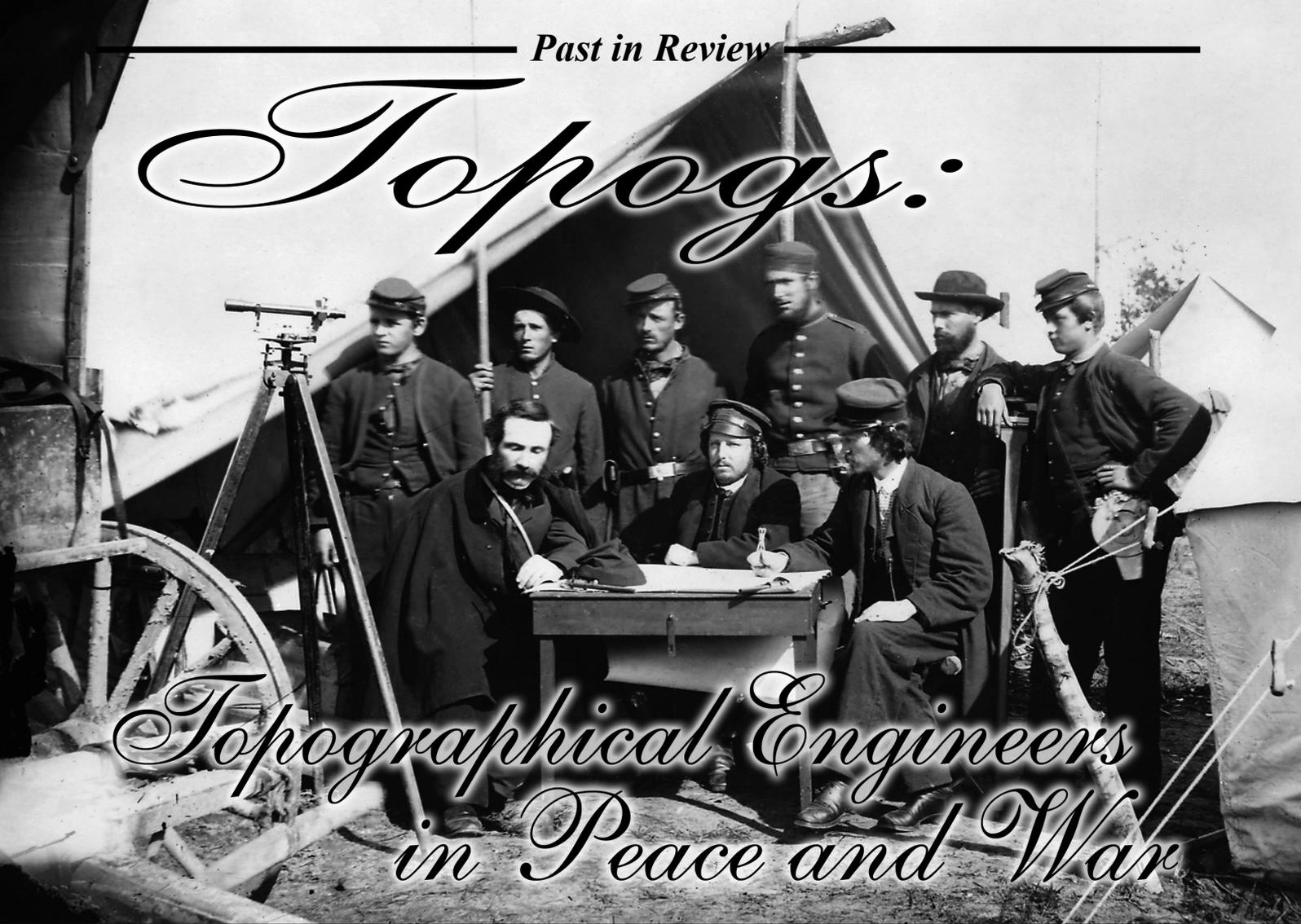


Topogs:

Topographical Engineers in Peace and War



By Mr. Gustav Person

Photograph by James Gibson (Library of Congress)

Although the topographical engineers only served the United States Army as a separate branch for a relatively short period of time, their accomplishments were considerable. They achieved significant geographic and scientific discoveries, broadened our knowledge of unexplored areas, and contributed to the nation's desire to achieve its Manifest Destiny. Their wartime surveying techniques provided the most up-to-date and accurate maps, and during periods of peace they labored extensively on civil works projects authorized by Congress. This article examines the origins and the significant roles of the topographical engineers in the early 19th century and many of the important officers and their accomplishments, and it will end with their service during the Civil War.

Origins

Unlike the Corps of Engineers, the *topogs*, as they were usually known, lacked a central office or branch as a separate corps for much of their existence. For example, in the first quarter of the 19th century, the War Department generally assigned them as individual staff officers to the two military departments.¹

During the War of Independence, at least three men had performed topographical and geographical duties for the Continental Army. Topogs were first appointed officially during the War of 1812. An act of Congress on 2 March 1813 authorized the appointment, as part of the general staff, of eight topogs with the brevet rank, pay, and emoluments of majors of cavalry and eight assistants with the brevet rank, pay, and emoluments of captains of infantry. As prescribed in the later 1841 regulations, the duties of the topogs "shall consist, in surveys for the defense of the frontier, inland and the Atlantic, and of positions for fortifications; in reconnoissances [sic] of the country through which an army has to pass, or in which it has to operate; in the examination of all routes of communication by land or by water, both for supplies and military movements; in the construction of military roads and permanent bridges connected with them and, in the absence of an officer or officers of the Corps of Engineers, of military bridges, and of field-works, for the defense of encampments, fords, ferries and bridges. For which purposes, officers of the Corps of Topographical Engineers shall always accompany armies in the field."²

The topogs were disbanded in 1815 by the act of 3 March that reduced most of the Army. In spite of the 1815 housecleaning, some continuity was maintained as two of the topographers, Majors John Anderson and Isaac Roberdeau were kept on active duty to complete surveys of the northern frontier and Lake Champlain. The following year, topogs were again authorized to assist the Board of Engineers for Fortifications. In 1818, the regulations assigned them fully to the Engineer Department, along with the United States Military Academy at West Point and the Board of Engineers for Fortifications, and made them subject to the orders of its chief. Thereafter, a few topogs usually found themselves assigned to fortifications work. In August, a further regulation of the War Department established a Topographical Bureau in the Engineer Department. Located in Washington, D.C., the Bureau's main duties consisted of housekeeping tasks but not control over programs or personnel. The Bureau collected and preserved the specimens brought back by scientific expeditions, compiled maps, and stored and cared for the topogs' survey instruments.³

The partnership between officers of the Corps of Engineers and the topographers was uneasy. The competition for work and influence between the engineer and topographical officers resulted in substantial bitterness and tension. An additional reason for the animosity was that regular engineer officers were chosen from the top ranks of graduating West Point classes; topographical engineers were normally chosen from the second rank or from civilian life.⁴

Civil Works

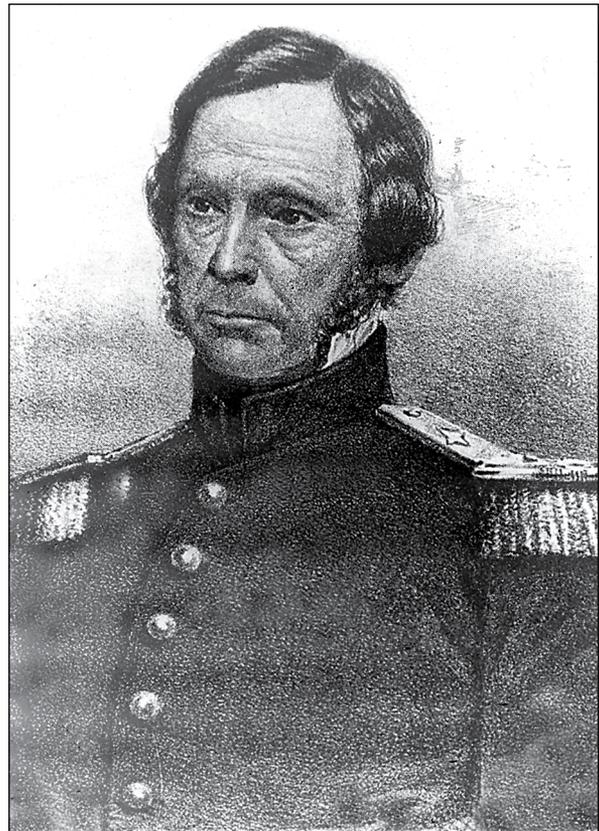
By 1824, the importance of waterways, canals, roads, and bridges in the young nation was clear. These were the paths of commerce and westward expansion. On 30 April 1824, Congress passed the General Survey Act, which sought "to procure the necessary surveys, plans, and estimates upon the subject of roads and canals." It authorized the president to direct work on routes considered of national importance for commercial, military, or postal service purposes. Congress provided \$30,000 to cover expenses. To carry out the surveys, the president was authorized to hire additional civil engineers to augment the topogs. A further act on 24 May appropriated \$75,000 to improve navigation on the Ohio and Mississippi Rivers. Within a week, President James Monroe appointed a Board of Engineers for Internal Improvements to administer the General Survey Act. By the end of 1824, all ten topogs had been assigned to internal improvement projects. During 1826, Major Stephen H. Long supervised the construction of a wing dam on the Ohio River, as well as supervised commercially developed steam-powered snagboats to clear the river of hazardous limbs and debris to improve navigation. Long had graduated from Dartmouth College in 1809. He joined the topogs in 1816 and taught mathematics at West Point for two years. Thereafter, he had a wide-ranging career as an explorer, railroad and river engineer, and inventor. His duties at this time also

involved ensuring the navigability of the Mississippi River. By 1830, topogs led 10 of the 13 surveys for canals, roads, and railroads, while civilians headed the other three.⁵

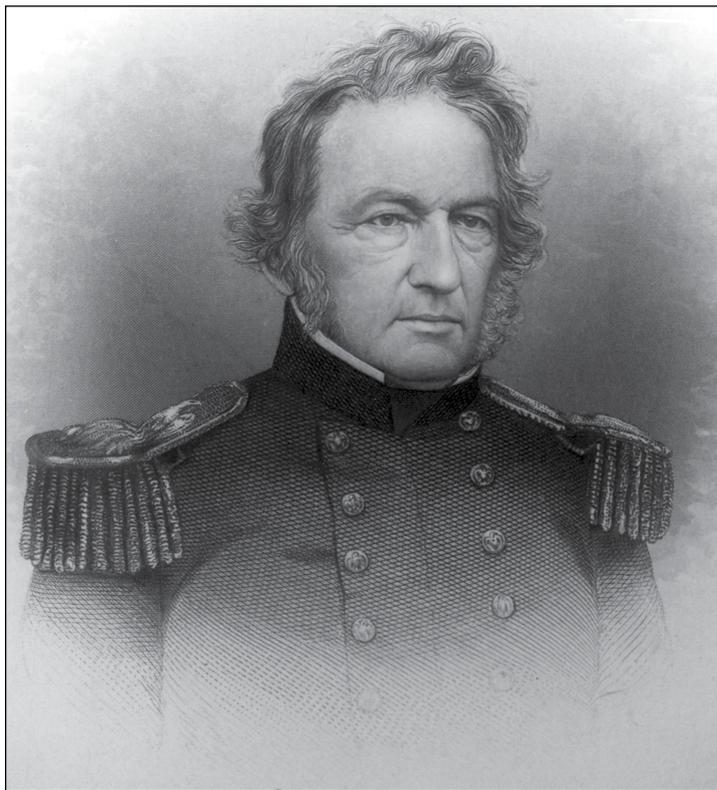
Meanwhile, the Engineer Corps officers began to shoulder the major tasks of designing and building the fortifications that would guard the eastern seaboard and the Gulf of Mexico. The topogs actually transferred to the Corps of Engineers all their plans and drawings of fortifications.

Throughout the 1830s, the topogs carried out internal improvements to the country, both governmental and private. After surveys had been completed, all governmental projects were carried out on contracts superintended by the Corps of Engineers and the Quartermaster Department. Major Long gained a reputation as a railroad engineer during this time and was employed on such projects in New England and the South. Upon the reestablishment of the United States Coast Survey as part of the Treasury Department in 1836, the topogs again became associated with this work. Thereafter, until 1863, one or two officers were always assigned to this duty.

Beginning in 1834, the topogs were employed with the construction of lighthouses. These were turned over to the Treasury Department for administration upon their completion. When the United States Lighthouse Board was established in 1852, two topogs were appointed as members.⁶



Colonel Stephen H. Long, last Chief of Topographic Engineers, 1861-1863 (Office of History, U.S. Army Corps of Engineers)



Colonel John J. Abert, Chief of Topographic Engineers, 1838-1861, Engraving by J.C. Buttre (Office of History, U.S. Army Corps of Engineers)

In January 1829, Lieutenant Colonel Isaac Roberdeau suddenly died and, after some deliberation, Major John J. Abert took over as the head of the Topographical Bureau. During the following year, he succeeded in gaining representation on the Board of Engineers for Internal Improvements; however, the Secretary of War abolished that board in 1831.⁷

Abert had graduated from West Point in 1811, but resigned from the Army to become a lawyer. He reentered the service in 1814 as a private soldier in the District of Columbia Militia and fought in the Battle of Bladensburg in August of that year. He became a topog in November and served until his retirement in 1861. Abert recognized that he needed immediate help. His two additional sources of assistance each year were 20 to 30 officers from other branches of the Army and 10 to 15 civilian engineers. He also began work to establish a separate Corps of Topographical Engineers, a project that would take almost ten years. Meanwhile, Abert began to consolidate and increase his responsibilities. For example, up until 1836 the Corps of Engineers had handled all river and harbor construction projects, but in that year the War Department transferred several Great Lakes and Lake Champlain projects to the Topographical Bureau.⁸

With so many plans for the future, and his officers thoroughly engaged in a variety of civil projects, Abert was unprepared to meet the cartographic needs of the Army during the Second Seminole War. The first war in 1818 had

only required the assistance of one of the Army's ten topogs. The second war in 1836 placed a much greater demand on them. The lack of data relating to Florida seriously impeded operations against the Seminoles who sought refuge in the Everglades. By the end of that year, eight topogs—diverted from civil works projects—were in the field with various forces, performing reconnaissance, collecting topographical information, and drawing maps. Topographers later stayed in Florida through the 1840s, building and maintaining roads, as well as collecting data, making surveys, and updating maps.⁹

Throughout the 1830s, Abert continued to urge the formation of a Corps of Topographical Engineers. He based his arguments on the solid premise that the work of the topogs was vital to the country's military security and of great benefit to its economic progress. He pointed out that this move would be less expensive than the continual hiring of civil engineers to perform the work that had been too extensive for the few topogs. He also noted that efficiency would be promoted by ending the practice of detailing line officers, for much time had to be spent in training them—usually two years. Abert's efforts were energetically supported by Secretaries of War Lewis Cass and Joel R. Poinsett and resulted in the organization of the Corps on 5 July 1838. A provision was included to increase the size of the new organization to consist of one colonel (Abert), one lieutenant colonel, four majors, ten captains, ten first lieutenants, and ten second lieutenants—a total of 36 officers. As before, no enlisted personnel were assigned to the topogs. In a further move, Secretary Poinsett ordered—on 1 August 1838—the assignment to the topogs of “all new works of improvement, not of a military character, [and] not connected with the fortifications.” Therefore, between 1838 and 1841, the Engineer Department transferred more than 70 civil works projects to the topogs. Chief among those projects was the construction by Major Long of a number of inland Marine Hospital Service facilities around the country for disabled seamen.¹⁰

Western Expansion

During the late 1830s and 1840s, a number of topogs conducted widespread explorations of the West. Beginning in 1838, John C. Fremont, a newly appointed second lieutenant (but not a West Pointer), conducted a reconnaissance of the Upper Mississippi and Missouri Rivers. Fremont explored the Oregon Trail to the Columbia River and California in 1842-45. His reports became guidebooks for the many emigrants flowing toward the new lands. Upon his third and last expedition for the government, he detached Lieutenants James W. Abert, the colonel's son, and William G. Peck—in August 1845 at Bent's Fort on the Arkansas River—to survey the Canadian and Washita Rivers. In the same year, Lieutenant William B.

Franklin accompanied Colonel Stephen W. Kearney's military expedition along the Oregon Trail. On his march to Santa Fe and San Diego in 1846, Kearney's route was sketched and described by Lieutenants William H. Emory and William H. Warner.¹¹

In 1846-48, many of the topogs were withdrawn from civil projects to participate in the war with Mexico. Two-thirds of the 36 men of the Corps served in the field with various tactical commands, independent of the bureau. In California, Fremont became involved in the Bear Flag revolt and the overthrow of Mexican rule. Captain Joseph E. Johnston accepted a promotion to lieutenant colonel and became second in command of the Regiment of Voltigeurs and Foot Riflemen, a new unit of mixed cavalry and infantry. Captain George Hughes became military governor of the area around Jalapa and Perote, northwest of Vera Cruz, with Emory as his lieutenant governor. Major Long built steamships for the Quartermaster Department in Texas. Topogs played important roles in all the major battles along the road to Mexico City, engaged in reconnaissance, scouting, and combat operations. Throughout the war, the majority of the topogs kept their technical lines of communication open to the Bureau and Colonel Abert. He had reason to speak proudly of his officers. The topogs, he said, showed "the versatility of talent in the Corps and its ability to fulfill any military duties which it may be found necessary or proper to assign to it."¹²

The acquisition of the vast Southwest from Mexico, as a result of the war, and the settlement of the Oregon controversy with Britain, opened up the Far West for further exploration

by the topogs and the undertaking of numerous boundary surveys. Before and after 1853, Captain Emory successfully surveyed the difficult and complex boundary of the Gadsden Purchase separating Mexico and the Southwest. The creation of new states and territories provided further boundary work for the topogs. For several years after 1853, Lieutenant Gouverneur K. Warren and other topogs were chiefly engaged in surveys of four routes for railroads from the Mississippi to the Pacific coast. As part of this work, Warren actually went on three expeditions to the northern plains during 1855-57. Unfortunately, Secretary of War Jefferson Davis later took the Pacific Railroad surveys from Abert's control and placed them under a new Office of Exploration and Survey that reported directly to him. Although these explorations demonstrated the practicability of spanning the continent with railroads along various routes, none was completed until after the Civil War.¹³

During the two decades prior to the 1850s, the topogs had flourished. They had achieved independence from the Engineer Department; acquired an elite corps of 40 capable, experienced, and dedicated officers; created and preserved an invaluable collection of maps, charts, and reports; expanded its range of duties and activities; established a number of field offices; and appeared capable of handling the kind of engineering tasks that the President, Congress, or the War Department might assign to it. During the 1850s, however, the Corps declined. It lost the services of several of its best officers, and the others were overworked. It lost completely, or in part, some of its most important functions, including lighthouse construction. Its prestige diminished, and favoritism and



The staff of Topographic Engineers, Headquarters, Army of the Cumberland

intrigue replaced purposefulness and direction. The decline began slowly after 1850, but picked up speed as the decade progressed. By 1861, the Corps was foundering badly.¹⁴

Yet, during this period, the Corps achieved some remarkable results. On and off for the entire decade of the 1850s, Captain Andrew A. Humphreys, assisted by Lieutenant Henry L. Abbot, conducted a major hydrographic study of the Mississippi River Delta. A chief objective was the best means of securing a wide navigation channel at the river's mouth. Their 1861, 500-page report entitled, "Report upon the Physics and Hydraulics of the Mississippi River," and later translated into a number of foreign languages, is still regarded as a model scientific study.

Some 6,000 miles of Great Lakes shoreline required surveying and exploration. The Great Lakes Survey had actually started in 1823. From 1841-60, Congress appropriated a total of \$640,000 for the survey. Major James Graham and Captain George G. Meade were the chief topogs engaged in these duties throughout the 1850s. Despite those successes, other science-oriented federal agencies were being established, and they began to assume some of the duties of the topogs. The existence of the Smithsonian Institution, the Naval Observatory, the Office of the United States Coast Survey, and the Pacific Wagon Road Office in the Department of the Interior reduced the prestige of the topogs from the levels prevalent in the previous decades.¹⁵

Civil War

Colonel Abert's leadership abilities had declined with age and failing health. In 1861, just three days before the firing on Fort Sumter, the 73-year-old colonel was involuntarily retired because of physical disability. He was temporarily succeeded by Lieutenant Colonel Hartman Bache, and then by Colonel Stephen Long, himself a septuagenarian. Long would only serve as chief for less than one year, and a good part of that time was spent on leave. He has been described by historian Garry D. Ryan as "old, tired, uninspiring, and uninterested." With the coming of war, the few civil works under the direction of the topogs were suspended. Only the Great Lakes Survey survived the war.¹⁶

In two acts of Congress passed on 3 and 6 August 1861, the Corps of Engineers and the topogs were each authorized an additional 12 officers. From a total of 45 officers at the beginning of 1861, the topogs were reduced a year later to 28 as a result of seven officers resigning to join the Confederacy, four forced retirements, and others who accepted senior promotions in the volunteer forces. The War Department also gradually assigned the remaining topogs to duties that placed them under the directions of some authority other than the chief of the Corps. Twenty-four topogs were eventually promoted to general officer rank, an impressive number indeed. Four others lost their lives during the struggle.¹⁷

The question of rank was of particular importance to both Corps. The members simply held grades too low to serve

efficiently in the field. Rarely did anyone above the rank of major serve as an engineer in the field; most were lieutenants and captains. Because they were prevented from accepting regimental volunteer commissions at the beginning of the war, these officers were frustrated that they, considered the elite of the army, were not sharing in the opportunities and benefits of wartime expansion. It is not surprising that those who could quickly accepted promotions in the volunteer forces outside their own Corps.¹⁸

The topogs were also authorized to organize a company of enlisted men. In 1845, as tensions with Mexico mounted, Abert had sought authorization to raise a company of 100 men to assist in making maps and surveys. Congress ignored his request, so the topogs had to find their own assistants who were mainly civilians. In September 1861, two lieutenants were ordered to Boston to begin recruiting duties. This effort was notably unsuccessful. The Corps lacked a central depot, officers for instruction, and experienced sergeants. It also had to compete with volunteer units. Finally, since only a handful of recruits had come forward, these men were later transferred to the Corps of Engineers. The topogs never did field a company.¹⁹

By May 1862, the topogs had sent 24 of their remaining 30 officers to the war on active field duty. The relationship of these officers to the various headquarters was not entirely clear. During the Peninsula Campaign, the chief engineer of the Army of the Potomac diverted members of the topographical engineer staff to ordinary engineer duties, and one member, Lieutenant Henry Abbot, was assigned as his personal aide. During the later Atlanta Campaign, the chief topog of the Army of the Cumberland discovered that two of the three Army corps commanders had countermanded his instructions and were refusing to allow their topographical officers to pass on information to Army headquarters.²⁰

In the Western Theater at the beginning of the war, the armies operated with few resources. Only two topogs were available to map the entire region from the Appalachians to the Trans-Mississippi. Yet, the experience of the Army of the Cumberland was quite notable. In November 1862, Major General William S. Rosecrans immediately ordered the expansion of the topog staffs at brigade, division, and corps headquarters. The information, compiled and supplemented at each echelon, would travel up the chain of command to the topographical office at army headquarters, where it was turned into finished maps and published. "Skeleton" maps were continually updated, and this operation developed into a high state of efficiency.

Among the most important advances made during the war were the techniques of map reproduction. Before 1861, the Topographical Bureau at the War Department possessed no presses of its own and was compelled to use commercial printers. This practice continued during the war. During 1864, for example, 20,938 commercial maps sheets were issued to the armies. The printing presses of the Coast Survey were also used to supply 42,000 sheets in 1862 alone. In the field, armies

organized their own lithographic press operations to publish maps. Photography was also applied to map reproduction with excellent results. The most effective topographical section in the field was that of the Army of the Cumberland. Captain William Merrill took an inefficient section and boosted its productivity. He obtained lithographic presses and cameras and staffed the section with 38 draftsmen, printers, and photographers under a volunteer officer, Captain William Margedant. Captain Margedant had invented a new technique of rapid map reproduction using black tracing paper set over special photographic paper and exposed directly to sunlight. Using all these reproduction techniques, the topographical section of that Army followed closely behind the front lines in Georgia in 1864, printing map after map. During the Atlanta Campaign, the section issued at least 4,000 campaign maps. In July alone, the section published more than 1,000 sheets of 14 different maps.²¹

The Corps of Topographical Engineers remained a separate branch of the Army until 1863, primarily because of the abilities of its former chief, Colonel Abert. However, the attempt to abolish the Corps and the Topographical Bureau went back to Secretary of War Davis' report of December 1854 in which he asserted his conviction that the continuation of a separate Corps of Topographical Engineers was "inexpedient." In 1861, the Chief of Engineers, Colonel Joseph G. Totten, opposed the move, although a number of junior officers of both Corps favored an amalgamation of the two organizations. Colonel Long, however, made no attempt to stop it. By 1863, the exigencies of war had largely broken down the artificial barriers that separated the duties of the two Corps. Younger topogs, as well as engineers, were now engaged in the construction of bridges, blockhouses, entrenchments, and other permanent works. They also harbored a common grievance against the War Department's promotion policies. Major General George McClellan, himself a former engineer officer, sent a petition to Secretary of War Edwin Stanton recommending the merger in June 1862. Congress considered the resulting bill during the following months, with a number of changes made to the original proposal. On 2 March 1863, the Senate approved the bill by a 26 to 10 vote. The House accepted the Senate's amendments with little argument, and the bill became law on the following day. The unification of the two Corps, announced to the Army in War Department General Orders No. 73, dated 24 March 1863, was finally completed in fact as well as law on 8 August 1866, with the appointment of Andrew A. Humphreys, a former topographical engineer, as Chief of Engineers.²²

Summary

For nearly two decades, the topographical engineers had functioned as a major scientific agency of the federal government. At a time when the Corps of Engineers was primarily involved in the coastal fortifications program, the topogs led the way in exploration, internal development, and other civil works. It was only declining fortunes and

forces beyond their control that brought the extinction of the Corps of Topographical Engineers as a distinct branch of the Army. Their services within the Corps of Engineers, however, continue to this day. 

Mr. Person is the installation historian at Fort Belvoir, Virginia. He retired from the New York State Division of Parole after 30 years of service and is a retired lieutenant colonel from the New York Army National Guard. He holds a master's in history from Queens College, City University of New York.

Endnotes

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