would be both tactical, with guns able to move from place to place as needed, and strategic, with guns from a wide area of the country able to use railroad transport to concentrate quickly at a threatened point.
This idea appealed to many in the coast artillery during the first years of the 1920s but then began to fade in the face of realities. The U.S. rail system was not conducive to the strategic concepts involved. Railroad guns also had to be offloaded and mounted before they could be used, significantly limiting their mobility. Nor could one guarantee the accuracy of guns placed on hastily built platforms. More important, efforts to place a 16-inch gun on a railway mount proved unsuccessful, even though most coast artillerymen agreed that only that weapon would provide successful defense against a naval invasion force headed by battleships armed with such guns.31

Other officers in the branch, sensing that the future of the army lay with the mobile forces, argued that the coast artillery should abandon the forts and harbors altogether and find a place within the mobile army. Based on the experience of the world war, many coast artillerymen felt that this role lay with mobile heavy artillery. Advocates of this idea, which included General Coe, saw such a concept as the natural extension of the branch’s wartime service. The basic idea was to amalgamate the coast artillery with the field artillery into a single artillery branch, with coast artillery being responsible for heavy artillery, while the field artillery retained responsibility for light divisional artillery.32 As Coe argued, during the war “the Coast Artillery was expanded to meet the artillery needs of the army, while the Field Artillery was expanded to meet the needs of the division; both branches contributed to the artillery requirement of the corps.”33 The Coast Artillery Journal also expressed this idea, stating, “The Coast Artillery has become in reality the Heavy Artillery of our military establishment and coast defense, . . . is only part of its mission.”34

After the war, General Coe took a vigorous lead in the effort to amalgamate the two artillery branches, proposing the creation of a single branch headed by a chief of artillery assisted by two deputies to head sub-branches for divisional artillery and heavy artillery. And, if amalgamation failed, Coe favored renaming and reorganizing the coast artillery as “heavy artillery.”35 He continued to pursue this idea vigorously in the early 1920s.36 In 1921 the Coast Artillery Board published a pamphlet titled Tactical Employment of Heavy Artillery, which was hailed by the Journal of the United States Artillery as likely to become the coast artilleryman’s “Bible.”37 Three years later the branch was reorganized along regimental lines since, as it was explained, in time of war it was likely that coast artillerymen would “serve with artillery that is operating in the field.”38

While interest in this idea continued throughout the 1920s, it faded by the end of the decade. Field-artillery officers were opposed to a reunification or any reorganization of the army that left their branch with responsibility only for
light artillery serving with the division. Finally, although it was never stated, officers in the coast artillery may have thought that abandoning the big coastal guns in favor of becoming the army’s mobile heavy artillery would mean giving up a mission that was solidly part of their branch’s tradition and for which its members had a clear expertise to adopt a role that was amorphous and for which it had no particularly legitimate claim. In any case, after 1925, the concept of mobile heavy artillery was discussed less often in the Coast Artillery Journal, and by the end of the decade, the chief of coast artillery assured his officers that he was “not at all convinced that seacoast artillery has passed out of the picture or even lost any of its importance.”

Instead, during the second half of the twenties, the coast artillery returned to the coast to redefine its mission in terms that were more traditional. A new definition of the mission, “seacoast defense,” emerged, which encapsulated the branch’s traditional mission into a larger strategic concept in partnership with both the navy and the mobile army. This idea had its origins in a pamphlet published in 1920, Joint Army and Navy Action in Coast Defense. The pamphlet had been brought to the attention of members of the branch in 1923 in Captain Thomas R. Phillips’s prize-winning article in the Coast Artillery Journal. Phillips explained: “The strategy of Coast Defense consists of a series of strong points protecting our naval bases, essential war industries and essential harbors. The naval bases are protected to insure the navy freedom for offensive action. The unfortified coast is protected by the naval coast defense forces and the mobile forces of the army.”

Interest in the concept of seacoast defense spread quickly among those coast-artillery officers anxious to keep their branch mission focused on harbor defense. They found the cooperative nature of the strategy appealing as a means to overcome the supposed limitations of the big-gun defense of ports as well as the perceived isolation of the branch. It also legitimized harbor defense, the traditional mission of coast artillery, by putting it into the context of an overall national strategy.

By 1924, the idea had made its way into Fort Monroe, reaching both the renamed Coast Artillery School and Coast Artillery Board, where it received a favorable reception. At the same time, the chief of coast artillery announced that the term “coast defense,” which had traditionally been used within the branch to designate a harbor command, would no longer be used in such a narrow context. For the next several years, the board and the school examined closely that part of the 1920 pamphlet that dealt with the role of the army in coastal defense, an idea then called a “Positive System of Coast Defense.” By 1927, a consensus had emerged on the tactical and strategic doctrine that would govern such a system. Although this doctrine was never published officially, its essence appeared...
in a series of articles by Major Rodney H. Smith published in the *Coast Artillery Journal*. The key idea in Smith’s exposition was that coastal defense was to be a combined-arms operation involving several branches of the army, including the air service, as well as the navy. Within that combined operation, the coast artillery was to take responsibility for harbor defense, using both mobile and fixed heavy artillery. By the end of the decade, coastal defense had been unofficially adopted by the coast artillery as a guiding concept, and the debate over mission largely died out. During the 1930s, it remained the core of coast-artillery seacoast doctrine. But the concept generated little interest outside the branch, either in the rest of the army or in the public, and so provided no real answer for the coast artillery’s mission crisis.

The only successful answer was the development of an almost totally new mission, antiaircraft defense. At the time of the world war, antiaircraft artillery represented a virtually new form of combat. There had been a few experiences before the war with efforts to bring down aerial balloons with ground fire, but the experience of firing on moving aircraft was new. The initial mission was entirely tactical. Antiaircraft artillery was to protect military forces from both attack and observation by hostile warplanes. The coast artillery attacked the problem with the scientific and technological approach that was engrained in the mentality of the branch. Therefore, coast artillerymen assigned to antiaircraft artillery saw their problem largely in terms of developing a weapons technology and an approach to fire control appropriate to the task. Since most efforts during the war were in improvising a new form of artillery from existing weapons, the newly designated antiaircraft-artillery service within the branch emerged with an understanding of the kinds of weapons needed and how to approach the fire-control problem.

While the postwar demobilization initially left the antiaircraft-artillery organization in disarray, coast-artillery leadership immediately undertook efforts to organize and control a postwar antiaircraft service. Final approval for its creation was given to the branch in October 1919 by the secretary of war; the creation of small antiaircraft units to be assigned to harbor defense began immediately. The organization of the new service then proceeded rapidly. By 1920, the commander of the Coast Artillery School at Fort Monroe created a special battalion to test new weapons and “to act as a nucleus which can be expanded and used in service with the mobile army when called upon.” At the same time, the branch began the publication of its mimeographed *Bulletin*, “devoted exclusively to antiaircraft subjects.”

The coast artillery continued developing antiaircraft artillery in the early 1920s. Surprisingly, even though the branch was so reduced in size that it felt it could not carry out its basic tasks, there was little opposition to continuing to
invest personnel and resources in antiaircraft defense.\textsuperscript{53} As a result, the service grew rapidly in size. In 1922 it had an allowance of just over 500 men. By 1923, it had 1,325 men, amounting to over 11 percent of the diminished allowance of the branch.\textsuperscript{54} This development, nevertheless, was plagued by expressed skepticism for the project coming from all branches of the army, even from within the coast artillery itself.\textsuperscript{55} It also had to overcome public apathy and congressional neglect.\textsuperscript{56}

Yet two other factors played by far the dominant role in shaping antiaircraft-artillery development during the 1920s. The first was the public reaction in 1921 to the success of the air service bombing the Ostfriesland as well as a simulated air raid on Philadelphia.\textsuperscript{57} After that, the focus of the unit shifted from defending military units in the field to defending cities from bombers. The second was the almost immediate and unchallenged assumption that the best way to defend nonmilitary targets from attack by bombers was to bring down the bombers. Early in the decade alternative methods of protecting military units and cities from aerial attack, such as hampering and discouraging such strikes, were considered within the branch, especially since bringing down planes seemed to be so difficult that many were dubious of success.\textsuperscript{58} But these alternatives were summarily rejected by the coast-artillery leadership. Why they were rejected is unclear, but it seems likely that two factors were important. First, the only way to sell the idea of antiaircraft artillery to the army and the public was by proving its effectiveness in hitting targets. Arguments in defense of antiaircraft artillery were almost invariably based on demonstrations of the ability of guns to make hits; the effectiveness of alternative strategies was hard to demonstrate in peacetime.\textsuperscript{59} In addition, although this idea was never stated explicitly, coast artillerymen had traditionally approached their mission of protecting harbors by designing guns, fire-control systems, and training methods that would result in ships being hit and sunk, which they now sought to adapt to hitting and downing warplanes. Any other approach to dealing with aircraft would likely have been difficult to imagine and accept.\textsuperscript{60} In any case, as a result of the acceptance of this approach, the central focus of coast-artillery activities regarding antiaircraft artillery was developing guns and fire-control mechanisms that could allow some success in bringing down hostile aircraft.

The problems facing the branch in this regard were numerous and formidable. Much progress had been made during the world war in terms of providing the basic approaches and weapons, but the equipment that emerged was still largely unsatisfactory. Guns mounted on mobile platforms tended to vibrate so much when fired that crews were shaken off, while the guns had to be continually releveled for fire-control purposes.\textsuperscript{61} Shrapnel ammunition proved unsuitable
since burst fragments were irregular in size, so new ammunition that provided a more uniform set of fragments had to be developed. Finally, traditional powder fuses were found to burn unevenly at higher altitudes and had to be replaced with new mechanical fuses.

But by far the most difficult problem was fire control. Antiaircraft artillery sought to bring down planes by shooting fused high-explosive ammunition that would explode close enough to the aircraft to do lethal damage to the plane. The difficulty in this was in calculating not only the range to set the fuse correctly but also, and far more important, how far the gun should lead the target. By 1926, a redesigned 3-inch antiaircraft gun was developed bearing a set of instruments that calculated range and necessary lead angles and then sent this data electronically, together with fuse settings, to the guns. Personnel then had only to aim their weapons by matching pointers with the directors and load the guns with shells containing preset fuses. After that, the focus of the branch was on training to eliminate, as far as possible, human error.

The focus on protecting cities from aerial attack led to another set of problems. The experience of the world war had shown that cities would most likely be attacked by air at night. Again, the coast artillery emerged from the war with the basic technology and tactics for bringing down aircraft at night already set. Targets were to be illuminated by powerful searchlights, then attacked and brought down by guns. The difficult part was getting light on the target. Searchlight crews could not find targets merely by sweeping the sky, which produced only momentary glimpses of an aircraft as the lights swept by. Instead, crews had to be directed where to look. During the war, to find incoming planes, the Allies had developed instruments called sound locators. Manned by personnel with natural acute sensitivity to sound, the locators were designed to pinpoint the sound of aircraft engines within three degrees. These would then give the probable position of aircraft to the searchlight operators. By 1926, branch officers felt that they had this problem under control as well, with some claiming that the antiaircraft-artillery service was now almost more accurate at night than it was during the day.

The attention given by the coast artillery to antiaircraft defense changed dramatically at the beginning of 1930, when it received a new directive from the secretary of war.

It must be the normal mission of all Coast Artillery to serve antiaircraft guns. While the fixed defenses constitute the first line of defenses for the harbors on the coast against naval guns, the antiaircraft armament must
constitute the first line of ground defense against enemy aircraft at sensitive points and vital areas. This principle will be recognized and taught. In accordance therewith all Coast Artillery will be trained to serve, skillfully and effectively, antiaircraft armament, instruments, equipment, listening devices, searchlights, fire-control, etc., in addition to the permanent assignments that units may have to fixed defenses, railway, or tractor drawn artillery.68

This order came out of a growing awareness on the part of the General Staff of the rapidly increasing significance of air warfare and the vulnerability of the United States to air attack. It was carefully articulated in a secret memorandum by Assistant Chief of Staff for Operations and Training, Major General Frank Parker, in which he argued that the security of the United States from such attack required a coordinated air-corps and antiaircraft-artillery defense. But such a defense, would require a great reinforcement of the antiaircraft-artillery service, so Parker proposed an expansion of the army to provide that reinforcement.69 That increase did not happen. Instead, the antiaircraft-artillery capability of the army was augmented by making every coast artilleryman available for such defensive service.

But even though the coast artillery had already made major strides in developing its abilities and investment in antiaircraft defense, the new order still had wide ramifications. It caused major changes in the curriculum at the school at Fort Monroe, even including dropping the venerable courses in horsemanship to make room for more instruction in antiaircraft artillery.70 Significant reorganization occurred, as all personnel assigned to seacoast artillery had to be given wartime antiaircraft-artillery-unit assignments.71 The order also caused morale problems that widened an already significant schism between seacoast-artillery officers and antiaircraft officers, since many of the former felt threatened by the mysterious new equipment used by the latter.72 But the most significant consequence was that the antiaircraft-artillery service rapidly became the primary mission of the coast artillery.

The War Department order also reinforced a shift in attention from weapons and techniques to tactics.73 Discussions of tactics had occurred during the 1920s, but the topic was rarely given focused attention, and discussions rarely achieved any degree of doctrinal sophistication.74 This, however, was already changing in the late 1920s, as issues related to weapons and techniques began fading from sight, and tactics became the focus of attention. The Office of Chief of Coast Artillery initiated some studies of tactics regarding the defense of cities in 1928.75 Within a few years, the issue of tactics dominated antiaircraft artillery discussion.
For much of the 1930s, on a theoretical level, the antiaircraft-artillery service tended to look to Europe, specifically to Great Britain, for its guidance in the area of tactics. Although officers paid attention to all British developments, their chief source of inspiration was a book entitled *Air Defense* by E. B. Ashmore, who had played a major role in designing the air defense of London during the world war. Ashmore’s book dealt with experiences not only from the war but also from the redevelopment of London’s air defenses up to 1928. It came to the attention of American officers in 1930 and was cited frequently in writings throughout the decade to follow. Tactics for the air defense of cities were modeled after those described by Ashmore.

Efforts to develop a specifically American tactical doctrine were based on joint tactical exercises with the air service, which began in 1925 at Fort Tilden, New Jersey. At that time, however, these and several subsequent joint exercises were directed more at testing equipment than in developing tactics. The first set of exercises focused on tactics was held at Aberdeen, Maryland, in 1930, at which time fundamental ideas were tested for the first time. A far more sophisticated maneuver was held at Fort Knox in 1933, in which an actual defense of the base was attempted against an attack from Dayton. A final exercise was held at Fort Bragg in October 1938, during which civilian cooperation and a blackout of cities was attempted.

Actual tactical developments largely centered on two major sets of problems. The first was how to get sufficient warning of an approaching air strike so that guns could be manned and defending planes sent aloft. The service resolved this by borrowing the British idea of creating an intelligence network around a city, made up of civilian volunteers. The city was to be defended by two or three concentric circles of such volunteers, with the outer circle between 100 and 150 miles from the center. The most important phases of these exercises focused on testing this intelligence network, since its development was considered one of the most important tactical issues related to city defense. Several years were spent working out the appropriate communications linkages and procedures.

The less technical and more difficult tactical problem was how to coordinate the defense efforts carried out by the antiaircraft artillery and air service/corps. In the early 1920s, while antiaircraft weapons and techniques were still in their infancy, there was a consensus in the branch that a successful defense of cities from hostile aerial bombardment would require the cooperative efforts of the antiaircraft-artillery service and the air service, with the former clearly subordinate to the latter. As an editor of the *Journal of the United States Artillery* wrote in 1922, “The anti-aircraft gunner will be the first to admit that the most effective...
weapon of air defense is the aeroplane.” But by the middle of the decade, and especially by the 1930s, as confidence in the effectiveness of weapons and techniques grew, the branch sought tactical approaches to city defense that gave antiaircraft artillery a more dominant if not the sole role in that mission. Since it was difficult for planes and antiaircraft artillery to work together simultaneously, officers tried to solve the problem by setting out spheres for each arm. Early in the 1920s, it was suggested that aircraft be responsible for defense during the day and antiaircraft artillery take responsibility at night. In the mid-thirties, air-corps supporters began to claim that defense aircraft could fight at night. This led to the idea that aircraft would defend zones ranging 100–150 miles outside the city while antiaircraft artillery would be responsible for dealing with aircraft close in and over the target. Finally, it was suggested repeatedly that the successful defense of a city required subordination of all forces to a single unified command. Since the antiaircraft service controlled the intelligence network that could direct defending aircraft to an incoming enemy raid, supporters of the branch argued that it would make sense that antiaircraft service should provide that command.

By the end of the 1930s, however, some of the confidence in the effectiveness of antiaircraft artillery began to fade, leading to concerns and challenges to some of the basic premises upon which the tactical structure created in the 1930s were built. For one thing, air forces were learning how to muffle the sounds of their warplanes, seriously eroding the effectiveness of sound detectors. Pilots were also learning more about antiaircraft artillery, its tactics, and how to maneuver when under fire. One air-corps officer bragged that if a plane was not hit with the first burst, the pilot would be successful in avoiding the remainder. Pilots also learned that flying during periods of moonlight or haze severely reduced the effectiveness of searchlights. Finally, officers claimed that bomber tactics, including mass attacks on a single sector, would overpower any antiaircraft defense.

All of this led to a degree of unraveling of confidence in the antiaircraft-artillery service, as seen by the emergence of challenges to some of the basic principles upon which it was founded. By 1939, a few officers within the coast artillery were challenging some of the basic elements of the service. In one article, an officer condemned the existing fire-control system as too bulky and too fragile to stand up to the rigors of combat, the existing regimental structure as being irrelevant to the new forms of air attack, and the lack of an overall air-defense program that included a civil-defense aspect. Another challenged the idea of protecting cities by shooting down or turning back all attacking planes before they reached their target, an objective he saw as impossible. He instead suggested tactics based on hampering attacking aircraft. The officer also condemned the branch for its
tendency to seek to solve problems by inventing new weapons or techniques and approaching tactical challenges “from a too narrow mathematical and mechanical viewpoint.”

With America’s entrance into World War II, the transformation of the coast artillery into the antiaircraft artillery was complete. Coast artillery was dissolved as a branch, its officers placed into antiaircraft-artillery units.

During the period from 1919 to 1939, the coast artillery as a branch had transformed itself more than any other combat organization in the army. It managed to do so despite operating in an atmosphere of public apathy, congressional neglect, and professional skepticism from colleagues. It also did so without indulging in the self-pity and hysterical fascination on subversion and conspiracies that was seen in other branches. Finally, it did so on the most meager of resources. Its success in this transformation was largely due to the specific character of the professional self-image and outlook of coast-artillery officers. Their engineering background and training left them open to the introduction of new technologies and at peace with the mechanization of the society around them. The tradition of open mindedness that had been central to the coast artillery since the late nineteenth century also allowed a relatively easy acceptance of change. The branch was also fortunate that it had no object such as the horse to which it had developed an emotional attachment or played a role in its identity. Nor was it burdened with undue pride, so that all during the interwar period, it took the initiative in working with other branches. In these relationships, the coast artillery also had no problem accepting a secondary and subordinate role.

At the same time, if the coast artillery demonstrated the degree to which branches of the army could change in the interwar period, it also demonstrated the limitations of change. First, it did not so much transform itself from the big-gun defense of harbors into antiaircraft artillery as it merely lost all its other missions. Second, while coast-artillery leadership was open minded, it was not imaginative. Officers tended to work with borrowed ideas rather than develop their own innovations. They spent the interwar period tinkering with the weapons, techniques, and tactics developed in the world war, even though some of them, such as the sound locators or the huge intelligence networks with their ponderous communications systems, were clearly limited. The branch took little initiative in coming up with new ideas—including radar. In short, even amid a mission crisis, the coast artillery shared many of the conservative characteristics of other branches of the army.

In part, the coast artillery’s conservatism was the product of scarce resources. It was also engaged in the most conservative of objectives—self-preservation.
And, like other branches, it lacked institutional support for innovation. The Coast Artillery Board, like the boards of the other branches, was largely a reactive body, solving relatively minor problems submitted to it rather than reflecting on larger issues. In addition, despite its engineering tradition, the branch was less connected with the civilian scientific and engineering community than it had been before the world war. Finally, the coast artillery’s self-image as military professionals demanded that its members’ existing expertise be valued by themselves and by the public. As a result, change was difficult. This was particularly evident in the case of seacoast artillery, where the radical idea of transformation into mobile heavy artillery was finally rejected in favor of the doctrine of coastal defense—a return to the “normal mission” of the coast artillery.