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Situation Desperate: *U.S. Army Engineer Disaster Relief Operations, Origins to 1950* • Leland R. Johnson

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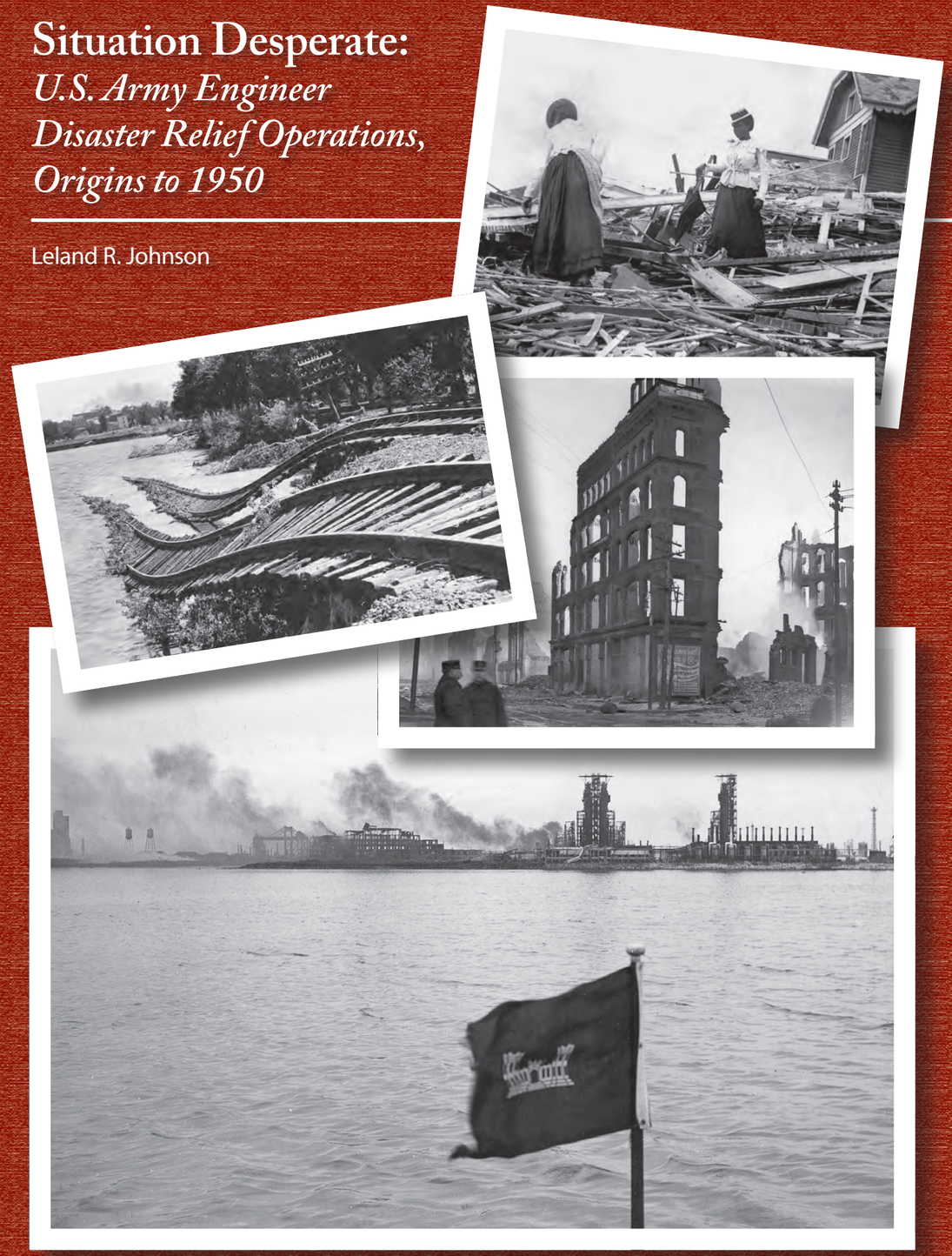

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U.S. Army Engineer Disaster Relief Operations

Origins to 1950

Leland R. Johnson

Office of History
Headquarters, U.S. Army Corps of Engineers
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ESSAYONS

Foreword

The U.S. Army Corps of Engineers is best known for its water resource development and military construction missions, but its emergency response work is a vital endeavor that has grown in importance and visibility in the wake of the terrorist attacks of September 11, 2001, and Hurricane Katrina in 2005. It is an old mission. For more than two centuries, the Corps has employed highly trained and well-equipped engineers at offices strategically located throughout the nation to conduct civil works and build fortifications, and, on a case-by-case basis, Congress or the president would frequently tap these resources to provide rescue and relief during local emergencies. In 1882 Congress made it official and formally tasked the Corps of Engineers with a rapid emergency response mission.

In the ensuing years, Army Engineers responded to hundreds of emergencies resulting from floods, hurricanes, tornadoes, earthquakes, volcanoes, and other natural and manmade disasters in America and abroad. Statutory authorities and Army regulations evolved, requiring the engineers to undertake emergency operations to save lives and property during disasters, and afterwards, by direction of Congress or the president, to assist state and local governments with urgent restoration and recovery efforts.

This volume on the history of the Army Engineer disaster assistance mission traces the federal program from its tentative beginnings in the nineteenth century to the enactment of a permanent federal policy on disaster assistance in 1950. It explains how the Engineers came to acquire that mission during the great Mississippi River flood of 1882, describes the development of the Corps' statutory authorities and the Army's regulations for emergency operations, and tells the stories of Corps and Army Engineer operations during various calamities. For nearly 130 years now, Army Engineers have performed the often perilous task of emergency response with intelligence, determination, and courage.

R. L. Van Antwerp
Lieutenant General, U.S. Army
Chief of Engineers

Preface

Situation Desperate has followed a long and circuitous path to publication. Leland Johnson wrote the first draft in 1976 on contract with the Office of History, Headquarters, U.S. Army Corps of Engineers. The project originally fell under the management of former chief of the office, Jesse Remington, and staff historian Albert Cowdrey. Later iterations were influenced by Remington's successors, John Greenwood and Paul Walker, and a long line of staff historians, including Martin Gordon, Frank Schubert, Fred Beck, Dale Floyd, Charles Walker, Martin Reuss, and Charles Hendricks. As a staff historian, I picked up the project in 2002, saw its importance in the wake of the recent terrorist attacks, and recommended the manuscript for publication.

With interest renewed in the project, Johnson initiated a series of limited revisions to the text, and this office scanned the typescript pages to create an editable and machine-readable file. In 2008 the office set up a team comprised of staff historians Matt Pearcy and Eric Reinert and editor Doug Wilson to shepherd the project to completion. Mr. Wilson carefully incorporated previous edits to the manuscript made by Mickey Loughlin and former office editor Jean Allen and made additional edits. Next came the important task of selecting images. Mr. Wilson took the lead in identifying photos from those that Dr. Johnson had collected during his research, from the Office of History's research collections, and from the Library of Congress, the National Archives, and dozens of image repositories around the country. He uncovered a good number of images spanning more than a century of disasters, and we began preparing for a heavily illustrated publication. Over time the office's historians and editor continued to develop the text, which took on an encyclopedic organization that reflects the unique nature of each emergency and subsequent response. The final product lends itself both to readers who wish to read start-to-finish and to those who will find value in the manuscript as a reference tool.

We were fortunate to obtain the services of EEI Communications in Alexandria, Virginia, to handle layout and design. Thankfully, Jayne Sutton, who worked closely with this office to produce the prize-winning publication, *Capital Engineers* (2008), and others, was EEI's project manager for this effort as well.

The final publication highlights the Army Engineers' long history of emergency operations through 1950. It sheds valuable light on the evolution of that mission narrated against the general background of developing federal disaster assistance policies and precedents dating back to the early nineteenth century. It also describes the seven major phases through which federal disaster assistance passed before the statutory establishment in 1950 of modern policies. Years of hard work by many have led to this attractive and useful publication that contributes to our understanding of the important mission, role, and activities of the U.S. Army Corps of Engineers during disasters and emergencies.

Dr. John C. Lonnquest
Chief, Office of History
Headquarters, U.S. Army
Corps of Engineers

Above: The Corps of Engineers responded to the terrorist attacks of September 11 at the Pentagon and in New York.

U.S. Army Corps of Engineers

Below: The Corps and the Army helped Florida recover after Hurricane Andrew in 1992.

U.S. Army Corps of Engineers

Left: The drift collection vessel *Hayward* recovered wreckage from American Airlines Flight 587 from Jamaica Bay, New York, in November 2001.

New York District (Brian Aballo)

Federal Assistance: Constitutional Questions

1

How did the United States Army Corps of Engineers acquire a disaster assistance mission? Answering this question requires an investigation into how the Army became involved in disaster recovery; that is, when and how did the Army first receive statutory authority to engage in disaster relief? An even more fundamental issue arises: When and how did Congress determine that providing assistance to disaster victims was a legitimate exercise of federal power?

The Army Engineers first received congressional authority to participate in disaster relief efforts in 1882. The Army, specifically its Quartermaster Corps, first received disaster assistance authority at the end of the American Civil War. At nearly the same time, Congress first approved federal disaster assistance to help the recently freed men of the South, regarded then as wards of the federal government.

Yet, before then, as early as 1811, Congress had enacted various laws that have been cited as precedents for national policy on disaster assistance. In 1950 the Library of Congress compiled a useful list of these prewar precedents and published it in the *Congressional Record*. Before exploring the post–Civil War role of the Army and its Corps of Engineers in disaster relief, review of prewar precedents and the accompanying congressional debates over the constitutional questions they raised is instructive and indicates that disaster relief was a highly controversial issue during early American history. National leaders then questioned whether granting federal assistance to disaster victims was permitted under the Constitution, and perhaps the majority of Congress then questioned whether the federal government should engage in any disaster relief whatsoever. Others contended a humanitarian obligation, higher even than the Constitution, demanded granting aid to disaster victims and that the constitutional authority of Congress to "provide for the … general welfare" encompassed such disaster assistance. These constitutional questions first arose in Congress in debates between a president of the Continental Congress and the "Father of the Constitution."

James Madison, a Virginia congressman subsequently elected president and remembered as the "Father of the Constitution," thought the proposed federal assistance legislation before the House of Representatives in 1794, if enacted, would set a dangerous precedent. He feared it might be "perverted to the countenance of purposes very different from those of charity." Nothing in the Constitution, he argued, granted Congress the right to expend public revenues for charitable relief. He warned the House that once rules laid down in the Constitution were broken it would become impossible to predict "to what extremities this practice might be carried."[1]

Congressman Elias Boudinot of New Jersey, a former president of the Continental Congress, arose in the House to oppose Madison's interpretation of the Constitution. "To refuse the assistance requested," said Boudinot, "would be to act in direct opposition both to the theory and practice of the Constitution." Congress, he pointed out, had extended relief to destitute

Indian tribes and had provided subsistence for prisoners-of-war—just where were these practices authorized by the Constitution? He proclaimed that charitable relief rested on the law of nature, the law of nations, and moral obligations higher than the Constitution itself. As to legal theory, Boudinot suggested members of Congress should closely examine the first clause of the eighth section of the Constitution. "By that clause," he declared, "the Congress is warranted to provide for exigencies regarding the general welfare."[2]

Thus, as early as February 1794 were drawn the battle lines for constitutional debates over the legality of federal assistance in the wake of disasters; and the debates would continue in Congress and out for more than a century. Madison and Boudinot stated clearly the lines of argument, defined as *strict* versus *broad* construction, or interpretation, of the Constitution.

Strict constructionists argued the federal government had no constitutional authority to expend public funds for charitable purposes or disaster relief. Broad constructionists contended that these benevolent activities were authorized under the "general welfare" clause of the Constitution. Strict constructionists declared disaster assistance to be solely the responsibility of private charities and state governments. Broad constructionists asserted that the federal government should share in this responsibility. Debates over these differing interpretations of the foundation document of the United States marked the proceedings of Congress each time a major disaster afflicted the nation during the nineteenth century. Strict constructionists had the upper hand in the debates until after the Civil War, when special circumstances opened a door for the broad constructionists.

The ongoing constitutional debates in effect prevented federal agencies from participating officially in disaster relief activities, no matter how serious the disaster or enormous the needs. In the case of the U.S. Army Corps of Engineers, individual officers of the Corps occasionally assisted in local disaster relief activities as volunteer humanitarian gestures, but the Corps itself had no official role in disaster assistance until 1882. With their limited numbers fully occupied with transportation and military engineering projects across the nation, the Army Engineers before the Civil War lacked both the substantial resources and the legal authority necessary to undertake disaster assistance missions. To understand the origins of Army Engineer involvement in disaster assistance, it is worthwhile to explore the earliest federal activities in that regard and the limitations imposed upon those activities by constitutional questions and thereby find principles guiding federal efforts to respond to emergencies and Army Engineer participation in those efforts into the twenty-first century.

The French Refugee Bill, 1794

The James Madison and Elias Boudinot debate of 1794 concerned the first bill proposed in Congress that touched on the issue of federal funding for humanitarian purposes. Thousands of Frenchmen had fled to the United States during the summer of 1793 to escape the Haitian revolution, where slaves had risen against French slaveholders. Penniless and without skills, many French aristocrats became public wards, supported by aid from charities and state and local governments. On New Year's Day of 1794, a committee from the state

Artwork by Jacques François Joseph Swebach-Desfontaines depicts citizens fleeing the city as Cap-Français (now Cap-Haïtien) burned in 1793.

Bibliothèque Nationale de France

of Maryland advised Congress that its state funds supporting indigent French immigrants had been exhausted and it petitioned for federal aid. An investigating committee of the House of Representatives reported as many as three thousand Frenchmen were indeed suffering in America and it recommended that Congress take appropriate action.[3]

When Madison and Boudinot stated their positions on the constitutionality of aid to the French refugees, Congressman John Nicholas of Virginia agreed with James Madison in opposing any federal aid for the refugees, asserting that for the Congress "to bestow the money of their constituents on an act of charity, though it would be extremely laudable, was yet beyond their authority." Samuel Smith of Maryland disagreed, pointing out the great debt of gratitude that the United States owed to France and its people for their assistance during the American Revolution. James Madison noted that the United States also owed a large war debt to France for loans made during the Revolution, and a payment on that debt would soon fall due. Shrewdly, he suggested Congress might sidestep constitutional issues by furnishing the necessary subsistence to the French refugees and deducting costs of the subsidy from the next installment due on the war debt.[4]

This arrangement neatly avoided constitutional issues and Congress accepted Madison's solution. On 12 February 1794 it appropriated $15,000 to be expended under the direction of President George Washington for relief of needy French immigrants and ordered that the sum be "charged to the debt of the French Republic." The president then distributed relief funding to 1,950 penniless refugees in ten states.[5]

"to bestow the money of their constituents on an act of charity, though it would be extremely laudable, was yet beyond their authority."

Thus was established a precedent and a pattern that Congress would follow during subsequent decades until 1865. When a major disaster came to the attention of Congress and some of its members suggested the federal government should provide disaster relief, other members commonly argued that constitutional limitations did not permit federal participation in disaster recovery activities. Compromise prevailed by furnishing the desired federal assistance only under a federal power clearly authorized by the Constitution.

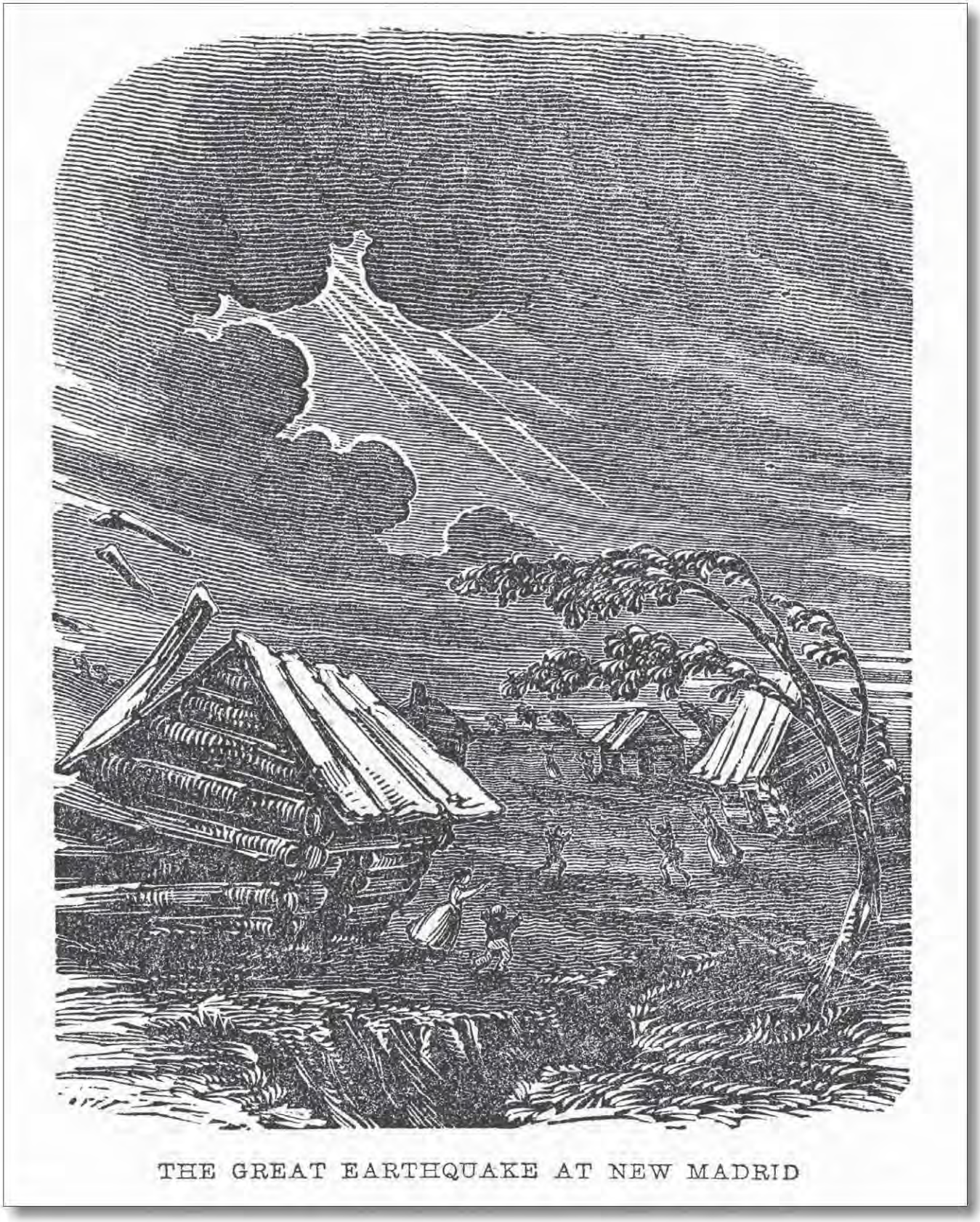
Library of Congress List

When Congress studied the advisability of creating an official federal policy on disaster relief in 1950, it asked the Library of Congress to conduct a thorough search of federal legislation enacted since the Republic's formation to identify laws that might conceivably be construed as precedents for disaster relief legislation. Although Library of Congress researchers ignored the aid extended to French refugees in 1794, perhaps because the distress in that instance did not result from a natural disaster, they produced a long list of laws that might be interpreted as precedents for federal intervention in disaster recovery efforts.[6]

Prominent on the library's list were eight laws, all enacted prior to the Civil War, whose roles as precedents for federal disaster assistance were rather questionable. Three of the eight merely delayed the collection of federal customs taxes at American port cities damaged by fires—an act of 1803 allowed an additional year for merchants who suffered losses in a major fire at Portland, Maine, to pay their customs taxes without penalty; an act of 1804 granted a similar privilege to victims of a conflagration at Norfolk, Virginia; and an act of 1836 allowed a similar extension to people who lost property in the memorable New York City fire of 1835.[7]

Congress debated none of these three acts because delaying tax collections clearly fell within federal authority to regulate taxation. None of the acts contributed funds directly to disaster relief and recovery, nor did they materially differ from scores of private bills enacted in each session of Congress to grant certain exemptions from the tax laws. Federal power to engage in disaster relief activities was never at issue in these cases.

The library's list of possible precedents also included a special act of 17 February 1815 permitting citizens who had lost their lands to the New Madrid, Missouri, earthquake of 1811 (still the greatest earthquake of record on the North American continent) to take up an



Inhabitants were forced to flee their homes during the New Madrid earthquake of 1811. State Historical Society of Missouri

equal amount of acreage from the public lands without cost. Congress here, however, exercised its unquestioned authority to dispose of public lands, and it did not debate the bill as a disaster relief measure. If the bill had been presented as such, President James Madison probably would have vetoed it, his opposition to federal disaster assistance having been well known since 1794.[8]

Venezuela Earthquake, 1812

The first federal legislation that, taken at face value, may have constituted direct federal disaster relief was an act of May 1812 that appropriated $50,000 to purchase provisions for earthquake victims in Venezuela. Yet, other considerations lay behind the enactment of this charitable measure.

A tremor shook Caracas on the afternoon of 26 March 1812, leveling the city and surrounding towns and killing some twenty thousand people. News of the catastrophe dispatched from the American consul in Venezuela arrived in the United States in late April, and on 8 May

The Convent of the Carmelites in Caracas suffered severe damage during the 1812 quake and had not been repaired by the time engraver Richardson Cox captured the scene in the 1850s.

Courtesy of the National Information Service for Earthquake Engineering, EERC, University of California, Berkeley

Congress authorized President James Madison to export $50,000 worth of provisions to sustain the Venezuelans. Madison, who in 1794 had declared federal disaster assistance unconstitutional, approved the aid extended to Venezuela without comment even though $50,000 was a sizeable expenditure in a year when federal revenues totaled $22.6 million. Indeed, the emergency supplies sent to Caracas proved to be the only federal aid given to any foreign disaster victims prior to the Messina, Italy, earthquake of 1909.[9]

Although Congressman John C. Calhoun of South Carolina supported the 1812 appropriation for disaster relief of Venezuela, he later commented that he opposed federal involvement in disaster relief activities generally. He distinguished between foreign aid and domestic relief. The assistance furnished Venezuela, he contended, was authorized under federal powers to make treaties and to conduct foreign relations, while domestic disaster assistance clearly was unconstitutional.[10]

Official records praised this $50,000 gift simply as humanitarian assistance, but circumstantial evidence indicates other motives. Humanitarianism doubtless had a role in the measure, but the aid sent to Venezuelans also involved foreign policy considerations. Led by Simón Bolivar and Francisco de Miranda, revolutionaries in 1811 had formed a republic, making Venezuela one of the first Latin American nations to declare its independence from Spain. Both Bolivar and Miranda had visited the United States prior to 1811 in search of American support, and Miranda, with covert American assistance, had undertaken an abortive attempt to seize control of Venezuela in 1806.[11]

The Madison administration, with James Monroe as secretary of state, was favorably disposed toward the new republic, and Americans generally viewed the Venezuela revolution as a gratifying emulation of the American Revolution. The Madison administration wished to support the Bolivar and Miranda government but preferred not to recognize its independence officially because of the baleful effects doing so might have on American relations with Spain at a time when the United States was preparing for war with Great Britain.[12]

The 1812 earthquake had shaken the Bolivar–Miranda government as well as the Venezuelan countryside. Collapsing barracks killed or injured many of the revolutionary troops, and the quake left the majority of Venezuelans homeless. The American consul reported that Spanish royalist priests were depicting the earthquake as the "chastisement of Heaven," and after the quake the royalist forces counterattacked. These circumstances strongly suggest the provisions sent to Venezuela in 1812 were intended to resupply the revolutionary army and to help restore public confidence in the Bolivar–Miranda administration.[13]

Secretary of State James Monroe sent five shiploads of provisions to Venezuela in the charge of a new American consul with instructions that specified: "You will not fail to intimate, in suitable terms, that this interposition for the relief of the distressed people of Venezuela is a strong proof of the friendship and interest which the United States takes in their welfare."[14] The new consul and the provisions reached Venezuela in June 1812, and the consul reported the gift was received with gratitude and made a lasting impression on the people, many of whom would have starved without it. A historian of American

diplomatic relations, however, later commented that the subsidy arrived too late to have the desired political impact. Before the end of 1812 the royalist forces had driven the republican government from power.[15]

…the gift was received with gratitude and made a lasting impression on the people.

The James Madison administration and Congress apparently viewed the aid to Venezuela as an instrument of foreign policy—as a means of supporting the Bolivar–Miranda government without embarrassing American relations with Spain. Again, if the congressional act had been presented as a disaster assistance program, no doubt President Madison would have vetoed it. This early charitable effort therefore cannot be regarded as a clear precedent for later federal policies on disaster assistance.

Alexandria Fire, 1827

Fifteen years elapsed before Congress took up another issue pertaining to disaster assistance. Many members of Congress witnessed the January 1827 conflagration in Alexandria, now located in Virginia but then part of the District of Columbia. Disturbed by the disaster, Senator William Henry Harrison of Indiana and Congressman Charles Miner of Pennsylvania soon introduced resolutions for a $20,000 appropriation to succor the seventy families made homeless by the fire and now suffering severely from the cold. A major debate ensued in the House over the power of government to offer assistance to the victims, and this debate reflects the congressional attitudes of the time.[16]

Congressman Tristam Burges of Rhode Island insisted the appropriation for Alexandria should clearly state that it was limited specifically to the people of the District of Columbia "so that sufferers might not be coming to this House for relief whenever any calamity happened in any part of the country." He declared if this were not made plain in the bill's wording, he would oppose it.[17] Frank Johnson of Kentucky rose to declare he would vigorously oppose the bill, even if its benefits were restricted entirely to the District of Columbia, because it clearly was unconstitutional.[18]

"When was it ever contended before," retorted William Brent of Louisiana, "that Congress had not the power embraced in this bill? Sir, the Government has often gone far beyond the principles of this bill." As precedents, he mentioned the land grant for victims of the 1811 New Madrid earthquake and the $50,000 gift to Venezuela in 1812.[19] Brent found support from Thomas Newton of Virginia, who had voted in 1812 to send aid to Venezuela. Newton took the floor of the House and read aloud a copy of the 1812 act for aid to Venezuela.[20]

"Sir, the Government has often gone far beyond the principles of this bill."

Andrew Stevenson of Virginia responded that the act of 1812 was not a precedent: it had been enacted under the foreign relations powers of the federal government. Aiding the people of Alexandria, Stevenson argued, would entail

"the exercise of a dangerous and unconstitutional power." If Congress could give aid to the Alexandrians, he asked, "why may we not undertake to compensate the inhabitants of Florida, and Michigan, and Arkansas, for the ravages of the Indians?" Although Stevenson recognized the intention of the aid proposed for Alexandria as benevolent, he warned, "The liberties of no country were ever overthrown, that it was not placed to the account of some supposed good."[21]

William Archer of Virginia contended that state versus federal powers under the Constitution were not at issue in Alexandria's case: because the District of Columbia had no state government, the federal government had to act to alleviate the crisis. He reasoned that to deny the power to distribute public funds to the District also denied the power to tax the District and take funds from its people. James Hamilton of South Carolina agreed: disaster relief for Alexandria was merely a municipal function exercised by Congress.[22]

Silas Wood of New York and William Drayton of South Carolina called for broader views of the subject. The justification for aiding Alexandria rested not only on Congress's special relationship with the District but also on its constitutional authority to provide for the nation's general welfare.[23] Drayton maintained the Constitution's general welfare clause allowed Congress to assist any part of the United States and any foreign country it wished whenever a great calamity rendered citizens helpless and a burden on their communities. Drayton declared:

> But by ministering to their wants—by supplying them with food, clothes, implements of trade, of husbandry, and habitations, they would be enabled to provide the means of their subsistence, and would gradually, by their labor and exertions, contribute toward the wealth and defence [*sic*] of the nation. Would not money thus expended be for the general welfare? Before this could be denied, it must be denied that the prosperity of individuals conduces to the general welfare of the body politic, of which they are members.[24]

After full debate, the House enacted the $20,000 appropriation for the relief of Alexandria's fire victims by a vote of 109 to 67. Emphasizing the special relationship of Congress with the District of Columbia in its discussions, the Senate, by a vote of 27 to 17, also passed the bill, and President John Adams signed it into law.[25]

"The liberties of no country were ever overthrown, that it was not placed to the account of some supposed good."

Despite Congressman Drayton's eloquent appeal for a broad interpretation of the Constitution's general welfare clause to include disaster assistance, it appears Congress would never have aided the Alexandria fire victims had not the town lay within the District of Columbia. The consensus of Congress then was that disaster relief was a state government or charitable institution responsibility, not a federal function. The proponents of states' rights, insisting on strict interpretation of the Constitution, maintained that the federal government lacked legal authority to dispense funds for disaster assistance, even in the District of Columbia.

The Library of Congress list of disaster relief precedents strangely included an act of February 1836 authorizing the Army Quartermaster Corps to distribute emergency rations to settlers driven from their Florida homes by the Seminole tribe. Although war could qualify as a disaster, provisioning persons displaced by war has not generally been considered a disaster relief measure. Certainly Congress did not debate the 1836 act as a federal effort to assist disaster victims.[26]

Supplying war refugees who sought safety at military camps and fortifications was common but on such a small scale that congressional approval was not sought, nor even thought necessary. At times, however, the Army—often through its primary supply arm, the Quartermaster Department or Corps—also extended aid to civilians afflicted by calamities. For example, in 1838, following a citywide fire, the Quartermasters, without congressional authority, assisted the residents of Charleston, South Carolina, by giving them temporary quarters in Army barracks and harbor fortifications.[27]

Ships for Disaster Relief, 1847

The last pre–Civil War precedent for federal disaster assistance came in 1847 when Congress approved the loan of two American ships to transport privately-contributed food to famine-stricken Ireland. As many as a million people starved in Ireland during the 1840s when a blight destroyed the potato crop, and another million fled to the United States. American charities funded the purchase of emergency food supplies but needed a means of transporting the food overseas to the Emerald Isle.[28]

Congress approved the loan of U.S. Navy ships to deliver food to Ireland following a public conflict between the Whig and Democratic parties over the constitutionality of the measure. The debate began when Whig Senator John Crittenden of Kentucky proposed that the federal government purchase $500,000 worth of food and send it to Ireland, copying in his bill the exact wording of the act that had sent provisions to Venezuela in 1812. Whig leaders evidently hoped thereby to obtain the Irish vote and embarrass James K. Polk's Democratic administration, which opposed federal disaster assistance.[29]

During the Senate debate, Senator John Niles, Democrat of Connecticut, pointed out that the federal government had never relieved the distresses of Americans, and he declared the Crittenden proposal a "dangerous exercise of power." Democratic Senator Arthur Bagby of Alabama agreed with Niles, denying that Congress had any constitutional authority to engage in disaster relief at home or abroad.[30] Senator John C. Calhoun of South Carolina mentioned that he had voted in 1812 to send aid to Venezuela and that he would vote for the Irish aid also but solely because both fell under federal powers to conduct foreign relations.[31]

The Crittenden bill appropriating $500,000 for Irish relief passed the Senate, with voting along party lines, but died in the House Committee on Ways and Means. A committee member later declared the committee had killed the bill to save President Polk the embarrassment of vetoing it. Polk had warned he would veto the bill on constitutional grounds if it passed, but he expressed

In a drawing by Fitz H. Lane, the *Jamestown* is leaving Boston in March 1847 bound for Cork, Ireland, on an errand of mercy.

Drawing by Fitz H. Lane; Lane & Scotts, Lithographers.

his personal sympathy with the Irish plight by contributing $50 to private Irish aid funds.[32]

As a substitute for the direct relief proposed by Senator Crittenden, Congress approved an act loaning two U.S. Navy ships—the *Macedonian* and the *Jamestown*—to private charities to carry their contributions overseas. The act required that the charities purchase new sails and rigging for the ships and also pay their crews, holding the government free of operational costs. In the end, the ships sailed to Ireland and delivered the vital foodstuffs.[33]

The 1847 loan of Navy warships set a precedent emulated later in the century. In 1871 Congress sent the U.S. Navy ship *Worcester* to France to deliver privately contributed supplies to starving victims of the Franco–Prussian War. Another special act of 1880 resembling the 1847 Irish relief act allowed the antique warship *Constellation* to deliver food to Ireland. Still, in 1892 a bill to deliver food aboard the same warship to suffering Russian peasants met defeat at the hands of such Democrats as William Jennings Bryan, who still maintained that federal disaster assistance in any form whatsoever was unconstitutional.[34]

Observations

The Library of Congress list of disaster relief legislation also cited three other laws enacted

during the American Civil War and immediately after as precedents for federal disaster assistance. In two acts in 1864 and 1866, Congress granted a total of $4,500 to victims of an explosion in the Washington Arsenal, where the accidental detonation of seventy-five thousand carbine cartridges killed twenty workers and wounded scores. These acts perhaps better qualify under the category of employee death and disability benefits than disaster relief. A third act approved payment of $200,000 to victims of Sioux Indian raids in Minnesota. This 1863 appropriation came from the annuities normally paid to the tribes, and the law properly belongs in a category other than disaster relief.[35]

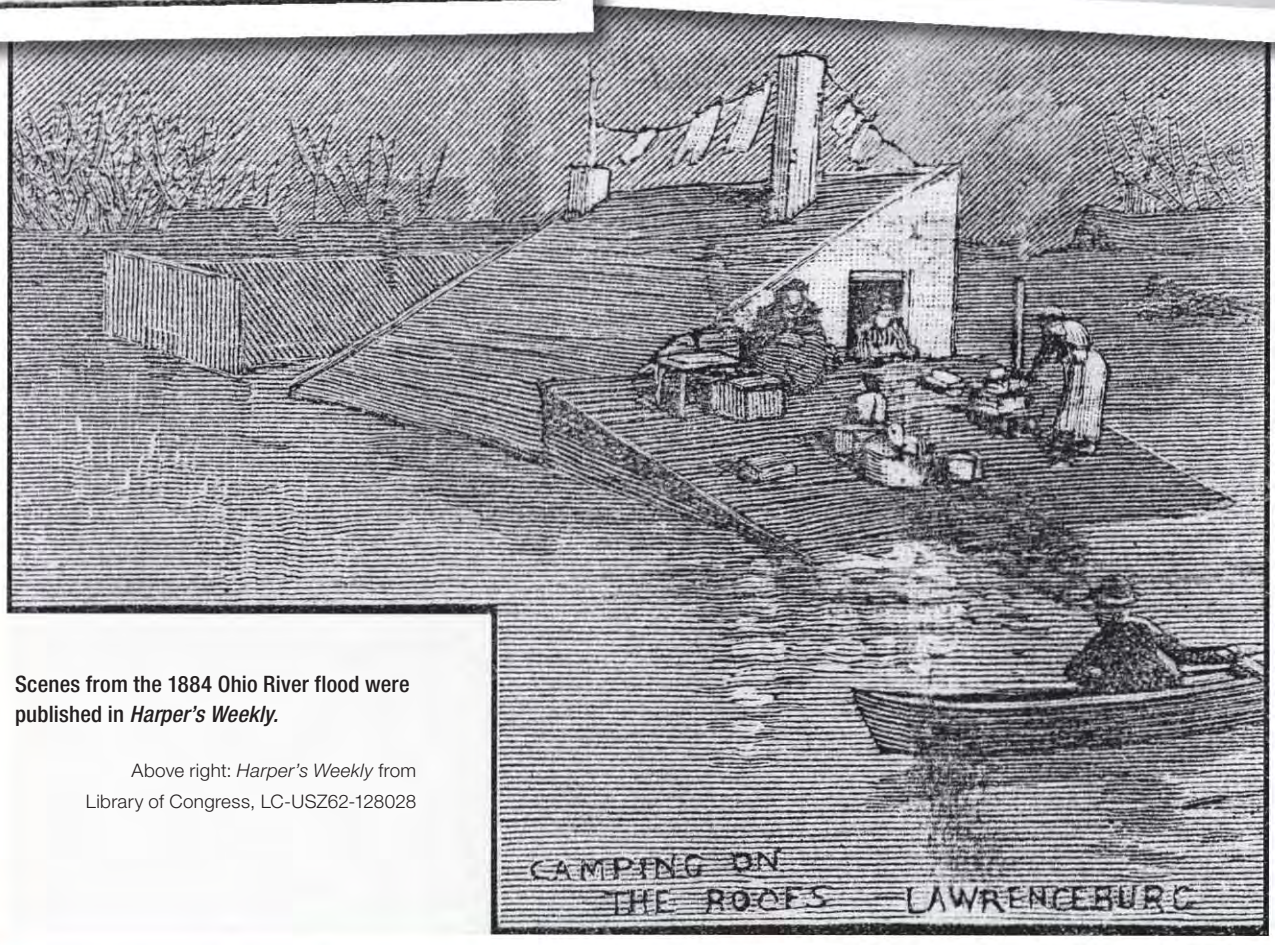
…whenever a calamity was so great that private, state, or local resources proved inadequate, then the federal government should intervene.

The legislation mentioned in this chapter was cited frequently in subsequent congressional debates as early precedents for federal disaster assistance, but none of the acts precisely qualified. Instead, the various laws rested upon some unquestioned federal power such as the power to regulate taxation, govern the District of Columbia, or conduct foreign relations. The prevailing opinion of Congress prior to 1866 held that federal assistance to victims of natural disasters was probably unconstitutional and certainly undesirable and that disaster relief was a responsibility of private charities or state and local governments. Still, principles upon which federal policies eventually rested were first broached early in the nation's history. Congressman Elias Boudinot in his 1794 debate with James Madison concisely stated the case for federal disaster assistance, arguing the Constitution's general welfare clause and, indeed, higher moral laws justified federal contributions to disaster relief and recovery. In 1827 Congressman William Drayton extended this argument, declaring the criterion for federal assistance should be the magnitude of the disaster: whenever a calamity was so great that private, state, or local resources proved inadequate, then the federal government should intervene to restore disaster victims as contributors to the national community. These principles laid the foundation of subsequent federal policies on disaster assistance.

When did the Army Engineers, the Army, and the Congress initiate federal disaster assistance? Review of the evidence indicates it was not before the American Civil War. Constitutional questions—exacerbated by the political and sectional divisions that also counted as causes of that war—prevented the development of a federal policy on disaster assistance. In early American history, Congress sometimes authorized humanitarian aid for disaster victims but only on grounds of some unquestioned federal power. In those years, if an Army or engineer officer supplied food or temporary housing to disaster victims it was done without congressional authority or funding. As it did to many aspects of American society and public policy, the American Civil War changed the federal approach to disaster relief.

Chapter 1 Notes

1. *Annals of Congress*, 3d Cong., 1st sess., 1794, 170–73.
2. Ibid.
3. Merle E. Curti, *American Philanthropy Abroad: A History* (Brunswick, N.J.: Rutgers University Press, 1963), 9–10.
4. *Annals of Congress*, 3d Cong., 1st sess., 1794, 170–73.
5. Curti, *American Philanthropy Abroad*, 9–10; *Annals of Congress*, 3d Cong., 1st sess., 1417–28, prints the act.
6. *Congressional Record*, 81st Cong., 2d sess., 1950, 11900–902, prints the Library of Congress's list of disaster assistance legislation. Office of Emergency Preparedness, *Federal Disaster Assistance Program Handbook*, OEP Circular 4000.78, March 1971, p. v, asserted: "As early as 1803, however, the Federal Government rendered assistance in special cases." Other publications also identify 1803 as the date of the earliest federal disaster assistance, obtaining their information from the Library of Congress list.
7. *Congressional Record*, 81st Cong., 2d sess., 1950, 11900–902.
8. *Annals of Congress*, 7th Cong., 2d sess., 1803, 375, 380, 401, 465, 515; *Annals of Congress*, 8th Cong., 1st sess., 1804, 278, 1093; *Congressional Debates*, 24th Cong., 1st sess., 1836, 14, 46–48, 103, 114–29, 391–92, 1092, 1875, 1991–94, 2239–40, 2703–17, 3117–20; *Annals of Congress*, 14th Cong., 2d sess., 1815, 1153.
9. *Niles Weekly Register*, 25 Apr. 1812, 131–32; Curti, *American Philanthropy Abroad,* 10–13; *Annals of Congress*, 12th Cong., 1st sess., 1812, 226–28, 1366, 1378, 2294.
10. *Congressional Globe*, 29th Cong., 2d sess., 1847, 534–35.
11. Charles C. Griffin, *The United States and the Disruption of the Spanish Empire, 1810–1822* (New York: Columbia University Press, 1939), 50, 55, 66; Julius Goebel, Jr., *The Recognition Policy of the United States* (New York: Columbia University Press, 1915), 116–19.
12. Goebel, *Recognition Policy*, 116–19.
13. William R. Manning, ed., *Diplomatic Correspondence of the United States Concerning the Independence of the Latin-American Nations* 1 (New York: Oxford University Press, 1925), 14–16; Robert Lowry to Secretary of State, 5 June 1812, National Archives and Records Administration [hereafter NARA], Record Group [RG] 59, Dispatches from U.S. Consuls in La Guaira, Venezuela, 1810–1906, Roll 1, Microfilm 84.
14. Manning, *Diplomatic Correspondence*, 1:14–16.
15. Alexander Scott to Secretary of State, 16 Nov. 1812, NARA, RG 59, Roll 1, Microfilm 84; *Niles Weekly Register*, 6 June 1812, 240; House Committee on Foreign Affairs, *Alexander Scott*, 20th Cong., 2d sess., 1829, H. Rept. 72, passim; Griffin, *The United States and the Disruption of the Spanish Empire*, 66.
16. *Congressional Debates*, 19th Cong., 2d sess., 1827, 68–71, 76, 747, 752–73.
17. Ibid., 752–53.
18. Ibid., 754.
19. Ibid., 755.
20. Ibid.
21. Ibid., 756–58.
22. Ibid., 760–65.
23. Ibid., 766, 770–73.
24. Ibid., 772.
25. Ibid., 68–71, 773, and p. i of Acts.
26. *Congressional Record*, 81st Cong., 2d sess., 1950, 11900.
27. Erna Risch, *Quartermaster Support of the Army: A History of the Corps, 1775–1939* (Washington, D.C.: Quartermaster General Office, 1962), 728–29.
28. *Congressional Record*, 81st Cong., 2d sess., 1950, 11900; Curti, *American Philanthropy Abroad*, 43–64.
29. Curti, *American Philanthropy Abroad*, 43–64.
30. *Congressional Globe*, 29th Cong., 2d sess., 1847, 512–14.
31. Ibid., 534–35.
32. Curti, *American Philanthropy Abroad*, 43–64.
33. Ibid.; *Congressional Globe*, 29th Cong., 2d sess., 1847, 557, 572, and Appendix, 440–41.
34. Curti, *American Philanthropy Abroad*, 77–78, 94–96, 102–07.
35. *Congressional Record*, 81st Cong., 2d sess., 1950, 11900; *Congressional Globe*, 37th Cong., 3d sess., 1863, 179–81, 192, 556, 763, 915, 947, 1054; U.S. Army, Chief of Ordnance, *Reports* 3 (1860 to 1889) (Washington, D.C.: Government Printing Office, 1890): 595–96 [hereafter GPO].



Scenes from the 1884 Ohio River flood were published in *Harper's Weekly.*

Above right: *Harper's Weekly* from Library of Congress, LC-USZ62-128028

2

Disaster Relief Origins

In the last year of the American Civil War, Congress took extraordinary steps to facilitate the transition from slavery to freedom in the erstwhile Confederacy. These efforts saw the federal government abandon a strict laissez-faire approach and assume full responsibility for the welfare of former slaves as they adjusted to their new status. When a great Mississippi River flood in 1866 destroyed crops and left thousands destitute, Congress issued tons of rations to flood victims, most of whom were poor former slaves. This incident established a precedent that would later open the door to a wider application of this principle—that the federal government had a responsibility to relieve suffering in the wake of great disasters. Originally, that responsibility fell to the Freedmen's Bureau and the Army Quartermasters, but another great Mississippi River flood in 1882 saw Congress turn to the Army Corps of Engineers.

Portland Fire, 1866

"Now, sir, where is this to stop? What is to be the line?" asked Senator Lyman Trumbull of Illinois during an 1866 debate over federal disaster relief. "We have already, at the present session of Congress, and since this dreadful fire in Portland, passed one or two resolutions for the benefit of the sufferers. We have passed one resolution authorizing the furnishing of tents and other accommodations from the quartermaster's department. We have passed another resolution or bill relieving the parties from the payment of taxes." Another senator quickly corrected: "Only suspending the collection of taxes."[1]

A wind-swept fire had ravaged Portland, Maine, on the Fourth of July, 1866, destroying a large section of the community and leaving twelve thousand people homeless. Congress quickly responded, authorizing the Treasury Department to suspend tax collections at Portland and the quartermaster general to dispatch surplus Army clothing, tents, and camp gear to the homeless. A few days later, however, when Senator Reverdy Johnson proposed a $50,000 appropriation to be dispensed to the fire victims by the governor of Maine, Senator Trumbull thundered his opposition.[2]

"This is a loss by fire such as never occurred anywhere else."

"Sir," Trumbull declared, "you can hardly take up a newspaper in the United States that you will not see an account of a fire somewhere. Where is the line? Where is the distinction? If you commence appropriating money to distressed people who have been burned out, you cannot stop at Portland!"[3]

"This is a loss by fire such as never occurred anywhere else," replied Johnson. "It is a loss, the sufferings caused by which cannot be provided for and hardly mitigated, by individual contributions of citizens of the State in which it occurred." As precedents for his proposal,

The city of Portland, Maine, lay in ruins after the fire on 4 July 1866.
Library of Congress, LC-DIG-ppmsca-09960

Johnson recited the land given to New Madrid earthquake victims in 1811, the aid given Venezuela in 1812, and the relief supplied to the homeless after the 1827 Alexandria fire. He added that the Freedmen's Bureau Act of 1865 provided millions for the subsistence and education of former slaves in the prostrated South, and he declared this act clearly qualified as a direct public relief measure. Pointing out that Senator Trumbull had voted for the Freedmen's Bureau Act, he asked why Trumbull could not also support extending similar assistance to Portland's destitute and homeless people.[4]

Senator Trumbull retorted that the prewar laws cited by Johnson were not precedents for federal legislation on disaster relief. Besides, he added, the Congress had never been governed by precedents.[5] "I wish such precedents could be set oftener than they are; they would endear the Government of the United States to the hearts of the people," interrupted Senator Benjamin Wade, who took the broadest view of the subject. "Let relief be extended when these great overwhelming calamities occur," he said. "Where they are not so great but that the benevolence of the surrounding communities can relieve the sufferers, there the Government does not step in; but upon a great occasion like this there is no civilized Government that would withhold its aid, and I hope of all others ours will not."[6]

"…upon a great occasion like this there is no civilized Government that would withhold its aid."

The Johnson and Wade argument that the national government should supply direct relief to victims when a disaster exceeded the resources of state and local governments proved persuasive in the Senate, which enacted the bill for the relief of Portland. The bill died in the House, however, and Portland's homeless had to be content with a tax suspension and such emergency supplies as the Army Quartermasters could deliver.[7]

Federal Disaster Measures During Reconstruction

With the states' rights elements of the national political parties weakened after the Civil War, members of Congress who thought disaster assistance to be constitutional federal power had a freer hand. Although they seldom could muster sufficient votes to appropriate funds for direct disaster relief, their persistent efforts sometimes carried bills authorizing the Quartermaster Corps and the Freedmen's Bureau to dispense Army rations, clothing, and tents to suffering victims of catastrophes.

These measures were especially important on the Mississippi River where flooding was frequent and sometimes devastating. For more than a century, the riparian landowners had built earthen embankments, or levees, along the river. These levees served to protect most of the major basins of the Mississippi valley. Through the mid-nineteenth century, local landholders assumed sole responsibility for the construction and maintenance of levees. In 1849 Louisiana led a congressional fight to transfer swamp and overflowed lands from the federal government to the states of the Mississippi valley, culminating in the Swamp Land Grants of 1849 and 1850. Generally the states drained these lands and sold them to individuals. Revenue thus raised paid for further levee improvements and encouraged the organization of levee districts throughout the lower valley. Over time, these districts acquired substantial authority, but they still lacked sufficient financing and coordination, and damaging floods persisted. The Civil War had disrupted proper levee maintenance and the Union armies had breached some levees for military purposes. When a major flood a year after the war's end inundated thousands of acres in the Mississippi delta, destroying crops and leaving thousands destitute, the Army, through the Freedmen's Bureau, issued tons of rations to flood victims.[8]

In March 1865 Congress established the Freedman's Bureau as a branch of the U.S. Army for the purpose of providing aid in the form of education, health care, and employment to four million destitute and landless former slaves. Gen. Oliver Otis Howard served as commissioner of the bureau throughout its existence; under him was an extensive hierarchy of assistants and subassistants. Assistant commissioners headed the bureau's state-level offices, supported by staffs that included a superintendent

of education, a traveling inspector, and, during the early months of the bureau's activities, a surgeon-in-chief. Despite the handicaps of inadequate funds and poorly trained personnel, the bureau built hospitals for and gave direct medical assistance to one million freedmen.[9]

During the Reconstruction era, several major floods covered the delta, and issuing Army rations to refugees became standard operating procedure. In the 1867 flood, for instance, the Freedmen's Bureau distributed $500,000 worth of life-sustaining rations to people impoverished by the flood and the consequent crop failures. The rations were vital yet spartan: one bushel of corn and eight pounds of salt pork per person monthly, with children receiving half that amount. This so-called plantation ration became the standard issue, and the Army commonly dispensed it after major floods in the South until 1913 and perhaps later.[10]

The Freedmen's Bureau also issued firewood and provided free medical care to the refugees. When Congress authorized it, the bureau distributed seeds to provide the flood victims with an opportunity to raise new food crops, replacing the plantings destroyed by the floods. This simple form of assistance, aimed at restoring the flood victims self-sufficiency, would later be classified a "rehabilitation" measure.[11]

If Congress, through the Freedmen's Bureau, could grant disaster relief to the emancipated slaves and poor whites of the South, it seemed logical that it had a similar power in the North to alleviate the impacts of calamities. In the northern states, disaster assistance fell to the Army Quartermaster Corps rather than the Freedmen's Bureau. There, Congress approved quartermaster distribution of rations and tents to people made homeless by disastrous fires, not only at Portland, Maine, in 1866, but also in Michigan and Wisconsin and, in 1871, at Chicago, Illinois.[12]

After the great Chicago fire of October 1871, Lt. Gen. Philip Sheridan, at the request of Chicago's mayor, posted troops in the burned district to prevent looting and ordered that quartermaster supplies be dispatched to the city. Maj. D. C. Houston, commanding the Corps of Engineers Chicago office, lacked the authority to assist with the fire fight or support the relief measures; he occupied himself and his staff with efforts to save Army Engineer property and records from his office before the fire ruined the building.[13]

The city of Chicago, in fact, handled disaster relief, rehabilitation, and reconstruction largely on its own without federal assistance. Other than the emergency assistance from Sheridan's forces, the sole federal contributions to Chicago's recovery were acts of Congress suspending federal tax collection and remitting import duties on incoming building materials.[14]

In 1872 Congress phased out the Freedmen's Bureau and its assistance programs in the South and it began to rely on the Army Quartermaster Corps for prompt response to disasters in both the South and the North. In the immediate postwar years, however, the Corps of Engineers occupied itself with its traditional duties. In 1867, for example, Corps officers numbered around one hundred, many of them serving far from Washington in the engineer offices responsible for carrying out projects in the field (the predecessors of Corps districts). Twelve officers were assigned exclusively to river and harbor improvements throughout

During the Chicago fire of 1871, the Corps of Engineers lacked authority to assist in firefighting or relief efforts. The blaze destroyed much of the business district, including the Piano Manufacturing Building. National Archives, 59-HB-1

the country, as far west as the Pacific coast, and thirty-nine served in offices that both constructed coastal and frontier defenses and improved waterways. The officers relied on a force of civilian employees—including engineers, mariners, and laborers—to perform the work required. In the year prior the Corps' river and harbor work totaled around $3.5 million for forty-nine projects and twenty-six surveys. The remainder of officers took up various duties—five worked on the Great Lakes Survey; thirteen were with the engineer battalion; and others served on the staff of military departments or were detached to other organizations, such as the Lighthouse Board, the northwest boundary commission, and the commission for a Pacific railway.[15] Any disaster assistance, however, rendered by the Army Engineers

before 1882 was strictly unofficial and consisted largely of volunteer humanitarian efforts by individual officers. For instance, witness the case of Lt. Eugene Woodruff.

Humanitarian Services by Individuals

> He died because too brave to abandon his post even in the face of a fearful pestilence and too humane to let his fellow beings perish without giving all the aid in his power to save them. His name should be cherished, not only by his many personal friends, but by the Army, as of one who lived purely, labored faithfully, and died in the path of duty.[16]

Capt. Charles Howell sorrowfully penned this tribute in 1873 to his deputy in the Corps' New Orleans office, Lt. Eugene Woodruff. Howell had ordered the young officer to supervise the clearing of a great log raft blocking the Red River of Louisiana. Capt. Henry Shreve in 1837 had first cleared a path through the log jam to open river navigation to Texas, but logs and driftwood had blocked the passage again during the war and years of neglect.[17]

Woodruff left his workboats and crew on the Red River in September 1873 to recruit new workers at Shreveport, Louisiana, where he found the city in the grip of a yellow fever epidemic. Fearing that he might carry the disease back to his workers at the raft if he returned, he elected to stay and tend the sick. He volunteered his personal services to the Howard Association, a Louisiana disaster relief charity, and traveled from house to house, delivering food, medicine,

Lt. Eugene A. Woodruff, Corps of Engineers, lost his life in 1873 while tending the sick during a yellow fever epidemic at Shreveport, Louisiana. USMA Archives

and good cheer to the sick and dying. While rendering this service, he contracted the disease and perished on the last day of September "a martyr," according to Shreveport's newspaper, "to the blessed cause of charity."[18]

"His conduct of the great work on which he was engaged at the time of his death," said the Corps of Engineers commander at New Orleans, "will be a model for all similar undertakings and the completion of the work a monument to his memory." Howell then assigned the responsibility for finishing the Red River clearance project to the lieutenant's brother, George Woodruff.[19] Thanks to the lieutenant's reluctance to carry yellow fever back to the job, the workers escaped the epidemic and broke through the log raft the following November. The Corps subsequently named a powerful snagboat, built to clear log

While rendering this service, [Woodruff] contracted the disease and perished on the last day of September "a martyr to the blessed cause of charity."

snags from inland rivers, in tribute to Eugene Woodruff; and even a century later the people of Shreveport still cherished the memory of the lieutenant's sacrifice.[20]

Although tangential to the story of the Corps of Engineers' official role in disaster assistance programs, the unofficial service during disasters by Corps officers merits mention. Of the several cases, one as early as 1762 involved a British army officer who later joined the U.S. Army. British army engineer Thomas Hutchins issued relief supplies to American Indians driven by flooding into Fort Pitt (Pittsburgh) at the head of the Ohio River. Although the British royal government had no disaster relief policy, Hutchins then was responsible for distributing "presents" to the native tribes allied with the British against French forces in middle America. The safe refuge and emergency supplies Hutchins gave to the flood victims therefore were considered a normal function of Hutchins' mission. During the Revolution, Hutchins left the British army and joined the Continental Army in America, where his expertise was welcomed, and in 1781 Congress appointed him a Geographer of the United States.[21]

In addition to the disaster relief given by Hutchins to the Indians, the 1762 flood at Fort Pitt occasioned a study by the British that perhaps qualifies as the first disaster after-action report written by Army engineers in America. In it, British engineers recommended that Fort Pitt either be relocated to hills above the river's floodplain or its buildings raised to place their floors above flood levels. Modern engineers recognize that these recommendations constituted floodplain management and flood-proofing of buildings. These protective techniques eventually became standard means of reducing flood damages, but the British command did not implement the techniques at Fort Pitt in 1762 and the fort was nearly destroyed by an even higher flood in 1763.[22]

A second highlight of volunteer Army Engineer initiative during a natural disaster involved Col. Joseph Swift, the Army's Chief Engineer during the War of 1812. Swift left the Army after the war and accepted employment with the Corps as a civilian specialist on New York's harbor project. When a fire in December 1835 threatened to destroy New York City, Swift volunteered to stop the spreading flames by demolishing buildings, thus opening a firebreak. Planting demolition charges to collapse the buildings inward without damaging adjacent buildings, Swift opened a firebreak that brought the advancing fire to a halt. The city officials subsequently voted their thanks to Swift for saving their community from general destruction. This service had been performed on Swift's personal initiative, of course, not as a representative of the Corps of Engineers.[23]

In 1835 retired Col. Joseph Swift, a Corps employee, acted on his own to create firebreaks and halt the spread of fire in New York City.

Library of Congress, LC-DIG-pga-01587

First Official Engineer Disaster Mission, 1882

In the spring of 1882 virtually the entire alluvial valley of the Mississippi River below Cairo, Illinois, was inundated by two flood waves: the first crested at Cairo on 3 February and the second on 23 February. These waves overwhelmed the local levees, causing 284 crevasses (breaks in the earthen levees) with an aggregate length of more than 56 miles. Indeed, entire levees were destroyed by the flooding and thousands of cold and hungry people took refuge on the hills in the back of the valley.

The delivery of emergency supplies to these refugees in some instances became a matter of life or death.[24]

To relieve the suffering, Congress appropriated $100,000 for quartermaster supplies to be given to the homeless. Senator George Vest of Missouri learned, however, that a large portion of the fund might be consumed by transportation charges for delivering the supplies to locations in the valley. Vest then contacted the owners of steamboats at St. Louis to ask if they might deliver the relief supplies without charge; the owners refused but told the senator that the Army Corps of Engineers had a large fleet of

workboats stationed at several river ports that could make the deliveries at low costs.

Indeed, the years following the Civil War had seen a steady rise in the Corps' workload, resulting in increases to its civilian workforce and fleet, although the number of officers assigned to the Corps rose much less dramatically. By 1882 the Corps had approximately 120 officers, many of whom directed the 371 projects and 135 surveys that comprised $19 million worth of river and harbor work that year. Approximately 2,900 civilians worked for the Corps of Engineers, only about 150 of whom were in Washington. That figure does not include a fluctuating number of hourly and daily laborers hired directly to work on specific projects or during particular seasons. In 1883 some 1,200 such laborers were on the rolls. The Corps had also developed into an organization that was truly national in geographic scope. Its members were involved in river and harbor improvements and construction of coastal and border defenses along three coasts, on the Great Lakes, and on inland rivers most everywhere but the arid west. The Corps had a presence there too; officers assigned to the Army departments, along with their assistants, were surveying, examining, and mapping the lands west of the one hundredth meridian.[25]

Because one of the primary and growing missions of the Corps was to improve the nation's navigable waterways, naturally it maintained a

A levee in Louisiana was breached during the Mississippi River flood of 1882, the year the Corps officially received its disaster response mission.

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large and growing fleet of workboats, officially referred to as *floating plant.* The vessels ranged from large dredges to small skiffs and launches and included derrick boats, pile drivers, graders, snagboats (to remove obstructions from the rivers), maneuver boats, tugboats, towboats, lighters, concrete mixing plants, and quarterboats to house workers. Crews on the larger vessels often consisted of masters, pilots, mates, engineers, watchmen, laborers, clerks, machinists, cooks, carpenters, blacksmiths, "cabin boys," "laundresses," and " chamber maids." In 1883 the Department of the Interior reported that the Corps (and the Mississippi River Commission) owned a total of eighty-two "vessels," a number that would rise significantly in following years as the workload assigned to the Corps increased concomitantly. Ten years later the fleet topped two hundred. These figures do not include hundreds of smaller or unmanned craft, such as scows and barges, that often went uncounted. By 1913, the first year in which the chief of engineers submitted an exhaustive inventory as part of his annual report, the Corps owned almost five hundred vessels, a number that tops one thousand when quarterboats, barges, and small craft are included. Some of these were stationed on the west coast, but the majority worked the rivers in the South and Midwest. The district at St. Louis, for example, maintained 386 pieces of floating plant of all types that year, and the office in Memphis had 156. In contrast, the districts in Boston, New London, and Newport operated a combined total of fourteen. Although the engineer fleet was much smaller in 1882, it still provided a ready and cost-effective means to rescue people and deliver relief supplies.[26]

Having been reminded of the Corps' workboats, Vest visited the office of Secretary of War Robert Lincoln on 10 March to meet with the secretary, the Army's commissary general, and Chief of Engineers Maj. Gen. Horatio G. Wright. Wright agreed that the Corps' fleet on the Mississippi could deliver the emergency rations because, after all, it could not work on the river-improvement projects until the flooding had receded. Wright pointed out, however, that the fleet's operations were paid from appropriations for river and harbor projects, and therefore the fleet could not assist in the disaster relief efforts unless Congress granted the authority.[27]

Accepting this suggestion, Vest drafted a congressional joint resolution that would make the Corps' fleet available for disaster assistance on the Mississippi. The first resolution of its kind, it read:

> Resolved, … That the Secretary of War be authorized in his discretion, to use the steamers and other boats and vessels belonging to or now employed by the Government upon the Mississippi River and its tributaries, or as many thereof as may be necessary, in the transportation and distribution of the rations and supplies furnished by the United States, or individuals, to the sufferers by the recent overflow of said rivers, the expenses of manning, equipping, and navigating such steamers and boats to be defrayed out of any money in the Treasury not otherwise appropriated, which necessary sum is hereby appropriated for that purpose.[28]

Congress approved Vest's resolution that same day and President Chester Arthur immediately signed it. Wright telegraphed his mobilization orders to his field commanders in the Mississippi valley, directing them to cooperate fully with the Quartermaster Corps' commis-

sary officers to deliver rations vital to the flood refugees' survival.[29]

Capt. Oswald H. Ernst, the Corps' engineer officer at St. Louis, contacted the commander of the quartermaster depot at St. Louis and proffered use of the Corps' steamboat *Anita*. The quartermaster officer accepted the offer, equipped the *Anita* with yawls for rescue operations, loaded the emergency rations, and dispatched the boat toward Memphis with orders to pick refugees off rooftops and threatened levees and take them to safety while also dispensing food to the hungry.[30]

Captain, soon to be Major, Alexander Mackenzie, the Corps commander at Rock Island, Illinois, sent the snagboat *General Barnard* and the towboat *Coal Bluff* to St. Louis where they were loaded with quartermaster supplies. The *Coal Bluff* left St. Louis towing barges carrying 1,689 barrels of cornmeal, 383 boxes of bacon, and seventeen bales of tents. It delivered these supplies to New Madrid, Missouri; Memphis, Tennessee; and Helena, Arkansas, and arrived at Vicksburg, Mississippi, where the quartermasters released it to return north for repairs. The *General Barnard* completed three trips from St. Louis south, two to Helena and one to Vicksburg, delivering a total of 750 tons of relief supplies.[31] The quartermasters also asked the help of the engineer office at Little Rock, which dispatched the snagboat *C. B. Reese* down the Arkansas River to distribute rations to the hungry along the lower Mississippi River.[32]

All told, the Quartermaster Corps spent $369,000 assisting one hundred thousand flood refugees. Of this total, about $15,000 was credited to the Corps of Engineers for the use of its boats. These transportation costs were substantially less than the costs of chartering commercial steamboats for similar service.[33]

The Corps of Engineers' disaster assistance mission thus began in support of the Quartermaster Corps' ration distribution efforts, and the decentralized organization of the Corps of Engineers civil works program yielded an unexpected bonus for the American taxpayers: it made available a cadre of trained and equipped personnel at the field offices who could respond quickly to widely-dispersed disaster situations.

Levees and Work Relief

After the Corps of Engineer workboats left on their missions of mercy, Congress debated a new approach to the disaster assistance problem. In March 1882 Congress considered a resolution appropriating $150,000 for the relief of Mississippi River flood victims and extending to the secretary of war the novel authority "to expend such part thereof as he may deem advisable for labor only on strengthening the levees of the Mississippi at the points in his discretion, but he shall only employ persons to whom he is issuing rations on account of their destitution

"…these people who are receiving the bounty of the Government, if practicable, should be employed by the Government, in order that they may not get the impression they are to be provided for in the future by the bounty of the United States."

During the nineteenth century, those displaced by floodwaters often camped on the levees. National Archives, 77-MRC-5-71736-058

caused by the floods and overflow of said river and its tributaries."[34]

Congressman Frank Hiscock of New York explained to the House that this resolution would ensure "that these people who are receiving the bounty of the Government, if practicable, should be employed by the Government, in order that they may not get the impression they are to be provided for in the future by the bounty of the United States." People displaced by the floods would be employed by the Corps of Engineers to repair the broken levees; this was a plan later labeled "work relief." When Congressman Richard Townshend asked that the work relief program be extended to the Ohio River, to include restoration of the levee around Shawneetown, Illinois, Hiscock protested. He asserted that the former slaves of the South were wards of the federal government and had special claims upon it: "There is no more reason that the State of Illinois and the State of Ohio and the State of Kentucky should get that aid from the General Government," proclaimed Hiscock, "than there is that my own State of New York should obtain it when she has her temporary freshets on the Hudson River and her citizens suffer thereby."[35]

George Robinson of Massachusetts complained that the proposed resolution was an entering wedge to involve the federal government in flood control on the Mississippi River. "We will give these sufferers food, we will give them support," he said, "but let us not pay for labor on works upon which this Congress has never entered." To appease opponents of federal participation in flood control work, the resolution was amended, adding the phrase: "Provided,

That nothing herein contained shall commit the United States to the improvement or maintenance of the Mississippi River levees." The Senate passed this amended resolution, but the House deleted the section requiring the flood refugees to work repairing the levee system.[36]

Later that year opponents of federal involvement suffered a legislative setback. Congress had established the Mississippi River Commission (MRC) a few years earlier in 1879 to develop plans to remake the Mississippi River into a dependable commercial artery to support a young and developing industrial nation. It was composed of seven members nominated by the president of the United States and confirmed by the Senate. Three of the organization's members, including its president, were officers of the Army Corps of Engineers. In its early years the commission coordinated the activities of the numerous levee districts up and down the lower river but did not itself have the authority to build levees or flood control structures. However, with additional support coming in the wake of the 1882 floods, the proponents of federal construction of levees along the Mississippi carried legislation in August 1882 that granted the MRC greater latitude to repair and construct levees in light of the recent flood and the damage it caused. The Corps of Engineers would execute the work for the commission, which divided the construction responsibilities among four districts at ports along the river, each commanded by a Corps of Engineers officer. This expansion into federal levee-building was one of the first cracks in the door toward eventual federal involvement in flood control, not fully realized until 1936.[37]

The 1884 Flood on the Ohio and Mississippi

Col. William Merrill, commanding the Corps office at Cincinnati, stepped into a skiff to inspect the February 1884 flood on the Ohio River. He rowed eight blocks through flooded streets to reach what formerly had been the riverfront; he then boarded the steamboat *City of Madison*, which was moored to a submerged freight train. Buildings along the Cincinnati riverfront were entirely submerged.

The *City of Madison* steamed downriver on the crest of the flood, and when it reached Lawrenceburg, Indiana, Merrill was shocked by what he saw. He returned to his skiff and rowed into the town. "The highest part of the streets was ten feet underwater," he said, "many cottages were wholly submerged, with nothing but the chimneys visible, and about one half of the second floors were underwater."[38]

Dodging buildings floating in the streets and guiding his skiff over telephone wires, Merrill searched out Lawrenceburg's mayor, who had asked him to visit the town while it was flooded to help plan a levee for flood protection. After learning the mayor had the town's evacuation and care for the homeless in hand, Merrill resumed his inspection voyage. In his subsequent report on the Lawrenceburg situation, Merrill declared the town sorely needed protection against flooding and a levee should accomplish that goal. However, the levee would not benefit river navigation, then the only type of project approved by Congress for the Ohio River.[39]

The Valentine's Day flood of 1884, so remembered because it crested at Cincinnati on that

day, followed the major Ohio River floods of 1882 and 1883 that set records that stood until 1937. After the 1884 flood Congress received scores of appeals for disaster assistance, and it considered a resolution providing $300,000 for relief of the needy in the Ohio valley. Some members of Congress opposed this relief, arguing that early disaster assistance had gone to the emancipated slaves of the lower Mississippi valley, and these were special wards of government. Disaster assistance in the Ohio valley and the North, however, was unprecedented and unconstitutional. Their opposition failed, nevertheless, when Congress approved the resolution and also directed the Corps of Engineers to use its workboats to deliver emergency supplies to flood refugees.[40] Officers of the Army Quartermasters at Pittsburgh and Cincinnati obtained the necessary relief provisions and distributed them up and down the Ohio aboard chartered steamboats and such Corps of Engineers workboats as the *Bee*, sent to the scene from the Corps office at Charleston, West Virginia.[41]

"…many cottages were wholly submerged, with nothing but the chimneys visible."

An interesting aspect of the 1884 flood-relief campaign was the superb work of Clara Barton and the American Red Cross in that organization's first flood-related relief mission. Clara Barton chartered the steamer *Josh V. Throop* to

Stranded residents of Portsmouth, Ohio, were rescued by boat during the flood of 1884.

Southern Ohio Museum and Ohio Historical Society

Floodwaters, at their peak, covered the intersection of Second and Elm Streets in Cincinnati on 14 February 1884. Ohio Historical Society

dispense relief supplies along the Ohio from Pittsburgh to Cairo, Illinois; she also chartered the *Mattie Belle* for similar work on the Mississippi between St. Louis and New Orleans. In four months she distributed $175,000 worth of relief to flood victims, winning national recognition for her fledgling charitable institution and launching it as the principal private charity for disaster relief in the United States.[42]

Below Cairo the 1884 flood on the Mississippi River approached the record set in 1882, and the chief of engineers ordered his field offices there to cooperate with the Quartermaster Corps as they had in 1882. Maj. Oswald H. Ernst at St. Louis turned the steamboat *A. A. Humphreys*, fully manned, over to the quartermasters, who loaded it to the gunnels with relief supplies sent to the lower Mississippi valley. Maj. Alexander Mackenzie at Rock Island dispatched the snagboat *General Barnard* to St. Louis, where the quartermasters used it for emergency services.[43]

The Corps field officers in 1884 had no authority to use floating plant for rescue and relief without prior approval from the chief of engineers, but as the flood ravaged the lower Mississippi valley the Corps commander at Vicksburg, Capt. William Marshall, telegraphed the chief to urge immediate steps to "fish people and stock out of the water." Receiving this authority, Marshall sent the

towboat *Vidalia* to save people from their refuge on rooftops, treetops, and levees for delivery to high ground.[44]

Col. Amos Stickney at New Orleans reported that nearby areas had been inundated after parties of armed men breached the levees. He inspected the flooded areas, then telegraphed the chief of engineers that people in the areas, already impoverished by the 1882 and 1883 floods and resulting crop failures, needed government assistance even to survive. "In giving general relief there will of course be many cases of impositions," Stickney warned, "but this must be expected in efforts to reach all that are in need." On this advice, together with similar reports from other sources, Congress appropriated an additional $200,000 for flood relief on the lower Mississippi.[45]

North Carolina Storm, 1884

Shortly after Congress voted relief for flood refugees, cyclones struck Alabama, Georgia,

"So unexpected, so sudden, so awful, and so destructive of life and property…"

and the Carolinas on 19 February 1884, wreaking destruction and killing hundreds of people. Senators Joseph Brown of Georgia and Matt Ransom of North Carolina promptly introduced a bill to aid victims of this disaster.

"So unexpected, so sudden, so awful, and so destructive of life and property," declared Ransom of the storm, that "there are now in that afflicted district thousands of people without a shelter, without clothing, without food." Senator Isham Harris, formerly the Confederate governor of Tennessee, repeated the position taken in Congress before the Civil War, declaring: "While my sympathies go out as readily to those who have suffered by calamities such as have been described, while I would be as ready as an individual as any other to the extent of my little means to aid those sufferers, I cannot and will not at any time cast my vote in favor to taking one dollar out of the Treasury for any such purpose, because I believe that I have no Constitutional power to do so."[46]

The resolution to aid North Carolina went to the Senate Committee on Appropriations, which corresponded with the governors of the affected states. The committee reported on 29 February that it believed the suffering resulting from the storms was "not of that widespread, transcendent, and paramount character of impending ruin which baffles all local, individual, municipal and State relief and demands for the preservation of its citizens the Intervention of the Government."[47]

It pleased Ransom that the committee had merely reported that federal disaster assistance was not needed in North Carolina, not that such assistance was unconstitutional. The principle, he asserted, is that "whenever in the judgment of Congress there is such widespread distress and suffering and such imminent and impending ruin to the people of any section of the country that local and state aid cannot relieve it, it is the duty of the Government to save the lives of their people. In my judgment the power is unquestioned, but there should be the great-

est discretion and an undoubted necessity in its exercise."[48]

Although states' rights advocates such as Harris continued to maintain that disaster assistance was not a proper federal activity, the 1884 appropriation for relieving Ohio River flood victims in the North, reinforced by debates on the southern cyclones, firmly established the principle that Congress might step in whenever public distress resulting from a disaster was so acute and widespread that it exhausted private and local government resources. Moreover, disaster assistance was no longer restricted to those people—such as the emancipated slaves and residents of the District of Columbia—with special relationships with the national government.

Charleston Earthquake, 1886

With guidelines for federal disaster assistance thus emerging, Congress and the executive branch expanded the role of the Corps of Engineers in such work. The first non-flood disaster involving the Corps came after an earthquake shook Charleston, South Carolina, on the last day of August 1886, in which forty people perished. The quake so damaged buildings that people feared to enter them and resume their normal lives and reopen their businesses. In this emergency, Charleston's mayor asked the secretary of war to rush engineers to the city to survey damages and certify building safety and thereby restore public confidence. Charlestonians living in tents could then return to their buildings before the return of summer rains.[49]

"It is to be hoped that the wish expressed in Charleston for a Government survey of the houses that have been affected may be gratified, with no loss of time by means of the official routine," editorialized the *New York Times*. "The Secretary of War has under his orders a considerable number of engineers competent to make such a survey."[50]

When Charleston's mayor agreed to reimburse the costs of damage surveys, the secretary of war ordered Capt. William Bixby, of the Wilmington office, to the stricken city to meet with Lt. Frederic Abbot, of the Charleston office, for the survey. Because it was the Corps' first non-flood disaster mission, the secretary's generously broad orders may be of interest:

> Representations have been made to the Dept. that the greatest need in Charleston, now, is to know what buildings are safe and what are unsafe, and that their local Corps of Engineers and Architects is very small; and in view of this, request has been made that Officers of the Engineer Corps be asked to at once advise with the City Authorities and upon personal examination, show the people what to do in this emergency. The President therefore directs as necessary for the public service that in addition to your public duties you repair to Charleston and confer with the Mayor of Charleston and do whatever lies in your power as an officer of the Engineer Corps,

> to advise with him in regard to relieving these afflicted people in this moment of their great necessity.[51]

Bixby and Abbot met with the mayor and accepted appointment to a commission headed by William Speir, a Treasury Department building inspector, to inspect the damaged structures, determine the extent of damages, and report whether they were safe for occupancy. For this task, the commission collected a small staff headed by J. P. Allen, senior civil engineer in the Corps' Charleston office.

The commission conducted building inspections continuously from dawn to dusk each day from 8 to 23 September. They examined some five thousand buildings, and of this number selected sixteen hundred for detailed study. They prioritized and first inspected federal and municipal buildings, then hospitals, churches, and factories, then businesses and residences. They identified safety hazards and devised means of correcting them, determining which buildings should be demolished and which might be restored, then delivered their recommendations to city authorities.

Corps employees surveyed damaged buildings in Charleston after an earthquake struck in 1886. Hundreds of structures, like this brick house, were severely compromised.
U.S. Geological Survey, Photograph by J. K. Hillers

"…do whatever lies in your power as an officer of the Engineer Corps, to advise with him in regard to relieving these afflicted people in this moment of their great necessity."

The engineers estimated total damages to Charleston's buildings at approximately $6 million. In their final report, they proposed measures for use in reconstruction to minimize building damages in future earthquakes: Masonry walls should be bonded throughout their thickness and securely anchored with iron reinforcing bars to floors, ceilings, and roof timbers; the use of projecting parapets and cornices should be discontinued; and porches and piazzas should be firmly anchored to buildings and adequately supported. No federal assistance was offered Charleston for its post-disaster reconstruction, which was left to local authorities and private enterprise.[52]

With the official thanks of the city of Charleston, the engineers completed their mission at the end of September and returned to their civil works duties. These engineers had performed the first damage survey work assigned to the Corps, and because the Corps had substantial structural engineering expertise, it would receive many similar damage survey assignments in following decades.

Observations

During the Reconstruction era, Congress developed the federal policies on disaster assistance that were to prevail into the twenty-first century. While the states' rights elements of political parties continued their prewar opposition to federal disaster relief, the proponents of federal action to alleviate national distresses gradually achieved their goal. The first federal disaster aid, administered by the Freedmen's Bureau, was initially for the benefit of the emancipated slaves of the South during major Mississippi River floods. When the Freedmen's Bureau closed in 1872, it transferred its disaster assistance functions to the Army Quartermaster Corps, which continued providing relief services well into the twentieth century.

While individual Corps of Engineers' personnel often volunteered to assist people during major disasters, the Corps itself had no official mission. That mission first came in response to the Mississippi River flood of 1882 when Congress drafted the Corps' floating plant to deliver emergency supplies to flood refugees. In 1884, when the Ohio River flooded, Congress for the first time provided disaster assistance outside the South—to the states of Ohio, Indiana, Illinois, Kentucky, and West Virginia—thus establishing the principle that northern as well as southern states qualified for federal emergency aid. Then in 1886 at earthquake-shaken Charleston, South Carolina, the Corps conducted its first non-flood emergency operation when the president and secretary of war ordered the Corps to assist municipal officials with damage surveys and reconstruction studies. Thus was born the disaster assistance mission that has challenged the Army Engineers since.

Chapter 2 Notes

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3. Ibid., 3917.
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5. Ibid., 3920.
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7. Ibid., 3921, 4110.
8. James E. Sefton, *The United States Army and Reconstruction, 1865–1877* (Baton Rouge: Louisiana State University Press, 1967), 10; Howard A. White, *The Freedmen's Bureau in Louisiana* (Baton Rouge: Louisiana State University Press, 1970), 64–76.
9. See Eric Foner, *Reconstruction: America's Unfinished Revolution 1863–1877* (New York: Harper & Row, 1988).
10. White, *Freedmen's Bureau*, 64–76; Paul D. Phillips, "A History of the Freedmen's Bureau in Tennessee" (Ph.D. diss., Vanderbilt University, 1964), 44, 64–80, 84–112; Joe Gray Taylor, *Louisiana Reconstructed, 1863–1877* (Baton Rouge: Louisiana State University Press, 1974), 344–45.
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17. *ARCE* (1874), 3, 702–03, 709.
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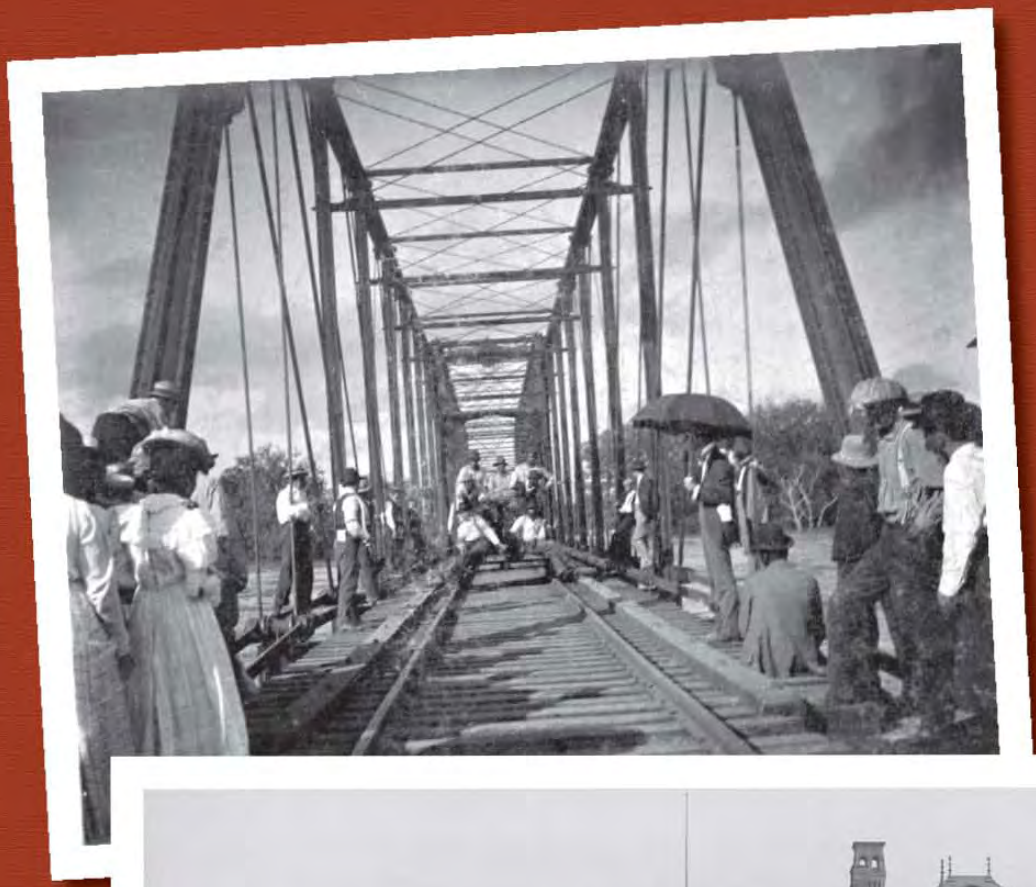
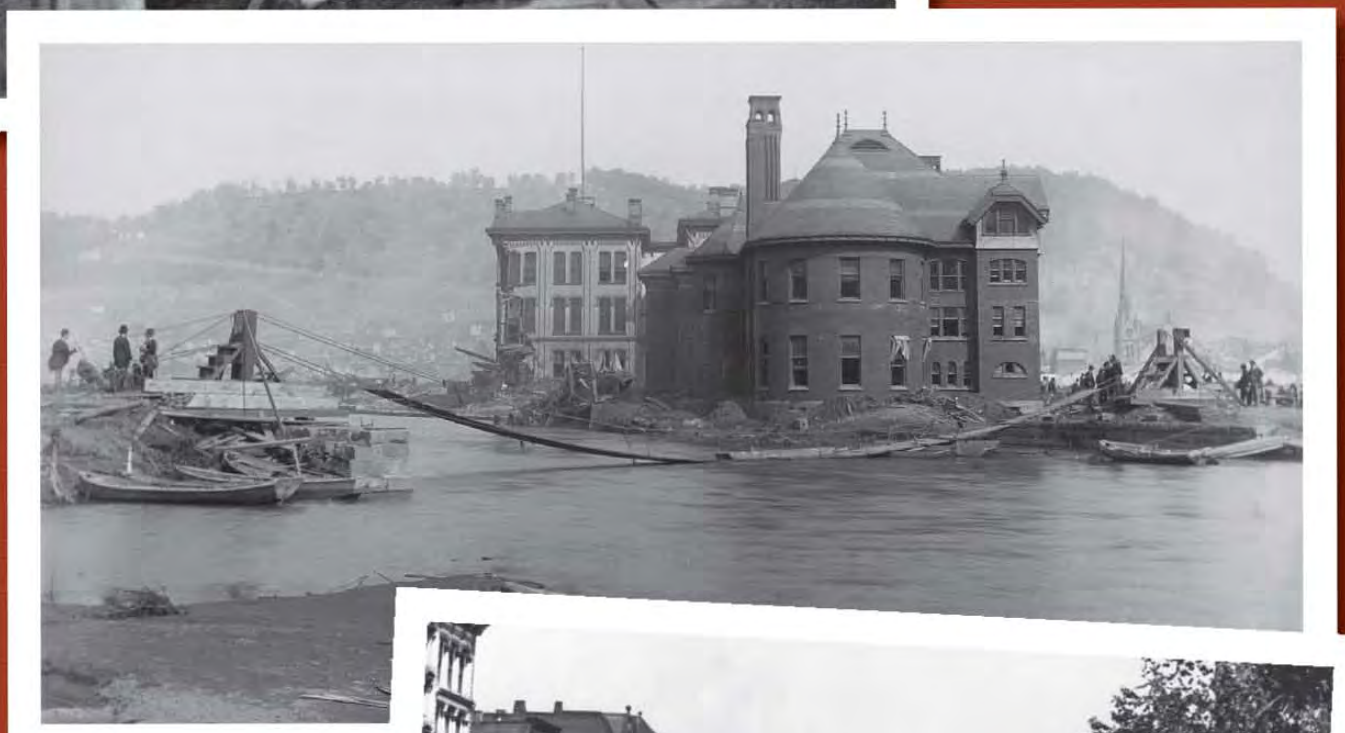


Left: Flood victims used a railroad bridge to reach a relief camp near Richmond, Texas, 1899.

Courtesy of the Fort Bend County Museum Association, Richmond, Texas

Below: A temporary bridge crossed the Conemaugh River in Johnstown, Pennsylvania, 1889.

Library of Congress, LC-USZ62-79364



Right: Floodwaters encroached upon Pennsylvania Avenue in Washington, D.C., 1889.

Office of History

The Corps Builds A Tradition

3

In the last decade of the nineteenth century, the Corps of Engineers developed valuable expertise in its emergency response mission and was no longer restricted to providing food and supplies and rescuing flood victims from rooftops. The Johnstown flood of 1889, for example, gave the Corps of Engineers the opportunity to apply some of its technical expertise in clearing away a wire-tangled debris mass lodged against the stone bridge in the downtown area, and yet another massive Mississippi River flood in 1890 found engineers tasked with securing levees in desperate flood fights up and down the river. These efforts and others were rewarded with a new resolution in 1896 that gave the Army Engineers standing authority to take measures to save life and property from natural disasters without prior approval from headquarters. An additional flood fight in 1897 saw the Corps of Engineers establish itself as the preferred agency for the administration of disaster relief operations.

Johnstown Flood, 1889

President and Mrs. Benjamin Harrison spent Sunday, 2 June 1889, with Secretary of War Redfield Proctor reading the poignant and shocking dispatches coming from Johnstown, Pennsylvania. An old earthen dam upstream of the city had given way on the last day of May, unleashing a flood wave that caused 2,209 fatalities. The failure of South Fork Dam released a wave onto already swollen streams that smashed its way down the Conemaugh valley, ripping up trees, wiping out villages, and engulfing entire trains. By the time it reached the city at the confluence of the Little Conemaugh River and Stony Creek, a mass of debris was rolling on its crest. Johnstown was destroyed by what would become the most deadly river flood in American history.[1]

President Harrison was so moved by the disaster that he presided at a mass meeting in Washington to collect contributions for the victims, and he telegraphed the governor of Pennsylvania to ask what could be done to help. The governor requested temporary bridges: all bridges at Johnstown, except a stone bridge blocked by debris, had been washed out. Lack of bridges gravely hampered relief efforts, and people were unable to learn the fate of relatives and friends living on opposite sides of the streams.[2]

Harrison ordered the Corps of Engineers to Johnstown to install temporary bridges across the streams. The Corps had one ponton bridge at the Military Academy at West Point, where Superintendent John Parke used it to train cadets. Colonel Parke had a personal interest in the Johnstown emergency: his nephew and namesake, John Parke, a summer employee at the South Fork Dam, had made a historic horseback ride down the valley to warn that the dam was failing. Parke the elder had his pontons (flat boats) aboard a train and on the way to Johnstown before noon on 4 June. He placed Lt. John Biddle and a thirty-man detachment from Company E of the Battalion of Engineers in charge of the bridge and its placement.[3]

After the 1889 flood at Johnstown, the military established a post on Kernville Hill overlooking the devastated city where men could get some rest.

Library of Congress, LC-USZ62-52432

Col. William King, commandant of the Engineer School at Willets Point, New York, had surplus Civil War–era pontons in storage at the school. He loaded the pontons and unassembled bridge trestles onto railroad cars and placed them in charge of Capt. Eric Bergland, who commanded Lieutenants Mason Patrick and Thomas Rees and sixty-nine enlisted men skilled in bridge construction.

To plan operations and command the mission, the chief of engineers sent Capt. Clinton B. Sears to Johnstown. Reaching the devastated city on 5 June, Sears met with Pennsylvania's adjutant general and arranged for Baltimore and Ohio Railroad engineers to erect a temporary trestle bridge over Little Conemaugh, leaving Stone Creek for Corps attention. Sears inspected the stream and selected sites for two bridges over the creek at points where bridges had stood before the flood.[4]

Because railroad washouts and congestion delayed the arrival of the Corps pontons, Sears had ramps constructed next to the railroad for unloading and a road cut from the tracks down to Stony Creek's bank. The ramps and road were ready when the trains arrived the night of 7 June, and at dawn the engineers moved the pontons from the cars down the ramps and floated them into Stony Creek.[5]

Continuing rains kept the creek at a high stage with swift currents and dangerous floating and

submerged debris threatening the pontons. The engineers had left West Point and Willets Point in such haste that they left behind their rubber boots and ponchos; moreover, they had gotten little sleep while aboard the train. Yet, they disregarded personal discomforts and got to work in a hurry. On the first day, by 1:30 PM they had opened a 200-foot bridge wide enough to carry wagons, and by 5:00 PM the second bridge, 320-feet long, was in service. In ensuing days, both bridges carried heavy and constant traffic.[6]

The rapid progress and the presence of uniformed troops cheered the despondent residents of Johnstown. In addition, Clara Barton and the American Red Cross arrived the same day, bringing medical supplies and provisions. After dispensing these vital supplies, Barton launched the Red Cross's first rehabilitation effort—building wooden apartment buildings to house the homeless.[7]

After their bridges were in service, the engineer troops erected tent camps nearby and rendered any minor services requested by local authorities. Because coordinating the relief efforts of state, local, and volunteer workers was challenging, a

Capt. Clinton B. Sears of the Corps of Engineers recommended methods for removing the debris that blocked the river at the only remaining bridge in Johnstown. Library of Congress, LC-USZ62-79363

citizens' committee requested Sears take complete charge of all relief and recovery operations. Sears refused, later explaining: "As there was no officially responsible person to back me up, and, as I was a commissioned officer of the United States, and in a manner representing the Secretary of War, such action on my part might be construed as committing the United States in a way not intended." He confined his activities to furnishing technical advice on the operations.[8]

…they disregarded personal discomforts and got to work in a hurry.

By request of Pennsylvania's adjutant general, Sears undertook to devise a workable plan for systematically removing the mountains of debris and wreckage from the city. After inspecting the operations and the needs, he prepared a coordinated plan that divided the city's damage areas into five districts. He assigned civil engineers, contractors, and volunteers to each district, thereby greatly reducing confusion and conflicts in the disaster area.[9]

Removing the immense wire-tangled debris mass lodged against the stone bridge in downtown Johnstown proved a major challenge. Blocking the flow of the stream, it contained human bodies and animal carcasses that constituted a health hazard. After the bodies were removed, a private demolition expert, Arthur Kirk, began blasting the pile apart, but the resulting detonations broke windows and cracked walls in the buildings that had survived the flood, leading to public complaint that explosives would destroy what the flood had missed. Observing that the blasting was not removing the debris, merely changing its location, Sears recommended the use of small steam engines and hoisting derricks, similar to those used aboard Corps of Engineers snagboats to clear debris from rivers. Once separated and stacked on land, the debris could be put to the torch. Pennsylvania authorities accepted Sears' plan, obtained the equipment, and soon had the debris cleared away to open the stream's flow.[10]

"As the work was now properly organized and well in hand," Sears declared, "I could be of no further use, and asked for a recall." Sears and most of the engineers left Johnstown on 15 June. Patrick and fifty-three enlisted men remained behind to construct temporary trestle bridges. They returned the pontons, no longer needed, to their depots in early July. The chief of engineers commended the troops for their energetic work; President Harrison expressed his personal satisfaction with their services; and the city of Johnstown presented its public resolution of gratitude to the Corps.[11]

In this first use of engineer troops for disaster emergency service, the troops' primary mission had been delivering, placing, and maintaining the temporary bridges, and they performed well. Although declining to manage the recovery projects, Sears furnished useful technical assistance for the post-disaster debris removal efforts. The Red Cross and the Johnstown Relief Commission conducted the principal relief, recovery, and rehabilitation programs, expending $1.8 million in doing so, none of which came from the federal government.[12]

Both convict and paid laborers worked with wheelbarrows to close the crevasse in the Morganza levee south of Old River, Louisiana, during the flood of 1890.
Mississippi River Commission

The 1890 Mississippi River Flood Fight

"It was a very angry looking break," reported Capt. Dan Kingman, the MRC district commander at New Orleans, vividly describing the Morganza levee crevasse in 1890. "The swamp had not yet filled with water and there was a fall of several feet right in the throat of the crevasse. The water dashed in among the trees, which were trembling and falling, and the noise of the rushing water could be heard for more than a mile."[13]

Eight years of administration by the Mississippi River Commission and levee construction by local organizations led to real progress by 1890 when a flood surpassed all crest records on the Mississippi below the mouth of the Arkansas River. The lower Mississippi River levee system had been breached at 284 places during the 1882 flood, 224 places in 1883, 204 places in 1884, but only 23 places in 1890, when the river continued at flood stages longer than during the earlier floods.[14]

On 1 March 1890 the Army's chief signal officer, then in charge of weather forecasting, warned that the coming flood would exceed the records set in 1882 on the lower Mississippi. He estimated the flood would force the evacuation of ninety thousand people, and he warned that loss of life was probable. The Corps had only $8,701 left in its flood emergency budget, and the Mississippi River Commission appealed to Congress for an early and adequate emergency appropriation for the coming flood fight. Congress obliged.[15]

"The water dashed in among the trees, which were trembling and falling, and the noise of the rushing water could be heard for more than a mile."

Capt. Willard Young and Senior Civil Engineer Arthur Hider fought the flood from Memphis. They stationed the steamboats *Emma Etheridge, Osceola,* and *Vidalia* with double crews at

strategic points along the river to conduct rescue operations and deliver flood-fight materials where needed. The local levee districts supplied the labor, and the government furnished the materials: 440,000 sandbags, 35,700 pounds of bagging, 2,520 pounds twine, and 470,000 board feet of lumber.

The engineers planned and supervised the action. Laborers topped the levees with sandbags laid in tiers. Brush topped with sandbags checked the sloughs (erosion points) on the back sides of levees, and seepage was slowed by dumping loose earth or placing canvas weighted with sandbags on the river side of the levees. Where bank caving threatened, the engineers directed the construction of dikes to deflect river currents: workers drove wooden piles ten feet apart and tied the piling together with wire cables, laid willows and brush against the cables, and dropped sacks of earth behind the brush.[16]

"Had it not been for the very energetic and heroic work…the overflow would have been much more general and disastrous."

As the flood crest approached, the first break in the levee system came at Opossum Fork north of Arkansas City where twenty-five desperate men armed with Winchesters drove away the levee's guards and deliberately breached the levee, inundating two Arkansas counties. These villains hoped thereby to relieve pressure on the downstream levees that protected their own homes and farms. Other crevasses, caused chiefly by foundation weaknesses, then followed.[17]

"Had it not been for the very energetic and heroic work of the several State levee organizations," commented Young, "supplemented by the timely and liberal assistance rendered by the General Government, a very considerable portion of the levee line would have been breached, and the overflow would have been much more general and disastrous." At points the flood climbed fully two feet up the side of the sandbags stacked on the levee crown.[18]

A labor shortage hampered the flood fight near Memphis. For example, at one crevasse Hider could not recruit the workers needed to close the gap, even though the levee and the Corps of Engineers quarterboats were crowded with male refugees fished out of the flood. "They are an improvident set of people," complained Hider, "and should the U.S. begin issuing rations, it would utterly demoralize the labor and do more harm than good at present."[19]

Eventually the Corps found a solution to this challenge, although Young later had to explain to the chief of engineers a certain item listed as a flood-fight expenditure. Local laborers were accustomed to enjoying whiskey rations as part of their normal compensation, and the Army engineers felt compelled to offer the same fringe benefit. "The men refused to work unless they were supplied with this whiskey ration as before," Young admitted, "and as a failure to hold the laborers would have resulted in the loss of the levee line a part barrel of whiskey was … issued to the men." In time the chief approved this emergency cost.[20]

Kingman and Senior Civil Engineer H. S. Douglas at New Orleans encountered similar challenges. They sent sacks, lumber, tarpaulins, nails, shovels, and wheelbarrows to threatened levees aboard the *General Newton* but could not hire sufficient temporary labor even for the

Beattyville, on the Kentucky River, was inundated during the 1890 flood.
National Archives, 77-RH-34

munificent wage of ten cents an hour. Even those laborers who did accept their generous offer refused to work on Saturday afternoons or Sundays.[21]

As crevasses farther north relieved pressures against other levees, the river stage in the upper part of the Fourth MRC District began dropping. Kingman warned the local levee managers that a second crest would come when the water that had escaped through the upstream crevasses flowed back into the Mississippi via the Yazoo and Red rivers. Apparently no one believed his warning, however, and the laborers left for home. Then came the second rise.

Kingman and his staff, with such labor as they could locate, managed to raise the Morganza levee an additional foot with heaped earth and sandbags, to no avail. A storm the night of 21 April sent waves crashing over the sandbag topping, driving back the workers and causing the "angry looking break." Two more breaks occurred in the district at Nita and Martinez levees, and the Corps lost the fight.[22]

With floating plant fully committed to the flood fight, the commander at Memphis asked for authority to purchase twenty skiffs and to charter steamboats for the rescue of stranded people. Congress then considered a resolution to allow the Corps the use of river and harbor appropriations to purchase watercraft for rescue work.

Congressman James Blount of Georgia suggested limiting the expenditures for rescue boats

to $3,000. Congressman Thomas Catchings of Mississippi immediately objected to any cost limitations. "I would like also to impress upon the House the fact that the president of the Mississippi River Commission is General [Cyrus] Comstock, who is well known to many here present, and there is not today in the service of the Government a more prudent, painstaking, or efficient officer," Catchings explained. "He will have the disposition of this fund, and, knowing him as I do, I would not hesitate, if it were a contribution from my own private funds, to leave it entirely to his discretion." Catchings' argument proved persuasive and Congress did not restrict the rescue expenditures.[23]

"Suffering universal. It is beyond the power of the state to make any provision for such widespread calamity. Situation is desperate."

Poignant pleas for help poured in to Washington during April 1890, and the House Committee on Appropriations investigated them. It requested damage reports from state governors and from the Corps commanders at Mississippi River districts. In reply, Kingman at New Orleans dispatched a blunt telegram: "There are both suffering from destitution and danger of loss of life. There are many breaks in levees and fears that but few levees withstood the storm of last night. Suffering universal. It is beyond the power of the state to make any provision for such widespread calamity. Situation is desperate."[24]

Receiving similar telegrams from other officials, the House committee recommended an urgent appropriation of $150,000 to subsist thirty-five thousand people for twenty-one days, at a cost of twenty cents per ration. During the House's consideration of the bill, Congressman Richard Bland of Missouri demanded to be told what article of the Constitution justified such an appropriation. House Speaker Joseph Cannon of Illinois thundered in reply: "In the starving condition of 35,000 poor people who cannot be relieved otherwise." Congress quickly enacted the relief bill, and the Corps steamboat *Emma Etheridge* delivered the sustaining food supplies to the refugees.[25]

The 1890 Mississippi River flood marked the first large-scale emergency response of its sort performed under Corps management. In its aftermath, the Corps began studies of crevasses, sloughs, and sandboils (large leaks), seeking better methods of handling these levee-threatening conditions. It became clear to the Corps, moreover, that close liaison with Congress, always important, is vital during emergencies requiring swift legislative action. In turn, Congress learned the Corps could be counted upon for accurate reporting of disaster situations, while the public deluged Congress with alarming rumors and exorbitant demands for federal aid.

Discretionary Disaster Authority, 1896

On 8 December 1896, Brig. Gen. William P. Craighill, Chief of Engineers, issued Circular No. 18 granting authority to engineer officers engaged in civil works projects to undertake emergency rescues. This first standing authority for Corps officers to take measures to save life and property from natural disasters without awaiting approval from headquarters specifically

envisioned the use of Corps workboats during flooding:

> By authority of the Secretary of War, permission is given to officers of the Corps of Engineers having charge of Government property, to use or loan Government boats, barges, and other appliances, in cases of sudden emergency not permitting request for previous authority, when life is endangered. The use of such plant is also permitted to save property; provided that no suitable private boats or appliances are available, that the plant can be spared without detriment to Government works, and that no extra expense to the United States is incurred. Prompt report, with full statement of facts, will be made to the Chief of Engineers of all such use of Government property.[26]

Circular No. 18 did clear up misunderstanding about the role of the Corps during emergencies and encouraged field commanders to respond more aggressively to disaster situations. Some confusion, however, still remained; for instance, the phrase "extra expense" was difficult to interpret in that the cost of fuel and wages for boat crews on emergency service could be considered "extra." Nor did the circular fully explain the responsibilities of individual engineers engaged in emergency response. A case involving an engineer commander in Minnesota and an ice jam in Wisconsin illuminated this problem.

In early December 1896, Col. William Jones, commanding at St. Paul, Minnesota, received an urgent plea for help from the mayor of Chippewa Falls, Wisconsin. A forty-foot-high ice gorge had formed downstream of the city, damming the river's flow, and the Chippewa River had begun rising at the rate of a foot an hour. The city had used two thousand pounds of dynamite trying to break up the ice jam without success, and the mayor wanted Jones to advise on how to dislodge the ice. When Jones reached the city, he told the mayor that dynamiting the ice was useless; he directed sandbagging to save the town. His mere presence on the scene helped to quell public panic. After the river itself had forced open a new channel through the ice, the waters began to subside. His mission accomplished, Jones stayed another day to help the city engineer plan a local flood protection project, then he returned to his office.[27]

A month later, the mayor of Chippewa Falls was shocked to receive a bill from Jones for $200 to cover his professional services in the emergency.

"I went there prepared to meet the emergency in whatever shape it might appear."

The mayor then took up the bill with the Army adjutant general, explaining that, while the colonel's services had been valuable, the Chippewa River was a navigable waterway of the United States, and the city therefore should not be required to pay a public officer for his services.[28]

When the adjutant general referred the question to Jones for report, Jones responded that the Chippewa River did not flow within his command area and that it had no authorized federal waterways project funds from which to reimburse his services. He had explained this to the mayor before he went to Chippewa Falls. He further elaborated the situation:

> I went there prepared to meet the emergency in whatever shape it might appear. I

took an Assistant along who was conversant with the river in that locality. I was not. I sacrificed three days of the leave of absence to which I am entitled under the regulations, there being no other lawful way I could absent myself for this duty. I left the City with no word of thanks for my services. No offer to reimburse my expences [*sic*]. I waited for a month for some sort of public recognition of my services, some offer to meet my expences, and then sent in a bill.[29]

Because no Chippewa River project existed, because the ice jam site was outside his area of responsibility, because he used his personal leave to undertake the mission, Jones thought the technical assistance he supplied Chippewa Falls had the character of consulting engineer services for which the city was liable. "I should say," he concluded, "that no municipality was entitled to the public service of a public officer unless the same had been specifically provided for by Act of Congress."[30]

Craighill vehemently disagreed with Jones. "A terrible disaster threatened the people of the city," said the chief of engineers, "and I am of the opinion that it was the duty of the nearest engineer officer, within the limits of whose

When the Red River overtopped its banks in 1897 and flooded surrounding areas, citizens of Fargo, North Dakota, refused federal assistance, preferring to rely on one another to get through the ordeal. Institute for Regional Studies, NDSU, Fargo (2042.10.2)

"…it was the duty of the nearest engineer officer…to aid without charge, by his wise counsel and professional knowledge, in allaying the fears of the alarmed and excited people."

district even a portion of the river is situated, to aid without charge, by his wise counsel and professional knowledge, in allaying the fears of the alarmed and excited people." Jones never collected his Chippewa Falls account.[31]

During his rugged tour at St. Paul, Jones seemed fated for disaster. On 11 April 1897, after receiving pleas for help from people living along the flooded Red River of the North, Jones boarded the Corps steamboat *Ogama* at Grand Forks, North Dakota, loaded it with privately-contributed relief supplies, and dodged ice floes to get downstream to supply refugees. Seventeen miles below Grand Forks, the *Ogama* rammed an underwater obstruction, smashing the boat's hull. With swift work, Jones and the captain managed to ground the boat in twelve feet of water, preventing its sinking in midstream with probable loss of life. Rowboats carried Jones and the relief party safely to the bank, but the relief supplies were ruined.[32]

The 1897 Red River flood was also marked by an unusual event, perhaps unique in American history. On 8 April Congress enacted a resolution approving the distribution of $50,000 worth of relief supplies to flood victims along the Red River. When this news reached Fargo, North Dakota, the town's mayor called a mass meeting of its citizens. They politely told Congress thanks, but no thanks—they would handle disaster relief on their own, without a dime of federal assistance.[33]

Flood Fight Operations, 1897

Record floods in 1897 were not limited to the Red River of the North. New flood records were set on the Monongahela, Cumberland, and Tennessee rivers in January, and high water reached New Madrid on the Mississippi River on 20 March, remaining at flood stage there until 4 April. The flood peaked at Vicksburg on 16 April at 52.5 feet—3.4 feet higher than previous records. Lasting fifty-nine days, the 1897 Mississippi River flood was of shorter duration than the floods of 1882 and 1884, yet was higher because the improved levee system kept the river more closely confined to the channel.[34]

The 1897 flood fight began on the upper Mississippi near Rock Island, Illinois, where Col. William King and Senior Civil Engineer Montgomery Meigs patrolled the river in steam launches. These vessels transported sandbags to local levee districts in Illinois and Iowa and riprap stone to armor levees where waves threatened to erode the earthen dikes. One crevasse, resulting from tunnels made through the levee by muskrats, occurred near Rock Island, and King sent the snagboat *General Barnard* and labor to help the local levee managers close the crevasse.[35]

The Mississippi River Commission in 1897 had three Corps officers in charge of its four districts on the lower river. Capt. Graham Fitch commanded the First and Second districts covering the Mississippi between Cairo and the mouth of the White River; Lt. Henry Newcomer had charge of the Third District

responsible for the river between the mouth of the White River and Warrenton, Mississippi; while Maj. George Derby commanded the Fourth District at New Orleans.[36]

Fitch prepared for the flood fight in the First and Second districts in early March, placing an assistant in direct charge of each levee section and sending the *Titan* and other towboats up and down the river to place barges loaded with lumber and sandbags at convenient locations. These materials could be used by local levee boards as needed during the flood fight, while the barges also served as central rescue stations for refugees.

The MRC joined with local levee boards in the First and Second districts to raise the levees, using mule-drawn scrapers to heap earth atop the levee crowns and armor the fresh earth with sandbags to reduce wave erosion. Their work proved futile, however, for the 1897 flood crest along that river section reached up to 4.6 feet higher than the record set in 1890. Armed villains deliberately breached a levee near Caruthersville, Missouri, and fourteen crevasses occurred at other points. The river actually flowed over the top of one eleven-mile levee section.[37]

Newcomer and the Third District began their flood fight well in advance of the crest. They sent the steamboats *Emma Etheridge, Vedette, Meter*, and *Thomas B. Florence* to deliver barges filled with lumber, sandbags, and tools, along with quarterboats for housing laborers and refugees, to strategic points throughout the district.

Local levee districts hired all available laborers and put them to work raising the levees. Mule-team scrapers dragged earth into place atop the levee crowns; workers dropped sandbags along the river side of the levees; and sometimes the engineers and laborers provided additional height by installing wooden bulkheads—two parallel rows of planks with the space between filled with earth—on the top of the levees. As the flood crest drew nearer, the workers moved earth from the landward side of levee crowns to heap on the river side. The 371 miles of levees in the Third District, nevertheless, had inadequate grades to withstand a flood as much as three feet higher than previous crests. Eight crevasses broke the levee system, flooding forty-eight hundred square miles of land in Mississippi, Arkansas, and Louisiana.[38]

In his post-disaster report, Newcomer mentioned two problems experienced during the flood fight. First, the fight consumed 986,000 sandbags, far more than necessary. Local levee boards apparently thought sandbags the panacea for all high-water troubles and used them to prevent wave wash and to slow sloughing, the sliding down of the levees' landward slopes. Some even used them to build ramps and roadways. Second, cattle driven up onto the levees for safety during the flood mired down in the saturated earth and caused dangerous sloughing. Levee guards had orders to shoot cattle and keep them off the levees, with much resulting ill will in the surrounding country.[39]

Derby and Senior Civil Engineer W. J. Hardee conducted a masterful flood fight along the 452 miles of river in the Fourth District. They started by placing forty-two barges and quarterboats loaded with materials and tools at fifteen-mile intervals along the lower Mississippi, with towboats stationed at sixty-mile intervals to move the barges and perform rescues.[40]

A Mississippi River levee failed near Stokes Plantation in April 1897.
National Archives, 77-MRC-5-71736-003

For rapid inspection of threatened levees, Hardee implemented a novel system. In January 1897, as a condition of employment, Hardee had required each levee inspector to purchase and use a bicycle. During the flood fight, he kept his inspectors constantly bicycling along the levees, and he personally covered thirty miles of levee each day on his bike, including stops for observation (and presumably to catch his breath).[41]

During the emergency, Derby coordinated the operations of six independent forces: individual planters, railroads, parish governments, levee districts, state governments, and the Corps—not an easy task. Often the first agency on the scene began raising and repairing a levee then argued with the forces that arrived later about how work was to be allocated and what methods should be used.

Derby and Hardee later reported that pan scrapers (sometimes called fresnoes or wheelers) pulled by mule teams were the most economical means of raising levee grades. Where scrapers could not be used, workers moved the earth with wheelbarrows or used sandbags. Wave wash protection was provided by driving stakes into the levee crown and nailing planks to the stakes. Hardee directed that seepage be plugged by dumping dirt into the river at the site of the leak. Laymen thought it foolish to dump dirt into the river, but Hardee had learned this technique by watching rivermen at New Orleans plug leaky barges by dumping sawdust into the water near the leaks. The dirt, like the sawdust, was drawn into the weak levee section by the water's flow, thus plugging the path of seepage. Larger leaks, often called sandboils, were cut off by placing a sandbag ring or dike around the leak's outlet behind the levee. When water

inside the sandbag ring rose to the level of the river on the opposite side of the levee, it equalized pressures and flow through the leak ceased.

Stopping sloughing was more difficult. Water standing against the levees for long periods percolated or seeped through the levees and caused *rottening*, the softening of the inside landward slopes. The soils in the levees became semi-fluid and sloughed, or moved down and out, reducing the width of the levee. If not checked, another slough would follow higher up the levee and so on until the river broke through. An older method for checking sloughs consisted of dropping brush into the slough and weighting the brush down with sandbags to preserve the drainage and somewhat improve levee stability. Hardee, however, became convinced in 1897 that the best protection against sloughing consisted of cutting a ditch at the landward base of the levee to carry off the water as it percolated through instead of allowing it to stand. These ditches eventually became common in standard levee designs.

Using these innovative techniques, the Fourth District directed a flood fight that involved capping two hundred miles of levees. Derby proudly reported that the Fourth District had successfully passed the greatest flood of record, which had stood against the levees for two months, with only a single major break at the Glasscock levee, and that break had resulted from muskrat burrowing.[42]

Downstream from New Orleans in the Lake Borgne area, however, there were no organized levee districts in 1897 and nothing was done to reduce flooding, but the Corps did perform rescue operations. At the request of the mayor of Dyersburg, Tennessee, Capt. John Biddle, in charge at Nashville, exercised his authority under Circular No. 18 (1896) and used the Corps barges and quarterboats near Dyersburg to rescue and shelter about one hundred people flooded out along west Tennessee's Obion and Forked Deer rivers. Assistant Engineer Benjamin F. Cheatham, who had charge of the rescue operations at Dyersburg, was a son of the Confederate general of the same name. He left the Engineers in 1898 to serve in Cuba with the Quartermasters, and in 1925 he took command of the Army Quartermaster Corps.[43]

John A. Ockerson, the Mississippi River Commission's senior engineer at its St. Louis headquarters, dispatched the steamers *Minnetonka* and *Vidalia* to rescue people flooded out between New Madrid and Memphis. Those two steamers in seven days saved 145 people along with their household effects and livestock. The Memphis-based steamboat *Itasca* picked up 177 refugees and their 95 horses and mules, 173 cattle, 82 hogs, and bundles of rescued household effects, while the survey boat *Abbot* brought out 63 people plucked from rooftops and trees. With no escape avenue other than these boats, many of the refugees might have drowned.[44]

Executive Initiative

In April 1897 Congress appropriated $200,000 for Mississippi River flood relief at the request of President William McKinley. In making his request, McKinley reviewed the calamitous losses, then explained:

> Under these conditions, and having exerted themselves to the fullest extent, the local authorities have reluctantly confessed their

> inability to further cope with this distressing situation unaided by relief from the Government. It has therefore seemed to me that the representatives of the people should be promptly informed of the nature and extent of the suffering and the needs of these stricken people, and I have communicated these facts in the hope and belief that the legislative branch of the Government will promptly reinforce the work of the local authorities in the States named.[45]

Congress, not the executive branch, had initiated most disaster relief measures prior to 1897, after its members had received specific requests for aid from their constituents and a committee of Congress had investigated each situation. Presidents, such as Benjamin Harrison in 1889, had occasionally ordered the Army to take certain emergency measures, but the relief furnished during the Mississippi River flood of 1897 was the first authorized at the request of a president who had investigated the disaster situation and had determined that the need for relief exceeded local resources.

President McKinley's request did not go unopposed. Congressman Joseph Walker of Massachusetts protested any relief appropriation, declaring that he thought federal disaster assistance not only violated the Constitution but also presented an affront to the "manliness of the States involved." Walker proclaimed that "there is nothing that could come to the citizens of those States that would have so good a moral and economic effect as to call upon them or rather have them to take care of their own people in the injuries now done, leaving them to do it."[46]

Sydney Mudd of Maryland resented Walker's opinion, asserting that Congress should never stand on technical construction of the Constitution when the issue was the relief of human suffering. "Men must be able to exist before they can prosper," he said, "and I understand it is conceded that under the general welfare clause of the Constitution, Congress has the right to bring prosperity to this country."[47]

In the Senate, William Bate of Tennessee preferred to transfer the mission of federal disaster relief from the Corps and the Quartermasters to the Marine Hospital Service, which was a Treasury Department bureau that administered marine hospitals for boatmen at St. Louis, Cairo, Louisville, Memphis, Vicksburg, New Orleans, and other ports. Arkansas Senator James Jones opposed such a transfer, contending that disaster relief should continue under War Department management. He reasoned:

> The War Department has all along these rivers where the flood now prevails officers in charge of local works. It has boats, it has crews of men, it has officers already at work. The men are along the levees that have been threatened recently; they are in the overflowed districts; they are familiar with the local conditions everywhere, and they are the men of all others who know where aid ought to be rendered, where suffering is to be relieved, and where no relief is needed.[48]

Jones's argument that the organization of the Corps of Engineers, with its strategically located civil works offices and trained and experienced personnel, was best suited to manage flood assistance prevailed in 1897. Congress enacted the appropriation requested by President McKinley, and the flood victims received the vital assistance dispensed by the Army Quartermasters and delivered by the Corps of Engineers. Although the Mississippi River floods were attention-grabbing, widespread

disasters, the more localized disasters also received Corps assistance. Two of these exemplify the Corps' emergency operations at the end of the nineteenth century.

Shawneetown Emergency, 1898

On 3 April 1898 the levee holding the flooded Ohio River out of Shawneetown, Illinois, suddenly failed. First reports said the failure drowned two hundred people, but more accurate information that followed reduced the number to fifty. The disaster left some two thousand residents of the town huddled without shelter or food along the top of the remaining levees and on nearby hills. Senator Shelby Cullom of Illinois appealed to the chief of engineers to hurry workboats to the site for rescue and relief. Ten minutes after receiving Cullom's request, the chief had telegrams on the wires to the MRC districts at St. Louis and Memphis, directing them to rush boats to Shawneetown.[49]

Capt. H. E. Waterman at St. Louis ordered the steamboat *Vidalia* loaded with emergency supplies at Cairo for delivery to the stricken com-

Residents watched as floodwaters covered the streets of Shawneetown on 3 April 1898. The Corps rushed workboats to the town for rescue operations.
Library of Congress, LC-USZ62-24140

munity. Lt. Mason Patrick at Memphis sent the steamer *Chisca* north. After stopping at an inadequate clearance under the bridge at Cairo, the *Chisca* paused while its crew cut off its smokestacks, then proceeded on to Shawneetown. The two workboats retrieved the stranded townspeople and dispensed relief supplies in the vicinity for several days. When they departed, their crews carried formal letters of appreciation from the community.[50]

Brazos River & New Bern Floods, 1899

"Devastation great. Immense loss of life probable. Prompt actions very important," warned the telegram sent by Governor Joseph Sayers of Texas to the secretary of war in July 1899. The governor went on: "Please immediately order by wire boats at Galveston to ascend rivers using launches and yawls to rescue people from the waters which are widespread over the lands of the lower Brazos."[51]

During early July heavy rains had flooded the Brazos valley, the Cotton Belt of Texas. The widespread flooding drowned three hundred people and marooned a thousand or more on rooftops and in trees.[52] Responding to this tragedy, the secretary of war replied to Governor Sayers' telegram: "The Chief of Engineers will place at your order all boats available at Galveston and the commanding officer at San Antonio has been directed to place at your immediate disposal 10,000 rations and to confer with you as to points of delivery."[53]

Capt. C. S. Riche, commanding at Galveston, dispatched eight men under direction of

"Devastation great. Immense loss of life probable. Prompt actions very important."

Assistant Engineer William Burke with four yawls, one life boat, and one skiff to the flooded area. He ordered Capt. W. W. Woolford, in charge of the tugboat *Anna*, to Velasco, five miles above the mouth of the Brazos. Burke and his team loaded the boats on railroad cars at Galveston and went to Sugar Land, where they launched their craft on 8 July to float down the Brazos. At no small personal hazard, they descended the river on the flood, dodging trees and floating debris. Listening carefully for signals from the trees and visiting every flooded homestead, they retrieved several bodies and picked up many people who had been stranded for days without food. They took these refugees to safety on high ground, where the Galveston Relief Committee furnished them shelter and subsistence.

Woolford aboard the *Anna* arrived at Velasco on 9 July and continued upriver with relief supplies and the rescue yawls, constantly blowing the boat's whistle to attract attention and stopping to search flooded homes. That first afternoon, the *Anna* saved forty people and took them to Brazoria. "Their condition was pitiable," lamented Woolford.[54]

At daybreak the following day the *Anna* resumed its rescue efforts. Woolford's detailed report on the work illuminated the situation:

> Our first work on this day was the rescue of a woman and her four children from the attic of their home, where they had been for several days without food except green

The Brazos River flood nearly covered a railroad bridge outside of Richmond, Texas, in 1899.

Courtesy of the Fort Bend County Museum Association, Richmond, Texas

> corn. They were brought aboard the Anna and given every possible attention. A boat manned by Captain Chester and Brick Pomeroy was patrolling the bottom about three miles from the river. This boat party discovered a slight ridge on which about 200 people had taken refuge. These people, too, were without provisions, except green corn. 50 of them were brought on board the Anna and the remainder, who preferred to stay where they were, were given provisions. A second trip was made in this vicinity and from two houses 17 people were rescued. A third boat party rescued 15 people from house tops about one mile from the river.[55]

After delivering the refugees to Columbia, where a local relief committee saw to their needs, the *Anna* returned to Galveston. The engineer commander at Galveston subsequently recommended that the Corps personnel who risked their lives in the rescue mission on the flooded river be awarded official commendations, but no records of an award survive.[56]

The last Corps disaster relief mission of the 1800s occurred on 22 October 1899. The commander at Wilmington, Capt. E. W. Van Lucas, received an urgent request from the people of New Bern, North Carolina, for help with the rescue of marooned flood victims at Ocracoke on the outer banks. Under the discretionary authority of Circular No. 18 (1896) for emergency use of floating plant to save lives and property, Van Lucas dispatched the Corps steamer *General George Thom* to Ocracoke,

where it saved the lives of thirty people. The Citizens' Relief Committee of New Bern subsequently reimbursed the Corps for the cost of the rescue operation.[57]

Observations

At the dawn of the twentieth century, the Corps of Engineers had established a tradition of effective emergency response to natural disasters in the field and had become, along with the Quartermaster Corps, the Army's preferred agency for the administration and performance of disaster assistance operations during major floods. The Corps' civil works mission, with highly trained staff in offices dispersed throughout the nation, allowed it to respond quickly to any emergency, and its reputation for integrity and capability inspired the confidence of Congress and the public. Its specialty, of course, was flood disasters, but in the twentieth century it was tested also by earthquakes and fires.

Chapter 3 Notes

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4. Johnstown flood reports are in files 2420–A, 3401–A, 2429–A, 2430–A, 2601–A, 2489–A, 2651–A, NARA, RG 77, Engineer Department, "Letters Received and Sent, 1889." See especially Clinton Sears after-action report of 15 June 1889 in 2651–A.
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19. Arthur Hider to Willard Young, 29 Mar. 1890, NARA, RG 77, Engineer Department, "Letters Received, 1890," File 2723.
20. Willard Young to Chief of Engineers, 15 May 1890, NARA, RG 77, Engineer Department, "Letters Received, 1890," Files 3524 and 3608.
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25. *Congressional Record*, 51st Cong., 2d sess., 1890, 3822–25; "The Mississippi Floods," *Harper's Weekly* 34 (22 Mar. 1890): 219; House Committee on Rivers and Harbors, *Floods Upon the Mississippi River*, 51st Cong., 2d sess., 1890, H. Exdoc. 291, passim; House Committee on Appropriations, *Affairs in the Overflowed Districts of Louisiana*, 51st Cong., 2d sess., 1890, H. Exdoc. 342, passim.
26. See reports in NARA, RG 77, Engineer Department, "General Correspondence, 1894–1923" [hereafter Entry 103], File 100210.
27. NARA, RG 77, Entry 103, File 19255 contains reports on the 1896 Chippewa Falls Incident; *New York Times*, 3, 4, 5 Dec. 1896.
28. City Attorney of Chippewa Falls to Adjutant General, 25 Jan. 1897, NARA, RG 77, Entry 103, File 19255.
29. W. A. Jones to Chief of Engineers, 1 Mar. 1897, NARA, RG 77, Entry 103, File 19255.
30. Ibid.
31. John Wilson to Adjutant General, 13 Feb. 1897, NARA, RG 77, Entry 103, File 19255.
32. W. A. Jones to Chief of Engineers, 28 Apr. 1897, NARA, RG 77, Entry 103, File 19255; *Minneapolis Journal*, 12 Apr. 1897.
33. *New York Times*, 10 Apr. 1897; *Congressional Record*, 55th Cong., 1st sess., 1897, 1469.
34. Harrison, *Levee Districts and Levee Building*, 140–53; *ARCE* (1897), 3523–27.
35. William King to Chief of Engineers, 1 May 1897, NARA, RG 77, Entry 103, File 20784.
36. Each officer's after-action report is printed in *ARCE* (1897).
37. *ARCE* (1897), 3705–07.
38. Ibid., 3730–32.
39. Ibid., 3743–47.
40. Ibid., 3812–23.
41. Ibid., 3813.
42. Ibid., 3812–23.
43. John Biddle to Chief of Engineers, 8 Apr. 1897, NARA, RG 77, Entry 103, File 20413.
44. *ARCE* (1897), 3663–67, 3709–10.
45. *Congressional Record*, 55th Cong., 1st sess., 1897, 636–40, 648–50.
46. Ibid.
47. Ibid.
48. Ibid.

49. *New York Times*, 4, 5, 6 Apr. 1898; Shelby Cullom to Secretary of War, 4 Apr. 1898, NARA, RG 77, Entry 103, File 21730.
50. After-action reports by Captain Waterman and Lieutenant Patrick are in NARA, RG 77, Entry 103, File 21730. After repeated flood disasters, capped by the 1937 inundation, the people of Shawneetown moved to higher elevations.
51. Joseph Sayers to Secretary of War, 5 July 1899, NARA, RG 77, Entry 103, File 31748.
52. *New York Times*, 1–12 July 1899.
53. *New York Times*, 7 July 1899.
54. C. S. Riche to Chief of Engineers, 6 Sept. 1899, NARA, RG 77, Entry 103, File 31748.
55. Ibid.
56. Ibid.
57. E. W. Van Lucas to Chief of Engineers, 8 Sept. 1899, NARA, RG 77, Entry 103, File 32620.

Right: Freight yards and warehouses were flooded in Kansas City, 1903.

Library of Congress, LC-USZ62-47149

Below: The National Guard kept back the crowd during the Baltimore fire, 1904.

Library of Congress, LC-DIG-npcc-18736

Above: One of the dynamite crews charged with bringing down unsafe walls in San Francisco, 1906.

Library of Congress, LC-USZ62-52426

Right: The Army blasted dangerous and precarious structures in San Francisco, 1906.

Courtesy of The Museum of the City of San Francisco

Disaster Mission Expansion, 1900–10

4

During the nineteenth century most Corps of Engineers disaster missions were responses to flooding, but in the early twentieth century the Corps' assignments included responses to various types of disasters. Soon after the 1900s began, the Corps was tested by a great hurricane, a shocking earthquake, and urban wildfires, along with a panoply of smaller emergencies that presented new challenges to Corps civilian specialists, engineer troops, and the headquarters command. All responded splendidly with one exception: when the most powerful hurricane of the era struck Galveston, Texas, the Corps of Engineers' response was entirely inadequate, principally because the storm destroyed all available Corps equipment and facilities in the Galveston area.

Galveston Hurricane, 1900

In number of lives taken, the Galveston hurricane of 8 September 1900 remains the most devastating natural disaster in American history. No one knows how strong the storm's winds were—the storm blew away the official anemometer after it recorded ninety-six miles per hour. Barometric pressure dropped to 28.48, the lowest recorded to that date, and the tide at Galveston reached epic proportions. High winds and tides put the highest point of Galveston Island under five feet of water and wiped out the city. At least six thousand died.[1]

Although the engineer office at Galveston had performed well during the Brazos River flood of 1899, it was completely unable to respond to the hurricane of 1900. The storm destroyed its office building, drowned some of its personnel along with their families, and sank or disabled its fleet. Even its giant seagoing dredge *Comstock* was beached high and dry.[2] Nearby Corps

"I regret to report the loss of all property in my charge excepting the launch. My office building has entirely disappeared…"

facilities also suffered the storm's devastation. E. N. Sanctuary, in charge of the Sabine River sub-office, for example, relayed the following sad report to headquarters: "I regret to report the loss of all property in my charge excepting the launch. My office building has entirely disappeared and even the Life-Saving Station is ruined. We are hunting for property and I sincerely hope I may recover some of the instruments."[3]

The coastal artillery fortifications at Galveston were destroyed along with everything else. An officer stationed in Galveston the day of the disaster dispatched to headquarters a vivid description of the losses:

> Island entirely inundated, water five feet deep on highest ground on Island. All bridges swept away, nearly all docks wrecked, water works, electric light works, every telegraph wire in city destroyed, over five thousand residences demolished

"Island entirely inundated, water five feet deep on highest ground…every telegraph wire in city destroyed, over five thousand residences demolished."

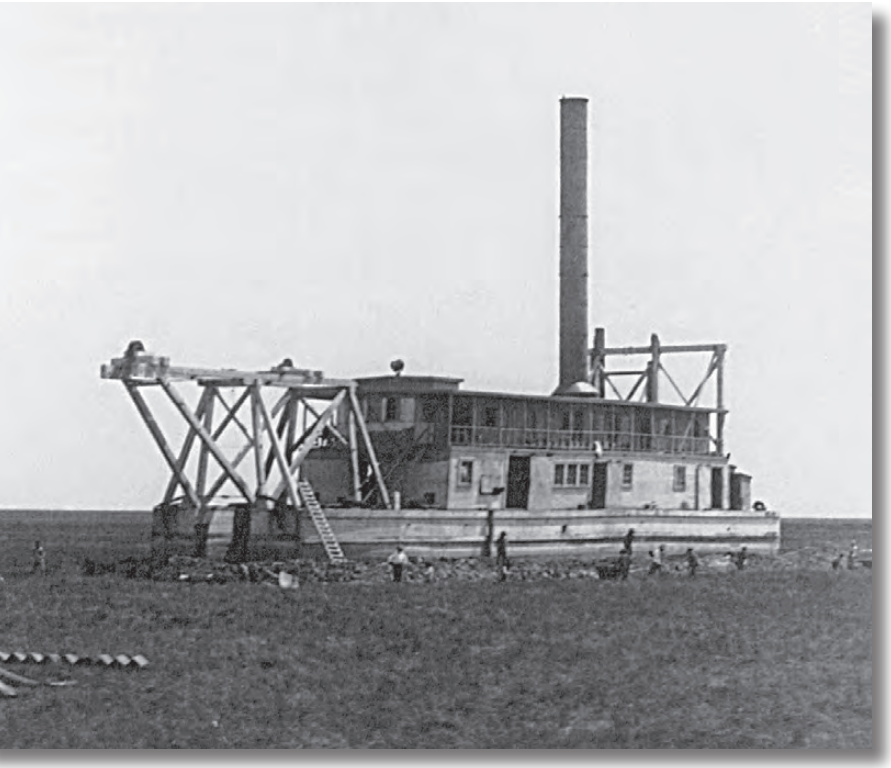
> …. Loss of life probably will never be known. I fear it will reach three thousand. Fortifications at Travis, Crockett, and San Jacinto practically destroyed; guns can be saved …. No article of government property saved; men and officers are absolutely destitute.[4]

The officer's estimate was greatly exceeded as final tallies of those killed topped six thousand, and the Corps of Engineers was unable to provide any immediate disaster assistance to the Galveston community.

To manage the recovery operations, the surviving people of Galveston established a commission, with each member in charge of a separate task: body recovery and disposal, relief supply distribution, finances, and so forth. This organization proved so effective in the exigencies that the city continued it after its recovery efforts ended, and later political scientists generally recognized it as the original commission form of city government.[5]

A dredge boat was stranded three miles from sea after the Galveston hurricane of 1900.

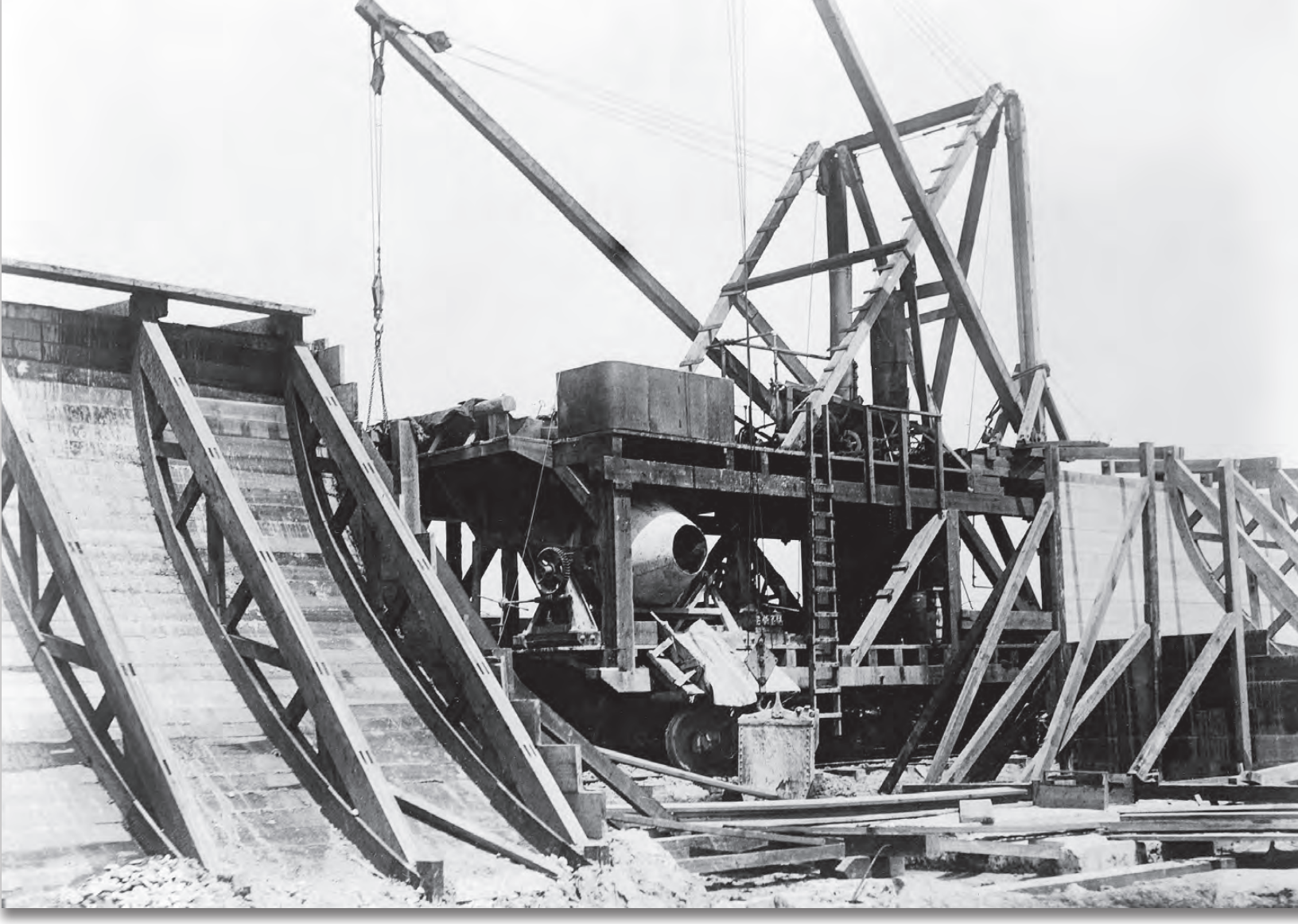
Library of Congress, LC-USZ62-68828



The commission printed public appeals for aid in newspapers throughout the country, and their appeals met with overwhelming response from individuals, businesses, and communities. Andrew Carnegie sent $20,000; Standard Oil gave $10,000; even the people of Johnstown contributed. All told, private relief contributions amounted to $2.5 million. Clara Barton and the American Red Cross provided major aid for Galveston, Barton's last act of charitable service in the disaster field.[6]

President William McKinley directed the secretary of war to furnish any quartermaster rations or tents needed at Galveston, and the Army shipped tons of these supplies to the island from Fort Sam Houston. So immense were the private donations, however, that there was little actual need for Army supplies. When Army troops, who had been performing street security duty, withdrew from Galveston on 15 September, they reported no continuing suffering of any kind in the city; indeed, there were "more physicians than patients." Congress appropriated no funds for the relief of Galveston, nor does it appear that the Corps of Engineers furnished any immediate disaster assistance.[7]

The Corps' contribution lay principally in the Galveston recovery and reconstruction program—the planning for construction of a



Following the hurricane, the Corps of Engineers and Galveston County planned, designed, and built new sea walls to protect the city of Galveston.

Library of Congress, LC-USZ62-124585

huge seawall and subsequently raising the island's level to protect it against future hurricanes. This immense project, completed in 1904, was tested and proved successful during many later hurricanes, notably the great hurricane of 1915.[8]

During the 1915 hurricane, Galveston Engineer District again lost a great part of its floating plant. Its commander reported the dredge *Barnard* had sunk and sixteen of its crew drowned. The remainder of the crew somehow stayed afloat in rough water for twenty hours, washing ashore twenty miles west of Galveston. The district's schooner, *Dora Allison*, was dashed to smithereens against the walls of Fort Crockett, but its master and crew were saved through heroic efforts by Company E, 2d Engineer Battalion, commanded by Capt. Ulysses S. Grant III at Fort Crockett.[9]

Bridging the Kansas River, 1903

Other engineer troops distinguished themselves during an emergency bridging mission that was reminiscent of the work performed by troops at

Johnstown in 1889. A major flood struck the Kansas (or Kaw) River in 1903 above where it joins the Missouri River at Kansas City. As much as fifteen inches of rain fell over the Kaw River basin in late May 1903, flooding Lawrence, Topeka, Manhattan, and Kansas City. Homes bobbing off downriver left twenty-two thousand people without shelter. The floating buildings smashed into bridges, destroying all crossings over the Kansas River except the Missouri Pacific Railroad bridge, which was saved by weighting it down from end to end with locomotives.[10]

Congressmen and Kansas City's mayor appealed to the secretary of war to send assistance. "Kansas City, with a population of sixty thousand, has one fourth of the people rendered homeless by reason of the floods," declared the mayor. "We need food, shelter and police protection. Give authority to the commander of Fort Leavenworth to issue all rations and tents called for by the Mayor of this city and also furnish soldiers for police protection."[11]

Fort Leavenworth's commander, by orders of the secretary of war, issued thousands of rations, plus tents, cots, and blankets, and sent two companies from the 6th Infantry to restore order in Kansas City.[12] Companies A and C of the 1st Engineer Battalion were ordered from Fort Leavenworth to Lawrence, Kansas, to install a temporary bridge. Captains Thomas Rees and C. A. F. Flagler commanded the companies, assisted by Lieutenants Robert Ralston, Horton Stickle, Nathaniel Bower, and Laurence Frazier. Rees in 1889 had commanded one of the engineer bridging details sent to Johnstown.[13]

Flooded, muddy roads mired the engineers and their mule-drawn wagons transporting the bridge equipage, and when they reached Lawrence they found their 225 feet of ponton equipment insufficient to bridge the 700 feet of channel between north and south Lawrence. In this exigency they innovated, devising and constructing a "flying ferry" to be driven back and forth across the river by the current. They decked two ponton boats to form a platform large enough to contain three wagons and teams and attached this platform by cable to an upstream anchorage on the bank. By changing the angle of the boat's hull to the current, the engineers ferried a steady line of people and wagons back and forth over the stream. Several troops operated the ferry until mid-July, while the remaining troops went to work with their wagons and teams to clear away flood debris.[14]

The secretary of war had also ordered Company B, 1st Engineer Battalion, with Capt. Herbert Deakyne commanding, from Fort Leavenworth to Kansas City, where the mayor requested that they bridge the Kansas River between the two Kansas Citys. Having only nine pontons, Deakyne planned to bridge the 678-foot-wide river with pontons over the deep channel and temporary trestles over the shallows. The mayor promised to furnish old barges for use as pontons and to supply timbers for construction of the temporary trestles. Yet, days passed and the mayor supplied nothing.

Maj. Smith Leach, commanding 1st Engineer Battalion, inspected Company B and found them loitering. Concerned by the mayor's non-cooperation, Leach commented, "Every morning it is stated that a dozen things will begin right after dinner, and every afternoon it is again stated that the same dozen things will be begun immediately after breakfast in the morning. Meanwhile, several dinners and

During the 1903 flood at Kansas City, locomotives parked on the Missouri Pacific Railroad bridge helped prevent the flood and debris from taking out the bridge. National Archives, 77-RH-34E-1

The St. Louis and San Francisco Railroad freight yard in Kansas City was nearly destroyed by the floods of 1903.

NOAA Photo Library

breakfasts have passed and they have not yet been begun." Leach proposed withdrawing Company B if Kansas City authorities did not soon provide the materials.[15]

Seeing his mission might fail, Deakyne requested help from the Corps civil works office at Kansas City, calling on its commander, Capt. Hiram Chittenden. Chittenden was employing the snagboats *Suter* and *McPherson* to clear flood debris from the navigable channels of the Kansas and Missouri rivers, and at Deakyne's request he directed the snagboat crews to pull old barges out of the flood debris, pump water out of them, and tow them to the temporary bridge site. Deakyne and the troops then caulked and repaired them for service as pontons. The troops also retrieved usable timbers from the flood debris for supports in the trestle bridge section.[16]

Company B had the pontons and barges in place and a pile driver pounding bents into place for the trestle section by 20 June. A twenty-six-foot span to join the last ponton in the floating section to the last trestle bent was needed to open the bridge. Deakyne quickly designed a timber span that would carry a twenty-eight-thousand-pound load, and the engineers built it and had it in place by 22 June.

A railroad tank car came floating down on the flood, threatening to smash the new bridge, but the bridge's guards had the presence of mind to move the pontons and let it pass through the open gap. Working throughout the night, Company B reassembled the bridge and put in back in service. Leaving Sgt. John Law and a detail to care for the pontons, Deakyne then returned with his weary troops to Fort Leavenworth.[17]

The after-action reports on the 1903 Kansas River flood emphasized the military value of the training obtained during disaster assistance operations. Leach pointed out several weaknesses in standard bridge equipage that he discovered during the disaster operations, and the chief of engineers promptly remedied these defects by revising the contract specifications issued for ponton equipment. Leach also recommended that the experience secured while building the flying ferry at Lawrence be incorporated into the engineer field manual for military bridge construction, and the chief of engineers ordered it done.[18]

Baltimore Fire, 1904

Maj. Edward Burr at Washington Barracks in the District of Columbia answered the telephone just after noon on 7 February 1904. The caller, the Army's chief of staff, instructed him to proceed immediately to Baltimore, Maryland, which was on fire. After reporting to Mayor Robert McLane, Burr was to demolish buildings to create a firebreak, aiming to stop the wind-driven flames that were consuming the city.

Burr located Capt. Claudius Gillette, Lt. George Pillsbury, and Lt. Edward Dent, and all boarded the next train to Baltimore. Burr left orders for Capt. James McIndoe to follow them

A National Guardsman patrolled the northeastern edge of the fire line on East Baltimore Street during the 1904 fire.

Courtesy of Enoch Pratt Free Library/State Library Resource Center, Baltimore, Md.

quickly with detachments from Company G and Company H of 2d Engineer Battalion and to bring a supply of high explosives. At Baltimore, Burr and his associates met the mayor and fire chief and went with them to the fire front. McIndoe, with ninety enlisted men and ample explosives, caught the train to Baltimore and reported to Burr at 4 PM.

By the time the troops arrived, however, Burr and the mayor had decided that demolishing buildings was unnecessary. The municipal fire department was checking the advance of the flames, and the National Guard had evacuated and secured the fire district. Because people were excluded from the area, the standing but damaged buildings did not constitute such an imminent threat to life that their demolition was required, and the mayor wanted careful study of the buildings made before they were destroyed.

After advising Baltimore officials on the proper demolition procedures for removing the burned buildings, Burr withdrew the engineer troops, catching the train back to Washington. Baltimore's mayor subsequently extended his commendation to Burr for the expert advice. Although demolition had not been required to stop the fire at Baltimore, the engineers' timely response had been impressive.[19]

Taking advantage of the opportunity to study the effects of fire on so-called fireproof buildings, the chief of engineers sent Capt. John Sewell to Baltimore to inspect the structures and identify methods for improving fire-resistant features. Sewell's report was later used by the Corps and by the insurance underwriters association to improve structural fire safety designs.[20]

San Francisco Earthquake, 1906

Brig. Gen. Frederick Funston, commanding the Army Department of California, was awakened by the quake, later identified as 8.3 on the Richter scale, at 5:15 on the morning of 18 April 1906. While dressing, he walked out of his home and saw smoke columns rising from downtown San Francisco. Striding quickly down the street toward the city, he saw the fires were out of control, water mains were broken, and the fire department was helpless. He decided to order out troops to guard federal property and to aid the municipal police and fire departments. Because telephone lines were down, he sent his orders by mounted messenger to the Presidio and to Capt. Meriwether Walker, commanding at Fort Mason.[21]

Walker, of the Corps of Engineers, had also been awakened by the quake, but, seeing no damage to Fort Mason, had returned to bed. Soon he was reawakened by the messenger pounding at his door with orders from Funston to report with all available troops to the City Hall of Justice. He roused his officers, Capt. William Kelly and Lieutenants Arthur Ehrnbeck, A. D. Barber, and Thomas H. Emerson, plus 150 troops of Companies C and D, 1st Engineer Battalion.[22]

Carrying rifles and twenty rounds of ammunition per man, the detachment set off at doublestep. Thirty minutes later, the first troops to arrive in the devastated city reached the Hall of Justice where they reported to Funston. "The arrival of these troops," Funston later commented, "was greeted with demonstrations of approval by the many people on the streets."

Army officers were in charge of dynamiting on Van Ness Street in San Francisco, 1906.

U.S. Geological Survey, Photograph by R. B. Marshall

Following the engineers came detachments of artillery, infantry, and cavalry. The Marines and Navy landed. The California National Guard was called out. Assistance to San Francisco involved all branches of the armed services.[23]

Once these troops began street security patrols, Funston telegraphed a message to Secretary of War William H. Taft: "We need thousands of tents and all rations that can be sent. Business portion of city destroyed and about 100,000 people homeless. Fire still raging; troops all on duty assisting police. Loss of life probably 1,000. Best part of residential district not yet burned …. I shall do everything in my power to render assistance, and trust to War Department to authorize any action I may have to take."[24]

Secretary Taft ordered tents and rations sent to San Francisco from all military depots on the West Coast, and he telegraphed Funston: "Of course, do everything possible to assist in keeping order, in saving life and property, and in relieving hunger …."[25]

The troops on street patrol had strict orders to "keep the crowds moving on, to allow no one to enter buildings unless satisfactorily identified as proprietor, to keep people away from the buildings as much as possible to avoid danger from falling debris, and to allow no one to go through the lines toward the fire unless passed by an officer."[26]

"…do everything possible to assist in keeping order, in saving life and property, and in relieving hunger."

Dangerous free-standing walls and other buildings in San Francisco had to be demolished for reasons of safety.

Courtesy of The Museum of the City of San Francisco

The troops enforced these orders rigorously. Col. William Harts, for example, was the Corps officer managing the California Debris Commission, and he learned the fire was threatening the commission's office at the Flood Building. He tried to reach the building in time to save the commission's records, but he could not pass through the line of troops in time and the fire destroyed the records along with the building.[27]

The 1st Engineer Battalion performed security duty through the night with meager rations and no sleep. Barber had to disperse looters in a liquor store and Ehrnbeck had to chase drunks from a boarding house, but the crowds generally were quiet, even somber. Although the Army subsequently was censured for its security activities, it was the police and National Guardsmen who shot nine looters, not the regular troops.[28]

The street security patrols were far from routine, however, and after the fire department began blowing buildings in an effort to check the spreading fires, Kelly, commanding the engineers patrolling Montgomery Street, became concerned. Later, he penned a vivid description of what he saw:

> Much of the effect was lost in breaking windows, and tumbling down bricks, etc. that had been loosened by the earthquake

"…either the gas main or the sewer blew up under a horse and buggy, throwing the horse down and overturning the buggy. … Between the blasts and the exploding sewers Montgomery street became a very uncomfortable place."

> on buildings within a radius of five blocks from the blast. About the same time the gas in the sewers began to explode. I saw a manhole cover at the corner of Bush and Montgomery streets blown at least 50 feet in the air. In front of the Russ House either the gas main or the sewer blew up under a horse and buggy, throwing the horse down and overturning the buggy. Fortunately the asphalt pavement prevented any fragments from flying. Between the blasts and the exploding sewers Montgomery street became a very uncomfortable place.[29]

By ten that morning a rising wind drove the flames toward the west, forcing the engineer troops to retreat before them. Seeing the fires had gotten out of control, Walker volunteered to take his command to Van Ness Street and begin dynamiting houses to create a firebreak. When he reached Van Ness Street, however, he learned that the city had exhausted its supply of explosives. At this juncture, he received orders from Funston to return quickly with the troops to Fort Mason.[30]

While Walker and his detachment were on street patrols, Lt. Jarvis Bain with twenty-four troops remained at Fort Mason, where a mass of refugees came in search of water, food, and shelter. Bain erected tents, filled them with the refugees, then filled the barracks, and still they came. Bain thought the refugees a disorderly lot, and he and his detail patrolled the area throughout the night to avert riots. On the morning of 19 April, the county's convicts came to the fort, driven by fire from the jail, further complicating Bain's situation. The crowd clamored for food, water, and blankets. Distributing what supplies he found in the post's commissary, Bain opened the post hospital to care for the sick and injured.[31]

When the engineer troops returned from security patrols, they built more latrines in the fort and put up more tents as materials arrived. By evening the crowd had consumed the fort's foodstuffs and requested more. Bain later described how this nutritional challenge was resolved:

> About 9 PM a boat from Stockton passed our dock loaded with supplies and Lieut. Barber who was on the dock succeeded in getting from it a large number of blankets and some food. Then came the task of getting these supplies up to the Post. Civilian wagons were seized, but the horses were so tired out and weak for want of food and water that men had to be sent with each wagon to help it up the hill. This work was not completed till 3 AM April 20th 1906, but it made it possible to issue food to the refugees at breakfast time that morning and this marked the end of all real suffering for want of food at Fort Mason.[32]

In addition to Walker's command at Fort Mason, three other engineer officers were

stationed in San Francisco at the time of the earthquake: Harts of the California Debris Commission, Col. William Heuer of the San Francisco engineer office, and Col. Charles McKinstry, chief engineer of the Army's Pacific Division. All worked in various capacities to help the stricken city. McKinstry inspected structural damages to buildings; Harts handled relief supply for the quartermasters; and Heuer dynamited buildings to create firebreaks.[33]

At noon on 19 April the advancing fires made it necessary to blow away all buildings on the east side of Van Ness Street between Golden Gate Avenue and the Pacific Ocean, a distance of a mile, and all available explosives were rushed to the action. The Navy brought a ton and a half of explosive gun cotton from Mare Island, and Heuer commandeered three hundred pounds of dynamite from the San Francisco engineer office. Even field artillery was employed, firing high explosive shells pointblank into the buildings. Determined to create a firebreak no matter the costs, the military destroyed about $1 million worth of buildings.[34]

Company D of the 20th U.S. Regulars takes a meal break in one of the burned districts of San Francisco. Library of Congress, LC-USZ62-58756

The engineer troops in the meantime fought to save Fort Mason from destruction. Walker saw a fire roaring toward the fort at dawn on 20 April. He turned out a dynamiting detail to prepare for action while the remaining troops tore down the fences and outhouses between the fort and the advancing flames. Soldiers formed bucket brigades to douse the sparks flying onto the buildings.[35]

Walker asked the Navy and the Quartermaster Corps to send their fire tugs *Fortune* and *General Mifflin* to the Fort Mason dock. Scavenging fifteen hundred feet of city fire hose found heaped on Van Ness Street, the engineers ran the hose from the fire tugs to Fort Mason and up the hill to a fire engine left in the street by exhausted firemen. The troops, some of whom had once worked in fire departments, put the engine back in service. The fire tugs at the dock pumped water directly from the bay through the hose to the fire engine, where the engineers sprayed water to depress the fire along Van Ness Street to prevent it jumping across the firebreak gap. They contained the flames at Van Ness and finally checked its spread on 21 April, perhaps saving the western section of the city from destruction.[36]

In his post-disaster report to the Army's Pacific Division commander, Harts estimated the earthquake and fire had destroyed thirty-four

hundred acres and more than $300 million worth of property and caused about five hundred fatalities. Subsequent official Red Cross figures listed 498 fatalities, 415 major injuries, 28,188 homes destroyed, and three hundred thousand people left homeless.[37]

Recovery Work at San Francisco

Offers of assistance poured into San Francisco. At the White House, President Theodore Roosevelt moved to expedite matters even though he was mindful of the political and legal implications: "I do not intend that any red tape shall interfere with at once succoring the San Francisco people in their dire need," he addressed Mabel Boardman of the Red Cross, "but we have to remember that when once the emergency is over there will be plenty of fools and plenty of knaves to make accusations against us, and plenty of good people who will believe them."[38]

The president offered California Governor George Pardee the federal government's full support and called for charitable contributions to be sent to the Red Cross at San Francisco. His impulsive announcement that the Red Cross would handle private relief donations caused consternation at San Francisco, where a local relief coordinating committee had formed to manage the funds. Roosevelt then issued a second public notice asking that private relief funds go to the San Francisco committee instead of the Red Cross.[39]

Congress enacted a joint resolution authorizing the secretary of war to issue up to $1 million worth of quartermaster supplies at San Francisco and directing the secretaries of treasury, navy, commerce, and labor to cooperate fully with recovery efforts. By the time Congress acted, the Army had $1.5 million worth of rations, tents, bedding, and medical supplies in or on the way to San Francisco. The secretary of war asked for an additional $1.5 million in disaster assistance funding, and Congress approved his request.

Senator Francis Newlands introduced a bill on 2 May to loan up to $150 million to San Francisco for its reconstruction and rehabilitation. His bill failed, however, after the Senate Committee on Finance reported it was beyond "the legitimate province of Congressional action."[40]

Maj. Gen. Adolphus Greely, famed Arctic explorer and former chief signal officer of the Army, commanded the Pacific Division in 1906 and was en route to Washington at the time of the earthquake. He arrived back at San Francisco on 21 April and, at the request of the mayor and governor, took charge of relief and recovery efforts. Greely told Secretary of War Taft that the situation demanded unified control and the secretary agreed to let him manage it without interference. Taft warned Greely that he "must not be blind to proper limitations upon our actions."[41]

"…there will be plenty of fools and plenty of knaves to make accusations against us, and plenty of good people who will believe them."

Greely opened his disaster headquarters at Fort Mason, where the 1st Engineer Battalion

Army-issued tents provided shelter for tens of thousands of refugees following the San Francisco quake and fire in 1906.

Courtesy of The Museum of the City of San Francisco

was caring for twenty thousand refugees. The engineers had doubled the kitchen force to operate a continuous mess. They had converted their barracks to hospitals, established orderly tent camps, and hauled in potable water aboard Navy ammunition barges. They dug latrines and impressed able-bodied refugees to clean the camps of garbage and litter.

Many civilians volunteered to help the troops care for the refugees, but some of their assistance apparently was misdirected. "I was very much hindered by some persons who wore red crosses," lamented Bain, "and who demanded all kinds of assistance and favors themselves, and who were working apparently alone and without organization of any kind. Others of the Red Cross … did great work and much to alleviate the sufferings of the victims of the conflagration."[42]

During recovery operations, Greely thought it might be necessary for the Army to restore the city's public utilities and transportation, and he assigned Heuer, Harts, and McKinstry to plan the restoration. These engineer officers, after investigation, reported that utility and transportation companies were handling the crisis promptly so they furnished only technical advice to local officials. Their discretion proved fortunate because the mayor and his associates were later indicted for accepting a bribe from a transportation company during the emergency.[43]

One lesson the Army and the Corps of Engineers learned during the disaster was the value of motor vehicle transport during emergencies. Two hundred private automobiles in the city were impressed into public service and used by Army and local officials for damage surveys and recovery coordination. The officials found they could cover much more ground in automobiles than by horse. According to the *San Francisco Chronicle*, "the automobile played an all but indispensable part in saving the western part of San Francisco, and at the same time has proved invaluable in the serious business of governing the city through its greatest stress."[44]

Greely ordered Harts, Walker, Emerson, and an engineer detachment to cooperate with city authorities demolishing weakened and unsafe buildings. The city engineer asked them to dynamite twelve buildings, but Harts objected in two cases. One building was located only a hundred feet from the central gas and electric plant, and Harts did not want to chance further damage to utility services. The second was the cupola of the Hall of Justice, which, after careful inspection, Harts concluded was structurally sound.

The demolition began, however, on ten other buildings. At one site, the McCormick Hotel at Turk and Market Streets, Sergeant Robbins of the 1st Engineer Battalion was setting a charge in the basement when the entire building, eight stories tall, collapsed. By chance, several girders arched over him, sheltering him against the falling bricks and masonry. The troops ran to him, dug him from the debris, and rushed him to the hospital, where he was pronounced uninjured. "His escape was marvelous," said Harts, "and his courage during his rescue was admirable." After Robbins' narrow escape, Harts assembled his troops and told them that thereafter the work would be entirely voluntary. The entire detachment volunteered, and the remaining buildings went down without incident.[45]

In his after-action report, Harts was highly critical of the demolition methods used by local authorities during efforts to create firebreaks. Lacking sufficient dynamite, the local authorities had substituted black blasting powder, which merely started new fires. They had also blown buildings that were already aflame, thus scattering fire brands. The lack of central control had hampered the demolition and, Harts believed, had resulted in the loss of several city blocks that might have been saved. "Had the

"His escape was marvelous and his courage during his rescue was admirable."

The Pacific Engineer Division staff designed pre-fabricated buildings to house San Francisco's homeless. The Red Cross had many of them built in Lobos Square. California Historical Society

The damage to the city was extensive. Many buildings in the area north of Bush Street and east of Grant Avenue were completely destroyed.

U.S. Army photograph

dynamiting work been placed in the hands of the Engineer troops at the first," he boasted, "these soldiers, who are drilled in just this kind of work, could have easily held the fire much farther back, even without water."[46]

Greely placed forty-five Army officers in charge of relief supply distribution under the command of Col. Lea Febiger. Febiger divided San Francisco into seven administrative sectors, each supervised by a senior officer assisted by several junior officers. Harts took charge of the fourth sector, where he found private charities issuing relief supplies without system or coordination, creating a situation ripe for abuse by rogues moving from one source of supplies to another. Harts consolidated the relief effort, reducing the distribution stations from forty to twenty-eight. He established an identification card system for ration recipients and ledger accounting for issues to families, thus putting a stop to "repeating."[47]

Harts also learned that supplies were being "lost" while delivery wagons transported them from depots to the dispensing stations. He reduced these losses by instituting a strict accounting system for teamsters and by sending a soldier to guard each wagon during the trips. During the first week of recovery, the Army supervised the daily issue of 245,379 rations. Through tight controls and as a result of revived business activities, the daily ration issues were gradually

reduced, declining to 44,289 by 31 May, and on 1 July Greely closed the food relief mission.[48]

Greely also assigned the engineers a role in providing temporary housing. One camp site chosen by the engineers in Lobos Park at Buchanan and Bay streets was assigned to Kelly and Emerson. The two designed the camp with 850 wall tents, four shower bathhouses, four large mess buildings, an administration and storage building, and the necessary number of privies. The officers obtained the construction materials and directed the two-hundred-man force that built it. With water piped in from an artesian well, the camp was ready for occupancy by 1 May.[49]

In the area east of Kearney Street, the Mills Building (at left) remained standing amid the rubble. U.S. Army photograph

Harts and the Pacific Engineer Division staff prepared three designs for prefabricated wooden buildings: an eight-family tenement that could be assembled by four carpenters in eight days at a cost of $681.16; a two-room, single-family cottage that four carpenters could build in a day for $93.96; and a small four-room house that cost $138.86.[50] Harts recommended use of the single-family unit because he thought the comfort and privacy afforded by the design would outweigh cost considerations. On construction procedures, he suggested "the cheapest method of constructing these houses would be to prepare plans and specifications and let the entire work by contract to lowest bidder, after soliciting proposals." The Red Cross accepted his plans and contracted for the construction of sixty-two hundred single-family cottages capable of housing twenty thousand refugees. The occupants eventually were allowed to move the cottages from the camp sites to private property for permanent use.[51]

Ernest Bicknell of the Red Cross coined the term *rehabilitation* during the San Francisco recovery efforts. To him the term meant that in addition to furnishing housing, the Red Cross issued tools to craftsmen, sewing machines to seamstresses, and new stock inventories to merchants to help them again become self-supporting. The organization also made small cash loans to the earthquake victims, but after quickly learning that the funds were seldom repaid, it discontinued the practice.[52]

The activities of the engineers at San Francisco in 1906 had many similarities to late twentieth-century disaster relief missions. As the troops first on the scene, the engineers performed street security patrol and helped with the firefighting. They furnished emergency relief directly, supplying refugees with water, food, shelter, and sanitary facilities. After the emergency phase ended, engineer forces assisted local authorities and other agencies with the restoration of utility and transportation services, demolition of unsafe structures, and design and construction of temporary housing.[53]

Greely proudly declared the Army's emergency relief efforts at San Francisco clearly demonstrated the value of trained and organized forces during natural disasters. Independent observers confirmed his statement, and the editors of *Harper's Weekly* commented: "The business of the Army is to meet emergencies, and in such a case as that of San Francisco its training and its system are invaluable."[54]

Operational Challenges, 1907

The use of Corps expertise during natural disasters was not confined to the large-scale operations like the San Francisco crisis that are normally considered as disaster assistance. Corps personnel who were engaged in civil works operations often had to take emergency measures. For example, consider the threatened failure of a Corps navigation dam on the Allegheny River in 1907 and rescues performed at sea by Corps channel dredges based in Savannah.

Weary, worried, and rain soaked, Maj. William Sibert and his senior civil engineers returned to their office in January 1907 to discuss the troubles they faced at Allegheny River Dam 3. Early that afternoon they had received an urgent call from the lockmaster at Lock 3, warning that a flood was undermining the dam's abutment.[55]

In 1907 the Corps of Engineers broke open Dam 3 on the Allegheny River to prevent bank erosion and property damage. The remnants of the dam are in the foreground.
Library and Archives Division, Sen. John Heinz History Center

By the time Sibert and his assistants reached the dam, its abutment was washed away and the concrete bank protection was rapidly crumbling into the breach. Although the dam itself had withstood the flood currents, the river was pouring through the abutment and around the dam, cutting an ever-growing new channel. By late afternoon buildings were dropping into the flood and the erosion threatened to destroy a factory and the main line of the Pennsylvania Railroad.[56]

Sibert and his staff discussed the challenge through the evening. If the dam held in place, and it seemed it would, the river would continue eating its way into the bank, finally severing the railroad and consuming a million-dollar factory. Sibert made his decision late that evening: The dam would have to go. He dashed off a telegram explaining the situation to the chief of engineers and issued orders to blast the dam out of the river the next morning.

At dawn, Corps personnel rowed a skiff loaded with dynamite onto the flood above the dam, floated downstream, and dropped anchors. From this mooring, the crew unreeled rope to slowly slip their skiff down to the edge of the dam, where they placed and detonated five-hundred-pound dynamite charges to blow off the dam's crest. They continued the blasting until a central 560-foot section of the dam was destroyed, opening a gap to return the river to its channel.[57]

"Now," Sibert told the chief of engineers, "we have a fighting chance to save the Heidenkamp plant. We are placing stone on the bank as fast as we can unload it."[58] After 23,479 tons of stone had been dumped from railcars onto the riverbank, the erosion stopped. Allegheny River Dam 3 was severely damaged, but its blasting saved the railroad and factory. The *New York Sun* subsequently published a biting critique of the slow construction progress it perceived

"No charge of dilatoriness can be brought against the officer who a few weeks ago saved a million dollars worth of property by … blowing up $80,000 worth of dam."

on many waterways projects, but, the editors commented, "no charge of dilatoriness can be brought against the officer who a few weeks ago saved a million dollars worth of property by assuming the responsibility of blowing up $80,000 worth of dam."[59]

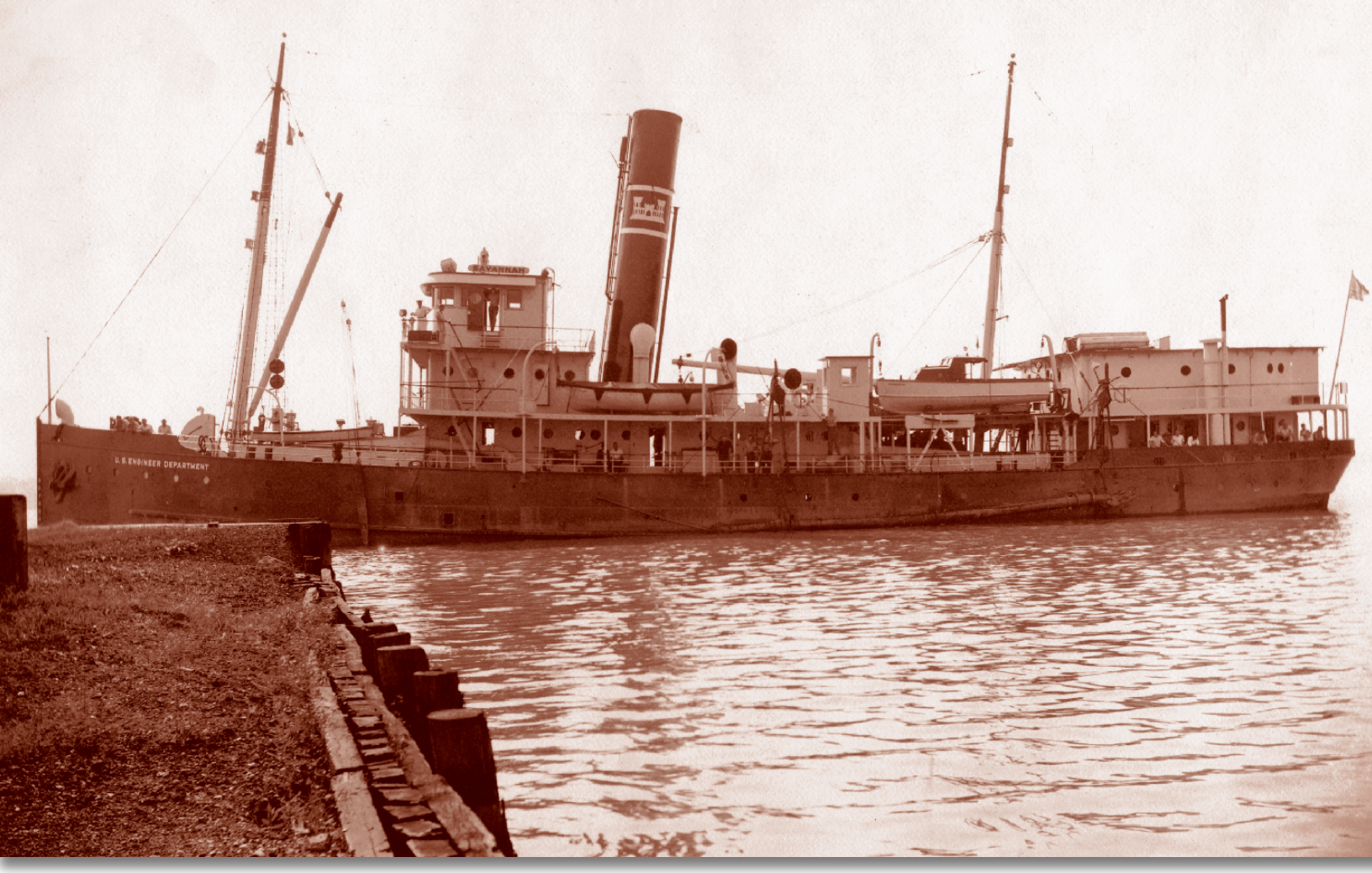
The chief of engineers praised Sibert's quick work at Dam 3 and commended his "ability and judgment of a high order." Sibert may have been the only Corps officer ever so honored for destroying a government dam, yet he was first to admit that the real heroes of the incident were the men who had rowed the skiff-load of dynamite out on the flooded river to set the charges.[60]

Spectators watched as floodwaters rose on Sixth Street in Pittsburgh during the flood of 1907. Carnegie Library of Pittsburgh

Six months later an operational emergency prompted quick response from personnel at the Savannah office. On the evening of 17 July the steamship *Alleghany*, loaded with rosin, turpentine, and lumber, caught fire near the mouth of the Savannah River. Hearing the ship's distress signal, Captains Nimrod Long and George Thomas of the sea-going dredges *Cumberland* and *Savannah* responded immediately. They closed on the burning ship, lowered life boats, and rescued the passengers and crew. Thomas of the *Cumberland* later reported:

> We ran up as close as safe and sent out all our boats to look for people. The *Alleghany* at this time was blazing very badly amidships. While our boats were away they picked up 2 boats from the burning ship with 5 people, including the Mate. Our No. 1 boat, 2nd Mate Thompson in Charge, took off the last 10 people from the bow of the *Alleghany* including the captain and chief engineer.[61]

The *Cumberland* and *Savannah* picked sixty-two people off the burning ship and out of the water and no lives were lost. The dredges were back at work the following morning, and the engineer commander reported to the chief of engineers that the rescue was accomplished at very little cost in the name of humanity. "I am sorry to say," he concluded, "that no recognition of this



In 1907 the Corps dredge *Savannah* rescued passengers and crew from the steamship *Alleghany,* which had caught fire at the mouth of the Savannah River.

Office of History

service has been made by the master, the owners, the underwriters, or the passengers."[62]

"The Chief of Engineers is much gratified by the courage and devotion shown by these employees, and desires this fact to be communicated to them," replied Brig. Gen. Alexander Mackenzie. "That no recognition of this service was made by the master, owners, underwriters, or passengers is greatly to be regretted, but such recognition is not necessary to complete the consciousness of having well performed a very dangerous duty."[63]

There were limits, nonetheless, to the scope of the Corps of Engineers' emergency response capabilities. After a Platte River flood in March 1910 took out a bridge at Columbus, Nebraska, Congressman James Latta asked the chief of engineers to send a two-thousand-foot ponton bridge for service until a new bridge could be built. The chief of engineers explained there was not two thousand feet of ponton bridging in the entire Army. Even if there was, assembling and building the bridge would cost no less than $6,000 and its construction would deprive engineer troops of pontons they needed for training maneuvers. "Moreover," the chief added, "the use or loan of public property for private purposes, excepting in emergencies involving danger of loss of life or property, is prohibited, excepting as authorized by Congress."[64]

Observations

From its nineteenth-century focus on rescue and relief during river floods, the Corps expanded its disaster assistance mission during the early twentieth century in response to a wide variety of disasters: hurricanes, earthquakes, fires, and combinations thereof. At the calamitous Galveston hurricane of 1900, the Corps' response to the emergency was limited, largely because the storm blew away or flooded all of its property in the vicinity, leaving nothing useful in service for rescue work. Relief and recovery efforts were managed well by Galveston's local government, largely with privately-contributed funding rather than federal assistance.

Ranking with the 1889 Johnstown flood as one of the most memorable natural disasters in American history, the San Francisco earthquake of 1906 involved Corps officers and personnel in every phase of crisis management. Engineer troops patrolled the streets, fought the fires, demolished buildings, and succored needy refugees. Engineer officers consulted on the post-disaster recovery efforts that eventually restored the city to a modicum of normalcy.

Installing temporary bridges at Kansas City, fighting fires in Baltimore—the requests to the Corps of Engineers for emergency assistance came from all sectors of the nation during the twentieth century. In its own civil works mission the Corps often faced operational challenges that tested its expertise and grit. The disaster response missions of the twentieth century certainly called for far more than delivering quartermaster rations to southerners flooded out by the Mississippi River.

Chapter 4 Notes

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63. Alexander Mackenzie to Dan Kingman, 30 July 1907, NARA, RG 77, Entry 103, File 64436.
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Above: Flood refugees gathered at a Baptist church in New Madrid, Missouri, 1912. Library of Congress, LC-USZ62-109378

Right: Floods reached high water at Rochester, New York, on 28 March 1913. National Archives, 77-FC-1-1

Below: The railway station at Cary, Mississippi, barely escaped the devastating 1913 flood.
National Archives, 27-G-1A-2-2

The Flood Fights of 1912 and 1913

5

Memories of the great floods of 1912 and 1913 in the Mississippi valley have long ago faded, supplanted by those of the more catastrophic floods of 1927 and 1937. Yet these earlier disasters rank among the most destructive in American history, striking the South in 1912 and the North in 1913. The Mississippi River climbed to record stages in early 1912, devastating the delta plantations, and in 1913 terrific floods north of the Ohio River wrecked Dayton and Hamilton, Ohio, then traveled downriver to surpass the records set the year before, again inundating portions of the delta.

During these floods, the Corps of Engineers applied the lessons it had learned in earlier disasters—conducting advance planning and coordinating campaigns with local officials to save the levees instead of merely reacting to the calamities. Moreover, out of these floods emerged the impetus for developing federal policies aimed at reducing flooding disasters and damages in the Mississippi valley and throughout the United States. These largely forgotten catastrophes therefore merit close attention.

Lower Mississippi River Flood, 1912

In early 1912 a combination of high water from the Ohio, Cumberland, Wabash, Tennessee, and upper Mississippi rivers, with contributions from the St. Francis and White rivers, brought the lower Mississippi to flood stage at Memphis

Refugees bided time on a barge during the Mississippi River flood in Louisiana, 1912. Library of Congress, LC-B2-2398-14

A flooded store was "still doing business" in Hickman, Kentucky, 1912.
Library of Congress, LC-USZ62-110682

on 24 March. The river remained at flood stage sixty days, cresting on 6 April, subsiding, and then rising to a second crest in May. All previous flood crest records were broken along the entire Mississippi below Cairo except at Vicksburg, where the 1897 record stood because levees there failed before the 1912 crest arrived, sending high water into the back country. The flood drowned about fifty people, but the exact number may never be known.[1]

Col. Henry Jervey, commanding the Corps office at Cincinnati, directed the 1912 flood fight along the lower Ohio River. He sent his senior assistants Robert R. Jones and Clinton Harris to threatened levees in Illinois at Shawneetown, Mound City, and Cairo to help those communities fight the flood. At Shawneetown, where the levee had broken with disastrous results in 1898, the people were prepared and held the levees there with ease, but Harris encountered major challenges at Mound City and Cairo near the Ohio's confluence with the Mississippi.

The 1912 flood caught the town of Mound City without reserve cash and without means of borrowing funds to conduct a flood fight. Harris therefore used federal levee project funds to purchase materials and, with volunteer local labor, raised Mound City's levees. He capped them

with a wooden bulkhead known as a *mudbox*—two rows of planks nailed to stakes driven into the levee with earth tamped between the rows and protected by a sandbag revetment to prevent wave erosion. The Ohio rose a foot over the top of the levee, stood against the mudbox capping, but did not break through to inundate the town. Levees protecting the bottomlands behind Cairo and Mound City broke at several places, however, leaving the two towns isolated by the floodwaters.[2]

The flood arrived at Cairo at a time when the Mississippi River Commission's districts at Memphis, Vicksburg, and New Orleans were strapped for funding. They had already exhausted their annual appropriation for the fiscal year, and the commission therefore requested an emergency allotment of $250,000. To ensure that fully adequate funding was available, Secretary of War Henry Stimson asked for $350,000, and Congress provided this amount on 3 April. This appropriation limited the expenditures to the Mississippi River and did not fund flood fights on its tributaries. Congressmen from Illinois and Kentucky soon brought this oversight to Congress's attention, and it amended the act to remedy this omission.[3]

Maj. Clarke Smith at Memphis managed the flood fight on 443 miles of the Mississippi between Cape Girardeau, Missouri, and the White River's mouth near Rosedale, Mississippi. At the upper end of his district, he worked with local levee districts to raise the levees before the flood's arrival, but this effort was to little avail because the river crested there as much as four feet above the levee crowns. Farther south, the district employed 350 men and supplied fifty thousand sacks to help the Reelfoot levee managers hold their area. Nevertheless, floodwater was standing about a foot up the sandbags atop the Reelfoot levee crown when on 5 April a windstorm drove waves over the bags, washing them out and destroying a mile of levee. Likewise, levees in the lower St. Francis area were sandbagged and held until the river climbed five feet above all previous records; three crevasses at St. Claire, Wyanoke, and Golden Lake, Arkansas, then inundated the countryside. Other levees along the Arkansas bank of the Mississippi held out the flood until 6 April when a crevasse occurred at Modoc, followed by others at Laconia Circle and Ferguson Landing.[4]

In the levee district of the upper Yazoo, east of the Mississippi River from the Tennessee line to Bolivar County, Mississippi, advance planning proved successful. By 1912 its system had been built to sufficient grade that even a flood cresting 2.4 feet above all records did not overwhelm the levees. At the crest stage, the Yazoo levees still had several feet of freeboard (the

A levee broke near Modoc, Arkansas, in April 1912.

Mississippi Department of Archives and History

vertical distance between the water surface and the levee crown) and held without a break.

Smith estimated flood damages in the city of Memphis alone at $3 million. Backwater from Bayou Gayoso, Cypress Creek, and Nonconnah Creek had crept into Memphis's suburban and industrial areas and climbed into the first stories of many buildings. The flood also entered the city's water supply and gas plants, putting them out of operation.[5]

A highly organized flood fight began in the Vicksburg Engineer District on 6 April. Maj. J. A. Woodruff, its commander, and his senior engineer, Arthur Hider, had made plans well in advance of the crest. They stationed engineers on both sides of the river, one in charge of levees in Mississippi and the other managing flood fights in Arkansas and Louisiana. They dispatched the district's six towboats up and down the river to deliver barge loads of construction materials and quarterboats for housing labor at strategic intervals along the levee system.[6]

The MRC district at Vicksburg raised and revetted (covered with stone or other materials) all levees along the Mississippi's main stem and along the lower Red River within the district's boundaries. The area's most desperate flood fights occurred at Lake Beulah levee on the Mississippi, where state authorities sent eight hundred convicts to help place the sandbags. Lake Beulah levee was piled with sandbags twenty feet high when it suddenly caved in on 17 April, and water roaring through the crevasse caught and drowned six convicts. Other breaks followed at Lake Jefferson, Panther Forest, and Salem levees.

Capt. Clarence O. Sherrill of the MRC district at New Orleans assigned each local levee board the responsibility for holding specific levee sections while he and Army engineers took direct charge over the remaining sections. As in the Vicksburg District, quarterboats for labor and barges loaded with tools, lumber, nails, and bags were stationed at strategic locations. To monitor the crisis, Sherrill instituted continuous levee inspections. He declared the inspections absolutely essential to prevent crevasses. "Frequently small depressions in the levees, such as worn ramps, cattle trails, etc., will be allowed to go unreported by the people of the locality," he explained, "until the water begins to go over the levee and a crevasse results before anything can be done."[7]

Three crevasses occurred in Sherrill's district during 1912, with the major break on 14 May at Hymelia levee thirty-five miles upstream of New Orleans. The Corps and MRC had never before attempted to close a crevasse, leaving that job to local levee districts, but Sherrill received a warning that a second crest was on the way and decided to try closing the Hymelia crevasse before the next rise. He recruited a twelve-hundred-man workforce who began driving timbers in a double row of piling that arched around the crevasse from each side of the break, dropping sandbags between the rows of piling to block the river's flow through the crevasse. Some $60,000 had been expended on this temporary dam when the rising river took out another levee section on 25 May, eroding it well past the end of the temporary dam. Emergency repairs stopped, and not until the flood receded in July was it possible to plug the crevasse.[8]

Although the Corps spent over $450,000 on emergency preparations and response efforts in 1912, the record crest made most of its efforts futile. The flood broke the levees at sixteen

places, destroyed an aggregate of 70,822 feet of levee, and overflowed 10,812 square miles of delta lands. Exclusive of direct damages to the levee system, the Corps estimated property damages resulting from the flood at $43 million.[9]

Rescue and Relief in the 1912 Flood

On 4 April 1912 Congressmen Ollie James of Kentucky and Joseph Russell of Missouri asked the House Appropriations Committee to report out a resolution for emergency flood relief. When the committee refused, they promptly went to the White House to discuss it with President William H. Taft. Of this meeting, Russell later recalled:

> We went to see the President and showed to him some of the messages received and made our statements, and in his own words he said, "Boys, I will try to help you out." I shall never forget his assuring words, nor cease to thank him for giving expression to them. He at once sent for the Quartermaster General, and in our presence said to him, "General, get busy. Send the necessary men into the flooded districts; send tents, blankets, and provisions necessary to relieve the suffering people, and I will trust Congress to protect me in the expenses necessarily incurred."[10]

The continued lack of a clearly defined federal policy and standard channels for disaster assistance appropriations often resulted in confusion and delay. Congressmen wanting disaster assistance for their constituents first tried the House and Senate committees, then the executive branch, until they found someone or some agency willing to take action. If a president took the initiative in disaster situations, he hoped for subsequent approval from Congress. In all cases of record, Congress did approve the president's emergency action, thus precluding a potentially embarrassing legal situation and jurisdictional dispute.

On receiving his orders directly from President Taft in 1912, Quartermaster General James B. Aleshire sent Maj. James Normoyle to Hickman, Kentucky, to organize flood relief efforts. He also contacted Brig. Gen. William H. Bixby, Chief of Engineers, to advise that the president had approved use of the Corps' fleet for emergency supply delivery. Bixby then sent the message to the Mississippi River Commission and its districts, where the fleet was already engaging in rescue work—the steamboat *W. R. King* had saved 40 people near Cairo and the snagboat *John N. Macomb* had picked 525 people off rooftops near Memphis.[11]

"Found his children perched on roof of cow pen, where he had cattle scaffolded. His house completely under water."

Logs of the 1912 disaster reaction have survived, and the journal of clerk W. J. Allen aboard the Corps steamboat *Nokomis* reveals the typical routine and humanitarian features of the rescue and relief mission. Towing a quarterboat for sheltering refugees and three barges loaded with rations, tents, and livestock forage, the *Nokomis,* commanded by Capt. Walter Irwin, left St. Louis on 8 April and two days later was on patrol near the Missouri bootheel.[12]

After stopping to check conditions and leave supplies both at Caruthersville, Missouri, and on the river's opposite side, the *Nokomis* stopped at Barr's Point and met the plantation owner. The boat's clerk described the crisis at the plantation:

> Found his children perched on roof of cow pen, where he had cattle scaffolded. His house completely under water. He and his four children came aboard. The people reported that there were 150 head of stock at this point. Some are in danger, others are O.K. unless storm should arise. They are all anxious to get stock out, but majority would not go without stock; the women and children refused to go without the father or brother. Succeeded in getting 27 people to leave; majority women and children …. These people state there are about 20 families left there who refused to leave without stock, and they are in a very serious position. About 17 houses have already gone away. Post office entirely wiped out; nothing saved.

After similar rescue stops at Carrs Landing, Gold Dust Landing, and Osceola, Arkansas, the *Nokomis* reached the Wilson plantation,

The engineer snagboat *J. N. Macomb* (shown ca. 1907) rescued over five hundred people from Memphis rooftops in 1912.
Office of History

where the boat's clerk graphically described the conditions:

> The water is rising and the current is very swift. Capt. Irwin, in charge of ship, states it is running about 10 miles and is strongest he was ever in. Reports of large numbers of hogs and chickens drowned in wake of flood. A number of people reported left on the 10th instant. About 150 negroes located in gin mill made of concrete and galvanized iron, which is considered safe. Fifty negroes are also safe in another mill. Mr. Wilson states he is feeding the destitute. Ship's captain and Capt. Kinney took out of huts about 25 negroes who were in danger of being swept away with the current and placed on board ship.[13]

On that day the *Nokomis* rescued ninety-two people and took them to Memphis safely. It continued on south to New Orleans, rescuing another five hundred people while on the way. Following it downriver were the Corps snagboat *J. H. Simpson* and the *W. R. King,* rescuing the people missed by the *Nokomis* and providing them with rations and shelter.

During its downstream voyage, the *Nokomis* passed the *Minnetonka* heading upstream with the Quartermaster Corps' commander Normoyle and Red Cross director Ernest Bicknell aboard. Normoyle and Bicknell established refugee camps at points such as New Madrid, Missouri, and Hickman, Kentucky, leaving quartermaster officers at each camp to manage relief ration issues.[14]

Because his quartermaster officers were all assigned to stations north of Memphis, Normoyle gave the relief mission on the lower Mississippi to engineer officers. The Vicksburg District commander used all available Corps boats for the rescue and relief efforts and even the discharge-pipe pontons of the cutterhead dredge *Gamma*. On the Black and Tensas rivers, the snagboats *Humphreys* and *Ransdell* conducted the rescue and relief operations. At the New Orleans District, Sherrill committed the entire district fleet to humanitarian service. The steamboat *John Newton* alone saved 470 people and 1,590 head of livestock.[15]

"About 17 houses have already gone away. Post office entirely wiped out; nothing saved."

After picking up the stranded people, the boats delivered them to tent camps on high ground. There the Corps fed them rations furnished by the Quartermaster Corps while the American Red Cross provided medical services and regulated the camps with National Guard assistance. The operation became immense: camps opened at Hickman, Kentucky; Tiptonville, Dyersburg, and Memphis, Tennessee; Vicksburg, Mississippi; Helena, Arkansas; and Baton Rouge, Louisiana, sheltering forty thousand refugees, some of them well into the following summer.[16]

Normoyle then followed the flood crest downriver from Hickman to New Orleans, not closing the Quartermaster relief effort until 22 June after expending more than $500,000. In his post-disaster report, he paid tribute to the assistance he received from the Engineer Corps, to which "we are deeply indebted for hearty cooperation and assistance, which was especially valuable in the early stage of relief work in the several

The steamboat *Lucile* rescued people during the 1912 flood.

Library of Congress, LC-B2-2412-5

districts, enabling us to get speedy and satisfactory action when conditions were most acute."[17]

Some engineer officers, nevertheless, had reservations about the free ration distribution as administered by quartermaster personnel. The engineer officers had difficulty securing enough workers for the levee flood fights, and they attributed this labor shortage to the ration distributions. Mississippi's governor had been forced to send state convicts to help shore up the levees, and Edward H. "Boss" Crump, Memphis's mayor, had conscripted two hundred loiterers in the city and shipped them off to the levees.[18]

Many rumors about the abuse of the free ration issues also circulated. Col. Lansing Beach of the Corps of Engineers, stationed at Jackson Barracks near New Orleans during the flood, heard the rumors and launched his own private investigation. He traveled through the flood area wearing civilian clothing and discussed the flood and relief efforts with people he met. His inquiries convinced him that not more than 15 percent of the rations issued by the Quartermaster Corps actually went to needy flood victims. It seemed the quartermaster officers, all sent to the mission from outside the delta, relied on local citizens' committees to distribute rations to bona fide flood refugees. Yet, nearly all tenant farmers were needy, though not necessarily as a result of flooding, and some of the Army rations had gone to plantation owners who charged the rations against the sharecroppers' annual deficits at the plantation stores. Beach heard of one planter who distributed enough "free" rations to fill the debit accounts of his tenants for two years, thereby making two cotton crops at government expense. He learned

in another case of a planter who fed the rations to his hogs.[19]

Beach continued his private inquiries during the flood of 1913, which brought him a second opportunity to observe the free rations program in action. Because his study was unauthorized, Beach did not at that time report his findings to the chief of engineers or the adjutant general.

Dayton Flood, 1913

Col. Lansing Beach observed two storms crossing the northern Ohio River valley in the third week of March 1913; they dropped as much as eleven inches of rain and caused raging floods in the Wabash, Scioto, Muskingum, and Miami rivers. Heavy runoff and high-velocity currents took 415 lives and damaged property worth $200 million. Because the havoc was greatest at Dayton, Ohio, in the Miami River basin, the public later remembered it as the Dayton flood.[20]

Secretary of War Lindley Garrison directed Brig. Gen. William Bixby, Chief of Engineers, to mobilize his civil works districts in the damaged area of Ohio for relief efforts in cooperation with the Quartermaster Corps. Although Bixby directed his district commanders to work closely with Maj. James Normoyle and other quartermaster officers, cooperation proved extremely difficult because the flood had disrupted communications and the quartermaster officers were constantly on the move.[21]

At the Pittsburgh Engineer District, most of which lay east of the disaster area, Col. Francis Shunk loaded the Corps towboat *Thomas P. Roberts* and the chartered steamer *Admiral Dewey* with relief supplies contributed by private charities and dispatched them down the Ohio River to Marietta, Ohio, to supply the Muskingum valley. Fallen bridges blocked Muskingum River navigation, however, and the relief materials destined upstream to Zanesville were forwarded on by rail.[22]

T. G. Ridge, in charge of the Wheeling District's fleet moored at Marietta, lost his boats when a wooden bridge floated out of the Muskingum and rammed them, sending them spinning down the Ohio. When he managed to recover the fleet, he used it to move people marooned in the upper stories of Marietta buildings to high ground. "The conditions here in Marietta are beyond description," Ridge reported. "Nearly everyone in the flooded district has lost all their household goods and a great many of them all their clothes except what they wore."[23]

"The conditions here … are beyond description. Nearly everyone in the flooded district has lost all their household goods and a great many of them all their clothes except what they wore."

Col. Frederick Alstaettler at Wheeling assigned his military assistants, Captains William Mitchell and John Hodges, to recovery operations. After trying unsuccessfully to contact Normoyle, the officers initiated the emergency response on their own. They beckoned the Corps towboat *James Rumsey* and launch *Nanina* from the Corps sub-office at Charleston, West

Virginia, to descend the Kanawha River to the Ohio River for rescue missions, even though the *Rumsey*'s smokestacks had to be cut off to get under the bridges across the flooded river. These workboats went to Parkersburg, West Virginia, and Marietta for rescue service, while Hodges took the launch *Burke* farther downriver for urgent work at Huntington, West Virginia.[24]

Normoyle and Ernest Bicknell of the Red Cross established their central office for disaster assistance in Ohio's capitol building at Columbus, where they could work closely with state officials. To improve communications with the Corps districts, Normoyle sent Maj. James Logan to Louisville, Kentucky, to open an emergency coordinating office at the engineer district office. Normoyle also selected several Army officers as his deputies and sent them to Marietta, Parkersburg, and Huntington to work directly with Corps of Engineers personnel.

To conduct the relief mission along the Ohio River efficiently, the quartermaster and engineer officers created floating bases, each composed of Corps towboats and barges supported by a small-craft flotilla. The first two floating bases formed up at Marietta and Parkersburg and included the towboats *Loma, Guyandot, Miami, James Rumsey*, and *General Craighill* together with the necessary barges and small craft. Quartermaster officers requisitioned or purchased rations, tents, blankets, and other vital items and loaded them aboard the floating bases at Parkersburg and Marietta for delivery along the Ohio River.

Farther south, Hodges helped local authorities restore power and telephone services at Huntington, then went to Catlettsburg, Kentucky, where he found extremely hazardous conditions. At the mayor's request, Hodges and the Corps took charge—directing debris cleanup, organizing rations distribution, and supervising sanitary work to prevent the spread of disease.

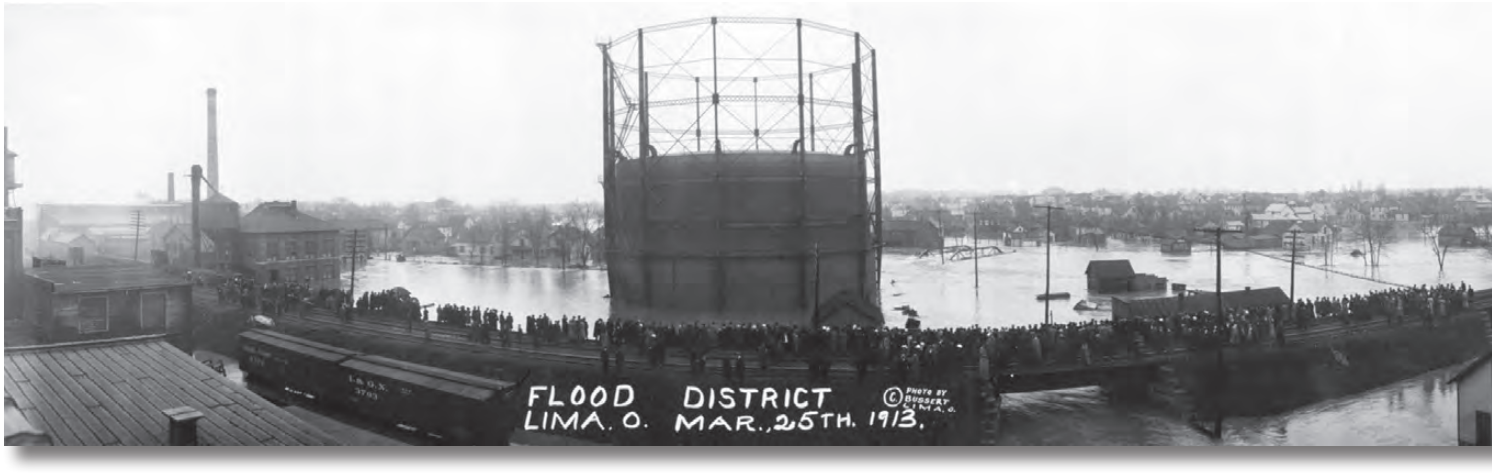
Surplus commodities sent to the river by the Navy included canned meats and rations of higher quality than the typical Army quartermaster supplies, and the Corps gave these Navy shipments special treatment. The Corps loaded the rations aboard the towboat *Guyandot* and barges at Parkersburg to form a "naval" floating base with Navy Paymaster L. N. Wertenbaker in charge. The naval base left Parkersburg

The flood destroyed much of Middle Hickory Street in Chillicothe, Ohio, 1913.
Library of Congress, PAN US GEOG - Ohio no. 33

Horse carcasses dotted the streets of Dayton, Ohio, after the 1913 flood.
Library of Congress, LC-H261-2581

on 4 April and proceeded downstream, delivering the Navy's superior rations to the hardest-hit communities.[25]

Because telephone and telegraph communication with Normoyle proved impossible, Col. Henry Jervey, commanding the Cincinnati Engineer District, went to Columbus to meet with the quartermaster commander. Jervey immediately dispatched Capt. John Kingman and Lt. Henry Finch to stricken Hamilton, Ohio, on the Miami River.[26] There they found that Hamilton's public sanitation needed urgent attention. Finch took charge of collecting and burning the animal carcasses littering the streets, while Kingman met with the city health officers to plan restoration of water and sewer services. The destruction of property in Hamilton was great and the loss of life could only be estimated, about twenty-five bodies having been recovered up to that time. Kingman reported to the chief of engineers from Hamilton: "Several hundred dead horses and mules were scattered about the city; the light, water and sewer systems were all out of commission; food supplies were coming in by motor trucks from Cincinnati, but the inhabitants were tired out and demoralized." At Kingman's request the Army adjutant general dispatched Medical Corps officers to Hamilton.[27]



Hundreds fled to elevated railroad tracks in Lima, Ohio, on 25 March 1913. Library of Congress, PAN US GEOG - Ohio no. 5

Finch saw that the people of Hamilton were tending to human needs on their own, but they had delayed disposing of the dead animals in the streets as the result of a misconception. He later wrote a vivid description of his solution, along with comments on the value of military training during disaster relief:

> It fell to my lot to cleaning up the carcasses and for two lively days gangs of volunteer laborers and commandeered trucks were busy gathering up the dead animals and carting them out to the baseball park where, covered with wreckage and baptized with crude oil, they made a great bonfire. No doubt the inhabitants of Hamilton would have done this earlier but for the fact that they had the idea that the carcasses must be buried in order to be disposed of, but army training had shown how easy it was to do the business with fire. Over 300 animals, mostly horses, were thus handled. The carcasses were found everywhere: I recall getting one dead horse out of the cloak room on the second floor of the public school building. A herd of them had been led up the stairway as the water drove them off the first floor.[28]

Once he had the Hamilton mission in hand, Finch, at Normoyle's request, proceeded south to Helena, Arkansas, with a detachment of five noncommissioned officers for flood duty on the Mississippi River. Kingman returned briefly to Cincinnati and then went on to investigate the emergency at Lawrenceburg, Indiana, near where the Miami River enters the Ohio.[29]

Boarding a launch at Cincinnati, Kingman dodged drift and debris to make the trip to Lawrenceburg, where he found the levee had failed and the town mostly submerged. Boating back to the hills, he found an operating telephone and called Logan of the Quartermaster Corps in Louisville. He arranged with Logan to have the Corps towboat *Scioto* loaded with fifty thousand rations and emergency supplies at Cincinnati for delivery to Lawrenceburg and points downriver.

Kingman made the *Scioto* and its barges a floating supply base, dropping off vital supplies at the Indiana towns of Lawrenceburg, Aurora, Patriot, Florence, Utica, and Milton on its way to Louisville, Kentucky. The Louisville Engineer District had a fully-equipped repair shop on Shippingport Island that quickly fabricated forty small rowboats for the rescue and relief work. These small craft went aboard the *Scioto* and the towboats *Cherokee* and *Kentucky,* which were then proceeding down the Ohio

River from Louisville to offer disaster assistance to devastated communities such as Uniontown in Kentucky and Shawneetown and Cairo in Illinois along the lower river.[30]

The rescue and relief services during the Dayton flood of 1913 were the result of a true joint effort by local, state, and federal authorities. Citizens' committees in nearly all damaged towns performed valiant emergency work. In Ohio, Governor James Cox declared martial law and put the National Guard to work; among the mobilized units were the 5th Ohio Engineers, tasked with restoring Dayton's water supply system. Participating Army forces included the Quartermaster, Engineer, and Medical corps. The Navy sent ship crews from the USS *Essex* and *Dorothea* to Cleveland for rescue service and also provided superior-quality rations to feed hungry flood refugees. Moreover, the U.S. Life Saving Service, forerunner of the U.S. Coast Guard, performed gallantly.[31]

U.S. Life Saving Service crews from stations at Louisville; Cleveland; Chicago; Lorain, Ohio; and Michigan City, Indiana, took their surfboats to the flood disaster area where they rendered splendid service. The Louisville crew, for instance, reached Dayton while it was still underwater to save people stranded by the flood. The crew's commander, Capt. Jack Gillooly, later explained that his crew braved the swift currents and obstructions to enter the city and found entire families in attics crying for food and water. His small boats did not permit evacuating the marooned crowds, but he took the sick and injured to safety.[32] Returning with rations and bottled water, the crews then dragged their boats over and around the wreckage blocking Dayton's streets, supplying eight hundred stranded victims with necessities. The small boats the Life Saving Service rowed, along with the crews' extensive marine training, allowed them to reach many buildings that were otherwise inaccessible.[33]

"…laborers…were busy gathering up the dead animals and carting them out to the baseball park where, covered with wreckage and baptized with crude oil, they made a great bonfire."

Secretary of War Garrison and Maj. Gen. Leonard Wood, Army chief of staff, personally inspected the damages and the disaster relief efforts in Ohio on 29 March. There, Normoyle of the Quartermasters assured them that the Corps of Engineers was cooperating in every way possible and working to the limits of its efficiency.[34]

Normoyle's generous assessment was not shared, however, by everyone. An Ohio congressman became disgruntled when the chief of engineers declined to send Corps ponton bridges to Hamilton, where the flood had destroyed all bridges. The chief explained that the ponton bridges would not reach Hamilton until long after the need for them had ended. Hamilton officials instead located a retired engineer sergeant who, in just thirty hours, assembled small barges found in the area into a temporary bridge spanning the Miami River. The bridge served well during the emergency.[35]

The Army Medical Corps and American Red Cross handled the post-disaster recovery mission, with Maj. Thomas Rhoads of the Medical Corps in charge. He divided Dayton into recovery districts and employed four thousand workers for four weeks. They hauled away 133,600 wagonloads of flood debris, cleaned and disinfected 12,131 homes, removed 1,420 dead horses, recovered 98 bodies, gave 2,100 people medical treatment, and issued 580,000 quartermaster rations. The Red Cross provided medical facilities and soup kitchens, built small cottages as temporary housing for the flood refugees, and helped people resume their livelihoods.[36]

In June, Jervey at Cincinnati advised the chief of engineers that the principal challenge encountered by the Corps during the Dayton flood was the disruption of communications. Because telegraph and telephone lines were down, Corps officers had to take independent initiative because they could not contact Normoyle for instructions. As a future remedy, Jervey recommended building a chain of wireless radio stations along the Ohio River for service during emergencies and also for management of Corps lock and dam operations. He estimated each two-kilowatt radio station would cost $2,750, but the chief of engineers rejected the proposed radio network as too costly. As a result, Corps

Fire, flood, and rain coalesced along the Mahoning River at Warren, Ohio, March 1913.

Youngstown Historical Center of Industry and Labor and Ohio Historical Society

installations in the Ohio River basin still lacked adequate radio communications during the 1936 and 1937 floods, and personnel were forced then to rely on volunteer broadcasting services offered by commercial stations.[37]

Mississippi River Flood, 1913

"Such a sequence of violent storms has never before been recorded in the Mississippi Basin," reported the Mississippi River Commission describing the 1913 floods. Two major floods washed down the Mississippi in early 1913 before the levees damaged by the flood of 1912 had been entirely restored. In January a flood took the gauge at Cairo, Illinois, to 48.9 feet and caused a crevasse at Lake Beulah levee as it passed downriver. The levees along the river remained saturated when the Dayton flood roared down the Ohio, shooting the Cairo gauge to 54.7 feet and surpassing the records of 1912. The April 1913 flood climbed up the levees to the highest stages ever before recorded between Cairo and Helena, Arkansas, and between St. Joseph, Louisiana, and Natchez, Mississippi.[38]

Sandbags hold back the water at a levee break at Poydras near New Orleans in May 1913. National Archives, 77-MRC-5-88605-975

The Corps commanders at Memphis, Vicksburg, and New Orleans braced for the assault in March. The Vicksburg commander had to get the Lake Beulah crevasse, left by the January flood, closed quickly before the Dayton flood arrived. He negotiated an emergency contract with the Illinois Central Railroad for swift construction of a rock-fill levee across the gap left by the crevasse. The railroad laid a track atop the levee, drove piling in a line straight across the gap to form a trestle bridge, then dropped trainload after trainload of riprap stone from the trestle to lodge against the piling. It finished this unique rock-fill levee in time to hold out April's flood.[39]

As had become customary by 1913, in preparation for flooding, the Corps districts on the Mississippi laced barges of materials and quarterboats for labor at intervals along the river and joined with the local levee boards in the flood fight. Advance preparations in 1913 extended also to the rescue and relief plans. On 29 March,

The railroad tracks at Cary, Mississippi, were surrounded by floodwaters in 1913.
National Archives, 27-G-1A-2

"Flood duty on the Mississippi River nowadays means a fight to help the levees to hold. And my hat is off to the men who do it. I cannot conceive of a more nerve-taxing contest in time of peace…such a campaign is as good as a war any day!"

recognizing that the flood would climb to new record levels, Maj. Edward Markham requested that tents for emergency shelter be sent to Hickman, Caruthersville, Memphis, and Helena and that necessary relief supplies be gathered before the crisis came. The job went, again, to Maj. James Normoyle of the Quartermaster Corps, who in April was still in Ohio managing the Dayton flood recovery effort. Normoyle activated the same disaster relief plans he had used in 1912—forming floating bases that transported rations and forage down the rivers to flood victims and performing rescue and relief with the Corps of Engineers' fleet.[40]

The floating base—composed of the towboats *Scioto*, *Kentucky*, and *Cherokee* of the Cincinnati and Louisville districts—that had distributed relief supplies along the lower Ohio River to Cairo in March merely continued its relief voyage on to Memphis in April. At St. Louis, the quartermasters loaded the Corps steamer *Nokomis* and sent it downriver for rescue and relief, just as it had in 1912. During its 1913 voyage, a barge loaded with hay for livestock caught fire off the bow of the *Nokomis*, but its captain never stopped. He simply sent his crew out on the tow to empty the burning barge while the steamboat's paddlewheel kept thrashing the river on its way to New Orleans.[41]

When the *Nokomis* reached the Skipwith crevasse—one of six that occurred during the 1913 flood—its captain learned that people behind the crevasse urgently needed immediate rescue from rooftops. Breaking a barge out of the *Nokomis*'s tow and shooting it through the gap in the levee, the captain went after the stranded victims. One Army officer who witnessed this courageous exploit later commented:

> I also wish to commend the Captain and crew of the Steamer *Nokomis* for the fine service rendered and especially Captain Walter Irwin, who, when a barge was needed inside the levee to help in the rescue work, ran one of the steel barges of the *Nokomis* through the break at Skipwith, Miss., with himself and three others on the barge; the three others being the second mate Harry Wells, Deckhand Schuler, and Sergeant Remington, 9th Infantry.[42]

It was a busy flood season, and Army Engineers displayed courage and tenacity throughout the region.

Lt. Henry Finch, who had disposed of the dead horses in Hamilton, Ohio, in March and then went south to join the April flood fight at Helena, Arkansas, penned a vivid description of April's action, comparing it to combat duty:

> Flood duty on the Mississippi River nowadays means a fight to help the levees to hold. And my hat is off to the men who do it. I cannot conceive of a more

W. H. Brown's gin house, two miles above the Skipwith crevasse at Addie, Mississippi, succumbed to floodwaters in 1913.

National Archives, 27-G-1A-2

> nerve-taxing contest in time of peace. The immense stretch of levee length to be patrolled, the problem of placing the field force (always inadequate at such times) to the best advantage, … the task of getting tools and sandbags to the right place in time, the matters of feeding, housing and transportation—such a campaign is as good as a war any day![43]

Floods and natural disasters were also similar to war in that both created victims and opportunities for corruption.

As the flood fight ensued, Finch grew increasingly concerned about the problems attending the free issue of Army rations during disasters. Finch thought the free rations had vicious effects on the people living along the rivers. In his opinion, the food gifts encouraged shiftlessness among the tenant farmers and prostituted the planters, who took full advantage of the opportunity to charge off the cost of caring for their tenants, even if they were not threatened by the high water. "In spite of the good intentions of the army officers in charge," Finch asserted, "in spite of their uniform high integrity, in spite of the sincere regret of the better class of men in every community, in spite of all efforts at control, there ensued … the most pernicious reign of graft that ever affected so large a section of this country." The existing methods of federal disaster assistance, Finch concluded, had to be changed.[44]

Observations

The record-setting floods of 1912 and 1913 ranked among the most destructive and costly in American history. During these years, the Mississippi River Commission spent a million dollars on its flood fights, and the Quartermaster Corps distributed another million dollars' worth of Army rations and emergency supplies. These were considered enormous expenditures in 1913, and they encouraged policy makers to look for other approaches.

Statesmen such as Theodore Roosevelt published critiques protesting the expenditure of millions of dollars for disaster relief but only pennies for flood protection. Roosevelt proposed the construction of better levees on the Mississippi together with reservoirs on its tributaries for flood control and allied purposes. He declared that one act of Congress would suffice: "We can lift the rivers out of politics by enacting a single adequate measure, establishing a policy and providing continuing funds exactly as was done in the case of the Panama Canal."[45]

In 1913 the Corps of Engineers, which held an attitude similar to Roosevelt's, received the blessing of Congress to conduct studies of various federal flood control measures and of improved methods for federal disaster assistance. The flood control studies that began in 1913 became the engineering foundation of the historic Flood Control acts of 1917, 1928, and 1936 that authorized federal flood protective measures in the Mississippi River basin and elsewhere. The Corps' criticism of the disaster relief program, then conducted by the Quartermaster Corps, was to result in 1916 in reassignment of the entire federal disaster assistance mission to the Corps of Engineers.

"In spite of the good intentions of the army officers in charge … there ensued … the most pernicious reign of graft that ever affected so large a section of this country."

Chapter 5 Notes

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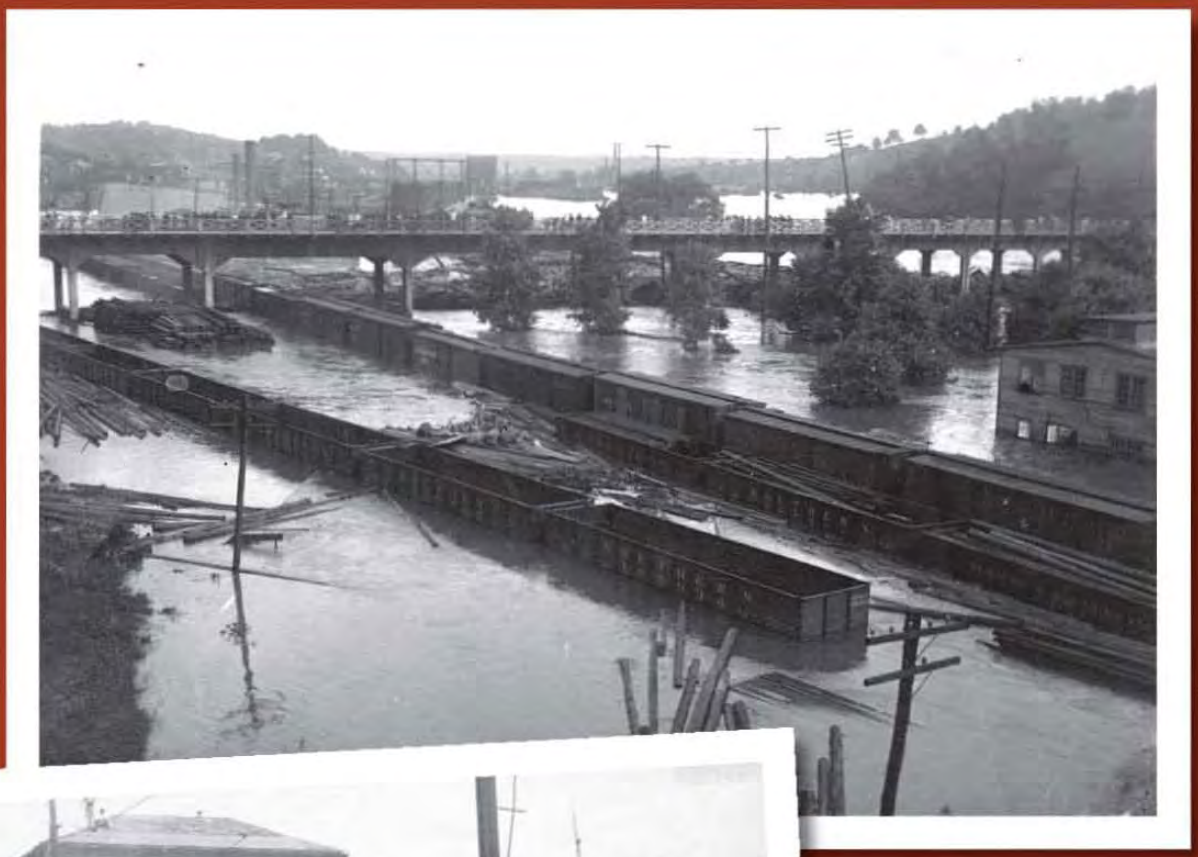
43. Finch, "Personal Experiences on Flood Duty," 398–99.
44. H. A. Finch to Third District Engineer, 23 Feb. 1916, NARA, RG 407, AGO Central Files, 1917–1925, Dec. 400.38, Box 929.
45. Theodore Roosevelt, "The Ohio Floods: Can Such Calamities Be Prevented?" *Outlook* 103 (5 Apr. 1913): 765–66. Post-disaster studies are House of Reps., *Report of Ohio [River] Flood Board*, 63d Cong., 1st sess., 1913, H. Doc. 246; House Committee on Rivers and Harbors, *Prevention of Damage by Floods,* 63d Cong., 2d sess., 1914, H. Doc. 914; and House Committee on Flood Control, *Flood Protection and Prevention*, 64th Cong., 2d sess., 1916, H. Doc. 1792.



Right: The rail yard at Asheville, North Carolina, was flooded in 1916.

Schandler Family Collection, Special Collections, D.H. Ramsey Library, University of North Carolina at Asheville

Left: A 1915 hurricane destroyed parts of New Orleans.

Collection of H. George Friedman Jr.

Right: Floodwaters covered Chattanooga, Tennessee, on 7 March 1917.

National Archives, 27-G-1A-7

The Corps Initiates Work Relief

6

Fierce hurricanes, spirit-dampening floods, politics, bureaucracy, war in Europe—the nation had little respite from troubles from 1915 to 1917. As one natural disaster followed another, the Corps initiated a new approach to federal relief and recovery programs: "No Work, No Rations." The conception of work relief, at the federal level, usually has been associated with President Franklin Roosevelt's program to restore economic vitality during the Great Depression—projects that put the unemployed to work rather than offering them the dole. The Corps of Engineers, however, applied this concept to a federal program prior to the First World War and on the heels of a hurricane and major floods afflicting the South.

Federal disaster assistance had begun in the South after the Civil War to benefit the former slaves who suffered intensely during Mississippi River floods. With some exceptions, notably the 1906 San Francisco earthquake, federal disaster relief had largely been confined to the South during the late nineteenth century and consisted of free rations dispensed by the Army Quartermaster Corps and transported by the Army Engineers. Troubled by shortages of the labor needed for emergency work on levees during the Mississippi floods of 1912 and 1913, the Corps proposed its new approach: instead of providing free rations to flood victims, offer them paying temporary jobs. During the flooding disaster of 1916 in the southern states, Congress gave the Corps an opportunity to implement its work relief program and test its concept. Considering the results, the Army in 1917 reviewed its disaster assistance responsibility, comparing the merits of the Corps' work relief concept with the traditional ration distribution.

Louisiana Hurricane, 1915

Maj. William Caples was commanding the Corps' New Orleans office when a hurricane blew ashore at the end of September 1915. His situation report, telegraphed to the chief of engineers, graphically described what he saw:

> Employees safe. Roofs partly off at depot. Quarterboat and coal flat ashore near Chalmette. Navy dock drifted around and blocked by wrecks. Navy wants wrecks removed. No available funds. Wrecks out of vessel track. Estimate four thousand. Request instructions. Levee above New Orleans moderately damaged. Wave fences about forty percent gone. One levee near Donaldsville apparently undermined. Damages outside of new levee probably under forty thousand. Levee just below New Orleans badly damaged. Washed past crown in several places. Would not stand high water. Visible losses apparently quarter million. Loss to shipping in harbor confined largely to coal fleet, tugs, and small craft. City wharves damaged. Wharves below city about half destroyed. Leave today to investigate reported loss of forty miles levees below city.[1]

Broken utility lines dangled precariously in New Orleans, 1915.

Collection of H. George Friedman Jr.

Waves sent inland by the hurricane raised the Mississippi River's level by five feet with maximum wind and wave action. The storm swept the wharves clean, whipped the bark off trees, and carried boats and barges crashing over tops of levees. When Caples examined the damage downstream of New Orleans he found the Barataria levees broken at thirty-three places and the Lake Borgne levees at twenty-three.

No disaster assistance mission came on the heels of the September hurricane, but Caples and the New Orleans District had to repair the levee system before spring floods arrived in 1916, a herculean task considering the storm had obliterated eighteen miles of levees and damaged another ninety-five miles of the system. Employing all the hired labor he could obtain and entering into emergency contracts with construction firms, Caples began immediate

Streetcars were among the victims of the hurricane in New Orleans, 1915.

Collection of H. George Friedman Jr.

"The storm swept the wharves clean, whipped the bark off trees, and carried boats and barges crashing over tops of levees."

repairs. The rushed work persisted through the winter and the repairs were done just before the flood came in February 1916.[2]

No Work, No Rations in February Floods, 1916

The flood crest at Cairo in early February 1916 was 1.5 feet lower than the record set in 1913. Downstream, however, the White River climbed to record levels and combined with extremely high waters on the Arkansas River to raise the Mississippi between Sunflower Landing and Natchez to a new peak. There, it reached 1.4 feet higher than all previous floods at Vicksburg.[3]

Congress was inundated by another flood—the appeals for federal disaster assistance, for the free rations issued during earlier disasters. A committee at New Orleans also cornered Maj. Gen. Leonard Wood and, believing the 1916 flood was worse than those of 1912 and 1913, they asked that quartermaster officers be detailed to the scene, engineer workboats get up steam, and emergency funding be made available for rescue and relief. Senator Joseph Robinson received telegrams from Arkansas asking him to use his influence to have the Quartermaster Corps send Lt. Frederick Hanna, who had supervised free ration distribution there in 1912, to again supervise the relief operations.[4]

Robinson introduced a resolution to appropriate $100,000 and direct the secretary of war to initiate disaster relief work. Robinson had reports from his state insisting that many lives had already been lost to flooding and hundreds were marooned without food. His resolution swiftly flowed through the Senate but abruptly hit a snag in the House. Congressman John Fitzgerald of New York read to the House copies of messages handed him by the chief of engineers. A telegram from Maj. J. R. Slattery at Vicksburg, for example, described the flood:

> Levees being subjected to severe test but no point specially endangered yet. Excellent chance of holding line if white population will put up proper fight. Can give employment and subsistence to all persons in flooded parts of Arkansas. Have already offered such assistance and am extending further offers. At present am having to pay fancy prices for labor to hold commission levees on Arkansas River. Arkansas authorities advised by my assistant several days ago that government boats would proceed to any point where life was in danger. It would materially help situation if all hope of free rations were squelched.[5]

The telegrams from Maj. Edward Markham at Memphis and Caples at New Orleans resembled Slattery's: the flood damages had not exceeded state and local resources for relief assistance and the issuance of free federal rations would hamper the flood fight in progress. In view of this opposition by Corps officers in the field, the

"It would materially help situation if all hope of free rations were squelched."

House adjourned on 5 February without action on Senator Robinson's resolution.[6]

The Corps officers' stance against federal disaster assistance shocked some congressmen, and Chief of Engineers Dan Kingman therefore requested additional information from the field. Knowing that Col. Lansing Beach and Capt. Henry Finch had personally studied disaster relief efforts in 1912 and 1913, Kingman ordered Beach to New Orleans and Finch to Vicksburg to investigate the situation and report.[7]

Over the weekend of 6 and 7 February, public pressure on Corps officers increased. Answering questions from the *Vicksburg Herald*, Slattery advised he would employ any person immediately on levee work. "Persons thus employed will be fed, sheltered, and paid fifty cents a day, *and worked* [emphasis original]," Slattery told the newspaper, adding: "Women and children driven from their homes by the water will be

"Women and children, hundreds in number, cribbed up; over 6 to 15 feet of water; three-fourths of county submerged."

sheltered as far as accommodations of quarter-boats permit. Food will be provided them and the cost thereof deducted from pay earned by their husbands and fathers. An endeavor will be made to provide employment for unmarried or widowed women, as there is considerable work that can be readily performed by such." He told the news reporters that if they could name a single person or locality in need of relief, he would send the boats to get them today and put them right to work on the levees.[8]

In a 7 February report to the chief, Slattery explained his actions just as he had to the reporters. He had deployed the entire Vicksburg District fleet strategically along the levees, well equipped with sandbags, shovels, and wheelbarrows, awaiting only the arrival of laborers to start the flood fight. He complained that the efforts by certain interests to secure free rations had caused serious difficulty obtaining the workers needed to raise the Arkansas levees.[9]

When Congress reconvened on Monday, Robinson presented letters from people of Hickman, Kentucky, and Clarendon and Lake Village, Arkansas, stating that the floodwaters had driven thousands from their homes and these refugees were suffering and needed prompt relief. Judge Harry Cook of Chicot County, Arkansas, castigated Slattery:

> Slattery first refuses aid, then grants insufficient aid; arbitrary and dictatorial in every instance. Government rations have always been refused where anyone refuses levee or other emergency work, and Maj. Slattery cannot truthfully assert the contrary …. Unless immediate relief is granted thousands of stock and many human lives will perish. Maj. Slattery unacquainted with suffering of people and too brutal and inhumane to conserve their dire necessities. County has dispatched physicians to aid sick and exposed on levee fronts. Women and children, hundreds in number, cribbed up; over 6 to 15 feet of water; three-fourths of county submerged.[10]

The White River reached the rooftops at Calico Rock, Arkansas, in early 1916. National Archives, 27-G-1A-7

Congressman Alben Barkley of Kentucky rose to the floor of the House and read a telegram concerning public distress at Hickman. Stopping short of calling Markham and Slattery liars, he urged the House to disregard the engineers' reports and at once enact a resolution for the relief of flood victims.

In response, Fitzgerald of New York read to the House another report sent by Maj. E. J. Dent from Little Rock. Dent stated the Clarendon levee on the White River had broken the night of 5 February, but the Corps towboats *Quapaw* and *A. D. Allen* were at the site. "Nothing alarming in situation at Clarendon," he concluded. "Inhabitants living in upper stories. No food shortage." The House then dropped its consideration of the disaster relief bill pending further information.[11]

Beach and Finch began their field investigations on 9 February. Reports from Lake Village, Arkansas, indicated four thousand people were in dire need; Beach found four. In his opinion, the demands for free rations came from people who apparently desired to handle the rations distribution or to make political capital by being the first to arrange the distribution. He recommended that the chief of engineers seek to modify any congressional

resolutions authorizing disaster relief to allow issue of free rations only "in the discretion of the Secretary of War." Beach was convinced that issuing free rations would hamper the Corps' flood fight.[12]

On receiving Beach's report, Kingman contacted the manager of the Associated Press and asked that the false reports of dire needs in Arkansas be taken off the wires. He did so, he said, "knowing that Associated Press desired to have its reports correct, and would request that correspondents be notified to send only truthful dispatches." He also passed along copies of Beach's report to the appropriate members of Congress.[13]

"My God, gentlemen, what good will tents do a man, what good will medicine do a child, when their bellies are empty, gnawing, and hungry?"

At noon on 10 February the House of Representatives resumed its consideration of the resolution authorizing disaster relief to Mississippi River flood victims. "It makes no difference what the War Department says," proclaimed Congressman W. A. Oldfield of Arkansas, alluding to the Corps' opposition to issuing federally funded subsistence. "I think the officers of the War Department spend most of their time on the Mississippi River, trying to keep the levees from breaking," he explained. "I do not blame them because they no doubt are doing their duty as they see it, but they ought not to come here and try to prevent this House from giving needed and immediate relief."

Congressman Henderson Jacoway declared the entire Arkansas delegation had called on Chief of Engineers Kingman to appeal to his humanity. The general told them he did not want to sound ungracious or unsympathetic, but the War Department would not act until Congress enacted a proper resolution authorizing disaster assistance. Alben Barkley said he too had visited the chief's office, carrying with him telegrams begging for disaster relief, but Kingman had merely shown him telegrams he had received from Markham, Slattery, Dent, and Beach. Those telegrams showed, thundered Barkley, that people were living in upper stories of their homes because the lower stories were filled with water. Just what, Barkley asked, did the Corps of Engineers think would be a condition justifying federal assistance?

Benjamin Humphreys of Mississippi pointed out that he personally had suffered through several floods and had seen the free rations issued time and again. "But, Mr. Speaker," he concluded, "we have it from a poet 2,000 years ago that 'the gods have destroyed whole families by answering their prayers.'" Humphreys said it had been his experience that federal issuance of free rations did more harm than good.

Percy Quin of Mississippi took umbrage at that idea. "Mr. Humphreys of Mississippi said he was willing to let them have tents and medicine, but he is opposed to them getting provisions," said Quin. "My God, gentlemen, what good will tents do a man, what good will medicine do a child, when their bellies are empty, gnawing, and hungry?" After being interrupted by applause, he continued. "It seems to me that it is heartless. I do not want to refer to my distinguished friend here, but he said that in his judgment it disorganizes labor. Do you mean

"If you defeat this legislation, the result to some poor, helpless people is going to be death…"

to say that some great employer does not want the poor people to receive relief simply because some of his labor might not be there to go to work Monday morning? That kind of sentiment, gentlemen, ought not to reach the Halls of the United States Capitol."

After lengthy and heated debate, the House defeated the resolution to authorize the secretary of war to supply flood victims with tents, rations, and other supplies. The House then took up a substitute, offered by Irvine Lenroot of Wisconsin, which differed from the defeated resolution by adding the words "in his discretion," meaning the secretary of war could issue rations and supplies at a time he thought appropriate.

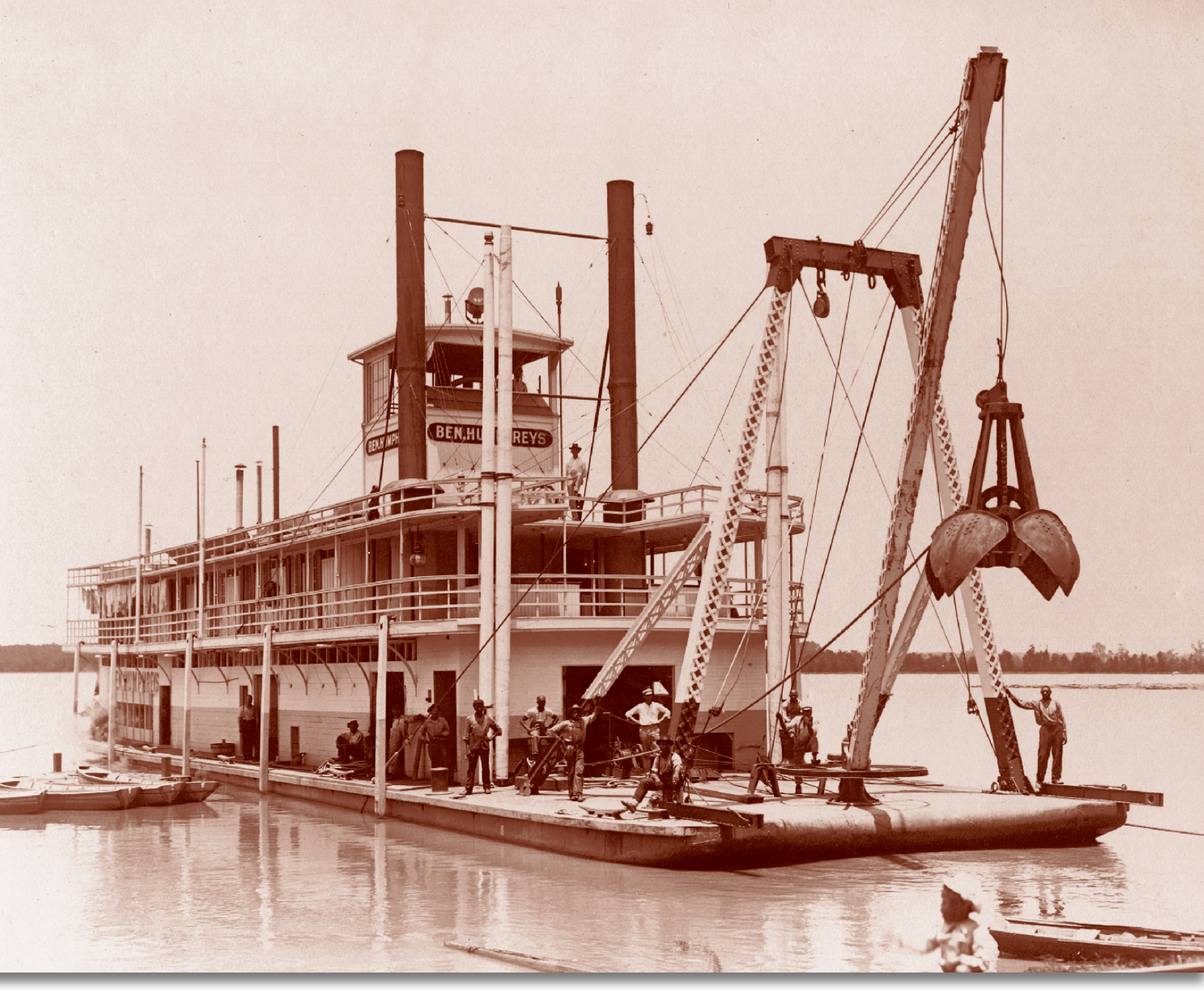
Congressman Thaddeus Caraway of Arkansas, upset by what he thought were slurs upon his state, took the floor. "I want to tell you that nobody on God's earth gives more liberally of his means than our people do. You do not have to open subscription lists so you can get your name published in the paper in order to get relief, either." He declared that Arkansas would care for its own to the limits of its ability. "We do not want your charity; we do not ask it," he continued. "If you defeat this legislation, the result to some poor, helpless people is going to be death, and if you can escape your moral responsibility for sending some of them to death by voting against this resolution and justify it in your consciences, bless your hearts, go ahead and do it…." The House then passed the substitute allowing the secretary of war to issue relief rations and supplies "in his discretion" by a vote of 93 to 44.[14]

Work Relief

The 1916 flood fight on the Mississippi River proved eminently successful. Throughout the fourteen hundred miles of main levees on the Mississippi there was only a single crevasse—at Buck Ridge on 15 February. Breaks occurred, however, on levees along tributaries for which the federal government then had no responsibility.[15]

The Corps snagboats *Joseph E. Ransdell* and *C. W. Howell* and the dredge *Waterway* conducted rescue operations on the Red, Tensas, and Black rivers; and the towboats *A. D. Allen*, *Quapaw*, *Lafourche*, and snagboat *Ben Humphreys* performed rescues where needed along the Arkansas River. Maj. J. R. Slattery at Vicksburg placed Capt. Henry Finch in charge of the relief operations along the Arkansas, and Finch strictly enforced the newly authorized policy of "no work, no rations."[16]

When the New Orleans District commander, Maj. William Caples, heard of suffering near St. Joseph, Louisiana, he asked that a quartermaster officer be sent to investigate. Capt. William Hunt of the Quartermaster Corps met Caples at St. Joseph, where the major told him the test to be applied before issuing rations was whether people were willing to work for the



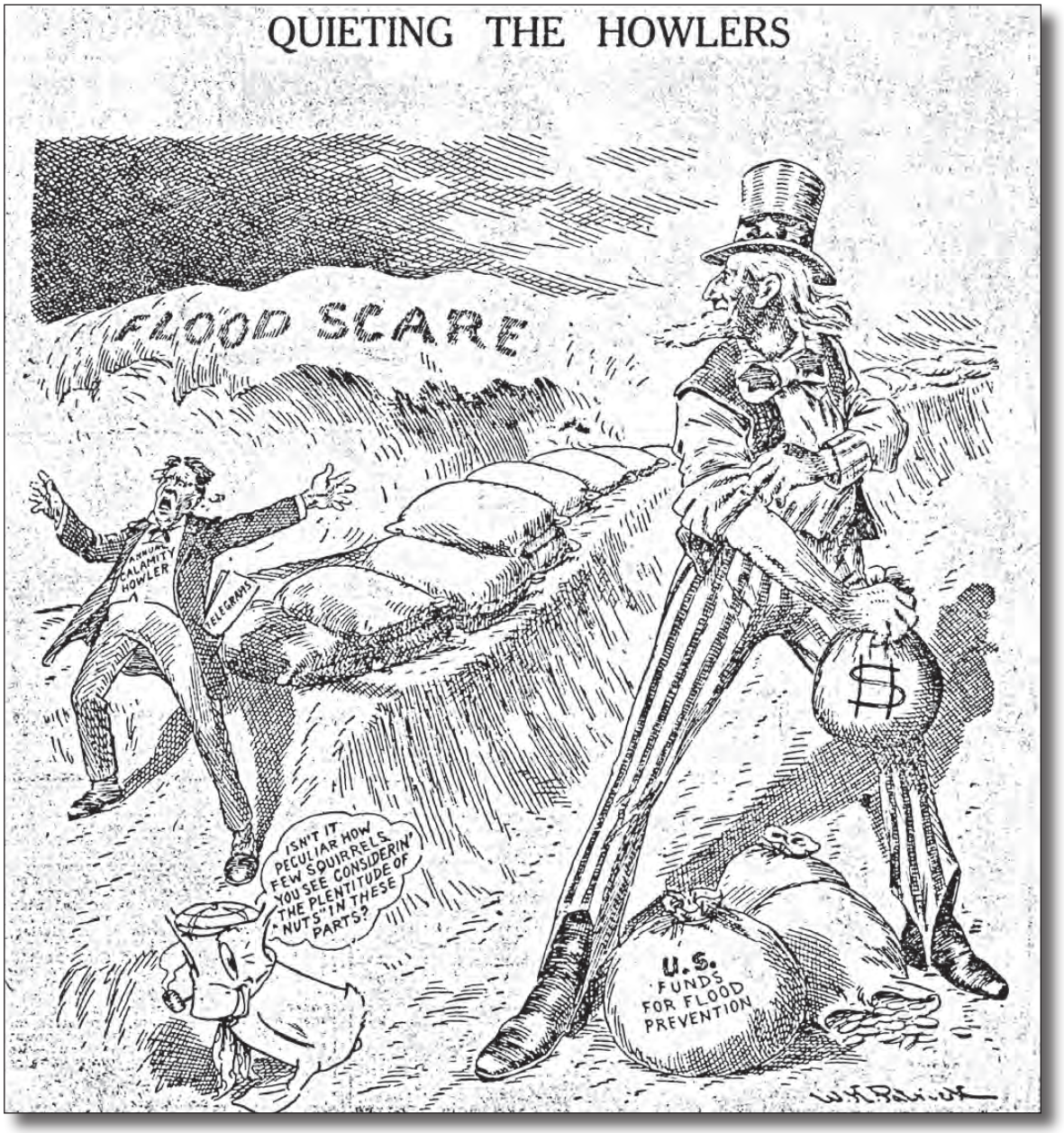
The engineer snagboat *Ben Humphreys* (shown in 1908) rescued people along the Arkansas River in 1916. Office of History

same. After inspecting conditions in Tensas, Catahoula, and Concordia Parishes, Hunt declined issuing rations.[17]

In a confidential and acerbic report, Hunt reviewed at length his assessment of the situation and new policy:

> Political phases of appeals and requests for Government assistance were very apparent. The state election in Louisiana takes place about the middle of April. The political pot is boiling hot. The primaries are past. All candidates for offices felt that they had of necessity to show to their constituents that they had exhausted their efforts to secure Government aid. They did not resent, neither did they feel badly at the investigations which were made by the Engineer officers and myself to find the actual conditions, but were glad that such investigations were made, as thereby they were able to tell their constituents that they had done the best

they could, and at least it was through no fault of theirs that Government aid was not forthcoming. I am convinced that the policy pursued this year, of personal investigation of appeals and requests by an Army Officer is the proper way to handle this matter. It is far from safe to take as gospel truths, appeals as forwarded to and through congressmen. My policy was to arrive unannounced at the place to be investigated and in advance of the time when I might be expected. So arriving, the local committee, if there were any, and many times no local committee at all had been formed, was not prepared and had no story carefully thought out. There were various hints that other crevasses might have occurred had the ration issue been started, etc. It is impossible to state whether or not such malicious breaks would have occurred.[18]



Editorial cartoon from the *New Orleans Times-Picayune*, 9 February 1916. *New Orleans Times-Picayune*

Finch declared in his final report that the "work relief" policy was the best ever devised, ensuring a labor supply for flood fights without pauperizing or demoralizing people. He admitted that a system of issuing rations to needy people only might be developed, but it would entail great cost and so much red tape that people would be either dead or helped by private charities before federal aid could reach them. Finch concluded: "It may well be the Engineer Department in adopting its policy this year believed the holding of the laborers in hand to be the first consideration. As important as this point undoubtedly is, I am positive that the greatest good has resulted to the communities themselves, because by enforcing this policy they have so far been spared a repetition of the demoralizing experiences of 1912 and 1913."[19]

Finch's report was approved by his superiors and submitted to the Army's adjutant general and quartermaster general for consideration. When a major Mississippi River flood occurred in 1922, the Army chief of staff reviewed the 1916 reports by Finch and Col. Lansing Beach on the issuance of free rations. No massive free ration issue followed in 1922, nor ever again. The Corps of Engineers helped with rescue and conducted flood fights, the Quartermaster Corps supplied refugees with tents and medical supplies, but feeding the destitute was left chiefly to the American Red Cross and other charities.[20]

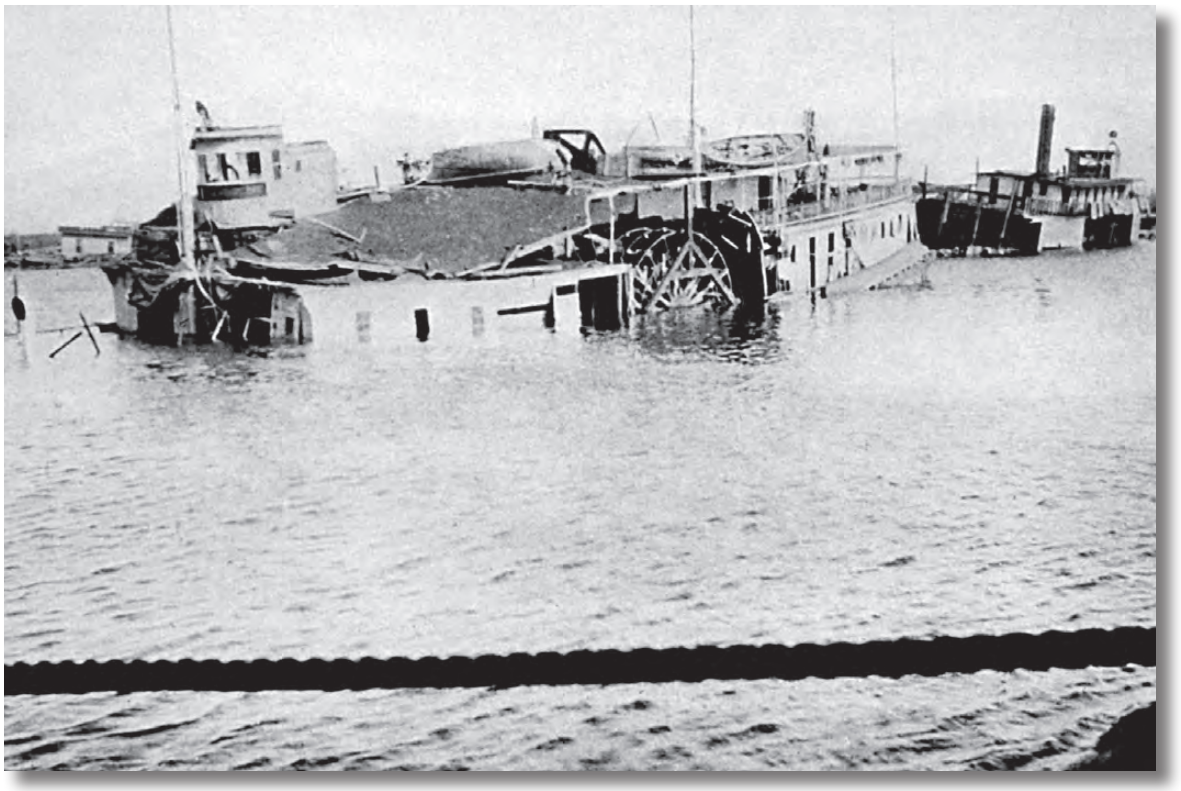
Southern States Floods, 1916

The southern states floods of July 1916, nearly a forgotten disaster, resulted in a unique disaster assistance mission. The Corps' "no work, no rations" policy a few months earlier on the Mississippi River was so admired that Congress gave the Corps an opportunity to apply this policy outside the Mississippi delta. This application of the policy proved so difficult, however, that the Army never used it again.

On 5 July 1916 a hurricane slammed ashore at Mobile, Alabama, causing extensive damage. It practically destroyed the Corps' fleet, sinking the *Biloxi* and *Chickasaw*, driving the *Demopolis* and *Dauphin* ashore, and setting the district's dredge adrift in Mobile Bay. After savaging the coast, the storm moved inland, dumping heavy rains on the South. Flooding nearest the coast consisted of lowlands inundation, but up to fifteen inches of rain in mountainous North Carolina and West Virginia caused flash flooding that washed out bridges and destroyed communications. News of the disaster's impact and scope filtered slowly out of the mountains, carried by mouth rather than the wires.[21]

Southern agrarians, already reeling from crop losses due to flooding in 1912, 1913, and the spring of 1916, plus the boll weevil's inroads, were approaching collapse when the July 1916 flood again destroyed their crops. News of this situation reached Congress and the chief of engineers in mid-July. Maj. Gen. William Black, for example, received an appeal from Selma, Alabama, that asserted the floods there had so damaged crops that planters could no longer care for their tenants and disaster assistance was essential to prevent much poverty and its attendant crime.[22]

Black relayed that telegram and others, along with instructions to investigate the circumstances, to Capt. Edward Schulz at Mobile and Capt. C. L. Sturdevant commanding the



The July 1916 hurricane sank steamers at Mobile, Alabama.
NOAA Photo Library

Montgomery District. These officers and their staffs personally inspected crop damage and interviewed the planters and tenants, concluding that economic collapse was indeed imminent: the flood had destroyed both cotton and corn crops. The earlier floods and crop losses had impoverished the people, and they could obtain no further credit, neither to eat nor to plant new crops. Sturdevant strongly recommended that the Department of Agriculture be requested to issue seeds to the needy for planting. Schulz made more far-reaching recommendations.[23]

Schulz reported on 21 July that floodwaters had stood on croplands in the Tombigbee and Warrior river basins of Alabama and the Leaf and Chickasawhay river basins of Mississippi for ten days; that at least five hundred families near Demopolis, Alabama, and Merrill, Mississippi, were in dire straits; and that the yearly crops were gone and people had nothing to eat and no hope for the future. He estimated that $10,000 to $15,000, if appropriated by Congress and distributed by the Red Cross, would subsist five hundred families for three months. "As an alternate proposition," Schulz suggested, "the Engineer Department could handle $10,000 to $15,000 in funding to remove overhanging trees and improve the banks along the Tombigbee and Black Warrior rivers if such an appropriation could be made. The wages paid would be temporarily below the normal, and only worthy sufferers employed. The amounts received by the laborers would enable them to feed their families until better conditions prevail." Schulz reminded his superiors that he had requested $50,000 for Tombigbee River navigation projects during the fiscal years, but had received only $35,000.[24]

A temporary railroad bridge was built across the Catawba River at Fort Mill, South Carolina, in 1916.

NOAA Photo Library

At the Charleston District in South Carolina, Maj. Gilbert Youngsberg investigated disaster conditions in the Yadkin, Santee, Wateree, Pee Dee, and Catawba valleys of North and South Carolina, learning that farmers and laborers in the area faced starvation. He found fifteen hundred people in the flooded areas without food or prospect for crops, and he suggested they needed some sort of construction work to furnish employment and some seeds for replanting.[25]

"…whatever relief is afforded should be in the form of an opportunity to work."

Maj. Lytle Brown and Capt. Jarvis Bain from Nashville and Chattanooga checked conditions in the mountains of Tennessee and North Carolina, learning that the fifteen inches of rain that had fallen in a single day near Asheville, North Carolina, had ruined crops and destroyed roads and bridges. Brown reported that the destruction of transportation routes had become the single greatest obstacle to recovery in North Carolina, and he suggested that the needy might be employed to repair the roads.[26]

Chief of Engineers Black summarized the disaster situation for the Army chief of staff, Maj. Gen. Hugh Scott: Corps investigations revealed severe flood damages in Georgia, Alabama, Mississippi, and North and South Carolina, with crops, roads, and bridges damaged and stream channels clogged—human suffering would be great by winter if action were not taken. "It is the general belief," he concluded,

"If this great flood had happened in the Middle Western States or in the East, every newspaper in the country would have been full of it."

"that whatever relief is afforded should be in the form of an opportunity to work."[27]

Black also relayed the damage surveys to members of Congress, pointing out the disaster was not an emergency in the ordinary sense of immediate danger to life; rather, it was a long-term problem involving subsisting the destitute until they could support themselves. If Congress wished to offer disaster assistance, Black recommended the employment of the needy on such public works as roads. "It is a question of policy that Congress must determine," he declared. "I know of no instance where the United States has undertaken the care of sufferers from a widespread calamity for longer than a very temporary period."[28]

On 29 July the secretary of war sent available information on the disaster to the House Committee on Military Affairs along with his estimate that supplying work relief to the destitute for three months could cost $540,000. Oscar Underwood of Alabama then introduced a joint resolution appropriating $540,000 for the "relief of persons suffering and in destitution by reason of recent floods in the States of North Carolina, South Carolina, Georgia, Alabama, Florida, Tennessee, and Mississippi." The resolution authorized the secretary of war to issue seeds to planters for producing fast-growing crops and to employ the destitute at moderate wages under direct supervision of Army officers in cooperation with local governments. "This is not as large or as great a calamity as that presented by the earthquake conditions in San Francisco that we relieved, but proportionately it is as great," Underwood asserted. "If this great flood had happened in the Middle Western States or in the East, every newspaper in the country would have been full of it."

Senator Lee Overman of North Carolina declared that destruction of roads and bridges in his state had been so complete that he had not heard of the losses until two weeks after the storm. He got news of the conditions in western North Carolina after a friend had walked "for days and days in order to get to some place from which he could send a letter off in the mail."[29]

Opposition to the resolution came chiefly from Senator Boies Penrose of Pennsylvania, who issued a wry warning to his Senate colleagues:

> If after due consideration the Senate shall conclude to pass this resolution, I shall make no very great amount of opposition to it; but I was a little curious to know whether the party now in power intends to meet all cases of floods with the same liberal disbursement of the public funds. Doubtless the Allegheny and the Monongahela rivers will again overflow their banks, as they have done almost every spring, or the Susquehanna or the Delaware may again rise and destroy property along their banks, and I did not know but that I might have the support of the Senator from Alabama and other Senators in having a resolution passed appropriating perhaps a million dollars to compensate the unfortunate sufferers who live along those streams.[30]

Congress passed the resolution on 3 August. Soon after it became law, several West Virginia congressmen saw need for their state to be appended to the list of recipients of federal funding. On the night of 5 August a storm dropped as much as fifteen inches of rain on the Coal River and Cabin Creek mining regions in the Kanawha River basin, causing flash floods that took thirty-six lives, destroyed hundreds of homes, and heavily damaged railroads and mines.[31]

Capt. John C. H. Lee of Wheeling surveyed the damages, traveling by rail to Charleston, by muleback to the Cabin Creek area, and by raft through a flooded railroad tunnel into the Coal River valley where he hired another mule. "The heavy downpour on the hills caused many slips and slides which left a debris of rock, gravel, mud and timber that created a large portion of the financial loss," Lee reported. "The mouths of the Kayford–High Coal tunnel were practically closed by this debris, trains were buried, houses covered over, railroad tracks blocked in many places, and on the Coal River the stream was completely dammed for a short space of time in several localities."[32]

Lee noticed the 2d West Virginia Infantry at Camp Kanawha had supplied rations, tents, and blankets to refugees and had maintained excel-

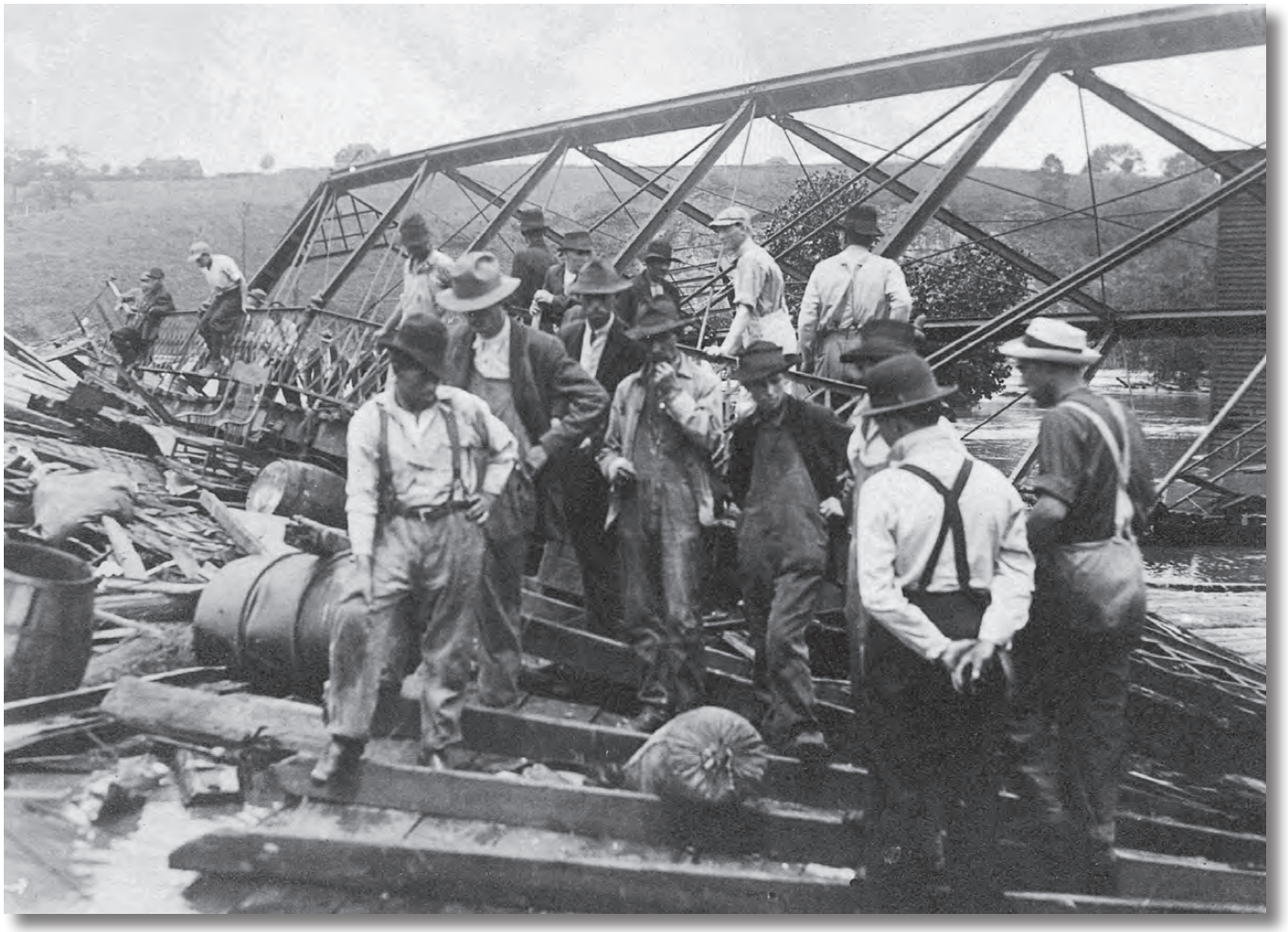
Residents inspected the devastation at Asheville, North Carolina, 1916.

Schandler Family Collection, Special Collections, D.H. Ramsey Library, University of North Carolina at Asheville

lent order and sanitation in the refugee camp. He therefore recommended that the federal government initiate no relief work in the Cabin Creek and Coal River areas, other than crediting the National Guard for the supplies consumed by refugees during the emergency.[33]

While Lee conducted his investigation, Senator E. E. Chilton of West Virginia introduced a resolution to appropriate $200,000 for federal relief in the Kanawha River valley. Senator Penrose of Pennsylvania promptly proposed an amendment to the resolution, giving a few hundred thousand dollars to Pittsburgh. By way of explanation, he read into the record a news clipping stating that a storm and resulting flash flood on 6 August killed two and caused a million dollars' worth of damages at the Steel City.

"I do not think this request," retorted Chilton, "should be met in the contemptuous or the laughing way suggested by the remarks of the Senator from Pennsylvania …. I do not think it is a time when we should be making merriment over the distress of women and children." In view of what he labeled the reckless and lavish spending by Congress in 1916, Penrose declared he would not object to consideration of Chilton's resolution and would allow the "merry dance" to continue. "It is," he philosophized, "a fairly



Residents milled around on a damaged bridge in Asheville, North Carolina, 1916.

Schandler Family Collection, Special Collections, D.H. Ramsey Library, University of North Carolina at Asheville

good campaign contribution to the Senator from West Virginia."

Senator Jacob Gallinger of New Hampshire protested that he personally had been moved by the accounts of suffering in West Virginia and he certainly would vote for the resolution. "I hope, however," he concluded thoughtfully, "that after a while we will take up this whole subject and see whether or not it is wise for the Congress to make appropriations whenever a calamity of this kind occurs in any part of the country." "These appropriations will cease when the rainy season is over," forecast Penrose. The Senate enacted the resolution, but the House amended it, making West Virginia eligible for assistance under the earlier act of 3 August that provided for work relief in the southern states.[34]

"I do not think it is a time when we should be making merriment over the distress of women and children."

The secretary of war, now with authority from Congress to spend disaster relief funding in West Virginia, also retained Lee's report that federal assistance there was unnecessary. He called on Maj. William Wallace of the West Virginia National Guard to inspect and submit another report on the disaster, and Wallace replied that no suffering existed in the disaster area, the demands for labor there exceeded the supply, and the National Guard had issued five thousand rations plus tents during the emergency and deserved reimbursement.[35]

At a conference on 28 August the secretary of war and the chief of engineers explained the situation to Senator Chilton, who still insisted something be done for West Virginia. The secretary therefore allotted $10,000 to the Corps of Engineers for flood relief in West Virginia, and the chief of engineers sent the funds to the Wheeling District commander, who reimbursed the National Guard for the emergency supplies it provided victims during the flood and returned the remainder to the Treasury.[36]

Work Relief Administration

No work relief was undertaken in West Virginia in 1916, but the Corps did oversee the relief program included in the congressional resolution for those southern states ripped by the storm flooding. Black ordered his district commanders at Mobile, Montgomery, Charleston, and Nashville to begin, in cooperation with local officials, improving public roads damaged by flooding by hiring the destitute to perform grading, ditching, repairs, and other tasks for which advance planning and design were unnecessary. "Prompt action is needed," ordered the chief of engineers, "and exercise of wide discretion is authorised."[37]

Youngsberg at Charleston divided the disaster area in his district into six sectors according to river basin: the Yadkin, Catawba, and Broad rivers in North Carolina and the Wateree, Pee Dee, and Santee rivers in South Carolina. He appointed an assistant to supervise the efforts in each sector, directing them to work hand in hand with local officials in repairing public roads, bridges, and drainage systems. The Charleston District employed thirty-five thousand workers and issued rations to one thousand who were physically unable to work, expending $185,000 before the work ceased in March 1917.

In Mobile District, Schulz employed thirty-eight hundred workers and seven hundred mule teams to clear and restore the disaster area's streams and public roads, paying laborers $.70 and drivers with teams $2.50 a day and also supplying weekly rations to people unable to work. The work performed in eleven Alabama counties and nine Mississippi counties ended in November 1916 and cost $96,768.

Sturdevant at Montgomery began the work relief in Wilcox, Dallas, and Perry counties, eventually expanding the mission to include fifteen Alabama counties and one in Georgia. Laborers received $.75 a day and families without able-bodied workers were given weekly rations of one peck of cornmeal and three pounds of salt pork per person. At the mission's peak, the Montgomery District employed 3,509 laborers in 121 work parties and it issued 13,755 weekly rations to the needy.

Brown at Nashville placed the work relief mission in Buncombe, Henderson, and Transylvania counties near Asheville, North Carolina, under the local direction of Capt. Jarvis Bain, who required applicants for work relief to submit forms stating their disaster losses and their needs before he offered them employment. Paying $1.00 a day, the Nashville District repaired 89.5 miles of roads and rebuilt two bridges at a total cost of $14,429. Because the district had been allotted $30,000 for work relief, it returned the $15,571 balance to the Treasury.[38]

In August 1916 Maj. Harold Fiske, who replaced Slattery at the Vicksburg District, received a surprise telegram from the chief of engineers stating that people in Webster, Choctaw, Montgomery, Attalla, and Carroll counties in Mississippi had requested work relief in the aftermath of a flood disaster. Neither Fiske nor the local newspaper and weather bureau had learned of flooding in that vicinity, so Fiske located the six people who had relayed news of the disaster to the chief. After investigation, Fiske found that the six knew of no specific cases of destitution resulting from flooding, and he therefore declined to offer disaster work relief.[39]

One feature of the August 1916 congressional resolution on disaster assistance provided that the secretary of war would dispense seeds for fast-growing food crops to victims of floods. Seed distribution had been done many times before, but always by the Department of Agriculture. The secretary of war therefore persuaded the agriculture secretary to administer the seed program, allotting $50,000 for the purpose. The Corps of Engineers supplied estimates of how many destitute farmers lived in each county, and the Department of Agriculture mailed bags of seeds to each county agent who distributed them to 20,554 families.[40]

Administering work relief in 1916 proved an eye-opener for many of the Corps personnel involved in the mission, and after-action reports flowed up to the chief of engineers. H. C. Mower, mission manager for the Mobile District, found the action astonishing:

> This work has been along new lines of endeavor for most of us; from its inception, it has been one succession of surprises, amusing and otherwise (usually otherwise), while the methods employed have been effective and, generally, satisfactory. The astonishing ideas found to prevail in some localities as to how "the Government money

should be parceled out" and the ignorance of the best available local employees in other localities have been responsible for a great many misunderstandings and embarrassing problems.[41]

But these problems were not unique to the Deep South.

Bain, who had served at Fort Mason during the 1906 San Francisco earthquake, commented that his service at Asheville, North Carolina, in 1916 differed substantially from his experience after the quake. At San Francisco it had been clearly evident who was in need of assistance, but many people in western North Carolina lived continuously at levels that would be rated elsewhere as poverty. Bain, like others, had difficulty determining which persons were destitute solely as a result of the disaster. He also learned that people in every part of the disaster area wanted more relief funds spent in their locality than in the neighboring communities. "Relief work, such as we have been doing in North Carolina," he concluded, "is not a pleasant duty, but it is my opinion that no one is as well prepared to do this work as district engineer officers of the Engineer Department, on account of their local knowledge and organizations for carrying on river improvement work."[42]

"Relief work…is not a pleasant duty, but it is my opinion that no one is as well prepared to do this work as district engineer officers…"

Maj. W. L. Guthrie, who succeeded Schulz as district engineer in Mobile, made an acidic review of the program. He thought much of the public distress resulted from the curse of "absentee landlordism and tenant farming," pointing out that tenants were charged as much as 10 percent interest per month on their credit, plus high percentages of their crops as land rental. He reported the suffering of tenants during the disaster forced many to migrate to the North, and he doubted they would ever return. The disaster therefore became, in his opinion, a blessing in disguise. "Taking this larger view of the situation," he philosophized, "the District Officer is impelled to state that Federal Relief Work is, in general, a mistaken charity."[43]

The political response to the Corps' work relief effort was much more favorable than Guthrie's. Congressman John Burnett sent a letter of appreciation to the chief of engineers on behalf of the people of Cherokee County, Alabama, and in a personal note he declared:

> It was a very happy thought of yours to have the provisions inserted in the bill requiring them to work for the Government aid. It was an innovation in bills of this kind, and while at first there was some opposition to the proposition in the House, its merit soon became apparent and the opposition ceased.[44]

The Corps of Engineers in 1916 won over the secretary of war and Congress to the work relief concept, but engineers in the field supervising the work did not find the mission appetizing, especially the pork-barrel appearance the work took on because 1916 was an election year. The final summary report on mission performance was not completed at the Office of the Chief of Engineers until 1919, and then it was filed away, never printed, and forgotten.

Within the Corps there was no subsequent rush to press for additional work relief assignments. Sturdevant and the Montgomery District, for example, met two disaster challenges soon after the 1916 mission. In February 1917 a tornado ripped across Hollins and Clay County, Alabama, and Sturdevant's survey showed the storm had blown away thirty-six homes, three churches, and three schools. He reported that putting the victims to work on public roads would not help them, because they needed funds to rebuild, and he recommended that this effort be left to the American Red Cross and local charities.[45]

Similarly, when the Alabama River flooded in December 1919 to a stage six feet higher than in 1916, and Corps workboats rescued people from the flood at Montgomery, Selma, and Wetumpka, hundreds were left homeless. The Red Cross and local charities were at work, however, and the Corps did not recommend federal disaster assistance.[46]

Special Regulation No. 67

The Army War College, perhaps interested in differences between the Quartermasters' free ration distribution and the Corps' work relief approach to disaster assistance, recommended to the Army chief of staff in September 1916 that federal policies on disaster relief be reviewed and reformulated. "The idea is to prepare a plan that will be practicable, quickly put into operation, that will afford relief to the really needy," read the recommendation. The chief of staff appointed three officers to a board "to formulate a policy and regulations to govern in future flood relief work of the War Department."

The officers were Maj. Herbert Lord of the Quartermaster Corps, Maj. Frank Cocheu of the General Staff, and Maj. William Kelly of the Corps of Engineers, who had distinguished himself during the 1906 San Francisco earthquake.[47]

The officers asked the chief of engineers to submit information about flood relief missions, and he in turn called for confidential reports from the officers who had supervised work relief in the South during 1916. Their reports candidly revealed their conflicts with members of Congress and local officials who sought political capital from the relief operations, as well as efforts to stop people from attempting to abuse or defraud the federal efforts to issue rations or employ the needy.[48]

In his report, Maj. J. R. Slattery of Vicksburg District described the abuse of free ration distribution during the 1912 Mississippi River flood. He mentioned that certain prominent men in Arkansas laughed about a quartermaster officer who had released rations to them with a free hand and to whom they had awarded a silver service as sign of their gratitude. When the Army adjutant general reviewed this report, he ordered Slattery to name the officer, and Slattery reluctantly named Lt. Frederick Hanna. Hanna then responded that the silver service had been a gift to his wife, presented in the presence of his commanding officer, Maj. James Normoyle, since deceased. The adjutant general advised Hanna that accepting the silver service was not conduct becoming to an officer.[49]

The real issue in contention was whether the Quartermasters or the Engineers would administer disaster assistance in the future. The board in 1917 broadened its studies to include fires, earthquakes, and great calamities in addition to

From Cameron Hill, men view the swollen river and distant bridges in Chattanooga, Tennessee, 1917. National Archives, 27-G-1A-7

floods; nevertheless, its members proved unable to agree upon disaster relief procedures. That June the board submitted three sets of recommendations: a majority report signed by Lord and Cocheu, a minority report by Kelly, and a memorandum of change in the minority report submitted by the chief of engineers.

The majority report, supported by the quartermaster general, required that the senior officer present at a major disaster report the facts to the adjutant general of the Army department commander who had jurisdiction over the area where the disaster occurred. The department commander would then control rescue work and manage relief operations. All military stores and personnel in the area, including Corps of Engineers districts, would at once fall under command of the Army department until relief efforts ended.

Kelly's minority report questioned the Army's authority to undertake disaster relief under the existing regulations, and he believed Congress should spell out this authority in law. He recommended that the Corps' civil works districts take charge of all relief operations during floods and that the district commanders should also command any troops detailed to assist with disaster recovery. During non-flood disasters, the Army's department commanders would command the response.[50]

Differing with both the majority and minority reports, Maj. Gen. William Black, Chief of Engineers, pointed out that the character and duration of disaster relief operations varied widely. He described the 1906 San Francisco earthquake as a disaster of such proportions that command and control by the Army's department commander was necessary; he thought the southern states flood of 1916 and subsequent work relief program a mission best performed by the Engineers; and he mentioned tornadoes,

Floodwaters reached the bridge at McCallie Avenue in Chattanooga, Tennessee, 7 March 1917. National Archives, 27-G-1A-7

requiring only the issuance of tents and rations, as a mission best done by the Quartermasters. Thus, Black recommended a flexible policy wherein the secretary of war in each case selected the best approach to specific disaster situations.[51]

After reviewing the three reports, the War College Division of the General Staff decided the Army's department commander, as the normal representative of the Army within the limits of his territorial command, should manage emergency responses; placing disaster relief work in charge of Corps officers and their civil works districts would be unwise. It recommended that the Army adopt the majority report of Lord and Cocheu, and the chief of staff and the secretary of war concurred.[52]

Special Regulation No. 67 of 12 October 1917 set policies to govern War Department relief work during floods, earthquakes, and other calamities. It made Army department commanders responsible for planning disaster missions within their areas. Appended to this regulation were detachable standard forms for requesting free rations from the Quartermaster Corps and for applying to the Corps of Engineers for work relief. The question of whether to issue quartermaster emergency supplies, or to offer the Corps' work relief program, or to implement other measures was left to the discretion of the individual department commanding generals.[53]

With publication of Special Regulation No. 67, the Army's role in federal disaster assistance entered a new phase. No longer would Corps civil works commanders or quartermaster officers conduct disaster relief operations independently, reporting to the respective chiefs of their corps. After 1917 these officers reported during disasters to the cognizant Army department commander, who made the necessary

assignments. In a 1920 administrative reorganization, however, the old Army departments were abandoned, supplanted by nine corps areas plus the District of Washington, with the commander in each corps area responsible for military activities and emergency response within his designated section of the United States.[54]

Observations

The Corps blamed the labor shortages it experienced during the 1912 and 1913 Mississippi River floods and the losses it suffered during flood fights at the levees in part on the federal practice of providing flood victims with free rations issued by the Quartermaster Corps, a custom that had prevailed since the Civil War. Although the rations were generally of poor quality—often merely cornmeal and bacon—engineer field officers at the civil works districts heard rumors that tenant farmers made homeless by flooding were too lazy to work at the levees if they were given free subsistence. Moreover, rumors circulated that land owners sometimes defrauded the government, taking the free rations, distributing them to tenants, and charging them to their tenants' accounts at the plantation stores. Considering these rumors, and the Corps' need for a flood fight work force, the Corps conceived a new approach: work relief. Rather than receiving free rations, flood victims would earn their subsistence by working at the levees.

After intensely debating the issues, Congress gave the Corps an opportunity to test its work relief approach after the devastating southern states floods of 1916. These floods, however, did not require shoring up the Mississippi River levees and instead involved flood destruction east of the Mississippi and as far north as West Virginia. No levee system there needed restoration, so the Corps instead put the victims to work clearing flood debris from streams and repairing damaged public roads. This work proved useful and the employment relief provided was sincerely appreciated, but the Corps was troubled by the mission's political aspects. First, 1916 was a presidential election year and the work relief assignment smelled of pork barrel politics nationally. Local politics also reared its ugly head in many places, influencing where the work was done and who deserved employment. The field officers in charge found the work relief program both astonishing and unpleasant.

As the work relief mission wound down, the Army initiated a review of its role in federal disaster assistance. It appointed a board to study the merits of free rations versus work relief and to recommend how the Army should manage its emergency responses. Although the board could not reach consensus, and the chief of engineers objected to its conclusions, the majority recommended that Army department commanders control the disaster missions and have authority for a flexible response, using free rations, work relief, or other measures where appropriate. The Army accepted the majority's recommendations, which subsequently limited the Quartermasters' disaster response activities. The Corps' civil works districts maintained primary responsibility for preparations in advance of flooding, for managing flood fights, and for rescuing people and property from floods. None of the Army's department or corps area commanders ever sought to limit or interfere with the Engineers' congressionally mandated programs.

Although the Corps' work relief concept, as applied in 1916, proved abortive, its "no work, no rations" approach to disaster recovery proved appealing to the American public. During the Great Depression of the 1930s, the Roosevelt administration revived and reapplied the work relief concept to restore economic vitality by getting people off the dole and on federal payrolls.

Perhaps it is more than coincidence that many managers of the Civilian Conservation Corps and the Works Progress Administration of the Depression years came from the ranks of the Corps of Engineers and, moreover, that the work undertaken included flood control and stream-channel improvement projects.

Chapter 6 Notes

1. William Caples to Chief of Engineers, 1 Oct. 1915, NARA, RG 77, Engineer Department, "General Correspondence, 1894–1923" [hereafter Entry 103], File 99050.
2. Ibid.; *ARCE* (1916), 3304, 3307–08, 3498–99.
3. *ARCE* (1916), 3304.
4. Leonard Wood to Secretary of War, 4 Feb. 1916, NARA, RG 94, AGO Central Files, Dec. 400.38, File 2473515; *Congressional Record*, 64th Cong., 2d sess., 1916, 2003, 2104–06.
5. *Congressional Record*, 64th Cong., 2d sess., 1916, 2003, 2104–06, 2186–87.
6. Ibid.
7. Dan Kingman to Lansing Beach, 3 Feb. 1916, NARA, RG 77, Entry 103, File 100210.
8. J. R. Slattery to *Vicksburg Herald*, 7 Feb. 1916, NARA, RG 77, Entry 103, File 100210.
9. J. R. Slattery to President, Mississippi River Commission, 7 Feb. 1916, NARA, RG 77, Entry 103, File 100210.
10. *Congressional Record*, 64th Cong., 2d sess., 1916, 2251–52.
11. Ibid., 2275–76.
12. Lansing Beach to Chief of Engineers, 9, 10, and 19 Feb. 1916, NARA, RG 77, Entry 103, File 100210.
13. Dan Kingman to Melville Stone, 11 Feb. 1916, NARA, RG 77, Entry 103, File 100210.
14. All quotations in this section in *Congressional Record*, 64th Cong., 2d sess., 1916, 2367–79.
15. *ARCE* (1916), 3418, 3447–48, 3451, 3485–86, 3491.
16. Vicksburg District Engineer to Chief of Engineers, "Use of Government Boats to Save Lives and Property," 21 Mar. 1916, NARA, RG 77, Entry 103, File 100210.
17. William Hunt to Adjutant General, 15 Mar. 1916, NARA, RG 94, AGO Central Files, Dec. 400.38, File 2473515.
18. Ibid.
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20. Beach and Finch reports, NARA, RG 407, AGO Central Files, 1917–1925, Dec. 400.38, Box 929.
21. Mobile District Engineer to Chief of Engineers, 6 and 10 July 1916, NARA, RG 77, Entry 103, File 101816; see also reports of other district commanders in this file.
22. Edwin Webb to Chief of Engineers, 20 July 1916, and William Black to C. L. Sturdevant, 17 July 1916, NARA, RG 77, Entry 103, File 101816.
23. C. L. Sturdevant to Chief of Engineers, 12 July 1916, and Edward Schulz to Chief of Engineers, 21 July 1916, NARA, RG 77, Entry 103, File 101816.
24. Edward Schulz to Chief of Engineers, 21 July 1916, NARA, RG 77, Entry 103, File 101816.
25. Gilbert Youngsberg to Chief of Engineers, 24 and 28 July 1916, NARA, RG 77, Entry 103, File 101816.
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27. Chief of Engineers to Chief of Staff, 25 July 1916, NARA, RG 77, Entry 103, File 101816.
28. Chief of Engineers to Gordon Lee, 26 July 1916, NARA, RG 77, Entry 103, File 101816.
29. *Congressional Record*, 64th Cong., 2d sess., 1916, 11904–11, 11933, 11990–91, 12006–07, and appendix 1624–25, 2075–76.
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36. Ibid.; Chief of Engineers to Secretary of War, 29 Aug. 1916, and Chief of Engineers, "Report on Operations of Engineer Department for the Relief of Flood Sufferers in the States of North Carolina, South Carolina, Georgia, Alabama, Florida, Tennessee, Mississippi, and West Virginia, August, September, and October 1916," 14 Feb. 1919, NARA, RG 77, Entry 103, File 10271.
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47. W. W. Macomb, War College Division, to Chief of Staff, 25 Sept. 1916, NARA, RG 94, AGO Central Files, File 2473515; War Department, Special Orders No. 251, 26 Oct. 1916.
48. Confidential reports and endorsements in NARA, RG 94, AGO Central Files, File 2473515; and in NARA, RG 77, Entry 103, File 102800.
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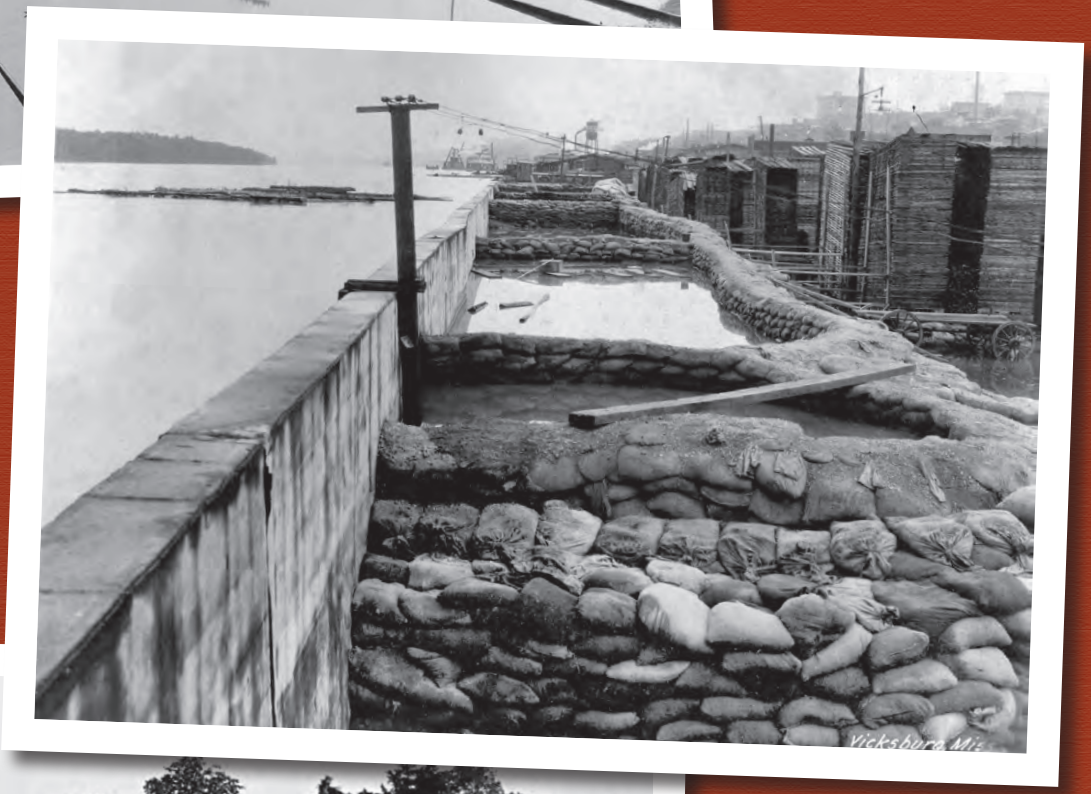
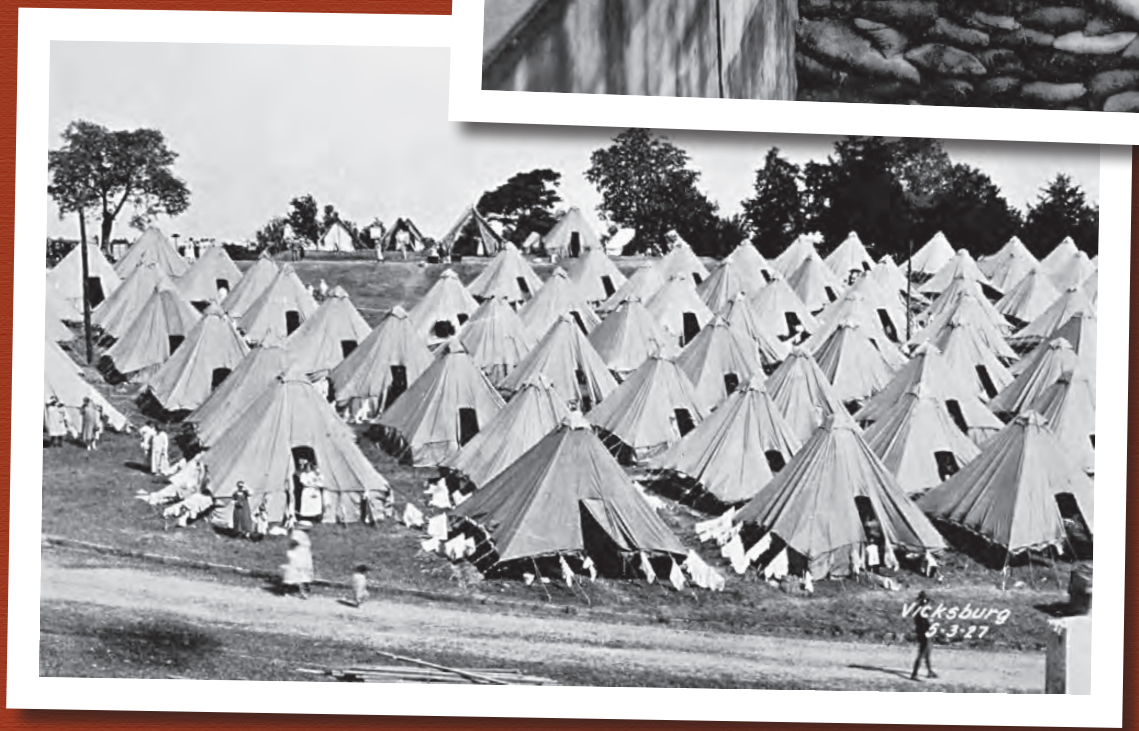
51. Ibid.; William Black to Adjutant General, 21 Mar. 1917, NARA, RG 94, AGO Central Files, File 2473515.
52. Joseph Kuhn, War College Division, to Chief of Staff, 2 June 1917, and Tasker Bliss, Chief of Staff, to Adjutant General, 5 June 1917, NARA, RG 94, AGO Central Files, File 2473515.
53. War Department, Special Regulations, No. 67, *Regulations Governing Flood Relief Work of the War Department, 1917* (Washington, D.C.: Government Printing Office, 1917), passim. The regulations permitted either work relief or free ration issues; paragraph 10 described "plantation rations" as consisting of one pound of cornmeal, a half-pound of salt meat, a gill of molasses, and small quantities of coffee and sugar to be issued at regular intervals; paragraph 44 required employing disaster refugees on government work at wages not exceeding 75% of normal wages.
54. War Department, General Orders No. 50, 20 Aug. 1920.

Left: Floodwaters came perilously close to the Vicksburg city front in May 1927. Office of History



Right: Sandbag cells reinforced a locally-built floodwall at Vicksburg, Mississippi, on 3 May 1927.
National Archives, 68-AM-289



Left: Many victims found refuge in tent camps at Vicksburg in May 1927.
NOAA Photo Library

Roaring Floods of the Twenties

7

The Army's response to natural disasters became increasingly cautious during the 1920s for several reasons. First, Special Regulation No. 67 of 1917 ended the free-wheeling relief work of the Quartermasters and Engineers of earlier decades; under No. 67 these technical corps necessarily coordinated their activities with the commanding generals of the appropriate Army corps areas. Second, the frugal national administrations of the 1920s constricted funding for the Army generally and for its disaster relief work specifically. Where the Army earlier had expected and received nearly automatic validation and reimbursement for its disaster services, several times during the 1920s it had to eat the costs, making its officers wary of rushing to the rescue. Finally, the Corps continued to insist on its "no work, no rations" policy—feeding hungry refugees should be done by the American Red Cross and private charities, not by the Army.

Still, there were memorable calamities that elicited the best work, sacrifices, and even heroism from the Army, the Corps of Engineers, and allied relief agencies. Especially notable is the historic Mississippi River flood of 1927, which was fought to the death on the levees by Corps personnel and was followed by the largest relief and recovery mission since the 1906 San Francisco earthquake. Another highlight came at Pueblo, Colorado, in 1921, when a Corps officer managed what might well be termed the first "modern" disaster assistance mission.

Arkansas River Flood at Pueblo, 1921

Col. William Caples was a disaster "magnet"—catastrophes followed him around the country, from the New Orleans hurricane of 1915 to the Mississippi River floods of 1916 and in 1921 to Pueblo, Colorado. Cloudbursts over the upper Arkansas River basin on 3 June 1921 caused a rapid rise in the Arkansas River and in Fountain Creek at Pueblo. They climbed as much as 3.5 feet in fifteen minutes and overtopped Pueblo's floodwall and levees. The flood crested 6.5 feet over the levees and high velocity currents swept the city, destroying bridges, water supply and sewage systems, telephone communications, and electric power lines. The flood washed out all but one bridge, destroyed five hundred buildings, and drowned 156 people.[1]

Recovery efforts had just begun when Schaeffer Dam up Beaver Creek failed, releasing another wall of water. The resulting flood destroyed the towns of Portland and Swallows and, because Pueblo's flood protection system was already breached, it disastrously inundated the city a second time. The ensuing crisis far exceeded the ability of Pueblo's municipal government to respond.[2]

The city council appealed to Congress for assistance, explaining that property damages exceeded $15 million and that the loss of life could not be determined because the city could not remove the debris and recover the bodies. The council requested funding to clear the

When Fountain Creek in Pueblo, Colorado, flooded in June 1921, bridges and roads were washed out.

Denver Public Library, Western History Collection, Arthur Osbourne Ridgway, Z-5009

debris, restore utility services, and repair flood protection structures.

In the Senate, Lawrence Phipps of Colorado declared that in his opinion the secretary of war had standing authority to render immediate assistance during disasters. Senator Oscar Underwood disagreed: "He may render aid and have his action approved by Congress subsequently, but under the law I do not think he has any authority to do it." Few disputed Pueblo's need, however, and Congress enacted a resolution approving the release of quartermaster rations to the victims and restoration of utility and sanitation systems by the Army without specific restrictions on expenditures.[3]

The Colorado Rangers and National Guard entered Pueblo to secure the city. Under martial law, the National Guard employed every willing citizen in the city to clear flood debris at a fixed wage of $.43 per hour. Transients unwilling to volunteer were rounded up and forced to work without pay under military guard.[4]

The Eighth Corps Area commander ordered Caples to Pueblo with an Army field hospital and sufficient bedding and tents for two thousand refugees. Caples camped with the supplies next to the city hospital, and after observing some refugees leaving with blankets and other

property, he surrounded the camp with wire and arranged National Guard patrols. He did not issue free rations, but the Salvation Army opened a kitchen and mess hall in the camp. Caples then surveyed the ravaged city, estimating damages at $10 million. The flood left some seven hundred homeless, destroyed inventories and bankrupted merchants, and ruined the city's sanitation. The disaster was, he reported, truly one of "national magnitude."

After providing temporary shelter for the homeless and ascertaining the damages, Caples began the "temporary sanitary measures" approved by Congress. He saw three urgent needs: debris removal, water supply restoration, and levee repairs. The secretary of war approved his estimates of $100,000 for debris removal, $80,000 for water supply restoration, and $26,000 for levee repairs. Although the debris removal later proved more costly, the water supply and levee repairs were less, allowing completion of the mission within original cost estimates, a remarkable feat then as now.[5]

The Eighth Corps Area commander sent Company A, 8th Engineers, under Capt. C. E. McKee, from Fort Bliss, Texas, to assist Caples. McKee and his company, with twenty-four mules pulling five wagons loaded with tools, reached Pueblo on 16 June. Caples detailed the

Union Avenue in Pueblo was covered with debris, mud, and silt from the Arkansas River flood in June 1921.

Denver Public Library, Western History Collection, Arthur Osbourne Ridgway, Z-5082

ninety enlisted men to debris clearance, and noncommissioned officers served as foremen of civilian street cleaning gangs. The company later undertook levee repairs, dumping slag from railroad cars and using mule-drawn drag scrapers to place it.[6]

Caples maintained communications with the Army corps area commander by aircraft—the first recorded use of aircraft for disaster relief. He gathered a staff and assigned officers to manage specific missions: debris removal, water supply restoration, levee repairs, finances, personnel, and motor pool. Two of his staff were of the Army Engineers: Capt. S. L. Damon in charge of water supply and Lt. E. F. Barnes responsible for debris removal. For their guidance and for the information of civilian authorities, Caples laid down four principles:

A. Both the city and the private property owners must put forth their utmost efforts. Aid by the United States will be limited to what is clearly beyond their ability.

B. Federal aid will be limited to work of a clearly defined sanitary nature and consist of removal of unsanitary debris and the restoration of sanitary works or equivalent work in lieu thereof. No work amounting to betterment will be undertaken.

Refugee compounds and supplies were surrounded with barbed wire fencing near Pueblo, Colorado, 1921.

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Both the city and the private property owners must put forth their utmost efforts. Aid by the United States will be limited to what is clearly beyond their ability.

> C. All work will be conducted in the most economical manner consistent with preventing disease. Unreasonable demands for rentals, wages, or materials will be rejected, so long as unsanitary conditions are not created thereby, even though the work be greatly prolonged due to lack of adequate force.
>
> D. Unsightliness, high fire risk and objectionable features other than lack of sanitation will not be considered.[7]

These principles guided all work during the flood and its aftermath.

When Caples took charge of debris removal, the city had five hundred workers under the supervision of Capt. Durban Van Law of the Engineer Reserves. Caples combined this force with Company A. Pueblo was buried beneath two feet of mud and collapsed buildings, intermingled with animal carcasses and human remains. Building cellars had filled with debris, but, except at the direction of the U.S. Public Health Service, the workers could not enter private property. Caples agreed, however, to remove the debris after the property owners carried it from the cellars onto the adjacent streets.

Because the flood had drowned draft animals and ruined motor vehicles, the city began the debris removal manually. Caples swiftly mechanized the work, renting motor trucks, cranes, and shovels and obtaining assistance from a motorized Army Cavalry unit. The city council supplied the disposal sites, guaranteeing the United States against damage suits and caring for sanitation at the dump sites. Deposits of river mud were taken to the levees and compacted into place as reinforcement.

Caples and Barnes organized for speedy debris removal. Tractors and wagons hauled animal carcasses to crematories outside town. Army tractors and tanks smashed and pulled down buildings strewn across public streets. Steam-powered cranes and clamshell shovels were each assigned nine to twelve trucks that carried the debris to the dump sites; labor gangs trailed the heavy equipment to shovel remaining debris into wagons. By 13 August, when the job was finished, the Army, employing 330 men for fifty-one days, had removed 106,440 cubic yards of debris at a cost of $115,000.

The city of Pueblo had signed a cost-plus contract for repair of its levees, but Caples, who thought cost-plus contracts extravagant, refused to accept any arrangement whereby the federal government reimbursed the costs. He took over the levee repair job on 26 June, the city closed its contract, and Caples rented the contractor's equipment—at a figure estimated to give the contractor a $1,500 profit—and put Company A, 8th Engineers, to the task.

After consultation with Adelbert Weiland, a local member of the American Society of Civil Engineers, Caples determined that area soils were adequate for levee foundations and the Pueblo levee failures had resulted from overtopping. About 27,500 cubic yards of earth fill and 1,814 cubic yards of furnace slag paving closed the six levee breaks at a cost of $18,497.74. "All that has been done," reported Caples, "is to give

Crews repaired the levee at Fourth Street along the flooded Arkansas River in Pueblo, June 1921.

Denver Public Library, Western History Collection, Arthur Osbourne Ridgway, Z-5147

the city the same measure of protection which formerly existed until such time as it can be decided what measures will be necessary to give adequate flood protection."[8]

While levee repair plans were underway, Caples turned to Pueblo's water supply. The city's supply system was an antiquated, makeshift relic of earlier times before the city had formed through the merger of several small towns. The flood had destroyed one of the city's water storage dams and had broken many of the old water mains. At Caples' request the chief of engineers sent hydraulic engineer J. A. Grant to help plan the water supply restoration.

Caples rejected many of the projects the city's water commission requested because the work could be classified as "betterments." The commission, for instance, wanted the Army to repair the water mains, but Caples refused because the mains had been cheaply built, they were in perilous condition before the flood, and, he said, it "would have been hard to stop short of rebuilding the water system."[9]

Damon managed repairs to Pueblo's water supply dam. The city asked for a concrete gravity dam; the engineers, receiving excellent cooperation from local industry, instead built an economical rock-fill dam with an impervious slag core. The Denver and Rio Grande Railroad furnished pile drivers, engines, crews, and most materials at actual cost; and the Colorado Fuel and Iron Company furnished a crane and crew at nominal cost together with the slag used in the dam.

In July the pile drivers pounded steel rails across the old dam and the break, forming a trestle for slag and stone delivery. Dumping materials from the trestle to rebuild the dam stopped on 2 August when a sudden cloudburst and flood washed out the construction trestle; however, the dam was nearly completed and withstood the test. The engineers completed the dam in August at a cost of $26,000.[10]

When Caples closed the mission at Pueblo in August, he and his team had cleared the debris from all streets and alleys, restored flood protection, and repaired the water service. Caples lacked the authority to do more, although he admitted that permanent rehabilitation of the city and its people remained to be accomplished—a task he thought should be done by the city itself rather than the Army.

"One great and very important problem is the prevention of disasters such as occurred here," summarized Colonel Caples at his mission's end. "This problem concerns not merely the city of Pueblo but also the whole valley of the river in three states. Additional Federal aid in the study of this problem, as has been granted in the Mississippi, Ohio, and Sacramento Valleys, appears to be well justified." In this remark he referred to the flood control measures that Congress had approved in 1917 for the three basins he named; but Congress did not extend similar measures to the Arkansas and other rivers until the late 1930s.[11]

The city of Pueblo and the state of Colorado asked the chief of engineers to assign Caples to stay on after the recovery period to plan additional flood protection for the city. Lacking the authority and funds, however, the chief declined their request. Instead, the city contracted its flood protection study to Arthur Morgan, who had designed and built a flood control system for Ohio's Miami River basin.[12]

The work of Caples and his colleagues at Pueblo in 1921 seems, in retrospect, to be the first "modern" disaster relief mission performed by the Corps of Engineers. Tasks included clearing debris, supplying temporary housing, restoring water supply, and repairing flood protection structures. That work, and the policies and priorities set in accomplishing it, presaged legislation of the 1950s that set modern disaster assistance policies and activities. In fact, with only minor revisions, Caples' after-action report on the Pueblo disaster might easily substitute for more recent after-action reports such as that written on the Johnstown, Pennsylvania, flood disaster of 1977.

Mississippi River Flood, 1922

When Brig. Gen. Lansing Beach became the chief of engineers in 1920 he had definite opinions about the disaster relief mission. He had, after all, been the Corps officer who first questioned the value of issuing free rations when workers were sorely needed on the levees. The "no work, no rations" policy was his. When a flood came roaring down the Mississippi in the spring of 1922, therefore, he quickly reassured the Vicksburg District commander: "All relief will be furnished by the Red Cross. No rations will be issued by the Government."[13] Much of the 1922 flood came out of the White River and set a new record from its mouth down the Mississippi to Carrollton, Louisiana; as a consequence, the severest test fell on Maj. J. A. O'Connor commanding at Vicksburg

and Maj. Richard Coiner at the Fourth MRC District at New Orleans.[14]

With the cooperation of local levee districts, O'Connor and the Vicksburg District raised many miles of levees in advance of the flood. The water climbed 1.5 feet higher than previous records at Vicksburg, however, and the flood fighters were nearly exhausted when the landward side of a levee near Arkansas City sloughed down into the borrow pit, threatening to break open a crevasse. Reporting that the effort had exhausted local resources, O'Connor urgently requested a $250,000 allotment to continue the fight.[15]

"My action is somewhat contrary to regulations, but the present emergency demands it. This communication is not written from an alarmist point of view."

"My action is somewhat contrary to regulations, but the present emergency demands it," O'Connor stated. "This communication is not written from an alarmist point of view. We have every confidence of preventing a break. Difficulties undoubtedly will arise when we come to the question of settlement, and I am sending this forward requesting support for my action. Congressional action seems necessary." Congress wisely appropriated $1 million in response to O'Connor's plea.[16]

O'Connor recommended that Army Special Regulation No. 67 be implemented to care for refugees fleeing the backwater (water accumulating behind the levee system because it could not flow into the flooded river), but the secretary of war declined the request. The secretary did not consider backwater flooding an unexpected catastrophe warranting Army support. Although he thought loaning tents as emergency shelter, with costs borne by local communities, might be acceptable, he did not approve general application of No. 67.[17]

The argument of the secretary and Beach against issuing free Army rations gained support from Louisiana's Governor John Parker, who was determined to care for flood victims with state resources and Red Cross assistance. He urged Beach, however, to dispatch Corps officers to help local levee managers hold the line. Beach sent Maj. John Butler from Florence, Alabama, and Maj. Paul Reinecke from Galveston, Texas, to Louisiana and assured the governor that anything necessary "to help win the high water fight will be done. May we be successful."[18]

Observing growing hysteria over the free rations issue, O'Connor at Vicksburg requested that the secretary of war release a statement that all disaster assistance would come from the Red Cross. O'Connor reported: "Owner of overflowed island stated if Red Cross issues rations he will care for his own help, that he never gave Red Cross enough [to] entitle him to assistance now. But if government issues rations he is going after everything coming to him. My opinion [is] my recommendation will simplify and expedite relief question for all concerned."[19]

The secretary telegraphed the Fourth Corps Area commander that federal aid would be strictly limited and warned:

> Undoubtedly numerous calls for relief will be made. These must be resisted and your

Workers added reinforcements to a threatened break in Ashbrook Dike on the Mississippi, 26 April 1922. Office of History

"Owner of overflowed island stated if Red Cross issues rations he will care for his own help….But if government issues rations he is going after everything coming to him."

representatives warned that no authority of law exists for same except under conditions stated in paragraph one Special Regulations sixty-seven which must be strictly adhered to. Primary function of District Engineers and their equipment is levee protection and repair work and no calls on them for relief work will be allowed to interfere with this primary function. Food supplies will be issued only after War Department approval of recommendation made by you and concurred by in District Engineer Officer and local levee board officials.[20]

The American Red Cross managed practically all relief and recovery activities during and after the 1922 flood. The Corps relief effort at Vicksburg consisted only of using its boats to take refugees from the lower Tensas basin to safety. At the request of Louisiana's governor,

the secretary of war directed the Fourth MRC District commander to loan supplies to the Red Cross: Coiner sent 1,646 tents, 18 ranges, 1,040 cots, and 1,090 sleeping bags.[21]

Thus the Corps of Engineers effectively held the line against issuing free rations during the 1922 flood on the Mississippi, also holding the main levee line without crevasses. This success made the Mississippi River Commission overly optimistic about the levee system. Four years later, the commission predicted that a glorious end to the fight for control of flooding along the lower Mississippi River was at hand.[22]

Convict labor and mules worked to stop a levee slough in the Upper Yazoo River basin near Tunica, Mississippi, 1922.

National Archives, 77-RH-34T-1

A tornado severely damaged Lorain, Ohio, on 28 June 1924.

National Archives, 27-G-15-28244-B

Five Minutes of Hell on Earth, Lorain Tornado

"At 14 minutes after 5 o'clock, the monster of the heavens came lashing and crashing through the city—killing, maiming and wrecking in its path. It was five minutes of hell on earth for Lorain," reported a colorful contemporary account of the tornado. Lorain, Ohio, a Lake Erie port, was a Saturday-night town in 1924. Farmers and transients from miles around were in Lorain on Saturday, 28 June, when a tornado struck, killing seventy, injuring six hundred, and damaging every downtown building and some five hundred homes in outlying sections. Although Red Cross director Henry Baker had

"…the monster of the heavens came lashing and crashing through the city—killing, maiming and wrecking in its path."

participated in eighty-seven previous disaster recoveries, he lamented: "It is the most complete destruction I have ever seen."[23]

At the request of Lorain's mayor, Ohio's governor sent the National Guard and asked for charitable contributions—eventually half a million dollars in aid went to Lorain. The commander of the 112th Engineers of the Ohio National Guard at Cleveland mobilized his troops by telephone that evening and hired thirty-five taxicabs to rush them to Lorain. As the first troops to reach the stricken city, the engineers secured the streets and established their camp among the fallen trees on the public square.[24]

Col. Spencer Cosby, the Great Lakes Division commander for the Corps, motored from Cleveland to Lorain to inspect the damages and report. "The wonder is," he asserted after seeing the mess, "that the loss of life was not much greater considering the extent of the damage."[25]

Cosby saw no wrecked boats or damages to the harbor's breakwaters on Lake Erie that required the attention of his office. He wended through the debris, located the 112th Engineers' commander, and offered any materials, personnel, or other assistance that the Great Lakes Division might muster, but the National Guard had matters in hand. Every street corner was guarded; gangs of workers cleared the debris; and volunteers, food, and medical supplies came to Lorain from all directions. Cosby reported to the Fifth Corps Area commander that state and local authorities controlled the situation and federal disaster assistance was not needed by the Lorain tornado survivors.[26]

Most natural disasters, even on the smallest scale, drew the Corps' attention. The nearest officer surveyed damages and reported, responding to the emergency if need be and, if not, as in the case at Lorain, recommending that no federal action be taken. But even smaller disasters could lead to complications, as was the case in 1925 on the Altamaha River.

Georgia Rivers Flood, 1925

When heavy rain in January 1925 flooded southern Georgia's rivers and inundated several towns, Georgia's senators requested action from the secretary of war, who ordered the commander of Fort Screven, Georgia, to investigate. Aboard a boat supplied by Capt. Dan Sultan, commanding Savannah District, several Army officers toured the stricken area. They recommended federal assistance for the flooded Georgia towns of Newton on the Flint River and Townsend near the Altamaha.

Newton, where houses had been submersed to the eaves, suffered from a great threat of epidemic disease. Fort Screven's commander therefore sent a Medical Corps detachment to the town, where they opened a dispensary. No epidemic ensued, the flood subsided, and no further federal assistance was offered.

Floodwaters had isolated Townsend, and Sultan sent a motor launch to transport rations and cots from Fort Screven to the community. The launch steamed by sea to the Sapelo River, then to Cedar Point, where rowboats distributed the emergency supplies to the needy.

The Altamaha flood relief mission ended in February after the Red Cross had spent $3,500 on recovery and the Army had issued supplies worth $733.57.[27] Reviewing this account, the War Department budget officer noted the small cost to the Army, and he recommended that the Army not ask Congress for reimbursement and merely request a resolution validating its actions.[28]

Although the amount was small, the principle was important to Brig. Gen. Fox Conner. He disagreed with the budget officer, complaining:

> The Army's humane work is a necessary National service and should be continued. No provision is made for it in the Budget. Formerly the Army could undertake this work with confidence that it would not suffer in consequence because Congress would reimburse it for its necessary expenditures. The action in the case of the Japanese relief has removed this feeling of confidence.[29]

"The Army's humane work is a necessary National service and should be continued."

Conner made the $733.57 an issue because the Army came out the loser in the aftermath of the terrible Japanese earthquake of 1923. After the quake had killed many thousands, Brig. Gen. Frank McCoy headed an American relief expedition to Japan with military doctors and nurses

Two men in a boat attempted to rescue a cow in the Flint River's high water near Albany, Georgia, January 1925.

Courtesy of Georgia Archives, Vanishing Georgia Collection, dgh246-86

An earthquake devastated Tokyo and Yokohama, Japan, on 1 September 1923. Brig. Gen. Frank McCoy headed an American relief expedition with military doctors and nurses and Army supplies from San Francisco.

U.S. Geological Survey Photographic Library, George A. Lang Collection, No. 4

and Army supplies from San Francisco. Total cost of the expedition exceeded $6 million.

This relief expedition had been initiated with the approval of President Warren Harding but without advance authorization and funding by Congress—a practice that had been standard for the Army for years. When it came time to settle accounts, however, Calvin Coolidge had succeeded Harding as president, and Coolidge did not dispense federal funds with quite the free hand that had characterized the Harding administration. Coolidge disapproved the Army's request for a deficiency appropriation to replace the Army supplies dispensed to the Japanese earthquake sufferers. It did not fit into Coolidge's budget.[30]

The Army's loss of funding for the relief expedition to Japan, in an era of severely constricted federal budgets, shook officers such as Conner. They lost confidence that the Army's emergency relief activities would be automatically approved and reimbursed. The Army's budget officer sought to reassure Conner by commenting that Congress always replaced Army supplies dispensed during emergencies if the Army's normal operations demonstrated a need for the replacements, and that the president had decided the costs of supplies issued to the Japanese earthquake victims would not disrupt the Army's normal functioning. Because these costs had totaled more than $1 million, the budget officer asserted the loss of $733.57 worth of supplies issued to Altamaha flood refugees surely did not adversely affect normal Army operations.[31]

After reviewing the comments by Conner and the budget officer, Secretary of War Dwight Davis concurred with the budget officer. He merely asked Congress to confirm the validity of the Army relief work on the Altamaha River and charged the $733.57 to contingencies.[32]

A direct cause-effect relationship between the fiscal decisions on the Japanese earthquake and the Altamaha flood and the reduced scope of total Army response to disasters of the late 1920s and the 1930s cannot be established. The reduced role may be attributable to other circumstances: the increased resources available to the American Red Cross, the Corps' "no rations" policy, the formation of federal work relief agencies during the Depression, or the tight-fisted military budget (when the Army often trained Reserves and Guard units with wooden weapons because it could not afford the real thing). Certainly the fiscal decisions on the Army's disaster missions could not have enhanced its response, because officers familiar with those decisions might have hesitated before rushing to the rescue.

Mississippi River Flood, 1927

In October 1926 the Mississippi River rose to a forty-foot stage at Vicksburg. Maj. John C. H. Lee noted that in previous years when the river surpassed the thirty-foot stage in October, a major flood followed in the spring. He ordered the Vicksburg District to prepare emergency mobilization plans with contingency procedures for all flood categories. Working with local levee boards, the district established an emergency management organization with complete plans for levee patrol, labor and equipment deployment, and public relations activities.[33]

Streams in the Mississippi valley remained at high levels through the autumn of 1926, and on New Years' Day a new record flood crest hit Nashville on the Cumberland River. Precipitation continued to fall on wet soils, and by March the Mississippi River Commission knew that major floods were headed down from the Ohio, Tennessee, and Missouri rivers. Water stood against the Mississippi levees throughout March, and they became saturated. Still, the commission thought the levees would hold and could withstand even greater flooding, provided high winds and waves did not erode them or floods from the Arkansas, White, and Red rivers did not also attack them. In April and May the Corps of Engineers proved luckless—every combination of nature worked against the levee protection.[34]

On 1 April the Mississippi River Commission advised Maj. Gen. Edgar Jadwin, Chief of Engineers, that the worst flood of history was expected. Thus forewarned, Jadwin informed the secretary of war that all Corps boats on the Mississippi would be needed to conduct the flood fight, and he asked that no boats be diverted from this work to perform disaster relief duty. The secretary so ordered.[35]

When the Corps inspection boat, the *Inspector*, reached Cairo, the rivers stood against the floodwall there at 56.3 feet on the gauge, a foot and a half higher than ever before recorded. Cairo had become an island in an inland sea. Cairo's leaders boarded the boat to plea for help; they were exhausted but still fighting with their backs to the wall.[36]

Maj. D. H. Connolly at Memphis committed all his men and equipment to the flood fight, battling the flood successfully, except for one crevasse at Dorena, Missouri, opposite Hickman, Kentucky. There the river stood at record levels, but from Columbus, Kentucky, south to Memphis its crest averaged a foot less than the record set in 1913.[37]

South of Memphis, however, the 1927 flood exceeded previous records, sometimes by up to four feet. Had it not been for crevasses releasing water into the back country, the flood would have overtopped the levees. The Corps could never have won a fight against such a flood, and some of its officers knew it at the time. Maj. W. H. Holcombe at the MRC in New Orleans later explained why he had continued the hopeless sandbagging of the levees. It would have accomplished nothing, he declared, "by telling the people behind the levees that further topping was unnecessary because the river would break through above, nor would any attempt to curtail the work have been possible under the tense conditions then existing. A high-water fight on the Mississippi River is about the nearest thing to war imaginable, and morale must be kept up just as in military operations."[38]

"A high-water fight on the Mississippi River is about the nearest thing to war imaginable…"

Confronting major floods on the Mississippi, White, and Arkansas rivers, Lee divided the Vicksburg District into six sectors, each with a separate commander, and he inspected the action daily, flying over in a crop duster loaned by the Department of Agriculture. He requested seaplanes and pilots from the Pensacola Naval Station and converted the snagboat *John N. Macomb* into a floating refueling base for the aircraft. Thirteen Navy seaplanes transported medical supplies and located stranded refugees from the air but did not attempt rescue because of the hazards of landing amidst snags and floating debris.[39]

Shortwave radio sets like this aboard the Nashville District towboat *Warioto* maintained communications during the floods of the 1920s and 1930s.

National Archives, 77-RH-33VV-3

Radio communications first played a significant role in disaster relief during the 1927 flood. The larger Corps boats were radio equipped, and Navy radios were installed on other craft during the emergency. Maj. Stuart Godfrey aboard the *Inspector* noted on 21 April: "Only the radio connects us with the outside world—and what a satisfaction to have that, even though its messages today can bring little comfort." The radio brought news that a levee crevasse had flooded Greenville, Mississippi, and the Arkansas River levees near Pendleton, Arkansas, had failed.[40]

Both the river and the sandbag stacks atop the levees continued to rise. Workers on both sides of the Mississippi determined that when a crevasse came it would be on the opposite bank. "We were truly catching hell and high water," remarked Lee, describing the high winds on

Convicts constructed a mudbox atop a levee near Fulton to hold out the Mississippi River flood in 1927. National Archives, 77-MRC-5-94431-92

the night of 21 April that sent waves crashing against the levee while driving rain drenched the workers piling on the sandbags. Lee penned a vivid account of the flood fight at North Bend levee on the Arkansas River:

> During the fight much heroism is possible, and we had our share. The men who were defeated at Pendleton during a storm on the afternoon of April 21, when the waves washed off the sacked topping and the men were unable to stand, moved on up the line to South Bend to make the fight there. A spur dike had caved in to the levee line and a vicious current sweeping around the point was eating into the main levee. For ten days, they held this front. The levee itself

"The men in charge worked in water until they could no longer wear shoes over their swollen, blackened feet."

The Cabin Teele levee crevassed at Madison Parish, Louisiana, in May 1927. Office of History

was almost entirely eaten away and only held by a new sack levee built up behind. Added to this great difficulty was sand-boil trouble. Huge springs would break out behind the levee and even on the embankment slopes—boiling up sand. They had to be checked immediately to avoid disaster. The men in charge worked in water until they could no longer wear shoes over their swollen, blackened feet. But they did not stop …. It was here that Captain Porterfield lost his life. He was the master of one of our hydraulic graders.[41]

"Defeat after a fight like that is bitter."

The Corps delivered more sandbags to the levee by aircraft, and the fight continued. National Guardsmen and state convicts joined the work force and put up the bags for ten days and nights. Finally the river went over the top. "Defeat after a fight like that," lamented Lee, "is bitter."

Following its loss on the Arkansas River, the Vicksburg District focused its attention on the crisis at Cabin Teele on the Mississippi. Water from an upstream crevasse cut south over the bottomlands through the Yazoo basin to Vicksburg where it again entered the river. It climbed 4.5 feet up the levee's sack topping on the Louisiana side and broke through at Cabin Teele. As the pressure threatened to widen the crevasse, Lee directed a week-long campaign there, dropping in barge-loads of stone to stabilize the levee. This effort stopped the spreading crevasse, and Lee estimated that it saved a quarter-million dollars worth of levee repairs and damages to the region behind it.[42]

In these appalling conditions, the Corps surrendered its effort to hold out all of its boats for the flood fights. As the levees caved away, rescue and relief became imperative, and Corps towboats from the St. Louis, Cincinnati, and Louisville offices went south to concentrate at Memphis as reinforcements.[43]

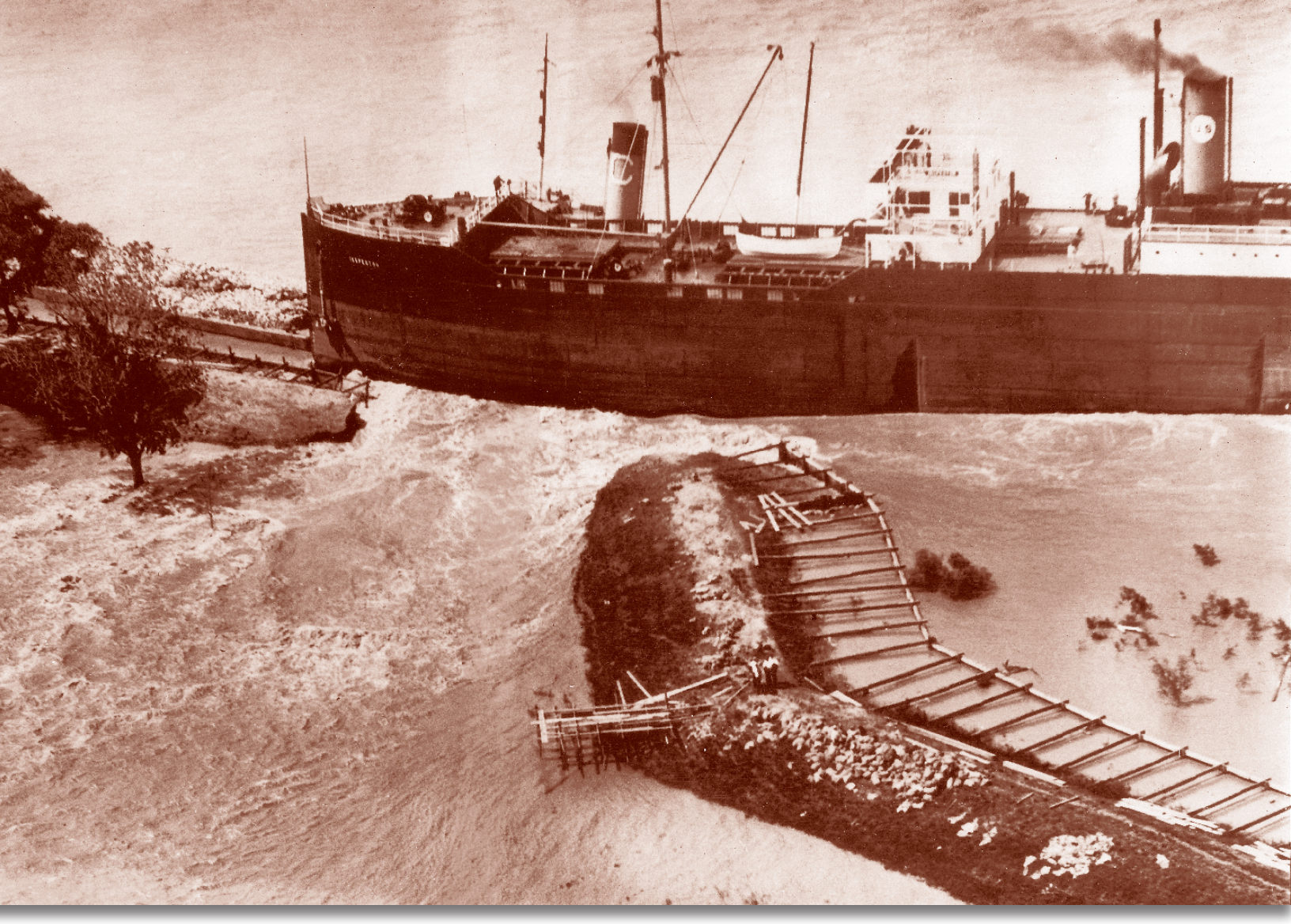
As the fleet headed south, the Mississippi River Commission aboard the *Inspector* landed at Greenville where they were greeted by an unforgettable scene. Godfrey attempted a description:

> The hundreds of families, white and black, living huddled in tents or rude shelters or having no shelter; the long lines filing past the savory soup kitchens for their dole; the other columns waiting to be "shot" by a busy doctor with typhoid vaccine; the cows and horses and dogs of every description wandering up and down the levees; the furniture, every kind of treasured junk imaginable; the stories of how the levee went out in spite of the most desperate fight to hold it; the five babies that were born on the levee last night![44]

Holcombe, who managed the flood fight below Vicksburg, had to contend with record floods coming down the Red, Black, Tensas, and Ouachita rivers and an unusual condition at the Old River, which connects the Red and Atchafalaya rivers with the Mississippi. Ordinarily the Old River flowed from east to west, but in 1927 it flowed first in one direction, then in the other, and finally in both directions at the same time. First, it carried the Mississippi flood west to the Atchafalaya, then the Red River flood east to the Mississippi, and, after those floods had passed, it carried backwater from the Tensas River into the Mississippi and Atchafalaya rivers simultaneously.

In Holcombe's district, an average of six thousand workers, with a peak of fifteen thousand, worked on the levees each day for more than six weeks. Some were lodged aboard nineteen Corps quarterboats and five barges, the largest of which bunked four hundred. The equipment included fifty scrapers, five thousand wheelbarrows, ten thousand shovels, seventy-six barges towed by ten steamboats, plus levee machines and derricks. These moved three hundred thousand cubic yards of earth, eight million sandbags, and five million board feet of lumber during the flood fight at a cost of $2.5 million, an expense that Holcombe felt was more than justified. "War is always expensive," he declared, pointing out that many levee breaks were prevented, and any one of them could have resulted in property damages exceeding the cost of the flood fight.[45]

"…the five babies that were born on the levee last night!"



A tanker ship collided with a levee on the Mississippi River forty miles downstream from New Orleans on 23 April 1927.

National Archives, 27-G-1A-4

As much as fourteen inches of rain fell in the lower Mississippi valley, flooding New Orleans behind its levees because its pumping system could not handle such a downpour. Then on 23 April a tanker ship accidentally rammed the levee forty miles downstream of the Crescent City, causing a crevasse.[46] Fearing further disaster, the city asked that the Caernarvon levee between Poydras and Braithwaite be deliberately breached to relieve pressures on the levee in front of New Orleans. The city and state government promised to reimburse land owners for property losses in the sparsely populated area to be deluged. Citizens of the parishes that would be flooded held mass protests, arguing the levee's destruction would be futile and the flood would break levees upstream of New Orleans without human assistance.[47]

The secretary of war told Louisiana's governor that he would not oppose the destruction of Caernarvon levee, provided the chief of engineers and the Mississippi River Commission did not object. On 25 April a delegation from New Orleans met with the MRC aboard the *Inspector* and passed a resolution requesting the chief of engineers approve its request to breach the levee. Jadwin reached Vicksburg the next

day and conferred with the MRC. Subsequently, Jadwin and the commission raised no objection to the levee's destruction. Jadwin emphasized, however, that the Corps would not take part in its destruction nor issue a permit for the breach; it would merely withhold objections.[48]

The first dynamite charges detonated at Caernarvon on 29 April opened only a trickle through the levee. Two days later, diver Ted Herbert placed underwater charges that fully opened the crevasse, and the flood stage at New Orleans began to subside. Those blasts, historians have noted, dynamited the "levees only" policy out of existence. In 1928 the Mississippi River Commission ceded much of its independence to the Corps of Engineers, and following the blasting of the levee the Corps and MRC began planning floodways, reservoirs, and other engineering measures to supplement the protection afforded by the Mississippi River levee system.[49]

The 1927 Flood Relief Mission

"This flooded area vitally in need of martial law," proclaimed Lt. A. C. Dimond in his 25 April report on flood conditions at Hollandia, Mississippi, to the Army's Seventh Corps Area commander. "Need soldiers and motor boats," he urged. "Unless some help is furnished quick people are going to drown like rats."[50]

In response to this and similar critical situations, rescue operations got underway. Corps floating plant was assisted in the mission by all available private craft, including the giant steamboat *Sprague* and Standard Oil Company towboats for the massive evacuation of Greenville, Mississippi. One observer of the Greenville situation related:

> There on the levees were men and women whose wits had fled, for they had seen loved ones swept away and disappear, their fates unknown, imagination dictating but one thought. There were broken arms and broken legs, untended wounds, desolation, despair. There was lack of food and shelter, the nights cool to coldness, danger of sickness. There was death and no burial place but the river.[51]

The suffering affected rich and poor, though the latter were often pushed to the very limits of survival.

Recognizing the crisis demanded action, President Coolidge appointed a Mississippi Flood Committee, headed by Secretary of

"Unless some help is furnished quick people are going to drown like rats."

Commerce Herbert Hoover, who had directed American relief efforts during the First World War. Hoover and Jadwin selected Memphis as the disaster relief headquarters, with the commanders of the Fourth, Fifth, and Sixth Army corps areas coordinating activities through a liaison officer sent to Memphis. The Red Cross supplied food and medical aid while the corps area commanders furnished quartermaster tents, cots, blankets, and mobile kitchens. Quartermaster supplies issued during the 1927 flood relief mission totaled a staggering $2.5 million.[52]

"There were broken arms and broken legs, untended wounds, desolation, despair.... There was death and no burial place but the river."

The Army, Navy, Coast Guard, Public Health Service, and Corps of Engineers sent representatives to Memphis to assist Hoover in planning the disaster assistance. Hoover appointed a Railway Transportation director and a Refugee Depot director, and Col. George Spalding from the Louisville District became Hoover's Water Transportation director, in charge of boat rescue and logistics operations.[53]

Spalding organized the rescue work as if it were a military campaign, with an advance guard, main body, reserves, and lines of supply. Captains J. C. Gotwals and Douglas Gillette headed the main rescue fleet collected at Memphis to follow the flood downriver. Capt. Lewis Pick became Hoover's aide, relaying to the secretary the engineering data sent by the Corps.[54]

The rescue fleet comprised 72 towboats, 163 motor boats, 255 barges, 27 aircraft, and 328 small boats from the Corps, Coast Guard, Navy, and private owners. The aircraft performed field reconnaissance. The towboats and barges, surrounded by small craft, steamed up bayous to moor at strategic spots, then the small boats scattered to locate the refugees and return them to the mother ship for sustenance and medical attention. After the towboats and barges filled with refugees, they steamed to the Army tent camps operated by the Red Cross and policed by the National Guard. In the disaster area the Red Cross operated 154 camps caring for more than three hundred thousand people.[55]

Godfrey remembered the days at Hoover's headquarters as a confused succession of broken levees and unbroken hours of work, of supply boats running shuttles to the camps, of shifting pins on a big campaign map on the wall. He was impressed by Secretary Hoover's grasp of all phases of disaster relief. Each morning, Hoover studied the maps, conducted a conference to hear reports from his department heads, and then issued his daily orders.[56]

Hoover kept in mind the limits of his relief committee's role, and, directing a federal program in southern states, he felt compelled to outline his thinking on federal disaster assistance policy:

> I believe in state rights, but state rights carry with them state responsibilities. We will rescue and feed and give medical care and clothes to every person in need for four or six weeks or whatever time is necessary. We will move them back to their homes. We may be able to give them cotton seed for the crop which still can be planted and harvested this year. But the longer work of rehabilitation must be met by the states themselves.[57]

Hoover, who was in effect the first coordinator of federal disaster assistance, emphasized the policy characteristic of national administrations of the 1920s: cooperative responsibilities between the public and private sectors and between the federal and state governments. He arranged a post-flood rehabilitation effort, for example, by organizing local bankers into corporations to finance low-interest loans to planters and sharecroppers on a business basis.

Flood victims at Arkansas City, Arkansas, camped on the levees in May 1927. Office of History

Stories from the time recount how, in a meeting with Memphis bankers, he demanded they raise a $5 million rehabilitation fund before his train left that evening. If the requested funds were not made available, he threatened to begin moving the flood refugees—the regional labor pool—north for resettlement that very evening. The bankers found the necessary capital.[58]

As was often the case, the American Red Cross received public criticism for its programs during the 1927 flood. The Corps of Engineers, however, recognized the Red Cross's meager funds and only semi-official status curtailed its response ability; indeed, the Corps had little save praise for the agency. The sole Corps critique came from Lee, who contended the Red Cross lacked a clear chain of command, resulting in confusion. He suggested the Red Cross could improve its management by recruiting retired military officers accustomed to command.[59]

When the Corps closed its emergency operations in June, Spalding took the occasion to highlight the connection between military preparedness and disaster assistance. "True military preparedness is never a waste, but a bulwark of defense against attack and a reservoir of relief for the Red Cross in case of disasters," he philosophized, concluding grandly: "And the officers and men of the Army and Navy … form an organized force that will serve just as willingly and just as loyally in peace in relief work under the great banner of the Red Cross, as we will in battle under the Stars and Stripes."[60]

Observations

The Corps suffered a major defeat and achieved a significant victory in its disaster work during the 1920s. The 1927 flood and the devastation

The engineer steamer *Tuscumbia* unloaded flood victims and mules on 18 May 1927. National Archives, 77-MRC-3-88

it visited upon the Mississippi Delta forced a wholesale reappraisal of the Corps' levee policy and galvanized legislative and popular support for comprehensive river improvements that would include levees, bank revetments, cut-offs, outlets, and reservoirs. The landmark 1928 Flood Control Act and subsequent legislation in 1936, 1938, and 1941 set the Corps on a course to become the nation's premier dam builders.

The Corps persisted in its campaign to squelch the issuance of free quartermaster rations during disasters, instead offering the victims useful employment as "work relief." Its policy prevailed against strong public protest, and by 1927 emergency food was supplied by the Red Cross and private charities, not by the Army. Indeed, the "work relief" concept became a principal tool in combating the economic depression of the 1930s, and many Corps of Engineers officers became managers in New Deal agencies.

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Right: The Quartermaster Depot at Jeffersonville, Indiana, was flooded on 27 January 1937 with immense loss of government property.

National Archives, RG407, AGO Central File 1926-1939, Decimal 400.38

Left: A levee was heavily sandbagged along the Nonconnah Creek backwater south of Memphis, 10 February 1937. Office of History

Below: Floodwaters filled city streets in Huntington, West Virginia, 25 January 1937, interrupting a showing of *The Charge of the Light Brigade* at the Orpheum Theatre. Huntington District

Emergency Service and Military Training

8

Lt. Gen. Leslie Groves became famous during the 1940s as the builder of the Pentagon near Washington and as head of the Manhattan Project, responsible for developing the first nuclear weapons. Both projects involved intensely difficult management tasks and were extremely stressful and urgent, and scholars studying them may wonder where Groves received the training that permitted him to manage them so successfully. Groves had indeed managed emergencies before the Second World War, once during a natural disaster in Vermont and again in Nicaragua. These missions have long been largely forgotten, and Groves did not even mention them in his autobiography, yet they merit historical attention as samples of the symbiosis between emergency response and military mobilization or crisis management in any form.

When the superfloods of 1936 and 1937 afflicted the nation's midsection as the greatest natural disasters of the era, officers in addition to Groves distinguished themselves by service in peace as well as in war. During the Depression years, Congress and the president had at their disposal the forces of the Civilian Conservation Corps and Works Progress Administration, two work relief agencies offering useful labor for the unemployed, and used these forces to the maximum for post-disaster recovery and rehabilitation efforts. The American Red Cross managed the immediate relief needs of refugees, thus leaving the Corps of Engineers to pursue its primary objective: shoring up the levees to prevent flood damages. Largely as a result of public support generated by the losses endured during these floods, Congress acted in 1936 and again later to assign the Corps the mission to reduce flood damages throughout the nation.

Vermont Flood, 1927

The Winooski River cut Vermont's capital off completely from the outside world in November 1927. Eight inches of rain in thirty-eight hours destroyed 1,258 bridges in the Green Mountain state and severed all telephone and telegraph lines into Montpelier. Desperate for information, Maj. Gen. Preston Brown of the First Corps Area at Boston ordered the commander of Fort Ethan Allen to send reconnaissance forces into Montpelier. Washed out roads and bridges prevented even mounted patrols from reaching the capital, but Capt. William Mayer and Lt. Francis Gardner dismounted and continued on foot, marching fifteen miles and swimming the swollen Winooski to reach Montpelier.[1]

When the two Army officers contacted state officials and relayed news of the disaster back to headquarters, Brown sent forward an eight-wagon mule train carrying rations, medical supplies, and Army physicians. Repairing the roads as they advanced, the cavalry got through to the capital with the mule train and initiated the relief effort. To overcome communication gaps, Brown dispatched aircraft to photograph damages, drop messages to isolated communities, and transport Army and federal officials into the area.[2]

Caving banks undermined a railroad in Vermont, 1927. Library of Congress, LC-USZ62-56133

Brown flew into Montpelier and, at the governor's request, sent troops for temporary security duty and sent engineer officers to help plan restoration of bridges, roads, and public utilities. He met with Red Cross representatives and arranged for them to handle all the relief needs and to furnish receipts for any Army supplies issued to them. The Red Cross requested that engineers travel to Burlington to replace bridges destroyed by floods with ponton bridges, and Brown relayed their request to the president.[3]

In the meantime, a resident of Cavendish, Vermont, somehow found an operating telephone line and called his cousin to ask for help. His cousin happened to be President Calvin Coolidge, born in Vermont. The president beckoned Maj. Gen. Edgar Jadwin, Chief of Engineers, to the White House and personally explained Vermont's needs. Jadwin ordered Col. W. J. Barden, Lt. Col. Robert Ralston, and Maj. F. B. Downing to Montpelier to furnish technical assistance. He called Col. Sherwood Cheney, commanding the Corps' Boston office, and directed him to contact the president's cousin; Cheney then sent Capt. Cecil Moore toward Cavendish. Driving a roadster, Moore got into Cavendish following dirt roads along the ridges. He met the president's cousin, a pleasant fellow and, surprisingly, a Democrat. Moore prepared a report on flood damages at Cavendish, then continued his "windshield survey" of flood damages across Vermont and New Hampshire via the ridge roads, and finally motored into Boston with his report. The Corps officers sent to Montpelier helped state engineers plan utility and road repairs and arranged a loan of pile drivers from the Corps depot at Columbus, Ohio, to speed the bridge repairs.[4]

Col. George Hoffman, commanding the 1st Engineers at Fort DuPont, selected his Company D to serve at Burlington, Vermont's largest city, under command of Lieutenants

Leslie Groves and Vincent Esposito. Company D boarded a railway express to Burlington with sixteen pontons, a 1.5-ton truck, and a motorcycle with sidecar. After reaching Burlington, they quickly installed the temporary ponton bridge between two milldams on the Winooski River, opening it to traffic on 12 November and thereby facilitating relief and recovery efforts.[5]

As he had earlier in the year for the Mississippi River flood, President Coolidge appointed Secretary of Commerce Herbert Hoover as the federal disaster coordinator, and Hoover sent his aide, Rankin Sleight, to the area. When a plane crash killed Sleight, Hoover went in person to Montpelier where Barden briefed him on the situation. Hoover met with Vermont's governor and state officials and determined that they had the emergency under control. Brown withdrew the troops, except for the Corps of Engineers. He later reported the Army had expended $17,400 on disaster relief, most of it debited to the American Red Cross.[6]

Debris floated down Main Street in Montpelier, Vermont, November 1927.
Library of Congress, LC-USZ62-133840

"There's a couple of instances in my life I came so near to disaster, and one of them was at that bridge. A disaster, in any outfit that you're commanding, usually means a disaster for you."

Groves and Company D remained at Burlington in charge of the ponton bridge. On 1 December they lost the bridge when a heavily loaded truck sank a ponton, setting the remaining pontons adrift to float downstream and go over a dam to their destruction. Groves brought in more pontons and reinstalled the bridge.[7]

The Winooski River froze over in January 1928, and floating ice packed against the ponton bridge. To break up the ice jam, Company D fused blocks of TNT and threw them onto the ice. On 2 February one of the explosive charges detonated prematurely in the hands of Sergeant Littlefield, killing him, injuring two privates, and wounding Groves in the face. After Groves was injured, Moore returned to Vermont to take command of the detachment and the bridge.

Captain Moore, who during World War II would become the Army's chief engineer in Europe, remembered his trying experiences in Vermont that winter and subsequently related:

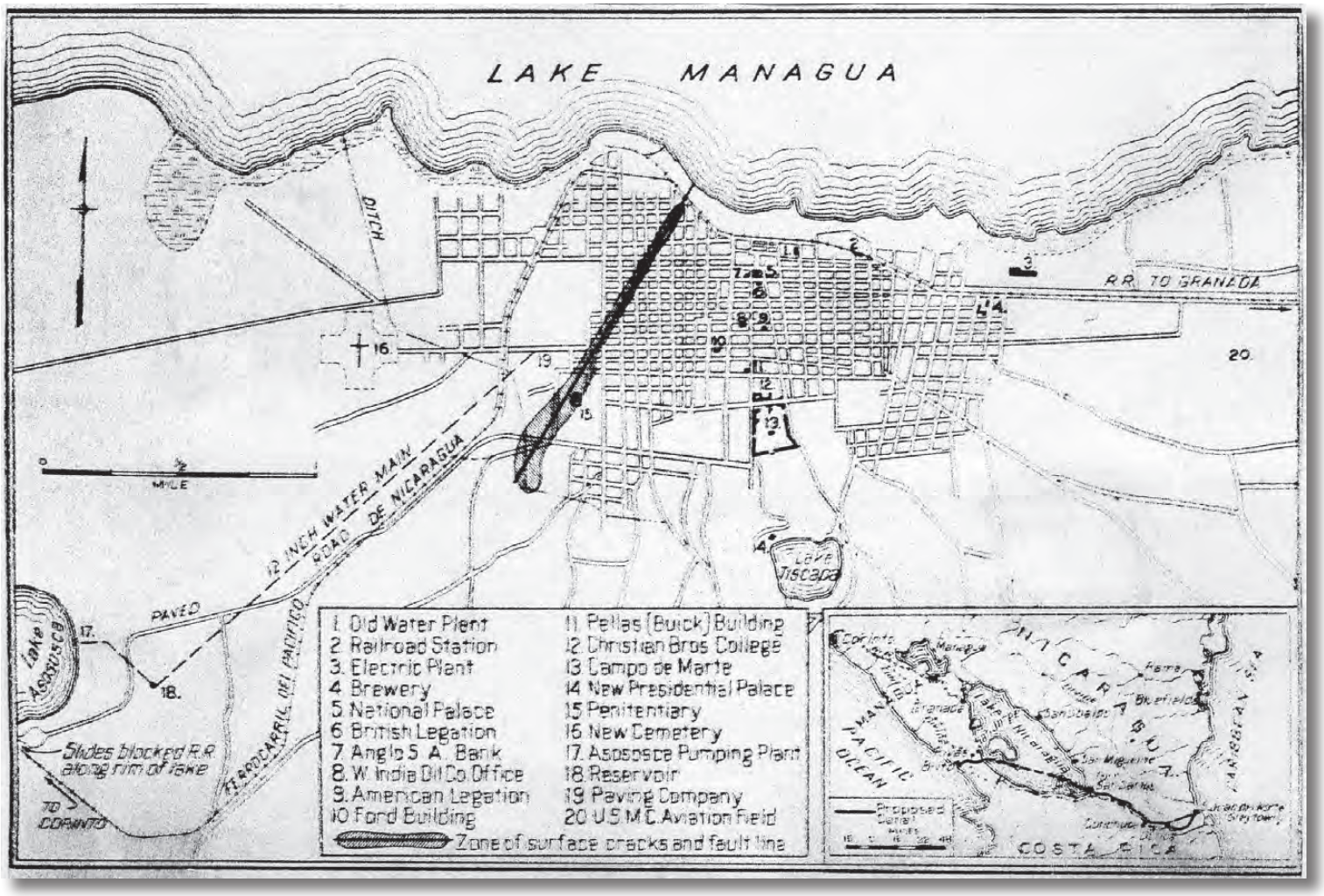
> There's a couple of instances in my life I came so near to disaster, and one of them was at that bridge. A disaster, in any outfit that you're commanding, usually means a disaster for you. When we started to put that bridge back in, we still had the cable that ran across. The old anchor system wouldn't work …. You'd start a boat with a bunch of people, and they'd have to work their way across, slide across this cable. Well, they had a cook in there who was very scared to death, and he got a hold of the next rope over …. He got the boat almost sideways. It seemed pretty nearly turned over. I yelled at him to let it go, which he didn't much like doing, but he did, and let it go. If that thing had upset, if that guy had held on another minute, he would have dumped a whole bunch of men into the river. It was the nearest thing to a tragedy or a disaster that I ever had, I think.

Moore declared it a tricky mission because ice coming over the upstream dam could strike the ponton bridge and send it downstream to be destroyed over the second dam. He relied on warnings from local old-timers about the river's ice breaking up and took timely measures to narrowly prevent loss of the bridge. Moore and Company D held their bridge against ice attack until the following spring melt when they withdrew from Vermont.[8]

Managua Earthquake, 1931

Three years after freezing in a Vermont winter, Lt. Leslie Groves sweltered in Nicaragua in the midst of a major fire. He was with the Provisional Engineer Battalion assigned to the Nicaragua Canal Survey when an earthquake shook Managua on 31 March 1931, killing two thousand and starting fires that threatened to consume the entire town. The earthquake fault had broken the city's water mains and covered its pumping plant with a landslide.[9]

Stationed at Granada, thirty-two miles from Managua, the engineers hardly felt the tremors. When news of the disaster reached



Maj. Dan Sultan drew a map of Managua, Nicaragua, after the earthquake of 1931. The Military Engineer, Vol. 23, No. 134, July 1931

Granada, however, Maj. Dan Sultan, at the request of Nicaraguan officials, mobilized his command. He and Lieutenants Groves, B. B. Talley, and Kenneth Nichols, with twenty-five enlisted men, collected explosives and boarded a train for Managua. Lt. H. L. Calvin of the Quartermasters, Maj. Paul Hawley of the Medical Corps, and three corpsmen joined the engineer command.[10]

The group reached Managua in the afternoon. Hawley and the corpsmen opened a field hospital, performing ten major and twenty minor surgeries in fourteen hours. Sultan sought out the 2d Marine Brigade commander at Managua, who was assisting the local *Guardia* with street security patrol. The marine asked the engineers to try to stop the fires. No rain had fallen in eight months, a high wind was driving flames through the city, and fifteen city blocks were on fire when the engineers went to work.[11]

Water supply was nonexistent. Fallen buildings blocked the streets and formed debris bridges across which the fires roared from block to block. Most people had fled the city, so the engineers had to fight the fire alone—just twenty-five enlisted men and four officers to save the entire city from combustion.

Sultan and his men felt the only feasible way to slow the destruction was to prevent the spread

of wind-driven fire. They cleared away the debris bridges across the streets, removed flammable materials from buildings facing the street in burning blocks, and knocked down with explosives any badly damaged tall buildings that might let loose sparks and embers high up where the wind could catch them.[12]

Once the conflagration entered a city block, it was hopeless to try to save the buildings; the engineers' firefight had to be made in the streets. Bodies littered the area, but the engineers had no time or personnel for burial details. Frequent aftershocks toppled more buildings, and the troops often risked their lives by climbing ladders propped against weak walls or by entering ruined buildings to take down burning embers. Talley especially remembered the sounds that orchestrated their three-day fire fight: the cries of distress, the whining of bullets fired by madmen who shot at anything that moved, the rattle of volleys as those madmen and looters were executed, and the thumps of the blasting.[13]

Time and again the engineers thought they had the fire stopped, only to see it jump the gap to another block and force them to renew their fight at the next street. They slowed the fire in front of the prevailing winds, stopped its spread laterally and against the wind, and at last on 2 April checked it completely after it had consumed thirty-one city blocks. Sultan left Talley and Nichols with a detail to guard against new fires springing from the smoldering ruins. He sent Groves and another detail to help restore the city's water supply.

Landslides had buried the city's water pumps at Lake Asososca. The dam and reservoir nearby and the water mains in the city were undamaged, but the pipe leading from the reservoir to the city was broken at the fault line. Groves and his men first installed a temporary pumping plant at two old wells and forced the well water

The earthquake and fire in Managua, Nicaragua, April 1931, left the National Palace in ruins. The Military Engineer, Vol. 23, No. 134, July 1931

into the city mains. Then they began repairs to the main system. They excavated the landslides at Lake Asososca to uncover the pumping plant, built a retaining wall to protect against more slides, restored the pumps to operation, and repaired the water main between the reservoir and the city.[14]

Meanwhile, Talley and Nichols, working with Nicaraguan officials, inspected buildings for safety, demolished dangerous walls, and opened the vaults of banks and public agencies located in the burned buildings. Talley recalled with amusement opening an elaborate concrete and steel bank vault with two shots of TNT, the door booming like an anvil and sailing across a patio. When the bank rebuilt the vault, it rejected a bid from the original manufacturer on grounds that it had been of such poor quality that the Yankees had opened it in two minutes.[15]

At the request of Nicaragua's president and the Red Cross, Sultan took charge of sustaining the homeless. He divided the city into eight zones, appointing a committee in each zone to register the needy and see that no ineligibles received free food. He employed able refugees in labor gangs to clear away the rubble under his supervision. At the peak of the recovery, he and the relief committee employed or fed twenty-five thousand people a day.[16]

Seventeen days after the earthquake, the engineers returned to their Granada base. For months afterwards they had trouble sleeping, never sure that the walls would not crumble down on them at night. American Red Cross chairman John Payne was impressed by the engineers' work at Managua and shared his opinion with Army Chief of Staff Douglas MacArthur. MacArthur relayed the message to Sultan, adding: "Your efforts and those of your fine command give all in authority here the greatest satisfaction."[17]

In his after-action report, Sultan asserted the principal lesson of the Managua earthquake emergency was that hasty demolition could not check the progress of a fire. "It is only by the systematic clearing out of a lane on the leeward side of the fire that definite results can be secured," he observed, warning: "This of course means that ample labor and considerable time must be available. In other words, you cannot stop a fire on a broad front by working immediately to the leeward of the burning section; you must move back far enough to give you room and time."[18]

"Your efforts and those of your fine command give all in authority here the greatest satisfaction."

The Corps initiated studies of demolition techniques in the aftermath of the Managua emergency, paying special attention to lessons learned there and at San Francisco in 1906. Demolition squads in combat engineer battalions received thorough training in the use of explosives of all types and instructions on the proper methods of checking fires in urban areas with explosives.[19]

Floods of 1936

Four storms crossed the northeastern United States in March 1936, dropping rain that, in

combination with snowmelt, generated record flows on many streams from West Virginia to Maine. The Susquehanna at Harrisburg crested 3.5 feet above all records; the Ohio at Pittsburgh surpassed previous records by 6.1 feet; and the Connecticut River at Hartford climbed 8.6 feet higher than ever before.[20]

Congressman Herman Koppleman toured flooded Hartford, Connecticut, by boat and vividly described what he saw. He saw "grim humor" in the brickyard building that had floated downriver from Windsor but also "stark tragedy" considering the losses suffered by its owner. The huge fuel storage tanks he saw hurling down the river, ripping and destroying everything in their path, concerned him, although he also saw a Corps boat pushing them to bank where they could be anchored. "I was amazed at the havoc wrought," he lamented. "Up the river, jammed against the Willimantic Railroad bridge, were whole houses that had been swept from their foundations into the river …. A heavy stillness like the quiet of a desolate cemetery hung over everything. The only motion was that of the water. Here there was no human activity."[21]

"I was amazed at the havoc wrought…. A heavy stillness like the quiet of a desolate cemetery hung over everything.

Leaving the boat, Koppleman visited the governor's office, where local, state, and federal officials collected to manage relief and rehabilitation work. At the meeting, Maj. Mason Young, heading the Corps' Providence District, spent most of his time attempting to answer the question: "What are you going to do to prevent another such catastrophe?" It was a leading question—Congress at that moment was considering the Flood Control Act of 1936 to make flood protection a standard national goal.[22]

Despite the great damages from the widespread flooding of March 1936, the role of the Corps of Engineers in the ensuing disaster relief mission was minimal for at least two reasons. First, the Army's corps area commanders viewed the Corps of Engineers' civil works districts as reconnaissance, warning, and damage survey units, not as part of the relief and recovery team; Army corps area commanders during the Depression instead relied upon the quasi-military Civilian Conservation Corps (CCC) for rescue and evacuation. Second, post-disaster recovery and rehabilitation were largely handled then by the Red Cross in cooperation with the Works Progress Administration (WPA) and other work relief agencies created by the Franklin Roosevelt administration.

Maj. Gen. Albert Bowley, commanding Third Corps Area headquartered at Baltimore, for example, explained how he managed the respective missions of the Corps of Engineers and other agencies:

> Arrangements were made through the various U.S. District Engineer Offices for a system of flood outposts to furnish prompt information on flood conditions. These outposts supervised by the District Engineers, who made frequent personal inspections, were in excellent position, not only to watch the streams themselves, but also to advise the Commanding General and his staff whether the danger to life and property was sufficiently serious to justify action by Army agencies to aid the local authorities, the Red

Railroad gondola cars were used for bank protection along the Allegheny River in Braeburn, Pennsylvania, 25 March 1936. Pittsburgh District

> Cross and other organizations who might volunteer to render some form of assistance …. An essential feature of the relief plans, as they were developed, was to obtain advance authority from the War Department for the use of any facilities available, including CCC supplies and equipment. Later, the President's order covering the use of CCC enrollees for relief work gave the Commanding General ample means for the temporary relief of homeless persons and for assistance in cleaning up towns and cities after the flood water receded.[23]

Unlike the Mississippi River districts, the Corps districts in northeastern states had no large fleet of workboats available for rescue and, in 1936, they had no significant levee maintenance responsibilities. That year the Corps took few actions in the flooded northeastern states that resembled Mississippi River flood fights, except perhaps at Washington, D.C. In the District of Columbia, the Corps supervised WPA and CCC workers building a sandbag dike along the western edge of the Mall to divert water from Constitution Avenue and prevent inundation of nearby buildings. At its crest, the Potomac

The intersection of Stanwix Street and Fort Duquesne Blvd. in Pittsburgh, Pennsylvania, was covered with floodwaters on 18 March 1936.

Pittsburgh District

River damaged the Potomac Park and National Airport areas but did not flood the city proper.[24]

In western Pennsylvania the Corps' Pittsburgh District conducted rescue operations near its locks and dams and supplied refugees at Vandergrift, which was hard hit by Kiskiminetas River flooding. The district commander, Maj. W. D. Styer, devoted most of his attention to saving a navigation dam on the Allegheny River and the Emsworth Dam on the Ohio, checking erosion that threatened the two dams by dropping tons of stone to stabilize the adjacent riverbanks.[25]

After the 1927 Winooski River flood, the Corps planned a flood protection project in Vermont. The New York Engineer District directed Civilian Conservation Corps workers who built two flood control dams at Wrightsville and East Barre in the Winooski basin to protect Montpelier. Although the March 1936 flood equaled that of 1927, the two CCC dams prevented millions of dollars worth of damages in the Winooski valley.[26]

Because Congress was debating national flood control policy when the 1936 floods caused such great damages, the chief of engineers immediately mandated studies to determine the full extent of flood damages in order that appropriations and planning for flood control might bear a closer relation to the facts. He made Col. Glen Edgerton responsible for the surveys in eastern Pennsylvania and New York, Col. George Spalding in New England, and Col. Roger Powell in the Ohio River basin. Information they collected went to the appropriate congressional committees.[27]

President Franklin Roosevelt appointed a cabinet-level Flood Emergency Committee to coordinate relief and recovery activities and made $43 million available for the efforts. The Secretaries of War, Treasury, and Navy, the American Red Cross chairman, and the Civilian Conservation Corps director served on the committee, but the president relied chiefly on the WPA's administrator, Harry Hopkins, giving him blanket authority to restore public roads, bridges, sewage systems, buildings, and water and power plants. With a quarter-million laborers already on the WPA rolls, Hopkins was able to perform the restoration tasks in short order.[28] Thus, the 1936 flood relief effort was managed primarily by the Red Cross—supported by CCC detachments assigned the mission by the Army's corps area commanders—and the WPA and allied work relief agencies handled the rehabilitation work.[29]

Although the Corps of Engineers was not involved in remedying the widespread destruction resulting from the March 1936 floods, the disaster generated broad public support for a national flood control policy. When Senator Royal Copeland asked Maj. Gen. Edward Markham, Chief of Engineers, to comment on the draft of a bill authorizing construction of dams and reservoirs to protect the Ohio River basin only, the chief replied that, while the proposed projects were meritorious, he thought their authorization "should be considered only in connection with such a general program, the terms of which thereafter may be construed as a basic policy definitive of Federal interest." Copeland therefore modified the bill to include the phrase "it is the sense of Congress that flood control on navigable waters or their tributaries is a proper activity of the Federal Government." This bill became the historic Flood Control Act of 1936, which launched nationwide flood protection programs.[30]

Superflood on the Ohio, 1937

The log kept by the Corps lockmaster at Ohio River Dam 44 near Leavenworth, Indiana, during the January 1937 flood graphically outlines the scope of the disaster all along the Ohio.

Date	Remarks
Jan. 21	Dam all down
Jan. 22	Began snowing 5 P.M.
Jan. 23	Depth of snow 5 in.
Jan. 24	Oil house gone
Jan. 25	Garage gone
Jan. 26	Maneuver boat 252 gone
Jan. 27	Warehouse gone
Jan. 28	Most of Leavenworth gone
Jan. 29	Leavenworth still leaving[31]

Leavenworth never fully recovered from the disaster, and the dam was later relocated.

"Rare meteorological conditions had created this calamitous inundation of almost Biblical proportions," wrote Capt. Paschal Strong, the Corps deputy at Cincinnati in 1937, better known publicly as author of the "Jack Armstrong, All-American Boy" serial. "A large anticyclone developed off the South Atlantic coast and its high pressure area continued in constant shape and position for almost a month," he elaborated. "The clockwise rotation of its air currents sent into the Ohio Valley a continuous mass of warm and wet air, which met a Polar Canadian air mass over the lower Ohio Valley, resulting in an intense and unprecedented deluge."[32]

When Strong and his district commanders at the Huntington, Cincinnati, and Louisville offices dispatched their early reports of major flooding, the chief of engineers was

A man clung to a ledge of a building above floodwaters in Huntington, West Virginia, 25 January 1937. Huntington District

"…this calamitous inundation of almost Biblical proportions… an intense and unprecedented deluge."

surprised—no major flooding had occurred at Pittsburgh, the headwaters of the river. Orders went to Capt. B. B. Talley, now stationed at Wright Field near Dayton, Ohio, to fly over the river and report what he saw. Upon his return, Talley telephoned Washington that the situation appeared even more serious than reported.[33]

Because rains fell first on the lower Ohio valley, the river hit flood stages there earlier than in the upper valley, leading to rumors that the flood wave had traveled upstream instead of down, though the crest actually proceeded downstream in a regular fashion. The flood exceeded all records on the Ohio below Point Pleasant, West Virginia. Huntington, West Virginia, was wet but communications continued there. The Portsmouth, Ohio, floodwall was under ten feet of water, Cincinnati was without utility services, and community services on the lower river had been wiped out. Towns along the lower Ohio were located on bluffs with lowlands behind them; the lowlands had flooded first, cutting off communications and transportation, turning the towns into isolated islands of misery.[34]

At the flood's beginning, Corps offices along the Ohio distributed sandbags to the few communities that had levees, but the distribution stopped when it became apparent the flood would overtop existing levees by five or more feet. Corps crews stationed at the forty-six locks and dams on the river began rescue and evacuation efforts, using the skiffs and flats available at the locks; they even caught floating houses and secured them with cables to trees. Divers stationed at the locks for repair work also undertook emergency underwater repairs to damaged municipal gas mains in various localities.

In Huntington, Corps personnel crawled through second-story windows to enter their offices and relied on portable water, heat, and sanitary units. They learned that ample relief supplies were available from the Army and the Red Cross, but broken communications made determining the needs of isolated towns difficult. Huntington's Corps commander established separate bases at Marietta and Portsmouth in Ohio, Point Pleasant in West Virginia, and Maysville in Kentucky, from which the Corps workboats embarked on daily patrols to ascertain public needs, perform rescue, and deliver supplies.

To allow the Corps fleet at Cincinnati to move to the lower river, the chief of engineers transferred control of the upper end of Cincinnati District to the Huntington District, placing emergency operations in charge of Lt. George Lincoln. Maj. Frederick Frech left Huntington for the lower river to open a Corps rescue and evacuation base at Paducah, Kentucky. Later, he followed the flood crest from Paducah to Memphis and New Orleans.[35]

The Corps' Cincinnati office installed pontons at one end of a bridge to restore access, allowing emergency vehicles to cross from Ohio to Kentucky, and it dispatched its towboats *Scioto* and *Chenoka* onto the flood. These secured floating fuel tanks to prevent further spread of

The 113th Engineers constructed a ponton bridge in Evansville, Indiana, in 1937. National Archives, 77-RH-35T-1

the fire that broke out in Cincinnati on Black Sunday, 24 January, after spilled storage tanks caught fire and burned thirty-two buildings. The flood crested on 26 January at nine feet above Cincinnati's previous record stage.[36]

Col. M. M. Kimmel inspected the actions at Cincinnati and Huntington for the Fifth Corps Area commander and filed a complimentary report on the Corps' emergency response:

> Many thousands of refugees owe their lives to these brave men, who worked day and night at this perilous task. Some of these men and boats operated in the Cincinnati area. A river depot was established and many government boats supplied to volunteer rescue parties. They supervised the building of a pontoon bridge to the L and N Bridge which sent fresh vegetables into Newport, Kentucky, for the first time in days.[37]

As the crest passed Cincinnati, towboats, skiffs, and emergency equipment moved from the upriver to the downriver districts, where they evacuated entire towns and cities. Three-fourths of Louisville, Kentucky, was flooded, and 175,000 people were evacuated as the city was placed under martial law. Among the Army units sent to Louisville was Company B, 5th Engineers, from Fort Belvoir, Virginia. Commanded by Capt. Robert McDonough and Lieutenants Kenneth Nichols, John Davis, and Ralph King, the 106 enlisted men of Company B set up portable water purification units and built floating bridges to facilitate Louisville's

evacuation.[38] Because the Corps' Louisville office was flooded, its commander, Lt. Col. Dabney Elliott, established his emergency operations center at Evansville, Indiana, nearer the massive evacuation mission on the lower river and where the Red Cross and U.S. Coast Guard had established emergency offices. He also opened emergency bases at Tell City, Indiana, and Owensboro and Paducah in Kentucky on the lower river.[39]

With authority from the chief of engineers, Elliott established a special flood district at Golconda, Illinois. Col. Charles Gross, Frech, and ten officers from Fort Belvoir directed the special district's activities at Golconda. The 108th Engineers, Illinois National Guard, opened roads from Golconda to the interior and maintained telephone lines to permit communications with other Corps offices. This special district managed the evacuation of entire towns, such as Shawneetown, Illinois, along the lower Ohio.[40]

At Paducah, where thirty-three thousand of its thirty-eight thousand residents had to be evacuated, the Corps collected the refugees in small craft and delivered them to a barge anchored at the Irvin Cobb Hotel, whence larger craft took them to Red Cross and CCC camps on higher ground. The St. Louis District towboat *Penniman,* equipped with a short-wave radio transmitter, provided communications at Paducah. Its radio reports to St. Louis were forwarded to the chief's office at Washington. The Corps office at Cincinnati had no radio system then, so to communicate with its field offices it resorted to daily broadcasts over powerful commercial AM stations in the valley, which volunteered their services during the crisis.[41]

To supplement the boats from the Corps offices along the Ohio, the Tennessee Valley Authority and the Corps offices at St. Louis, Kansas City, and Nashville also sent rescue vessels to Golconda and Paducah. The Nashville office, for example, sent seven towboats, twelve launches, three quarterboats, three derrick boats, six barges, twelve flatboats, and eighteen skiffs. This fleet could not descend the Cumberland River's channel to the Ohio because bridges over the river were too low for the larger boats to pass under. Despite the risks of hitting power and telephone lines, the fleet steamed out across flooded fields and over the approach ramps to bypass the bridges and reach their destination.[42]

"Many thousands of refugees owe their lives to these brave men, who worked day and night at this perilous task."

With no advance flood emergency plans in place, the Corps offices located along the Ohio improvised as the crisis dictated. Their three-fold mission was, in order of priority, to protect government property, to collect and disseminate hydrologic information, and to render local authorities all possible assistance. The Corps encountered substantial public pressure in favor of the third mission at the expense of the first two. Local officials at Shawneetown, for instance, insisted that the Corps evacuate sick refugees to Evansville, although Red Cross facilities were available at Shawneetown itself. Because officials at Carrollton, Kentucky, demanded that a Corps towboat remain there to quell panic in their community, the Corps complied and immobilized a boat that was badly needed elsewhere.[43]

Engineers loaded rescue craft in flooded Nashville, Tennessee, 1937.
National Archives, 77-RH-33VV-2

Despite frequent conflicts with local officials, the rescue and evacuation mission generally proved successful. Paducah's Disaster Committee estimated the engineer fleet saved no fewer than five thousand lives in the Paducah area, and a reporter there for *Engineering News-Record* wrote from the drowned city:

> Conditions on this river are simply hell. The people simply refuse to evacuate ahead of the time of serious danger, and then the rescue load comes all at once. The army engineers stepped into this strange job of rescue and evacuation in great style. They are doing all that is humanly possible to bring order out of chaos: I have seen it happen right here today.[44]

In addition, the 1937 superflood on the Ohio provided three memorable lessons for the Corps of Engineers. First, cooperation among Corps offices, through loans of personnel and equipment, provided the increased flexibility and resources needed during emergencies to perform all missions adequately. Second, first-class radio communications were vital during emergencies and needed for routine operations. Third, advance planning for disaster response was imperative. Thereafter all Corps offices in the Ohio valley prepared comprehensive flood emergency contingency plans.[45]

"Conditions on this river are simply hell. The people simply refuse to evacuate ahead of the time of serious danger….The army engineers stepped into this strange job of rescue and evacuation in great style."

Mississippi River Flood, 1937

As the Ohio River crisis abated, the floodwaters raged on toward the Mississippi. "A super flood is on the way," Col. Eugene Reybold, commanding at Memphis, cabled to the chief of engineers. "Water will surge almost ten feet above any recorded stage. There will be fifty-five feet in Memphis before the water now in sight from the Ohio moves out."[46]

Reybold and his Memphis staff carefully watched the dispatches from the Ohio River. By 22 January it had become apparent that the flow passing Cincinnati in conjunction with water coming down other rivers threatened unprecedented disaster in the Memphis District. Reybold mobilized defenses, launching a campaign to raise the levee and floodwall at Cairo with sandbags and mudboxes high enough to protect against the predicted sixty-one-foot stage. He then ordered that work begin to raise all 598 miles of levees in his district to a height capable of withstanding the expected sixty-one foot crest. The approaching crest, however, climbed to sixty-two feet at Cairo, a foot higher than predicted.[47]

Meeting with Maj. Gen. Stanley Ford, commander of the Army's Seventh Corps Area, Reybold requested and received flood fight assistance from the Civilian Conservation

Civilian Conservation Corps workers helped move people into the camp for flood victims at Forrest City, Arkansas, in 1937.

Library of Congress, LC-USZ62-123851

Corps. He also arranged for rescue and relief efforts by the Army, Coast Guard, and Red Cross in order that Corps boats and personnel might concentrate on saving the levees. He therefore withdrew the Corps dredge *Potter* and steamboats *Jupiter, Minnesota,* and *Nolty* from rescue work and sent them to assist with levee reinforcements. The Red Cross and the Coast Guard assembled a rescue fleet totaling 19 steamboats, 6 dredges, 59 cutters, 279 power boats, 37 skiffs, 14 airplanes, and 1 dirigible with an aggregate crew of 1,370.[48]

Resistance to the massive evacuation came at the New Madrid–Birds Point Floodway in Missouri. There, the Corps had purchased most flowage rights and had planned to construct a fuseplug levee—a section built to collapse during a flood to allow Mississippi River floodwaters to escape through the floodway, relieving pressures against the Cairo floodwall. Reybold ordered that evacuation of the floodway begin on 21 January and spread the news through radio broadcasts and by aircraft dropping leaflets. The government had not, however, acquired all flowage easements in the floodway at the time the flood came, the Corps had not yet degraded

Mudboxes protected Cairo, Illinois, from high waters in 1937. Office of History

"Time is a vital factor and the levee must be blown within a very few hours or heavy loss of life is almost certain to follow."

the fuseplug to blow out on its own, and some residents opposed the inundation of their lands to save Cairo; in fact, men with shotguns went to the fuseplug levee expecting to repulse any Corps personnel sent to open the plug.[49]

Col. George Spalding, who had directed flood rescue efforts along the Mississippi in 1927, was assistant to the Army chief of staff in 1937, and in Washington he helped coordinate the Army and the Corps civil works emergency response. He discussed the Birds Point situation personally with Secretary of War Harry Woodring, who asked Missouri's governor to remove any armed resistance from the fuseplug area and permit the Corps to open the floodway. "Time is a vital factor," said Woodring, "and the levee must be blown within a very few hours or heavy loss of life is almost certain to follow."[50]

The governor sent state police and National Guard units to clear and patrol the levee, and at 4:40 PM on 25 January Reybold's assistant, Maj. R. D. Burdick, began dynamiting the Birds Point fuseplug (picks and shovels having been ineffective). Blasting stopped temporarily at the governor's request to allow completion of the evacuation, then resumed at noon on 26 January. By late that evening, the river was moving through the floodway, eventually carrying a 500,000-cubic-feet-per-second flow, about a quarter of the total river flow past Cairo. When blasting had begun, the Cairo gauge had reached 58.6 feet, less than two feet below the top of Cairo's floodwall, and was set to rise several feet more. After the floodway opened, the Cairo stage fell to 57.9 feet on the morning of 28 January, then resumed its slow rise.[51]

The American Red Cross opened refugee camps at Charleston, Sikeston, and East Prairie, Missouri, near the floodway, where the WPA put up tents supplied by the Quartermaster Corps and built the necessary sanitary facilities. National Guard units furnished security for the camps.[52] The Corps, in the meantime, directed eight hundred civilians, twelve hundred WPA workers, and five hundred CCC recruits as they sandbagged and built mudboxes atop the Cairo floodwall to raise it high enough to protect against a sixty-three-foot stage. Near Cairo, the Mound City levee failed on 28 January, and the Corps evacuated its entire population. They also moved women and children out of Cairo as a precaution.[53]

"Cairo will be ready tonight," Reybold declared on 30 January, "for the full assault on its seawall and levees predicted for next Wednesday." Maj. Gen. Edward Markham, Chief of Engineers, traveled to Cairo to inspect the flood fight and was in the city on 3 February when the rivers crested. The wall held and Cairo was saved.[54]

Reybold concentrated his forces near Cairo at first, then moved them downriver, raising the levees ahead of the oncoming flood crest. By 30 January he commanded an army of fifteen thousand at work raising the 598 miles of levees in the Memphis District an average of two feet. The district furnished more than seven million sandbags and two million board feet of lumber for the task. As the crest moved downstream, Reybold threw reserve forces of WPA, CCC, and convict labor into the fight, and at one point these forces saved a levee even after water had begun running over its top.[55]

The Corps of Engineers' reservation was surrounded during the high water mark at Memphis, Tennessee, on Valentine's Day 1937. Office of History

Although the 1937 stages exceeded the 1927 records, Reybold and his Memphis District forces successfully held the Mississippi River's mainline levees with only backwater flooding and flooding along tributaries marring their efforts. "My military training," Reybold later heralded, "and similar training of countless Engineer officers sent to my assistance had a lot to do with the safe passage of the greatest flood the lower Mississippi valley ever experienced."[56]

The Vicksburg and New Orleans districts had it somewhat easier than did Memphis. The 1937 flood set new records at all gauges between Cairo and Helena, Arkansas, but below Helena only Natchez, Mississippi, reported a new flood stage record. The Vicksburg and New Orleans offices had raised the levees in their areas to levels above the 1927 records before 1937, and they now took prudent measures—raising low points, installing wooden revetments, and placing sandbags to reduce wave-wash erosion. The New Orleans office also began to open the Bonnet Carré spillway for the first time on 28 January. Eventually 285 of its 350 bays were opened to reroute the floodwaters, which served to hold the Carrollton gauge at New Orleans to a twenty-foot reading.

The 1937 superflood flowed downriver at a rate about fifty percent greater than the 1913 flood, yet the Corps had made such progress with the system, including the channel rectification and cutoff program begun in 1932, that the 1937 flood passed to the Gulf of Mexico without a single major crevasse occurring in the Mississippi River levees—a successful first.[57]

Administratively and geographically, the flood involved six of the nine Army corps areas in the continental United States, beginning with the upper Ohio River in Third Corps Area and passing through the Fifth, Sixth, Seventh, Eighth, and finally the Fourth corps areas. The corps area commanders dispatched troops wherever needed and stripped quartermaster depots from San Francisco to New York of supplies for Red Cross use in the post-disaster relief mission. Army commanders also relied heavily on the Civilian Conservation Corps, rather than regular troops, during the emergency. More than twenty-two thousand CCC recruits led by four hundred officers and using two thousand trucks helped with the rescue, sandbagging, and supply delivery. Seventy-five CCC camps provided shelter for flood refugees.[58]

National coordination of relief and recovery operations had begun in January at a meeting attended by Army Chief of Staff General Malin Craig, WPA Director Harry Hopkins, Chief of Naval Operations Admiral William Leahy, and Coast Guard Commandant Rear Adm. Russell Waesche. They agreed that the American Red Cross would act as the official relief agency, the WPA would furnish labor and equipment for the cleanup, and the Public Health Service would furnish medical supplies.[59] President Roosevelt also appointed Harry Hopkins of WPA, Surgeon General Thomas Parran, Chief of Engineers Edward Markham, and "Calamity Jim" Fieser of the Red Cross to a committee to monitor and supervise disaster relief fieldwork.[60]

The relief agencies assembled a massive rescue fleet at Memphis, similar to the one that performed so well in 1927. It included not only one-fifth of all Coast Guard vessels but also Navy vessels and amphibious aircraft and tonnage chartered by the Red Cross. Thanks to the levee system and the expeditious levee work by the Corps, this immense fleet saw little service in 1937.[61]

Observations

Commanding troops and civilian forces during disaster emergencies clearly was perceived by Corps of Engineers and other officers as equivalent to combat service. Those who performed outstanding services soon received promotions to more responsible positions. Leslie Groves, of course, became leader of the Manhattan Project in 1942 and completed one of the largest and surely the most secretive design and construction missions in Corps history. His work helped bring the Second World War to an abrupt and successful conclusion. Like Groves, Eugene Reybold distinguished himself as a leader during a natural disaster. Before 1937 he was just one of the colonels commanding an engineer district, but his successful management of the flood crisis in the Memphis District brought him national attention, making logical his appointment as the Army's chief of engineers in the Second World War, during which his organization managed the construction of military bases, airfields, and combat facilities throughout the world.

When the Army questioned, as it sometimes has, the assignment of military officers to the Corps' civil works program, the Corps has responded that managing civil works design and construction, especially during emergencies, is the most valuable experience any officer can obtain for military mobilization. The events related in this chapter support the validity of this argument.

Chapter 8 Notes

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61. "High Water, High Marks," *Survey* 73 (Mar. 1937): 73–74; Foster Rhea Dulles, *The American Red Cross: A History* (New York: Harper & Bros., 1950), 311–14; American Red Cross, *Flood Disaster of 1937*, 85–87; Committee on Flood Control, *Comprehensive Flood Control Plan for Ohio and Lower Mississippi Rivers: Hearings on H. R. 7393 and H. R. 7646*, 75th Cong., 1st sess., 1937, 49 U.S. Statutes 1570, 6.

Below: National Guardsmen were on duty in Fitchburg, Massachusetts, after the 1938 hurricane.

National Archives, 69-MPH-5-23

Above: A levee at Sand Mills, Arkansas, was reinforced by members of the 354th Engineer Regiment, May 1943.

Library of Congress, LC-USW33-029183-C

Left: The 1938 hurricane disrupted rail traffic through Peterborough, New Hampshire.

National Archives, 69-MPH-6-42

Right: The 1938 hurricane damaged buildings in Keene, New Hampshire.

National Archives, 69-MPH-6-29

Emergency Planning and Mobilization

9

The Corps' role in responding to national emergencies passed through a transition as the nation mobilized for the Second World War. In the wake of the massive flooding of 1937, the chief of engineers mandated emergency planning for various disaster contingencies, and in 1939 the Army revised its disaster assistance procedures. These plans and regulations envisioned continued reliance on the Depression-era work relief agencies for the labor required for flood fights and disaster recovery. Yet, the rules changed swiftly as military mobilization began and the work relief agencies closed, the workers moving into the military services or into war-production industries.

With the advent of war and massive military recruiting, the Corps lost its labor pool for emergency response. During floods in 1943 it obtained the work force needed to shore up the levees from engineer troops at stateside camps, where they were training for combat; the flood fights offered chances for these troops to practice their construction and bridge-building skills. By 1945 most of the troops had moved to overseas combat theaters and severe labor shortages confronted the Corps during natural disasters. In this exigency, the Corps obtained prison workers, both convicts from state prisons and prisoners-of-war from internment camps near the disaster areas. In the opinion of Corps officers, these prisoners performed satisfactorily at the levees.

Los Angeles Flood, 1938

"The sensational nature of our press, and the universal desire to raid the Federal Treasury, may produce false alarms of floods from time to time and misrepresent the needs for Federal aid," commented Col. William Caples in his report on advance planning for flood emergencies in the Ninth Corps Area. The 1937 floods had stimulated interest in emergency planning throughout the nation, and the Ninth Corps

"The sensational nature of our press, and the universal desire to raid the Federal Treasury, may produce false alarms of floods from time to time…"

commander at San Francisco had directed Caples to investigate the potential for flood disaster on the West Coast.[1]

Caples, a proponent of "work relief" before the First World War and the superb manager of the Corps' first "modern" disaster recovery effort at Pueblo in 1921, wielded a wicked pen. A superior once commented that in Caples' hands a telegram seemed a deadly weapon. Caples was cynical about federal disaster assistance generally, and his investigation of West Coast flooding history revealed that chances for such disasters were extremely remote, indeed "all but negligible."[2]

When Caples made his report in 1937, the West Coast had not experienced catastrophic flooding

The May 1938 flood of the Los Angeles River destroyed this railroad bridge in downtown Los Angeles. Office of History

since the nineteenth century. Unfortunately, the year following Caples' forecast proved him wrong. Intense rains in December 1937 sent raging flows down the Sacramento and San Joaquin rivers in California's Central Valley, destroying property worth $15 million. Three months later a March storm dropped up to thirty inches of rain along the coastal slopes of the San Gabriel and San Bernardino mountains in southern California, sending seething floods through Los Angeles that caused eighty-seven fatalities and damaged more than $78 million worth of property. Although Caples had thought the chances of flood disaster were negligible, they were quite real.[3]

Los Angeles County experienced a two-day nightmare during the 1938 flood, with telephone, transportation, and postal services completely disrupted. Maj. Theodore Wyman, District Engineer at Los Angeles, turned out all available forces at the peak of the flood on 2 March, established a disaster field office in Norwalk, and sent thirty-seven Corps trucks with personnel to the Norwalk and Artesia area

on the San Gabriel River for rescue operations. The Corps saved two hundred people from flooded homes and delivered them to local refugee centers.[4]

The 1938 flood disaster dramatized the need for advance flood emergency planning on the West Coast, and the Los Angeles Corps office devised a comprehensive plan for efficiently allocating manpower, materials, and equipment that greatly improved its response during subsequent disasters. In 1938 Chief of Engineers Maj. Gen. Julian Schley ordered all Corps district offices to develop flood emergency plans, and similar planning efforts went on at the Army's corps area commands and at Army headquarters.[5]

Special Regulation No. 67, drawn up in 1917 as guidance for the Army during disaster relief missions, had been renumbered in 1924 as Army Regulation 500-60. By 1938, however, AR 500-60 had become obsolete. The Army General Staff undertook a complete revision aimed at making the American Red Cross the primary coordinating agency for disaster assistance and incorporating into the regulations formal rules on the roles of the Civilian Conservation Corps and on cooperation with work relief agencies such as the Works Progress Administration. The effort went on for better than a year before

A temporary dumped-rock levee failed, causing flooding and erosion in downtown Los Angles during the 1938 flood. National Archives, 77-CF-1

the revised AR 500-60 was published. With the end of the CCC and the WPA's absorption by the Federal Works Agency in the early 1940s as the nation mobilized for war, AR 500-60 once again became obsolete.[6]

The extensive and lengthy revision of Army regulations, however, had little impact upon the customary role of the Corps of Engineers during disasters. The principal provision relating to the Corps in the revised AR 500-60 read:

> Officers of the Corps of Engineers having water transportation at their disposal should be prepared to use this transportation in rescue and evacuation of inhabitants of flooded and threatened areas under the coordination of the Red Cross or an agency acting for the Red Cross when in their discretion the transportation may be spared from vital flood prevention activities. Corps Area Commanders and the officers of the Corps of Engineers on River and Harbor duty on rivers subject to destructive floods will also be prepared for the possibility that the Army may be called upon to assume full charge, nationally or locally, of all rescue and evacuation activities either by direction of the President, or by local arrangement.[7]

This provision merely reinforced what was already being done. Since 1882 the Corps had used its boats for rescue during flooding, generally in cooperation with the Red Cross, and engineer officers routinely worked with the Army's corps area commanders during major disasters.

New England Hurricane, 1938

After the 1936 Connecticut River flood, the Corps of Engineers office at Providence, Rhode Island, initiated advance planning to improve its emergency response. It put its plan into effect when a hurricane blew toward the New England coast in September 1938—it alerted its field offices at Hartford in Connecticut and Springfield and Holyoke in Massachusetts; sent hydrologic survey teams to the field; and dispatched a team to the local Weather Bureau office to coordinate the hydrologic data sent by the field teams. Col. John Bragdon, Providence District Engineer, and Col. A. K. B. Lyman, Boston District Engineer, made contact with the Army's First Corps Area commander to keep him advised of hurricane and resultant flooding conditions.[8]

After crossing Long Island, the hurricane slammed into the Connecticut and Rhode Island shore, then plunged north through the Connecticut River valley into Canada. High winds and tides devastated the coastal areas. Heavy rainfall exceeded thirteen inches in some areas and led to flooding throughout New England. The storm drowned 494 people, injured 708, and destroyed nine thousand homes.[9]

The secretary of war ordered Brig. Gen. Max Tyler, Assistant Chief of Engineers, into the disaster area with full authority to call upon Army resources as needed. Bragdon and Tyler, accompanied by the Corps' North Atlantic Division Engineer, E. L. Daley, inspected the flood fights in progress at Northampton, Springfield, and Hartford.[10]

The most critical situation was at Hartford near the Colt firearms plant. Corps personnel

led the "Battle of Colt's Pike" with a thousand WPA, CCC, and volunteer laborers. They worked around the clock yet remained only a single layer of sandbags ahead of the flood. On 24 September the Connecticut River crested at 36.4 feet, nearly four feet up the sandbag capping placed atop the dike. The capping held, preventing some $4 million worth of damages to the city's power and sewage plants, airport, and the firearms factory.[11]

Flood fights at Northampton and Springfield also proved successful, although only quick work by the Corps saved West Springfield. The Corps' Providence office had completed a dike and floodwall at West Springfield in 1936 and transferred it to local government for operation. The 1938 hurricane flooding tore open a thirty-foot-wide crevasse in the dike. West Springfield authorities evacuated the area but made no effort to plug the crevasse.

A stone bridge in Hillsboro, New Hampshire, was swept away by flooding and wind from the September 1938 New England hurricane.

National Archives, 69-MPH-6-20

The hurricane that struck New England in September 1938 left part of the Pleasant View Hotel on Misquamicut Beach, Rhode Island, standing precariously in the rubble. National Archives, 69-MPH-7-2A

The local Corps office, however, mobilized all available personnel and plugged the crevasse in four hours, preventing damages that would have totaled four times the cost of the flood protection project.[12]

The 1938 hurricane flooded the Lackawaxen and Rancocas rivers in Pennsylvania and New Jersey. When the north branch of the Rancocas threatened to inundate Pemberton's water supply plant, Maj. C. W. Burlin of the Corps' Philadelphia office appealed to the Army's corps area commander for support. The commander ordered a detachment of the 1st Engineer Battalion from Camp Dix to Pemberton, where the men emplaced a sandbag dike that protected the town's water supply pumps.[13]

Once the 1938 hurricane's flooding subsided, the CCC, WPA, and Red Cross handled most relief and recovery efforts with some assistance from the Corps of Engineers. At Montpelier, Vermont, for instance, at the city council's request, the Army's First Corps Area commander sent New York Engineer District personnel and CCC workers, who were then building Waterbury Dam in the Winooski River valley, to clear away the flood debris.

Trees on Manchester Street in Manchester, New Hampshire, were uprooted and toppled by the 1938 hurricane, damaging a number of buildings along the street.
National Archives, 69-MPH-6

With the eighty-eight trucks and tractors available at the Waterbury Dam, the Corps and CCC laborers had the cleanup at Montpelier done in a week.[14]

Engineer Readiness

The 1938 New England hurricane set unforgettable storm standards. Any hurricane approaching New England thereafter aroused public fears that it might match the 1938 disaster. None of the subsequent storms occurring between 1938 and 1942 attracted national media attention, nor were they usually ranked as major disasters, yet some would have qualified under the federal disaster assistance policies prevailing after 1950. In these cases, the benefits derived from the emergency operations advance planning mandated by the chief of engineers in 1938 became apparent.

Tornado disasters rarely mobilized the Corps of Engineers prior to 1950 because these wind storms rarely caused the widespread flooding that automatically involved the Corps. Tornado victims typically needed temporary shelter

and help with removing the debris caused by the winds. The Quartermaster Corps and National Guard normally supplied the needs of tornado-stricken towns, and it therefore was merely chance that mobilized the Corps office at Charleston, South Carolina, in response to a 1938 tornado.

Three tornadoes raked through Charleston on the morning of 29 September 1938. One destroyed a three-story building across the street from the Charleston Engineer District office in the Federal Customs House. Learning that people had been buried by the falling building, Maj. Reading Wilkinson called out his office staff to dig through the debris to rescue the living and recover the bodies.

That afternoon Wilkinson and his staff conducted damage surveys in Charleston and mapped the damaged area to outline the paths of the three tornadoes. He presented the results to the Army's Fourth Corps Area commander and to local officials. The commander ordered troops from Fort Moultrie to conduct street security patrols to deter looting and directed Wilkinson to use the Corps' boats for patrol of the Charleston waterfront. Wilkinson also offered Corps personnel and equipment to assist the Red Cross recovery efforts, but this aid proved unnecessary.[15]

A similar emergency response in March 1939 saved Glasgow, Montana, from flooding. After rapid snowmelt and ice raised the Milk River two feet higher than ever before, threatening Glasgow with flooding, Maj. Clark Kittrell, commanding the Corps office at Fort Peck, sent crews to blast the ice jammed against bridges while he went to Glasgow. There he found leaks in the levee and called his crews and equipment from Fort Peck. The crews directed WPA and volunteer labor; together they built sandbag rings around the leaks and revetted the levee with sandbags to prevent further erosion, thus protecting Glasgow from disaster.[16]

In August 1940 the New Orleans Engineer District responded effectively when a hurricane dropped up to thirty-three inches of rain in the vicinity of Vermilion Bayou and Lake Arthur. The New Orleans commander, Capt. Robert G. Lovett, offered Corps support to the American Red Cross for rescue operations, and at their request dispatched twelve Corps launches to the disaster area. In four days these boats rescued 1,397 people and delivered ten thousand pounds of Red Cross food and medical supplies to communities isolated by the flood.[17]

In the same month, flooding occurred along North Carolina's Roanoke River. Col. G. W. Gillette at Wilmington sent assistants by one road to reconnoiter the flood while he took another route to Weldon near Roanoke Rapids. Gillette found the Weldon authorities caring for 150 refugees, but their city's water supply plant had been flooded and they feared an outbreak of typhoid. He agreed to find a water purification unit for their use, but he learned that all purification units in the Fourth Corps Area were with the Third Army on training maneuvers. Gillette placed a call at 9:30 on Sunday evening to Maj. Gen. Julian Schley, Chief of Engineers, and found him at home.

Schley called the commanding officer at Fort Belvoir, and by 11:30 that evening a water purification unit was on the way to Weldon in charge of Sgt. Alexander Angus. Angus set up the unit, capable of delivering 110,000 gallons daily, the following morning. Weldon officials

also requested the loan of dump trucks to help restore the city's water plant to operation, and Gillette placed calls in attempts to fulfill their request. Fort Bragg could not furnish the trucks, but Fort Belvoir sent six trucks in charge of Lt. Charles Bonesteel of the 5th Engineers. Once they reached Weldon, they removed flood debris from the water supply plant and hauled in replacement pumps.[18]

After locating and securing the equipment, Gillette motored down alongside the Roanoke River, offering assistance to each community and learning that none was needed. When the emergency passed, Gillette reported his actions to the Fourth Corps Area commander and the adjutant general. Reviewing the report, the adjutant general asked the chief of engineers to explain by what authority the actions had been taken and why the Fourth Corps Area commanding general had not been advised in advance in order that he might reject or approve the actions. Schley pointed out that Gillette had informed Fort Bragg's commander and had received no help. Because a typhoid epidemic threatened North Carolina and the water purification units were with the Third Army on maneuvers, the chief of engineers had assumed the necessary authority and responded to the emergency. Schley sent instructions afterwards, however, to all Corps

Rescuers sorted through the rubble of Charleston's City Market, destroyed by a tornado on 29 September 1938. The building across the street from the Corps of Engineers' Charleston District office was also destroyed in the storm.

Courtesy of The Charleston Museum, Charleston, South Carolina

In 1939 the Corps of Engineers reinforced the levees protecting Glasgow, Montana, from flooding caused by ice dams and snowmelt. The city was nearly surrounded by water but remained dry. Montana Historical Society Research Center, Photographic Archives, Helena, Montana

field commanders, reminding them that regulations required prompt reports to Army corps area commanders.[19]

Two weeks after the Roanoke River flood, a cloudburst dropped up to fifteen inches of rain in eight hours over an area between Smyrna, Delaware and Fort Dix, New Jersey. The resulting flood destroyed sixty small private dams in the area and drowned four people. This flood also occurred on a Sunday, 1 September 1940, but Maj. H. B. Vaughan, commanding the Corps's Philadelphia office, located personnel and rushed them to the disaster area for reconnaissance. Local authorities needed little assistance, however, and Vaughan merely supplied sandbags to the town of Wenonah, New Jersey, and arranged delivery of a water purification unit from the 1st Engineer Battalion at Fort Dupont to Bridgeton, New Jersey, which had lost its pumping plant to the flood.[20]

The Corps' Galveston office saved many lives during the 1899 Brazos River flood, and it returned to the Brazos in 1940 for a similar rescue mission. After five days of heavy rain in November 1940, floods descending the Brazos, San Jacinto, and Colorado rivers moved so rapidly that they stopped navigation on the Houston Ship Channel and Louisiana–Texas Intracoastal Waterway. Currents were so swift that they overturned the Corps dredge *Dorothy* and sank it at Matagorda. Corps personnel went

out onto the flooded Brazos in small skiffs and rescued stranded victims to transport to Red Cross camps.[21]

Although these emergencies, from the 1938 Charleston tornado to the 1940 Brazos River flood, have generally been forgotten, they provided the first tests of Corps emergency operations under the advance planning procedures mandated by the chief of engineers, and the improved emergency response was notable. Except where the threat of damages to navigable channels or flood protection structures had been clear, the Corps' response to disasters prior to 1938 had often seemed passive; that is, the Corps waited until local governments or the Red Cross requested assistance or until superior authorities directed that it take action. After 1938 all Corps district offices had contingency plans and emergency management organizations; and they acted aggressively during disasters, going immediately into stricken areas for damage surveys and offering assistance directly to local governments and relief agencies. Before 1938 the costs of emergency operations were reimbursed either by special or deficiency appropriations by Congress, by Army contingency funding, or by funding for civil works operations and maintenance. In Section 5 of the Flood Control Act of 18 August 1941, however, Congress provided continuing funding for Corps emergency services by authorizing the secretary of war to allot $1 million each fiscal year to finance any necessary rescue work and the repair and maintenance of flood protection structures threatened or destroyed by floods.[22]

Reorganization and Manpower

The national defense mobilization that began in 1940 forced changes in planning for response to disasters because the Corps and Red Cross could no longer count on assistance from the CCC and WPA; these Depression-era work relief agencies were phased out at the advent of war and their disaster assistance roles filled by the armed services. Liaison between the Corps civil works organization and the Army's corps area commands (succeeded by Army Service Forces commands) became closer because the Corps relied on troop support during flood emergencies. When available troop numbers were reduced by increasing overseas combat requirements during the later years of World War II, the Corps obtained the necessary manpower for emergency operations from prisoners-of-war.

Realizing that WPA and CCC labor and equipment would no longer be available, the chief of engineers began a study of the emergency manpower problem in 1942. An Army reorganization that year had placed all support and logistics functions in the United States—including the Corps of Engineers—under Services of Supply, later renamed Army Service Forces. In January 1943 the chief of engineers recommended to the Services of Supply commander that engineer troops training for combat be made available during flood emergencies. Pointing out that flood fights could provide superb training for engineer troops, the chief asked that he be permitted to order engineer troops under field command into flood fights in support of his civil works districts, and that the commander of the Engineer Training Center at Camp Claiborne, Louisiana, report directly to

the Mississippi River Commission during flood emergencies. The secretary of war approved these procedures.[23]

The 1943 Floods

Conditions in 1943 brought a real test of the new procedures when floods of varying severity covered more than nine million acres in the Mississippi River basin, killing sixty-two people and causing damages exceeding $96 million.[24] The 1943 flooding, as often in the past, started in the Mississippi basin's northern sector. "I started the troops on Monday night, May 17, 1943," reported Col. C. Lacey Hall, commanding the Corps division at Cincinnati. "The rains started on Saturday night, May 15, 1943, and by Monday it became evident we were going to have a superflood, or it looked like it; and the commanding general of the Fifth Service Command very kindly met all my requests for troops. In the meantime I had sent Engineer Department employees capable of handling the jobs to each of the danger centers. The troops arrived and helped out very greatly."[25]

To ensure full coordination of his military construction and supply missions, Hall had moved his Cincinnati office to Columbus, Ohio, in 1942 near the headquarters of the Fifth Service Command. When floods began in 1943, he naturally turned to the Fifth Service Command for troop assistance.[26]

Army troops placed sandbags along the Illinois River near Beardstown, Illinois, during the 1943 flooding.

National Archives, 77-RH-34C-1

The 1943 flood in the Ohio River basin concentrated along the Wabash River and lower Ohio River, and the Corps office at Louisville, Kentucky, implemented its emergency flood plan on 11 May, opening field offices at Logansport, Terre Haute, Vincennes, and Evansville, Indiana, to direct flood fights along the Wabash and Ohio.

Corps personnel, for example, supervised four hundred volunteers and seven hundred engineer troops detailed from Fort Benjamin Harrison, Indiana, as they raised the levee protecting Vincennes. They closed road and railroad openings with sandbags and built a mudbox bulkhead atop the floodwall to protect against the flood. Terre Haute's levee proved weak, so the Corps and troops evacuated the city and then controlled the seepage, boils, and sloughs to save the levee and prevent inundation of western Terre Haute. The flood overtopped a levee at Peru, Indiana, before the Corps and troops arrived, but they sandbagged another section to prevent inundation of part of the town.[27] Hall later submitted a vivid report on the Corps's Wabash River flood fight:

> Our principal rescue job was done at West Terre Haute, Ind. We had considerable difficulty there because a lot of people did not want to move from their homes, and the greatest tact had to be displayed by the troops to persuade them they had better get out before they were drowned. In other places, the rescue was not so difficult because there seemed to be plenty of notice, but the assistance in trying to hold the levees involved a tremendous amount of work.[28]

To prevent the inundation of vital military production plants near the Ohio River at Louisville, 415 troops of the 382d Engineer Combat Battalion from Fort Knox placed eleven thousand sandbags on fifteen hundred yards of levee in a single day. This protection kept the plants in production, thereby contributing to the national defense effort.[29]

Soldiers from the 75th Engineer Light Ponton Company in a Ford GPA amphibious jeep rescued a man and woman stranded on a roof near Biscoe, Arkansas, in May 1943. Office of History

"…the greatest tact had to be displayed by the troops to persuade them they had better get out before they were drowned."

Seeing that severe flooding would occur along the Illinois and upper Mississippi rivers, Col. Malcolm Elliott, commanding the Corps' Upper Mississippi Valley Division, called Maj. Gen. Henry S. Aurand of the Sixth Service Command at Chicago to request troop assistance with the flood fights. Aurand mobilized troops from Fort Sheridan, Jefferson Barracks, Camps Ellis and Grant, the Scott, Chanute, and George Army airfields, and the Engineer Depot at Granite City, Illinois.[30]

During the May 1943 floods of the Missouri and Mississippi river systems, soldiers were mobilized to shore up the levee on the White River at Peach Orchard Bluff, Arkansas. Water purification equipment operated by the 364th Engineer General Service Regiment provided drinking water to the troops.

Office of History

Col. James Brownell at Granite City first sandbagged the levees around his depot to protect it, then dispatched assistance to other flooded areas. The depot stored large quantities of sandbags stockpiled for use in combat as temporary fortifications and also housed many assault boats designed for river crossings.[31] Trucks full of sandbags rushed north from the depot to Beardstown, Illinois, where an epic flood fight was underway against the Illinois River. Beardstown was saved by thirty-two officers and eight hundred enlisted men of the 732d Military Police Battalion, commanded by Col. Amory Miller. The men worked around the clock to cap the levee with sandbags. To keep his troops alert at night, Miller had his band loudly play martial music. The flood fight at Beardstown thus became the only one of record that was set to music in the grand Hollywood tradition.[32]

Laboring under supervision of forty student engineer officers sent from the Officers Candidate School at Fort Belvoir, Virginia, the military police, troops from Fort Sheridan, and other units filled and placed a million sandbags along sixty-four miles of the lower Illinois River, preventing the inundation of seventy-six thousand acres. By the struggle's end, the Sixth Service Command had committed 21,390 troops to the action and had supplied 331 trucks, 257 assault boats, 60 amphibious jeeps, and other equipment. It also cooperated with the Red Cross, establishing three refugee camps and furnishing tents, blankets, and cots.[33]

Regular troops also served during the 1943 floods on the Missouri and Kansas rivers. The Corps fleet, as usual, performed rescue work, evacuating 210 families and two thousand head of livestock as well as vehicles, tractors, and household effects. The Corps offices in the area received assistance with levee patrol and sandbagging from twenty-five hundred troops detailed from Fort Leonard Wood and Jefferson Barracks.[34]

More regular troops mobilized for flood fights along the White, Arkansas, and St. Francis rivers under the command of Col. Jarvis Bain. A veteran of the Spanish–American and First World wars, Bain had served in the 1906 San Francisco earthquake recovery mission and other natural disasters.[35] Recalled to active duty during World War II, Bain commanded the Memphis Engineer District, and he requested the assistance of forty-five hundred engineer troops, who reported to him on 14 May 1943. Under the arrangement devised by the chief of engineers, Bain commanded the troops during the flood fight while the unit commanders retained control of the normal supply and discipline functions. His command included the 359th, 95th, and 398th Engineer General Service Regiments from Camp Claiborne, Louisiana, the 527th Light Ponton Company

from Camp Swift, Texas, the 511th Light Ponton Company from Camp Bowie, Texas, the 78th Light Ponton Company from Camp Beauregard, Louisiana, and the 853d Engineer Aviation Battalion from Dyersburg Army Air Base near Halls, Tennessee.

Bain ordered these troops to critical areas along the Arkansas, White, St. Francis, and Mississippi rivers where they sandbagged and held all levees except at Booth's Point on the Mississippi. There, the 853d Engineer Aviation Battalion raised a road embankment used as a secondary levee by two feet before it crevassed. Because engineer troops had evacuated the area behind the levee, no lives were lost.[36]

The Arkansas River crested four feet above previous records between Fort Smith and Pine Bluff, where the Corps' Little Rock office managed a flood fight by nineteen thousand troops from Camps Chaffee and Robinson in Arkansas and Camp Livingston in Louisiana, plus the National Guard and German and Italian prisoners-of-war. The troop organization typically consisted of an engineer company matched with two infantry companies under supervision of Corps personnel. The Corps officers later commented that the prisoners generally worked hard to combat the flood, although guards had to thwart two escape attempts.[37]

On 15 May the flood broke a water main across the Arkansas River that supplied water to Camp Chaffee, so three engineer battalions from Oklahoma and Texas delivered water purification units that provided 745,000 gallons of water daily for the camp. The troops then built a ponton bridge across the Arkansas, capped the water main, and installed other water lines

Soldiers of the 359th Engineer General Service Regiment repaired a slough in the Jackson Bayou levee along the White River during the 1943 flood. Troops on the far bank filled sandbags, which were handed over the water for placement on the near side. U.S. Army photograph, SC183397

across the river to restore normal water supply, all done within twenty-four hours.[38]

The Corps office at Vicksburg committed 162 civilian personnel to flood fights in the lower Arkansas River valley below Pine Bluff. Obtaining assistance from the National Guard and the 372d Engineer General Service Regiment from Camp Claiborne, their efforts proved successful.[39]

In company with Lt. Gen. Eugene Reybold, Senate Majority Leader Scott Lucas inspected the Arkansas disaster area, and upon returning

to Washington, Lucas described the emergency to the Senate. He introduced a resolution to fund repairs to flood protection structures and to allow the Corps to improve them by raising the levees to adequate grades and sections rather than simply restoring the inadequate levees. As enacted, the resolution provided $10 million for emergency levee restoration.

The Red Cross, in the meantime, took care of immediate relief needs resulting from the 1943 floods, while the Farm Credit Administration financed replanting of crops and the Disaster Loan Corporation made available low interest loans for rebuilding homes and businesses. Help with restoring community water, sewer, and utility services came from the Federal Works Agency, then managed by Brig. Gen. Philip Fleming of the Corps of Engineers, although this agency had no other connection with the Corps.[40]

The 1945 Floods

Except in the St. Louis Engineer District, 1944 passed without a major flood emergency. During an April flood, the St. Louis office had the assistance of 5,053 Illinois State Guard troops (which replaced the National Guard then on active duty in federal service), 7,800 Regular Army troops, and 834 prisoners-of-war to strengthen levees along the Mississippi from St. Louis to Cairo. The flood breached several levees, but losses were not catastrophic.[41]

Corps offices reviewed their emergency plans in advance of the 1945 flood season and scheduled major planning conferences in January and February. The chief of engineers' staff met with the Mississippi River Commission, the Upper Mississippi Valley and Ohio River divisions, the Louisville and Memphis districts, and the Tennessee Valley Authority (TVA) to plan emergency responses.

TVA had received major defense funding to complete its multipurpose dams on the Tennessee River, dams to supply power to the Oak Ridge nuclear complex and aircraft aluminum production facilities. The Flood Control Act of 1944 had directed TVA to coordinate the operation of its dams and reservoirs to reduce flooding along the Ohio and lower Mississippi rivers. At the 1945 conferences with the Corps of Engineers, TVA agreed to regulate releases from its dams to help reduce flooding when the Corps' Ohio River Division deemed it necessary. It was agreed that flood danger existed on the lower Ohio and Mississippi rivers whenever a forty-four-foot river stage at Cairo was predicted.

The Memphis District staff met with the American Red Cross managers in February 1945 to formulate evacuation plans for the Birds Point–New Madrid Floodway. The plans called for the Memphis office to alert residents in the floodway at least five days in advance of evacuation; for the Army's Seventh Service Command to send the troops and equipment needed to carry out the evacuation; and for the Red Cross to house, subsist, and care for the evacuees.

When the Cairo gauge climbed to forty feet in February 1945, the planned emergency operations began. To preserve central control for procurement of equipment, supplies, and troops, the Corps district offices cleared all their requests through the Mississippi River Commission. Stationing technical personnel and Army Signal

Axis prisoners of war were put to work on various tasks, and paid, during the Mississippi River basin floods of December 1944, including construction of drainage channels. Office of History

Corps officers with radios in each engineer district in the Mississippi River valley assured uninterrupted and secure communications during the flood fight. Because engineer troops of Army Service Forces and Ground Forces had left for the combat theaters by 1945, the commander of Army Service Forces agreed to supply prisoners-of-war and mobilize the state home guard units for action during the coming floods.

At Vicksburg, Mississippi, on 20 March the Corps met with officers of the Fourth, Seventh, and Eighth service commands to discuss the use of prisoner-of-war labor. Some of the agreed-upon rules provided that service commands would establish tent camps for lodging 250 prisoners; Corps districts would furnish the transportation for prisoners to and from work sites; prisoners would work no more than twelve hours per day, although night shifts were permitted if lighting and extra guards were available; fraternization with prisoners would be strictly prohibited; and only members of the Signal Corps would be permitted to photograph prisoners. In addition, the prisoners would be compensated for their labor.[42]

Col. C. Lacey Hall began the 1945 flood fight on the Ohio River at Portsmouth, Ohio, on 6 March. The Cincinnati Corps office supervised troops of the Ohio State Guard, who built 2,900 feet of temporary earth dike and 1,450 feet of sandbag dike to protect Portsmouth from a river stage four feet higher than the city's existing levees. Working hastily, with sandbag bundles dropped at the last minute from Army aircraft, the Corps and the Ohio Guard beat the flood, which crested three feet up the side of the temporary capping on the levee.

At the time, Mill Creek Barrier Dam at Cincinnati was only partly completed and protected the city's industrial section only to a sixty-five-foot river stage. The Corps' construction workers and the Ohio State Guard used sandbags to raise the protection to a seventy-foot river stage, but their effort failed because the foundation beneath the sandbag dike washed out. Jeffersonville and Clarksville, Indiana, at the Falls of the Ohio had a local flood protection project underway in 1945, but the military mobilization had suspended its construction. To protect the towns, the Corps office at Louisville, Kentucky, called in 120 prisoners-of-war and two military companies from Camp Atterbury, Indiana, to raise the uncompleted levee sections with sandbags. The Corps installed portable pumps, closed traffic openings and sewer lines through the levees, and topped the levees with mudbox reinforcements, thus saving the towns from flooding. Across the Ohio, the Corps and prisoners-of-war attempted to sandbag the Point section of Louisville, Kentucky, to protect riverside industry and housing. This heroic effort failed, however, when the flood went over the temporary dike.

Farther down the Ohio at Paducah, Kentucky, where the local floodwall's construction also had been suspended during the war, the Corps brought in more prisoners-of-war to help the city's forces sandbag street openings in the levee. Because pumps had not been installed at Paducah's twelve pumping stations in the floodwall, the Corps trucked in portable pumps for the flood fight. The Corps also converted its suction dredges *Jewett* and *Harris* into powerful temporary pumping plants to keep the city dry behind its floodwall. Thus, Paducah was protected from the type of flood disaster it has suffered in 1937.[43]

In his after-action report, Hall noted that no previous flood fights in the Ohio valley had produced such good results: the emergency planning and the local flood protection projects had done much to avert property damages. He also commended the prisoners-of-war for their efforts, concluding:

> Part of the credit is due to the presence of considerable amounts of labor in the form of prisoners-of-war, but the most conspicuous fact is that the inhabitants of the valley have become extremely flood educated and that a very large number of civil officials know exactly what to do. It is to be particularly noted that the Governor of Ohio handled the flood fighting in the State without calling on the Federal Government for either labor or equipment. Some of the work done by the Ohio State Guard under the orders of the Governor of Ohio was really remarkable, and was especially noteworthy in that most of the soldiers were enlisted only because they were physically unfit for service during the war.[44]

By late March persistent rains battered the lower Mississippi valley, and the Corps offices at Memphis, Vicksburg, and New Orleans called upon the Army's service commands for prisoner-of-war labor. By April a total of 3,870 prisoners were engaged in flood fights along the Mississippi and its southern tributaries. Three successive flood crests roared past Cairo in thirty days: the first on 11 March at 53.9 feet, the second on 21 March at 53.8 feet, and the third on 4 April at 53.7 feet.

In April 1945, flooding on the Arkansas River caused the main levee at Hannaberry Lake to fail (upper left). An emergency loop levee was built to hold back the water, and a second loop levee was constructed behind the first.

Office of History

The Memphis office mobilized the personnel and equipment needed to evacuate people and open the Birds Point–New Madrid Floodway, but evacuation did not prove necessary that spring. At Booths Point, Tennessee, where a road embankment used as a levee had failed in 1943, the Corps began sandbagging on 10 March 1945, with the assistance of Tennessee state convicts. The embankment failed again, however, causing the inundation of twenty-six thousand acres but no loss of life.[45]

Another critical flood fight in the Memphis District occurred at the Hannaberry Lake levee on the Arkansas River. When the river began eroding the main levee there, the Corps built a loop levee four thousand feet long and six feet high, which was finished on 10 March. When it became apparent that erosion might take out the loop levee also, the Corps began construction of a second loop levee farther landward. The floodwaters breached the first emergency loop on 15 March, but the second loop held.

When a dangerous situation on the White River threatened levees in Woodruff, Prairie, and Monroe counties, Arkansas, the Memphis office secured help from four engineer combat battalions and one light ponton company. The troops, 110 officers and 2,275 men, in 100-man details, sandbagged critical points along the levees and ringed sandboils. They also bridged the Cache River with pontons and conducted rescue operations in Army assault boats. One soldier drowned when an assault boat capsized.

On 18 March, while the White River flood fight was still in progress, the engineer battalions were

ordered back to their home stations to depart for overseas combat theaters. The Memphis office, therefore, obtained the 1800th Engineer General Service Battalion (18 officers and 352 men) from the Fourth Service Command as replacements for the departing troops.[46]

More than four inches of rain fell on the White River watershed in early April, renewing the attack on the already saturated levees. The situation became so critical that all troops working on the White River levees were ordered to wear life vests. Water began to trickle over the levees and soon several crevasses flooded Woodruff, Prairie, and Monroe counties. Sixty Army M–2 assault boats and four Coast Guard boats went into the rough water and saved all the endangered residents. The troops were left marooned atop the damaged levees, but eventually they were evacuated by boat to join the flood fight nearer New Orleans.

The Corps office at Vicksburg used 250 prisoners-of-war to sandbag levees near Pine Bluff, Arkansas, and used Mississippi state convicts in the Yazoo River basin. At Jonesville, Louisiana, on the Black River, the town attempted to protect itself by building a ring levee of sandbags entirely around the community. The labor situation was so critical there that half of the volunteers carrying bags to the levee were women. Again, the Corps brought in prisoners-of-war to alleviate the labor shortage and to finish the ring levee.[47]

One interesting sidelight of Vicksburg's flood fights was the installation of a Bailey bridge by troops from Camp Shelby to restore traffic on

A diver from the 1298th Engineer Battalion checked for debris in the Cache River near Cotton Plant, Arkansas. The 1298th built a sturdier temporary bridge to replace this emergency bridge built by the 516th Engineer Light Ponton Company after the 1945 floods washed out the highway. Office of History

Highway 51 in Mississippi. The flood had submerged the highway, and the temporary bridge reopened it for emergency use. Bailey bridges had a large role in combat operations overseas, but this was the first time such a bridge was used in a domestic disaster situation.[48]

The Corps' New Orleans office relied on the Eighth Service Command for manpower. It sent many prisoners-of-war to construct wave-wash fences, emplace sandbags, build mudboxes, and generally strengthen the levees. The Corps opened the Bonnet Carré spillway on 23 March and by April all 350 of its bays were opened to pass the floodwaters. The 1800th Engineer Battalion, earlier marooned on a White River levee after it failed, reported to the spillway in April and armored its slope with stone to prevent erosion.

Plans also called for opening the Morganza Floodway in Louisiana when stages increased. The Corps closed its railroad and highway gaps and warned residents in the floodway that it would be opened on 9 April. When days passed without additional rains and flooding, however, opening the Morganza Floodway became unnecessary.

On the flooded Red River, the Corps established an emergency office at Marksville, Louisiana, and used prisoners-of-war to strengthen the levees. The levee at Harris Ferry, however, began to cave in, and the Corps rushed all available private and military earth-moving equipment to the spot, building in just five days a new 1,000-foot levee that looped behind the other. The new levee held back the flooded river.[49]

Corps records mentioned no misbehavior by the prisoners-of-war who volunteered to work on the levees, work that contributed to the successes of the 1945 flood fights. In fact, there was at least one instance of heroism: a German prisoner found a small levee break and threw his own body into the leak, plugging it until sandbags could be placed. In the opinion of Corps officers, the prisoners-of-war served effectively as emergency manpower and performed well under proper guard and supervision.[50]

Observations

The nation fortunately suffered few major natural disasters during its military mobilization from 1938 to 1945, and certainly none on the scale of the 1906 San Francisco earthquake or the 1927 Mississippi River flood. Such a large-scale disaster would have diverted critical materials, equipment, labor, and public attention from the worldwide military efforts.

The Corps' civil works organization and the Army's command in 1938 planned to rely on the Depression-era work relief agencies for emergency and disaster recovery labor, but both military recruiting and the closing of the agencies decreased the available labor pool. During the war's early phase, the Corps obtained emergency reinforcements from the engineer troops training near disaster areas, but these troops had gone to war by 1945. Rather than diverting soldiers from the military effort in 1945, the Corps obtained assistance from state convicts, prisoners-of-war, and the state home guards, and found their contributions useful. With the war's end, however, the prewar emergency plans and disaster assistance policies became obsolete.

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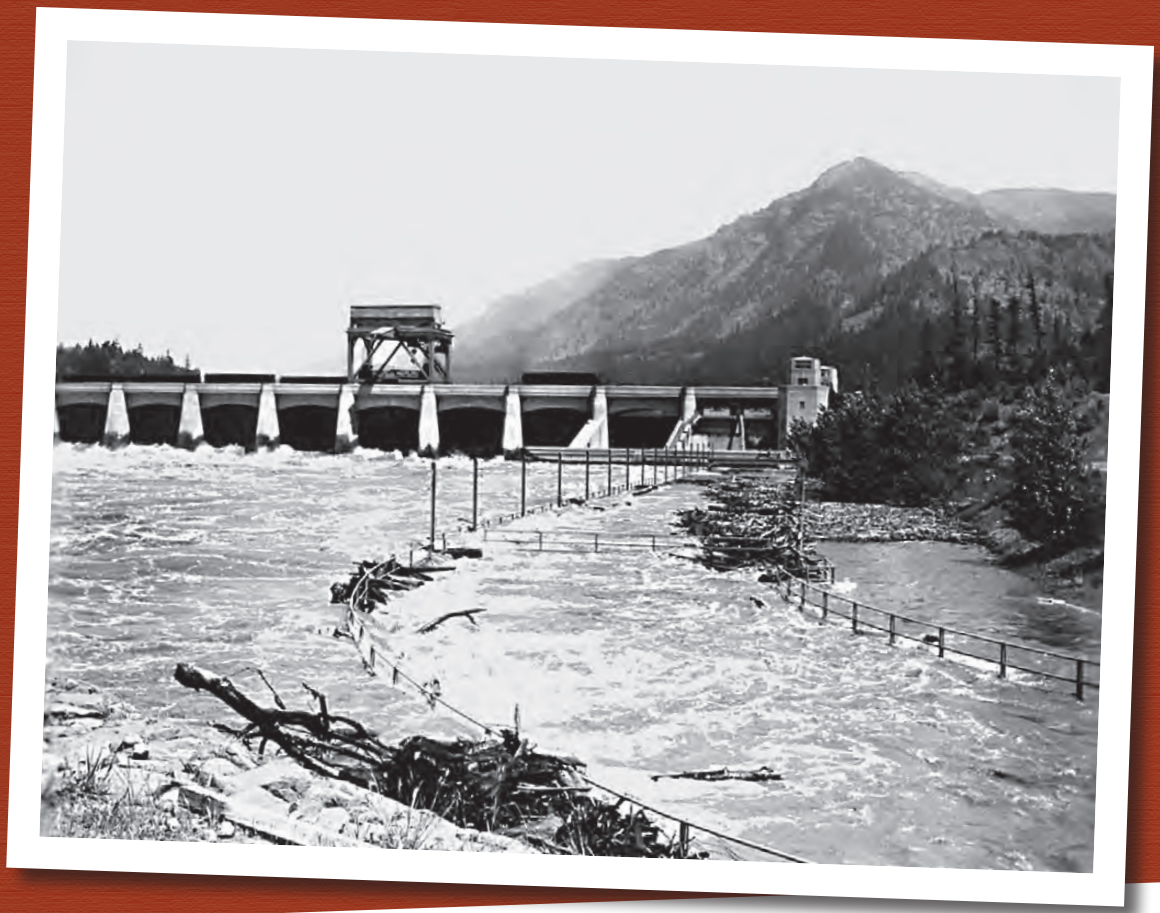
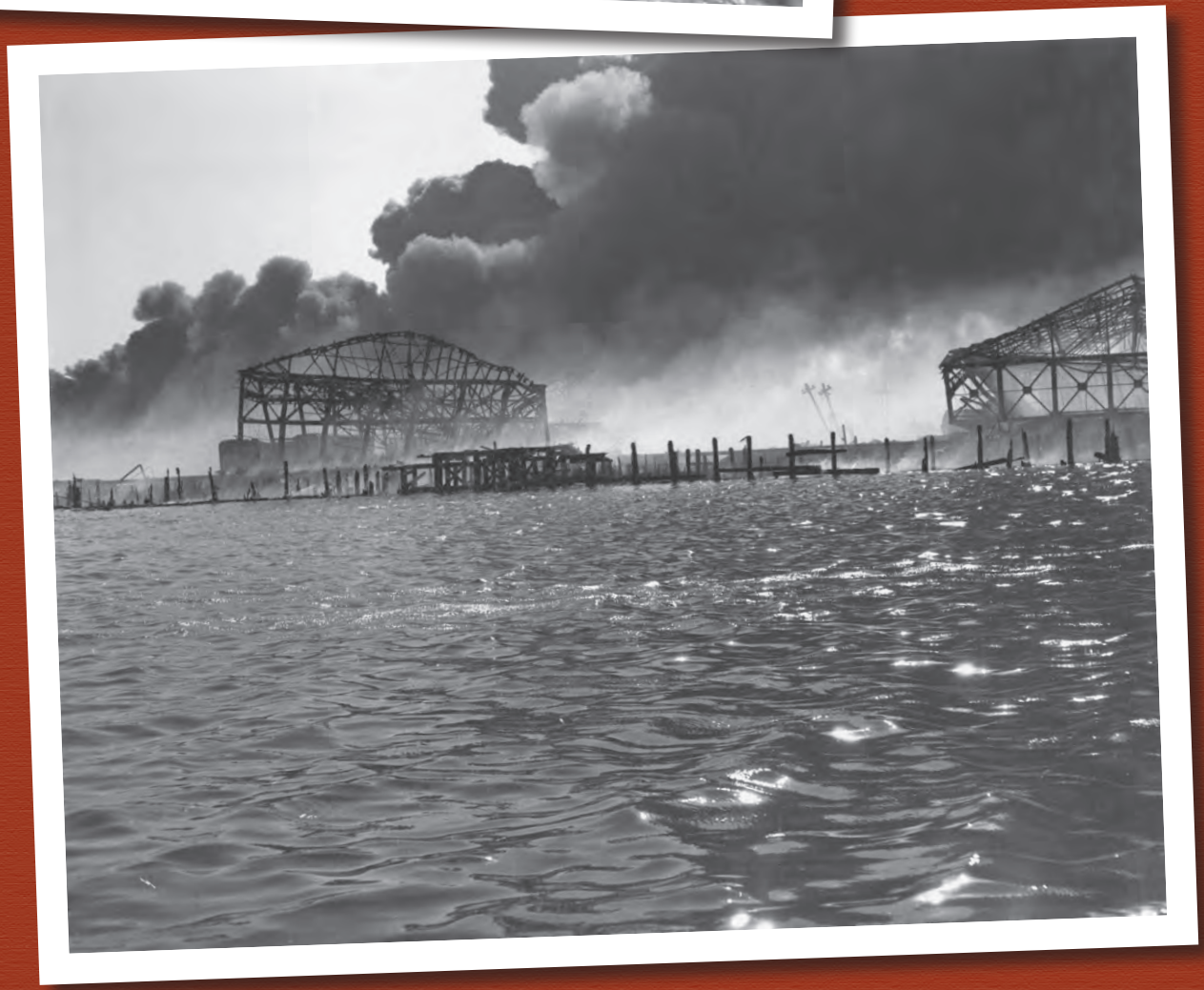


The Columbia River near Bonneville Dam flooded in May 1948.
Portland District



Many buildings were destroyed by the Texas City explosion, 16 April 1947.
Office of History

10 Postwar Emergencies

During the postwar years the Army Corps of Engineers continued to grow its disaster assistance mission. The Texas City explosion of 1947 represented one of the greatest peacetime calamities in American history, and the Galveston District arrived on the scene almost immediately with firefighting equipment and other necessities. Over the next few days, it cooked food, launched tugs to remove the dead and debris from port waters, and relayed radio transmissions in what became a textbook response to major urban disasters. A series of storms across the Missouri and Mississippi river valleys in June 1947 and major flooding in the Pacific Northwest the following year raised public awareness of Corps activities and bolstered expectations of federal disaster assistance. Congress responded by investigating the need for a federal agency to coordinate disaster assistance and a permanent national policy on disaster relief.

Texas City Disaster, 1947

"The press is filled with accounts of one of the greatest holocausts ever visited upon the United States," proclaimed Congressman John Connally, informing the House of Representatives about the Texas City explosion of 1947. "When the news first came to me," he went on, "I took the matter up with Gen. Jonathan Wainwright, commanding general of the Fourth Army at San Antonio, with the regional director of the War Assets Administration, Gen. Casper B. Rucker at Dallas, and with the Chief of Engineers of the War Department."[1]

Lt. Gen. Raymond Wheeler, Chief of Engineers, told Connally that engineer personnel and equipment were already at Texas City fighting fires and furnishing all assistance requested to local officials. Personnel from the Corps' repair depot in Galveston had heard the deafening blast and immediately set out for Texas City by automobile. They found the chief of police forty-five minutes after the explosion and, at his request, used their portable units to establish and maintain radio communications until the town restored its police radio network to service. Col. David Griffiths, commanding at Galveston, and his staff boarded the survey

When the explosion and fire knocked out other means of communication, Army Engineers used a radio car to communicate with other elements of the relief effort at Texas City. Office of History

"The press is filled with accounts of one of the greatest holocausts ever visited upon the United States."

launches *Ralph Millis* and *Guyer* and headed for Texas City by water, arriving just thirty minutes after the first Corps personnel reached the devastated town in automobiles.[2]

Griffiths transmitted his personal description of the Texas City disaster to Fort Crockett's commander in Galveston harbor. At 9:12 the morning of 16 April 1947, the ship *Grandcamp,* loaded with ammonium nitrate, exploded; it had been on fire an hour before the explosion. The blast wiped out Texas City's fire department, both men and equipment. It also caused a fifteen-foot wave in the harbor that flooded the surrounding area. It hurled burning cargo and metal fragments into a nearby Monsanto chemical plant, starting more fires that touched off more blasts. Griffiths asked Fort Crockett to report the Texas City crisis to headquarters and to send Army medical assistance. The Corps' Galveston District meanwhile would coordinate emergency operations by transmitting messages from its

Soldiers and cooks from the 41st Infantry Battalion and the 66th Tank Battalion worked round the clock to provide food for rescuers and residents in Texas City in the aftermath of the massive explosions.

U.S. Army photograph, SC280974-S

Flames and smoke poured from oil storage tanks set on fire by the ship explosion at Texas City. U.S. Army photograph, SC280968

mobile radios to its survey launches for relay on to the district office and Fort Crockett.[3]

Galveston District's motor pool vehicles took firefighting equipment, first aid supplies, and blankets to the disaster site. They transported the dead and injured to morgues and hospitals and supplied mobile emergency services until organized relief agencies arrived. When Fourth Army sent kitchens but no cooks, Corps personnel set the facilities up and cooked meals for the firefighters and evacuation crews. Along the waterfront, Corps launches and tugs removed the dead and injured and relayed radio transmissions. Griffiths escorted General Wainwright through the disaster area, and Wainwright established Fourth Army's emergency office at Fort Crockett and directed the Corps to continue assisting in the ruins of Texas City.

Because the blast had set afire the ship *High Flyer*, which also had a cargo of ammonium nitrate, the people of Texas City evacuated to a safe distance. This ship exploded that night, igniting oil tanks located around the harbor. After the second detonation, the Corps resumed its search for bodies, and Corps launches began a fathometer survey of the Texas City basin to locate navigation obstructions. At the mayor's request, the Corps also commenced damage surveys of the ruined waterfront, reporting the findings to local authorities and Congress.[4]

The Corps performed emergency services at Texas City until 23 April, then prepared its after-action review. For their emergency

After the explosions and fires, the Texas City railroad yard was filled with destroyed vehicles and buildings. U.S. Army photograph, SC280975-S

response efforts, General of the Army Dwight Eisenhower awarded personal commendations to Griffiths and the participating Galveston District personnel. Galveston District's response to the Texas City emergency later became a textbook model, studied by Corps officers attending the disaster recovery lectures at the Fort Belvoir Engineer School.[5]

Red Cross figures showed that Texas City blasts and fires killed 512 and injured 1,784 and caused estimated property damages of $47 million. At the time of the explosion, President Harry Truman issued an executive order directing federal agencies to do everything possible to help Texas City recover; and, upon enactment of Public Law 233 (Aiken Act) on 25 July 1947, Truman ordered the Army to give surplus equipment and materials to Texas City authorities responsible for repairing and restoring public facilities.[6]

With the crisis under control, officials turned to long-range problems. To avert an economic disaster resulting from closing the port of Texas City—and the subsequent unemployment that would have followed when plants closed for lack of materials—Griffiths sought authority for the Corps to clear wreckage from the harbor. Although much of the wreckage was

located at privately owned docks, the chief of engineers found the authority to approve the work under Section 20 of the 1899 Rivers and Harbors Act.[7]

The Aiken Act

Senator George Aiken of Vermont sponsored a bill in July 1947 to offer disaster-stricken communities federal assistance in the form of surplus military property. In 1946 the military underwent a severe retrenchment from World War II levels, and the services had warehouses full of materials left over from the war that would not be needed by the reduced armed forces. Aiken explained to the Senate how his bill would put those surplus materials to good use to assist with disaster recovery:

> The bill provides, first, that the President must make a determination that a catastrophe has occurred. A good example was the Texas City catastrophe. Another good example is the recent catastrophes from floods and other causes. When the President makes a determination, then the War Assets Administration is authorized to turn over to the Federal Works Administration [*sic*] any property which may be useful in alleviating the suffering of the victims. The Federal Works Administration will dispose of such surplus property to States and local governments, with or without compensation. Then the States and local governments will have the property wholly in their hands, and will make such arrangements as can be made to rehabilitate the people within their States or cities, under agreement, of course, with the Federal Works Administration.[8]

Aiken's bill became law on 25 July 1947 and authorized the Federal Works Agency (FWA), after the president declared a "major disaster," to loan or give to state or local governments rations, medicines, trucks, and bulldozers for recovery and reconstruction purposes. The FWA, however, could not supply the fuel or other materials needed to operate the equipment, nor could it recruit and pay the labor employed for debris removal and reconstruction.[9]

Maj. Gen. Philip Fleming, an engineer officer who headed the Federal Works Agency from 1941 to 1949, had been selected by President Roosevelt in 1933 as deputy administrator of the Public Works Administration (PWA). While still ranking in the Corps of Engineers, he served successively in several New Deal agencies: as coordinator of the Resettlement Administration, administrator of the Wage and Hour Division under the Fair Labor Standards Act, and administrator of the Federal Works Agency. One of only two men in uniform privileged to witness the 1945 inauguration of President Truman, he was later selected by Truman to serve as undersecretary of commerce and then as ambassador to Costa Rica.

Fleming's Federal Works Agency was a hodgepodge, an administrative umbrella consolidating remnants of the "alphabet" agencies of the Depression years; it also included the Bureau of Public Roads and the Public Buildings Administration. Fleming placed the disaster assistance function assigned him in 1947 in the Bureau of Community Facilities, which had built federal housing projects near Army installations during the Second World War. This bureau had nine regional offices scattered across the nation, staffed by engineers, architects, and

personnel familiar with the design, construction, and management of public facilities.[10]

The president and Congress expected the FWA to fill the gaps left in the federal disaster relief program by the demise of the Works Progress Administration. Under this logic, the Corps of Engineers and the Army would manage flood fights and rescue, evacuation, and emergency needs; the Red Cross would continue to handle individual relief and rehabilitation needs; and the FWA would assist communities to restore or replace damaged schools, hospitals, water and sewer systems, and other public facilities.

The key to implementation of the Aiken Act was a presidential determination that a "major disaster" had occurred, thus invoking the act's federal assistance provisions. President Truman took full advantage of the act in 1947, declaring eight major disasters.

First, he interpreted the Aiken Act retroactively, applying it to the Texas City blast, a flood in Rutland County, Vermont, and flooding in the Missouri and Mississippi valleys. He then declared major disasters in the aftermath of a Gulf Coast hurricane, floods in New York, forest fires in Maine, and a tornado that crossed Louisiana and Arkansas. Of these eight official disasters, the Corps of Engineers responded to four: the Texas City explosion, the Rutland flood, the Missouri and Mississippi floods, and the Gulf Coast hurricane. (Hurricanes were not then assigned names alphabetically.) The FWA also exercised its new authority in disaster operations during the first year of the Aiken Act.[11]

Rutland Flood, 1947

Four days of rain in early June 1947 filled to capacity the four reservoirs owned by the Central Vermont Public Service Corporation along East Creek between Rutland and Chittenden, and six-foot-high flashboards atop its Chittenden Dam failed. Water released from this dam uppermost on the stream had a domino effect, subsequently causing failures of the East Pittsford, Glen, and Patch dams. A fifteen-foot-high wall of water gushed down the narrow valley, demolishing bridges, homes, and public buildings, disrupting water, sewer, and utility services, and layering the streamside towns with mud. A cloudburst two days later caused more damages and changed the course of the Neshobe River.

Col. William F. Heavey, commanding the New York District, went immediately to the disaster area and, through the chief of engineers and the First Army's commander, arranged for engineer troops from Fort Belvoir to bring water purification and chlorinating units to the area. These units supplied all the potable water needed until the municipal systems resumed operations.[12]

A rumor spread on 5 June that Chittenden Dam had utterly failed, releasing a new flood wave down the valley. The resulting panic proved a near catastrophe: everyone in Rutland scrambled for the hills, gorging all roads leading out of town with automobiles, five abreast. When the leading drivers reached high ground, they stopped to watch the expected flood, blocking the escape route for the cars following. To allay public fears and persuade them to return home, Heavey and the First Army's engineers inspected the dam and pronounced it

Engineer officers inspected the erosion under the spillway apron of Chittenden Dam after the Rutland, Vermont, flood of June 1947.

Office of History

safe, and Army vehicles equipped with public address systems broadcast that fact to the crowds, restoring order and convincing people to return to town.[13]

First Army detachments, Red Cross representatives, and local governments had the emergency relief situation in hand by 1 August when President Truman declared the damaged section of Rutland County a "major disaster" area. With this authorization, the FWA loaned trucks, tractors, and surplus equipment to the Vermont Highway Department and local governments to help restore public roads and facilities.[14]

Missouri and Mississippi River Floods, 1947

A series of storms crossing the Missouri River and upper Mississippi River valleys in June 1947 caused severe flooding in the Corps' St. Louis and Rock Island districts. Although no Corps levees failed and the Fort Peck dam cut 2.5 feet off the Missouri River's flood crest, major damages occurred along uncontrolled streams: the Des Moines, Raccoon, Nishnabotna, Nodaway, Platte, Grand, Chariton, Republican, Elkhorn, Kansas, and Kaskaskia rivers.[15]

Col. Robert E. Smyser, commanding at St. Louis, reported two river crests at the city,

reaching 36.5 feet on 14 June. His St. Louis District workboats and vehicles assisted with rescue operations and delivered 1.8 million sandbags and other materials valued at $275,380 for the flood fight. Corps personnel furnished technical assistance to the communities and drainage districts engaged in the struggle to hold the flood.[16]

At Rock Island District, Col. William Leaf concentrated the Corps' rescue efforts at Ottumwa and Keokuk, Iowa, where swift currents had overturned small rescue craft manned by volunteers. He ordered Corps personnel in large craft with powerful engines to take control of the rescue and evacuation mission. At the levees, Leaf furnished sandbags and materials worth $235,000 for the flood fights. He committed eighty-five personnel as well as Corps dredges, bulldozers, cranes, vehicles, barges, and skiffs to the fight to maintain the levees.[17]

When President Truman, at Fleming's recommendation, invoked the Aiken Act for the Midwestern flood disaster, the FWA sent stricken communities earthmoving equipment, temporary bridges, and concrete, steel, and lumber to repair roads and public facilities. At the mission's end, the FWA's Bureau of Community Facilities transferred to the communities 22,774 war surplus items ranging from Bailey bridges to air compressors and sewer pipe.[18]

Sandbags helped keep floodwater out of the Iowa Memorial Union building at the University of Iowa, June 1947.

Iowa Memorial Union, University of Iowa

After the flood, President Truman called a conference on 12 July 1947 to consider the future of the Missouri and Mississippi river valleys. Congressional support had grown for creating a Missouri Valley Authority similar to TVA to manage water resources. Proponents of such an organization claimed both the Corps' and the Bureau of Reclamation's plans for the Missouri were inadequate. At the planning conference, Lt. Gen. Raymond Wheeler presented a joint report from the War, Interior, and Agriculture departments proposing a ten-year flood protection program for the valley. The plan envisioned Corps construction of reservoirs, levees, and spillways; Bureau of Reclamation construction of reservoirs for irrigation and water storage; and Soil Conservation Service management of runoff control measures.[19]

In his memorandum on the July conference, Arthur Morrell, deputy to Fleming at the Federal Works Agency, commented that Wheeler expected the joint plan the Corps had presented to quash support for a Missouri Valley Authority. Morrell observed that the FWA could perform the proposed construction in the valley better than the Corps or Bureau of Reclamation. Whether the Corps or other agencies were aware of the FWA's ambitions is not apparent, yet the Corps subsequently proved unreceptive to any expansion of the FWA's roles, including its function as federal disaster assistance coordinator.[20]

Vanport Debacle, 1948

Flooding in the Pacific Northwest was 1948's most memorable disaster. It began in May when the Kootenai River hit flood stage and

Troops of the 2d Infantry Division placed sandbags to reinforce the levee protecting Portland Air Base, threatened when the Columbia River flooded in June 1948. Office of History

Col. Theron Weaver, North Pacific Division Engineer, mobilized Corps offices at Seattle and Portland for the emergency. When Idaho's governor requested Corps assistance at Bonners Ferry on the Kootenai because the local levees could not protect the town against the flood, the Seattle office sent personnel with 110,000 sandbags to the town. The Corps also requested assistance from the Sixth Army commander, who dispatched the 5th Engineer Battalion from Fort Lewis with eighty-four pieces of construction equipment. They raised the levee with several feet of earth and sandbags, but the levee blew out on 23 May, a result of leakage through animal burrows. Their flood fight, however, had afforded time for residents of Bonners Ferry to evacuate with their property.[21]

When the St. Joe River threatened levees protecting St. Maries, Idaho, the Corps' Seattle

Residents of Vanport struggled to evacuate the flooded town, jamming the exit ramps with cars. The low-lying housing project was inundated by the Columbia River in May 1948. *The Oregonian*

office supervised sandbagging by an engineer detachment sent from Fort Lewis. Their work prevented the inundation of St. Maries, and similar success occurred at Cle Elum on the Yakima River, where Corps personnel and engineer troops raised an old levee and built a temporary dike. Farther downstream on the Yakima, however, erosion caused by debris jamming the channel and diverting currents breached several levees.[22]

In the neighboring Portland District, Col. Orville Walsh also requested troops from the Sixth Army commander. The commander dispatched three thousand soldiers equipped with sandbags, trucks, and equipment to assist local diking districts with their preparations for a Columbia River flood.

The river's rise threatened Vanport, a public housing project built during the war for forty thousand workers at the Portland, Oregon, shipyards. Located in the Columbia River floodplain, the housing project was completely surrounded by levees, one being a substantial railroad embankment. Concerned for the safety of eighteen thousand people then living in Vanport, the Corps discussed evacuation with

the housing authority. This disruptive action seemed unnecessary, however, because levees protected the community up to a 47-foot river stage and the predicted flood crest was only thirty feet. Just in case, constant levee patrol began and plans were made for evacuating the community if and when fire and air-raid sirens screamed. The housing authority distributed a circular advising the residents that overtopping of the levees was improbable and that they would receive advance warning if an emergency arose.[23]

"It has widened out since we looked at it," said one of the men patrolling the railroad embankment that served as a levee. He had seen a small boil behind the embankment, went to find an engineer, and returned with him to examine the boil. At that moment the levee blew out, forcing the two to run for their lives. The river then stood at a 29-foot stage, well below the embankment's top, but the levee had failed as a result of a foundation failure beneath.[24]

Attempts to sound the warning signals also failed because the power lines went down. Water gushed into Vanport, bowling over the wooden military-type buildings that served as housing. People trying to escape in their automobiles jammed traffic at the exist ramps, trapping 422 vehicles within the levee. Other residents scrambled up the levees and out on foot, or floated out while clinging to debris. Eighteen drowned, and the death toll surely would have been higher if the disaster had occurred on a weekday instead of Memorial Day weekend when many residents were traveling out of town.[25]

Because recovering the bodies could not be accomplished until the river subsided, and because it was difficult to account for the Vanport residents absent on vacation at the time, rumors circulated that the government agencies clandestinely removed bodies at night to conceal the disaster's scope and that six hundred bodies were iced down in a secret morgue. Because the housing authority had advised residents that constant levee patrols would provide adequate warning for the need to evacuate, the public blamed the authority, the Corps of Engineers, and the federal government generally for their losses. Personnel of the Corps' North Pacific Division received personal threats from angry residents who saw them walking through the division office's parking lot.[26]

Weaver and local civic leaders explained the facts to the media: The failed railroad embankment had a 75-foot top width while levees on the other side of the town were only fourteen feet wide; the 30.2 feet stage of the flood was four feet lower than the record crest of 1894 and far below the protection thought to be provided by the levees; the levees were constantly patrolled as planned; the embankment break was unexpected and came suddenly; the evacuation plan had not included a second warning system independent of the power supply; the warning and evacuation were not the Corps' responsibility. Nothing could mollify the suffering residents of Vanport—who sued for millions in damages—but the facts of the case convinced the courts, which subsequently found no negligence by the Corps.[27]

President Truman traveled aboard the train he used in his reelection campaign and reached Vanport on 11 June to inspect the disaster scene on foot. He met Weaver and Maj. Gen. Philip Fleming of the FWA there and on the spot signed an order to provide temporary housing for the flood victims. He ordered Fleming to coordinate the work of thirteen federal agencies

that would provide various forms of assistance to the disaster victims.[28]

With tents and kitchens furnished by Sixth Army, the Red Cross cared for the most urgent needs at Vanport. For the first time in the history of the federal disaster program, mobile homes were brought in and set up to house the refugees. Fleming had located six hundred war-surplus trailers made available under the Aiken Act and had them installed on a federal reservation as temporary housing. Under the Lanham Act, which had funded the wartime construction of the Vanport project, Fleming found the authority and the funds needed to remove debris from the flooded community. Thus, Fleming, under various authorities, restored some order in the community.[29]

At the time of the Vanport debacle, the Senate Public Works Committee was conducting hearings on establishing a permanent federal agency to coordinate responses to disasters. At the hearings on 14 June, Maj. Gen. Roscoe C. Crawford of the Corps of Engineers outlined the Corps' historic role during flood and disaster emergencies. He emphasized the effectiveness of the Corps' response to flooding in the Columbia

An Army Bailey bridge temporarily replaced a washed-out span over the Methow River in Washington, June 1948.

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"If an additional Federal agency is given authority to intervene… the result will be confusion, delay and reduction in the Army's effectiveness in providing emergency relief and in rescue work."

River basin, pointing out the Corps had committed four thousand civilian employees plus troops to the local flood fights.[30]

Crawford said the Corps and the Army opposed the creation of a permanent federal coordinating agency as proposed in the bill then under consideration by Congress. He read a letter from Secretary of the Army Kenneth Royall outlining the Army's opposition to the bill:

> In all catastrophes the entire resources of the Army are made available for rescue and relief work. Army personnel, equipment, and supplies strategically located throughout the United States and most needed in such emergencies are made available promptly and without awaiting administrative findings by any other official or officials. In case of catastrophe due to flood, the Corps of Engineers acting pursuant to existing law, has always taken the lead among Federal agencies doing rescue work and in preventing excessive flood damages. If an additional Federal agency is given authority to intervene later under the provisions of this bill, the result will be confusion, delay and reduction in the Army's effectiveness in providing emergency relief and in rescue work. It is accordingly recommended that S. 2831 be not enacted in its present form.[31]

Congress accepted this argument and did not establish an agency to coordinate federal disaster assistance at that time, but after each subsequent disaster, the president issued executive orders appointing the FWA to administer the program. Fleming usually handled the liaison in Washington and assigned field work management to George Field, head of the Bureau of Community Facilities, and to the chiefs of the bureau's regional offices.[32]

Other 1948 Floods

Though Vanport made the headlines in 1948, other memorable floods that year also forced mobilization of Corps and Army resources. Col. William Cassidy at Vicksburg, for instance, had two hundred Corps employees working with local levee district workers and two hundred state convicts during flooding in February near Greenwood, Mississippi. Cassidy's crews sandbagged levees and stopped the flow through a crevasse on the right bank of Roebuck Lake. Because this flood inundated only farm lands, however, Truman did not issue a major disaster declaration.[33]

Col. Walter Wilson Jr., commanding at St. Paul, and Col. William Leaf, commanding at Rock Island, managed flood fights along the upper Mississippi and Red River of the North in the spring of 1948. The Corps used amphibious vehicles for rescue missions and also supplied sandbags, trucks, pumps, and other materials to local levee districts in efforts to hold off the river. Although these floods inundated farm

lands, they caused no losses of life and were not designated major disasters.[34]

The most unusual disaster assistance effort of 1948 began in April when Col. Joseph Twitty at Mobile District received an urgent telegram from Senator Spessard Holland of Florida:

> Have wire from Board of County Commissioners, Jackson County, Marianna, Florida, reading as follows: Quote, Damage caused by recent heavy rains have us in a terrible plight. Schools closed over entire county. 75% of all bridges on county roads washed out. Any suggestions as to aid that would enable us to get over this situation would be appreciated. Unquote. Your consideration and advice will be appreciated.[35]

The Federal Works Agency and commanders at Eglin Air Force Base, Tyndall Air Force Base, and Fort Benning also received similar requests from members of Congress, including Senators Claude Pepper of Florida and Walter F. George of Georgia. Twitty went to Jackson County and met with the county commissioners and Congressman Robert Sikes. He learned fifteen inches of rain fell on the Chattahoochee River basin on 31 March and 1 April. Subsequent flooding destroyed 185 county bridges and made roads impassable.

These rains, after a wet winter, had raised the groundwater table by five to fifteen feet. The poor drainage in that area had caused subsurface flooding as well as surface runoff. Maximum flood crests occurred three weeks after the last rainfall and after the topsoil had dried out. Parts of Jackson and nearby counties remained inundated because floodwaters could neither run off nor be absorbed by the soils. Instead, the water ponded in sink holes atop the limestone bedrock that had few surface streams for drainage.

The commanders of Eglin and Tyndall Air Force bases and Fort Benning told Twitty they would comply with local requests for assistance if he would coordinate the mission. Twitty secured approval and on 7 April sent troops, equipment, and supplies to Jackson County for road and bridge repairs under Corps supervision. Twitty later observed that because "use of Air Force and Army facilities in the flood control program afforded an excellent field training exercise for the military personnel involved, it was possible to justify limited troop participation in this program as a training measure prior to allocation of emergency flood control funds to the District Engineer."[36]

Twitty selected Chipola Junior College (formerly Marianna Army Air Base)—where old barracks and an airstrip were available—to serve as the mission's field office. They opened a field mess, motor repair shop, and post exchange on the campus, and a military police detachment and radio communications team began work. Heavy construction equipment came from as far away as the Schenectady and Marion engineer depots.

Initial plans called for loaning heavy equipment to Jackson County for work under the county commissioners' supervision. Two military assistants, three civilian engineers, and a survey party from Mobile District acted in advisory capacities,

allocating military personnel and equipment to work at sites chosen by the county commissioners. These plans presented operational difficulties, however, and Twitty took control from the county to assure that resources were not wasted on inefficient operations that could not be completed within limits. He obtained additional support from Fort Bragg's 307th Airborne Engineer Battalion and organized a system whereby the Army and Air Force crews and equipment would support the Corps of Engineers—similar, he remarked, to combat support provided by an artillery battalion for an infantry regiment.

Reopening school bus, mail, and farm-to-market roads had the priority. By May the Corps and Third Army personnel had restored thirty-two bridges, repaired fifty road washouts, and moved twenty-three thousand cubic yards of earth into embankments, thereby reopening two hundred miles of Jackson County roads. The work extended into adjacent Washington County, where another fifty miles of roads were reopened.[37]

Water covered some roads because saturated soils and high water tables prevented percolation of

Engineers used heavy equipment to excavate Snead's Canal near Marianna, Florida, June 1948. The deepened canal drained floodwaters away from roads and buildings.
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"…use of Air Force and Army facilities in the flood control program afforded an excellent field training exercise for the military personnel involved."

the ponded water into the substrata to be carried off through underground channels in the limestone. Twitty's alternatives were either to haul in earth and raise the road fills above the water levels or to ditch new surface canals to drain the ponds. Because improved drainage would also restore farmlands to production, Twitty selected canal drainage as the cost-effective method.

The Corps excavated four drainage canals in Jackson County. One near Malone connected a chain of ponds extending over seven and a half miles and involved excavating ninety thousand cubic yards of soil. A second near Hornsville was fifteen hundred feet long and required seventy-five hundred cubic yards of excavation; a third near Sneads was forty-two hundred feet long;

The floods in Florida in 1948 were fought using drainage canals to divert water from towns, roads, and farmland. Workers placed explosive charges to expand Malone Canal near Marianna, Florida.
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and the fourth near Cottondale was two miles long. These canals drained the ponded water, thus reopening roads and farmlands for use.

In adjacent Houston County, Alabama, three and a half miles of canals drained three large ponds after the Corps moved one hundred thousand cubic yards of material. Twitty considered similar canal excavation in Decatur, Liberty, Seminole, Gadsden, and Calhoun counties, but conditions there did not seem to be an emergency. Any relief in that area of Florida, Alabama, and Georgia was left to a long-range program for treating drainage problems.

By late April, the Corps' Mobile office and the Third Army had seventy-three pieces of engineer equipment and eighty-two pieces of ordnance equipment in the area repairing roads and digging canals. Road repair units consisted of a Traxcavator, ten dump trucks, a D-6 dozer, and two graders. On the canal jobs, bulldozers and scrapers removed top soils while draglines opened the ditches. Where soils were covered with water or too soft to support draglines, excavation was done with explosives—in fact, the Cottondale canal was dug entirely with explosives.

When the Third Army commander requested the return of military personnel and equipment on 3 May, most of the mission had been accomplished. The Mobile District then rented civilian equipment and shifted field operations to a civilian basis. The mission field office moved to Dothan, Alabama, where the work was closed by 9 July 1948.[38]

Twitty's after-action review mentioned that he had few public relations problems because no daily newspapers published in the disaster area. Besides, he noted, because "it was impossible to satisfy all requests for assistance in the flood area, and in order to discourage initiation of additional requests, only a minimum of information on the flood control program was released to the public." He was relieved the flood had occurred prior to the construction and impoundment of Jim Woodruff Dam and Lake, thinking that if the disaster had occurred later the Corps might have been slapped with lawsuits blaming the flooding on the filling of the reservoir. He also noted that the road construction units were highly efficient, and he recommended that the Army adopt the same combination of equipment and trucks he had used for all combat road construction units.[39]

"…it was impossible to satisfy all requests for assistance in the flood area."

Operation Snowbound, 1949

The outstanding disaster relief mission of 1949 proved to be Operation Snowbound, the first snow removal emergency handled by the Corps of Engineers. The mission began in January when blizzards coated Wyoming, Colorado, and Nebraska with sixteen inches of snow drifting to thirty feet. At Red Cross request, the Fifth Army commander sent snow plows and M–29 cargo carriers (Weasels) to isolated towns and ranches for rescue and emergency supply. The Tenth Air Force launched its companion Operation Haylift, dropping food, blankets, and clothing to stranded ranchers and bales of

The amount of snowfall during the blizzard of 1949 was so great that to deliver supplies, food, and mail, the Army used tracked vehicles called Weasels. This Weasel made a delivery to a ranch near Phillip, South Dakota.

Rapid City Journal

hay supplied by the Department of Agriculture to starving livestock herds.[40]

The weather moderated in mid-January, but later in the month a second blizzard snowed in parts of Missouri, Kansas, Nebraska, and Wyoming, and the requests for aid swelled to an overwhelming volume. On 22 January Maj. Gen. Lewis Pick, commanding the Corps' Missouri River Division, called in his district commanders to define their mobilization plans. They drew up lists of available supervisory personnel, contractors and their equipment, and state highway stations and repair shops. They identified on maps the highways and railroads that were open and those that were closed.

The Army furnished its initial assistance under the authority of AR 500-60 until Maj. Gen. John Lucas of Fifth Army on 27 January toured the snow-stricken area, finding an average snow depth of thirty-six inches and towering drifts. Recognizing that human suffering could be severe and that nearly two million head of livestock might be lost, he asked the Army chief of staff to find adequate authority and funding to cope with the emergency. He also asked that Pick and the Corps be directed to head the emergency response, soon to be known as Operation Snowbound. Two days later President Truman declared the region a major disaster area, approving the use of Corps personnel and civil works funding for the relief work and directing the Federal Works Agency to coordinate the federal efforts.

Pick established the headquarters of the Fifth Army's disaster force in the Omaha Engineer District, selecting Omaha's commander, Col. Louis Prentiss, as his chief of staff. Maps, personnel rosters, and mobilization plans were ready, and by that night Corps personnel from the Garrison, Fort Randall, Harlan County, and Cherry Creek dam projects moved into the disaster area. Fifteen officers from the Fort Belvoir Engineer School and twenty-five officers with heavy equipment expertise joined the civilian technicians.

The Corps opened field offices for local management of disaster recovery. Col. John Paxton managed the area office at Ainsworth, Nebraska; Col. Craig Smyser directed the Alliance, Nebraska, office; Col. H. A. Morris became area engineer at Pierre, South Dakota; Col. J. S. Seybold supervised the Bismarck office; and Maj. William Mullin and Capt. John Morris headed the North Platte, Nebraska,

An Army bulldozer cleared snow from a road near Pierre, South Dakota. The Army coordinated more than one thousand bulldozers and heavy tractors used to help reach stranded towns, ranches, and livestock.

Photo courtesy of the State Archives of the South Dakota State Historical Society

office. These area office commanders submitted daily consolidated reports to Pick at Omaha, who assessed the daily requirements and realigned the crews and equipment to fit the needs. Because snow often blocked overland transport, the Corps' geographically decentralized field organization contributed to operational success.

Relief supplies quickly got to the field, and by 1 February nearly seven thousand people had been rescued, forty-six thousand cattle sustained, and 175 miles of roads reopened. The president, however, continued to add new territory to the official disaster region; eventually it included 193,000 square miles in Nebraska, Wyoming, South Dakota, and North Dakota.

Pick used his Missouri River Division and its district offices as the framework on which Operation Snowbound was built. He mobilized all division resources to manage the crews and equipment coming from Fifth Army or hired from contractors. He formed task forces for each selected area under the immediate direction of a Corps officer or experienced civilian. When air reconnaissance located stormbound people, Army Weasels equipped to run atop snow

moved out with vital supplies. The Weasels were followed by self-contained mobile strike forces, consisting of bulldozers, snowplows, fuel trucks, wreckers, tractors, and cargo vehicles, which cut their way through the snow into the isolated communities.

From his Omaha headquarters, Pick coordinated the responses of federal, military, Red Cross, state, county and local agencies. The Red Cross, transported in Army and Air Force vehicles or aircraft, went in to relieve human distress. The Corps, with its own and rented equipment, handled large-scale road clearance tasks. The logistics of the operation were as immense as a military campaign. When building the Ledo Road during the Second World War, Pick had available only 394 bulldozers; in Operation Snowbound he mobilized 1,320.

"It has been a battle, a battle waged against man's oldest enemy—the forces of nature."

Tenth Air Force's Operation Haylift merged into Operation Snowbound, its aircraft continuing to fly reconnaissance in difficult conditions and also air-dropping rations and hay into the areas of direst need. The 809th Engineer Aviation Battalion was also mobilized at Fort Francis Warren to clear snow from the roads leading to Lusk, Casper, Rawlins, Laramie, and Cheyenne, Wyoming.[41]

Extended exposure to high winds, biting cold, and drifting snow and the movement of heavy equipment made service during the mission extremely uncomfortable and hazardous. Winds and blizzards often closed roads behind the task forces, and drifts became so high that rotary snowplows sometimes could only tunnel through them. The work crews suffered frostbite and snow blindness, and one soldier and six civilians lost their lives in accidents.[42]

At its peak, 6,237 personnel participated in Snowbound. This number included 807 officers, 959 Corps civilians, and 4,008 contractors and crews, plus Navy, Air Force, and Red Cross workers. The heavy equipment clearing the snow totaled 1,665 units: 1,320 dozers, 121 graders, 44 snowplows, and 168 Weasels. All participants in the mission lauded the Weasels, the M–29 cargo carriers that moved over snow on the perilous rescue tasks that grabbed the headlines.

The job in Wyoming, Nebraska, and South Dakota was largely completed by 27 February, and Pick went east to become chief of engineers. Brig. Gen. George Stewart relocated the mission headquarters to Bismarck, North Dakota, where he mopped up and closed the mission on 15 March. Operation Snowbound had opened 115,048 miles of roads, restoring access to 243,574 people and feeding more than four million livestock.[43]

This operation became the first disaster assistance mission for which Army Commendation Ribbons were awarded. Lt. Richard Hartline of the Missouri River Division was the only officer who received the ribbon, and among the six enlisted men thus distinguished were Corporals John Donnelly and Melvin Shoemaker of the Corps of Engineers. Corps civilian employees received meritorious civilian service awards.[44]

Snowbound's after-action reviews recommended many improvements in combat equipment for cold weather operations. The most significant recommendation, however, was

to improve local responses to disasters. Most communities or county governments then had no organized disaster service committees to cooperate with the Army and Red Cross, and few civilians understood the procedures for obtaining assistance; often they telegraphed their congressmen, losing precious time while their requests filtered back to the Fifth Army disaster force. Fifth Army recommended that local disaster response committees be formed throughout the United States, with their functions coordinated by a national civil defense organization.[45]

In retrospect, Lucas of the Fifth Army heralded Operation Snowbound as valuable training experience for the army:

> It has been a battle, a battle waged against man's oldest enemy—the forces of nature. It has been excellent training for the Fifth Army Staff as well as for the staff of General Pick. Each one of these has operated exactly as it would in time of war and in actual battle.[46]

Observations

During the postwar years, the Corps confronted various emergency response challenges, and the manner in which it handled those missions brought increased recognition that it could deal effectively with disasters in addition to floods. Floods, however, remained the special province of the Corps. During the same time, the public had rising expectations of federal disaster assistance. After every disaster, the public expected that the Corps and the Army would arrive quickly with relief, just as they expected the cavalry to reach the fort on schedule in each Hollywood western. They also expected other federal agencies to step in immediately and offer various forms of aid to disaster victims. The political response to these rising expectations began with the Aiken Act of 1947 and continued with a probing congressional review of the needs for a federal agency to coordinate disaster assistance and a permanent national disaster relief policy.

Chapter 10 Notes

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St. Vincent, Minnesota, was inundated by the flooding Red River in April 1950.

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A National Policy on Disaster Relief

11

Through Maj. Gen. Philip Fleming, the Army Corps of Engineers played a leading role in the establishment of national disaster relief policy and, ultimately, a fulltime coordinating agency. In addition to his position with the Corps of Engineers, Fleming headed the Federal Works Agency (1939–49), which had participated in a number of major disaster recoveries and managed almost twenty thousand employees, including engineers. In 1948 he called for the creation of a fulltime coordinating agency and assumed that the FWA would take on those responsibilities. He was wrong. With the passage of the Disaster Relief Act of 1950, Congress for the first time authorized a coordinated federal response to major disasters but no single coordinating agency emerged. That would wait another three decades for the creation of the Federal Emergency Management Agency in 1979.

The Federal Works Agency and the Army

"This source of materials and equipment is shrinking steadily," Fleming warned President Truman. During its first year of operations under the Aiken Act, Fleming's Federal Works Agency had responded to eight major disasters, dispensing medicines, blankets, nails, sheets, clothing, generators, water purifiers, tractors, bulldozers, and thousands of other items valued at $4 million.

The surplus stockpile from the Second World War had dwindled at an alarming pace. Noting that the extent of human and community needs that followed in the wake of disasters was almost endless, Fleming pointed out that Red Cross resources were limited and that disaster assistance remained a fertile field that needed plowing by federal agencies.[1]

"…the time has come to consider a national policy for Federal aid in these emergency situations."

In Fleming's opinion, the Disaster Surplus Property Program had proven its worth in areas where equipment and materials were not locally available to fill the unforeseen gaps. It contrasted well with the earlier record of improvised and generally inadequate disaster relief provided by Congress on a case by case basis. Fleming concluded with a flourish: "Both my own experience and the nature of the problem lead me to believe that the time has come to consider a national policy for Federal aid in these emergency situations. The Federal Government should be ready to furnish more immediate aid, including financial assistance, and to act as the coordinating center for all Government help."[2]

"Thank you for your timely letter," replied President Truman, adding that this subject had been on his mind for some time. "I am gratified to know that you are studying this problem and I want to thank you for your consistent efforts to

coordinate disaster relief. We should now give consideration to making a permanent arrangement for disaster relief."[3]

Fleming and his FWA staff drafted a bill to establish a continuing national policy on disaster relief and a fulltime coordinating agency. The Senate Public Works Committee took up the bill during the summer of 1948. Fleming naturally expected that all federal coordination of disaster assistance would be assigned to his Federal Works Agency and its Bureau of Community Facilities. It had, after all, acted by executive order as the coordinating agency at various disasters since 1947.

"We look upon this flood fighting up there as a front-line fight…"

The FWA in 1948 administered the Bureau of Public Roads, the Public Buildings Administration, and the Bureau of Community Facilities. The Bureau of Public Roads had seven thousand employees, many of them capable engineers, and considerable heavy construction expertise. The Public Building Administration, with twelve thousand employees, had efficient structural and utility engineering capabilities. The Bureau of Community Facilities, which managed public housing and community service programs, had two thousand employees with administrative and federal–local liaison skills.

During the 1948 hearings, Fleming told the Senate Public Works Committee that war-surplus stockpiles would soon be exhausted. He argued that surplus property distribution as disaster relief should be replaced with a permanent national policy and disaster assistance should be coordinated by a federal agency to assure efficient relief administration. He then mentioned that thirteen different federal agencies had come under his purview during the Vanport disaster on the Columbia River. His staff seconded his arguments, contending that a coordinating agency could save both time and money in disaster crises.

Col. John Gerety of the Army General Staff's Plans and Operations Division told the Public Works Committee the Army opposed the creation of a federal coordinating agency that might interfere with the timely Army and Corps of Engineers responses to disasters. The Army would not object to such an agency, however, if it had authority only for post-disaster cleanup, recovery, and reconstruction. As an illustration, he said the Army could furnish trench latrines during disaster operations, but it wanted no involvement with restoration of community sewage systems and similar public facilities.[4]

The U.S. Coast Guard's representative said his service wanted a clear distinction made between emergency search-and-rescue and recovery-and-rehabilitation operations. The Coast Guard therefore preferred the formation of two federal coordinating agencies, one for the upfront crises and another for the backburner missions.[5]

Maj. Gen. Roscoe C. Crawford, the deputy chief of engineers, advised the committee that the Corps of Engineers did not wish to enlarge its emergency response duties to include post-disaster recovery, nor had it any opposition to the formation of an agency to manage federal rehabilitation efforts. It insisted, nevertheless, that the integrity of its authority in flood control

"Major disasters in the future, as in the past, will from time to time require prompt Federal assistance to stricken communities."

and flood fight contingencies not be abrogated. "We look upon this flood fighting up there as a front-line fight," Crawford insisted, "and we want to be able to carry that on and get that over with and then pull out, and then some other agency can coordinate all this relief."[6]

Because the bill under consideration in 1948 did not distinguish between the urgent crisis management by the Army, Coast Guard, and Corps of Engineers and the secondary recovery and rehabilitation efforts, the Public Works Committee tabled it. President Truman then directed Fleming and the FWA to confer with all interested federal agencies and draw up a new bill designed to establish a permanent federal policy on disaster assistance. As drafted in 1949, the new bill created a fund to reimburse federal agencies for their disaster relief costs and to allocate monies to local governments for rebuilt public facilities, the latter in lieu of the war-surplus property dispensed under the 1947 Aiken Act. The bill designated the Federal Works Agency as disaster assistance coordinator of all federal activities, but again it made no clear distinction between urgent rescue and relief operations and subsequent recovery tasks. In the meantime, Fleming retired, and in 1949 the FWA became the General Services Administration.[7]

Army authorities divided over the effectiveness of the new bill. The chief of engineers and the director of logistics recommended that the Army, instead of the Federal Works Agency, be designated the coordinating agency for all federal disaster assistance. The Army General Staff's Plans and Operations Division, however, supported the proposed bill for several reasons. First, it would supply ample funding for disaster operations, ending the need to submit deficiency appropriation requests to Congress for reimbursement of funds depleted during disaster operations. Second, in the wake of each disaster, the Army received many pleas for assistance from governors, members of Congress, and other civil officials, and the proposed coordinating agency would protect the Army from the criticism that often came when it could not honor all the competing requests for assistance. Finally, the Army needed to maintain its distance from civil functions.[8]

The Plans and Operations Division strongly emphasized the importance of its last reason, philosophizing:

> This overall coordinating agency should not be from the NME [National Military Establishment] as the disaster might be coincident with the commencement of hostilities or occur during war-time when the NME (Army) is fully committed to its primary mission. We must refrain from getting our command structure, communications net, and resources involved in the primary responsibility for disaster work which might seriously interfere with our principal role. Even in a peace time disaster it should not be a military function to coordinate the relief activities of agencies such as the Departments of Agriculture and Interior. There has already been popular criticism of

military men and agencies taking over civil functions.[9]

The principles advocated by the Plans and Operations Division prevailed, and the Army issued its tentative approval of legislation designed to establish a coordinating agency and a permanent national policy on disaster relief. In his budget message of 1950, President Truman noted his support for the legislation: "Major disasters in the future, as in the past, will from time to time require prompt Federal assistance to stricken communities. I again urge enactment of pending legislation to provide in advance adequate funds to meet such needs."[10]

Disasters of 1950

There were no disasters in 1950 on the scale of the Texas City blast of 1947, the Vanport flood of 1948, or Operation Snowbound in 1949. But, like most years, natural disasters occurred on a scale sufficient to mobilize the Corps of Engineers. To provide a relatively complete account of the Corps' emergency response record, a brief description of the calamities of 1950 is required.

A Wabash River flood washed through Indiana and Illinois in January 1950. Col. John Person, commanding at Louisville, mobilized his district and secured reinforcements from Fort Knox. The Corps directed the troops, who built a mudbox bulkhead atop the floodwall protecting Vincennes, Indiana, and saved the town from inundation. The town's mayor expressed his appreciation to the chief of engineers: "It is quite a coincidence that these same gentlemen rescued our people and city in 1943 and again so efficiently in 1950. Is it any wonder that we find it hard to express our thanks adequately?"[11]

Fourteen inches of rain fell over Kansas and Nebraska during three days in May, causing record flooding and twelve drownings. As usual, the Omaha and Kansas City Corps offices applied their full resources to help communities maintain their flood protection structures against the rising waters. Corps personnel from the two offices boarded skiffs with outboard motors to retrieve people from the flooded towns of Marysville, Kansas, and Beatrice, DeWitt, and Talmage, Nebraska.[12]

Soldiers of Company A, 10th Engineer Battalion collected unexploded ammunition that was strewn around the vicinity of South Amboy, New Jersey, when an ammunition barge exploded in the harbor in May 1950.

Historical archives of the Sadie Pope Dowdell Library of South Amboy, New Jersey

Receding floodwaters from the Truckee River flowed through the streets of Reno, Nevada. The Riverside Hotel (left) shows the high water mark on its façade.
Sacramento District

A violent non-deluge disaster occurred on 19 May 1950 when an ammunition barge in the harbor at South Amboy, New Jersey, exploded, heavily damaging the town and killing thirty-one. The governor of New Jersey called the First Army's commander for assistance, and he sent troops from Fort Monmouth to patrol the town. These troops found undetonated ammunition lying about the streets, so the commander ordered an engineer demolition team to South Amboy from Fort Devens, Massachusetts. Twenty-five troops of Company A, 10th Engineers, led by Lt. Hugh Casey, cleared the town of explosive ammunition. They recovered six thousand mines—and also twelve bodies, which they sent to the local coroner. The Fifth Army commander subsequently remarked that the engineers' efforts curtailed further losses and injuries, making the situation a "sudden" event instead of a "major" disaster.[13]

Col. J. S. Seybold, leading the Corps' South Pacific Division, oversaw the response to 1950's westernmost disaster, the destructive floods caused by snowmelt in the Sacramento–San Joaquin river basins and the Truckee, Carson, and

Walker river valleys in California and Nevada. Although the Corps' Sacramento office helped local officials with flood fights and the evacuation of twenty-five thousand people, property damages still totaled $37.5 million. In the flood's aftermath, the Sacramento office spent $1.1 million repairing the levees at seventy points.[14]

Floods in the St. Paul District, 1950

The most memorable deluges of 1950, however, occurred on the Red River of the North and the upper Mississippi River at the very time Congress was debating the necessity of establishing a permanent federal policy on disaster assistance.

On the Red River of the North, which flows north between Minnesota and North Dakota to Canada's Lake Winnipeg, snow and ice melt first along its southern headwaters. As the melt flows north, it sometimes encounters ice on the river's main stem. When this phenomenon occurred in the spring of 1950, water backed over 1.2 million acres of land in the basin, causing damages estimated at $33 million. It flooded many communities and took five lives at Pembina, North Dakota, near the Canadian border.[15]

Col. Leverett G. Yoder at St. Paul issued flood warnings and sent survey teams to the disaster site, declaring an emergency and distributing sandbags to the local governments attempting to raise levees. Yoder also opened liaison with the Red Cross and Canadian engineers to

Engineer soldiers patrolled near Aitkin, Minnesota, in an amphibious DUKW. The vehicle was equipped with a makeshift rack in case of livestock rescue.

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"Valley City was saved by the Baldhill Reservoir… constructed by the Army Corps of Engineers…"

keep them posted on the flood's advance; the Canadians subsequently conducted an epic flood fight at Winnipeg.[16]

Simultaneously, the Corps office contended with floods on the upper Mississippi River and along the Sheyenne in the Missouri River basin. At Aitkin, Brainerd, and Palisade in Minnesota, the upper Mississippi River hit record stages and the Corps performed rescue and evacuation in skiffs and amphibious vehicles.[17]

After inspecting the critical situation in the Sheyenne valley, Yoder decided to operate the Baldhill Dam for flood control, even though the dam then was not entirely completed. He directed the dam project's resident engineer, W. C. Lincoln, to take his staff to Valley City, North Dakota, and fight the river there to save the city's power plant. On these successful efforts, Senator William Langer of North Dakota later commented: "Valley City was saved by the Baldhill Reservoir and Mandan by the Heart Butte Dam, 110 miles upstream. Baldhill was constructed by the Army Corps of Engineers, and Heart Butte by the Bureau of Reclamation. Mandan had the added protection of a high levee constructed by the Army engineers, without which Mandan would have been flooded by the runoff from the watershed below the Heart Butte Dam."[18]

During the flooding of 1950, the 682d Engineer Battalion used DUKWs to rescue people trapped in their houses in Grand Forks, North Dakota.

Minnesota Historical Society (Lee-Evanson Studio)

On 20 April President Truman determined that "major disasters" existed in the states of Minnesota and North Dakota. He allocated $400,000 from his executive emergency fund and directed the regional office of the General Services Administration (GSA) to administer the assistance. Through the Federal Property and Administrative Services Act of 1949, the GSA had absorbed the Federal Works Agency. By the end of fiscal year 1950, just before Congress enacted a permanent federal policy on disaster relief, the GSA had disbursed $745,000 from the president's emergency fund for the disaster relief extended during four disasters: a

Montana snowstorm, floods in North Dakota, floods in Minnesota, and floods in Nebraska.[19]

Federal Disaster Relief Act of 1950

During the floods in the St. Paul Engineer District, Senators Edward Thye and Hubert Humphrey and Congressman Harold Hagen inspected the disaster areas with Yoder and Brig. Gen. Don Shingler, the division engineer. The legislators were studying federal disaster policies at the time, and later they described what they saw during the spring floods of 1950 to the House and Senate Public Works committees. Hagen sponsored the bill that became the Federal Disaster Act of 1950.[20]

"It will be like every other new Government program; it will grow, and grow, and grow."

When the House debated a bill on 7 August to establish continuing funding and a coordinating agency for disaster relief, Hagen presented a long list of disaster assistance precedents compiled by the Library of Congress. He declared the proposed policies would eliminate the haphazard methods of handling disaster assistance that had prevailed since 1803. Michigan's George Dondero seconded Hagen, arguing that this bill would bring order out of chaos. "When a disaster occurs in the United States," said Dondero, "under the present law we appropriate the money without its being previously authorized, or someone rushes in here and introduces a bill in order to provide the money. That takes time, and before that time elapses the question of the need of the people has passed."

Congressman John Byrnes of Wisconsin feared the proposed bill would result in the shirking of responsibilities by state and local governments. Sounding much like the states' rights southerners who opposed federal disaster relief before the Civil War, Byrnes issued a dire warning: "This just establishes the principle, this is just a beginning. It will be like every other new Government program; it will grow, and grow, and grow. Five or ten years from now it will be $25,000,000 instead of five."

Kenneth Keating of New York agreed with Byrnes. He lamented that the bill merely "set up an additional kitty for the President to pass out any time he sees fit, here, there, or yonder, without any satisfactory standards." He urged retention of the case-by-case disaster relief program of earlier years in order that Congress might exercise full control over the purse strings.

John Kunkel of Pennsylvania objected that the bill merely established another bureaucracy. "If it is once made permanent," he said of the proposed coordinating agency, "then you will get away from emergency relief and you will begin adding new functions. The next thing you know we will have a bureau, and that bureau will come up here wanting more and more functions given to it."[21]

Despite these vocal objections, the bill received overwhelming approval in the House; it went to the Senate, where debates began on 19 September. Senator John McClellan of Arkansas, as the bill's principal proponent, fielded the questions. Remembering that a

"The purpose of the bill is to meet emergency needs, and to meet a situation which the local people cannot meet except at the cost of great suffering and hardship."

flash flood had recently damaged Botetourt and Rockbridge counties in his state, Senator A. Willis Robertson of Virginia asked if the bill would apply to that disaster, or to disasters of that scope, pointing out that even the loss of a single home constituted a "major disaster" in the eyes of the homeowner.

McClellan answered at length, denying that the bill applied to all disasters large or small, or that it intended to compensate people suffering losses everywhere. Its application would be restrictive, he elaborated:

> The purpose of the bill is to meet emergency needs, and to meet a situation which the local people cannot meet except at the cost of great suffering and hardship. It is not to make whole everyone who may lose property or may sustain damage. If we were going to do that, of course, the Government would get into everything. But this plan is something which has been used before. We have made appropriations such as this before. At this time we are attempting to provide for a somewhat different administration of the program.[22]

The Federal Disaster Relief Act passed in the Senate by voice vote, and President Truman signed it into law on 30 September 1950. Initially, federal coordination of disaster relief fell to the Housing and Home Finance Agency. Over several years, a succession of Department of Defense organizations took over the mission. In 1979 the newly-created Federal Emergency Management Agency took over the role of coordinating disaster relief as its primary mission. Although the Corps of Engineers had viewed with trepidation the formation of an organization to coordinate disaster assistance, it actually expanded the Corps' role in disaster recovery missions.

Observations

Before 1950 the Corps typically participated in rescue, relief, and flood fight activities but seldom in the recovery, reconstruction, or rehabilitation phases. After passage of the Federal Disaster Relief Act, the Corps still led the first-phase activities under its statutory responsibilities and Army Regulation 500-60, and the Housing and Home Finance Agency and its successors also began relying on the Corps' expertise for help with its post-disaster operations. The disaster reconstruction programs—clearing debris, restoring utility services, building temporary housing for refugees—required engineering and construction management capabilities for which the Corps was famous, and the Corps' civil works organization had the skilled personnel available in field offices across the country. Why should the coordinating agency staff up for this work when the Corps could accomplish it at lower long-range costs to the nation?

Chapter 11 Notes

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2. Ibid.
3. Harry Truman to Philip Fleming, 3 Mar. 1948, NARA, RG 162, Federal Works Agency, Fleming Papers, Box 19.
4. Senate Committee on Public Works, *Coordinating Emergency Activities of Federal Agencies in Disaster Areas, Hearings of June 14, 1948*, 80th Cong., 2d sess., 1948, 33–35, 50; includes Fleming's testimony.
5. Ibid., 21.
6. Ibid., 13–15.
7. House Committee on Public Works, *Aid to States and Local Governments in Major Disasters: Hearings, 18–19 July 1950,* 81st Cong, 2d sess., 1950, 1–9.
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19. House Committee on Public Works, *Aid to States and Local Governments in Major Disasters: Hearings, 18–19 July 1950,* 81st Cong, 2d sess., 1950, 82.
20. Lewis Pick to Secretary of Army, 26 Apr. 1950, and Frank Pace, Secretary of Army, to Luther Youngdahl, 24 Apr. 1950, NARA, RG 407, AGO Decimal Files, 1949–50, Dec. 400.38, Box 794.
21. *Congressional Record*, 81st Cong., 2d sess., 1950, 11895–11914.
22. Ibid., 15095–98.


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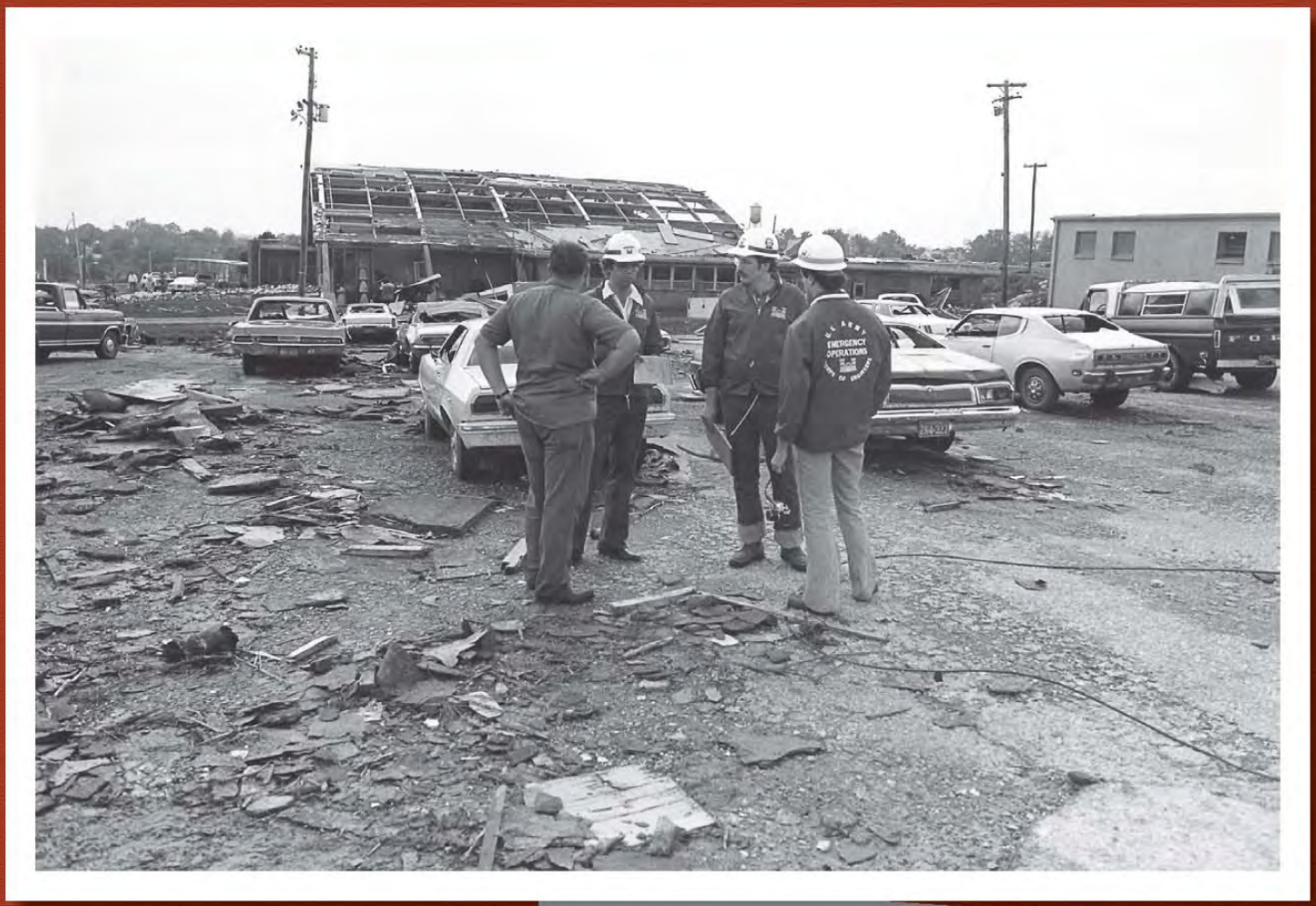

Above: Corps of Engineers officials arrived within hours after the tornadoes struck in Pleasant Hill, Missouri, on the afternoon of 4 May 1977.

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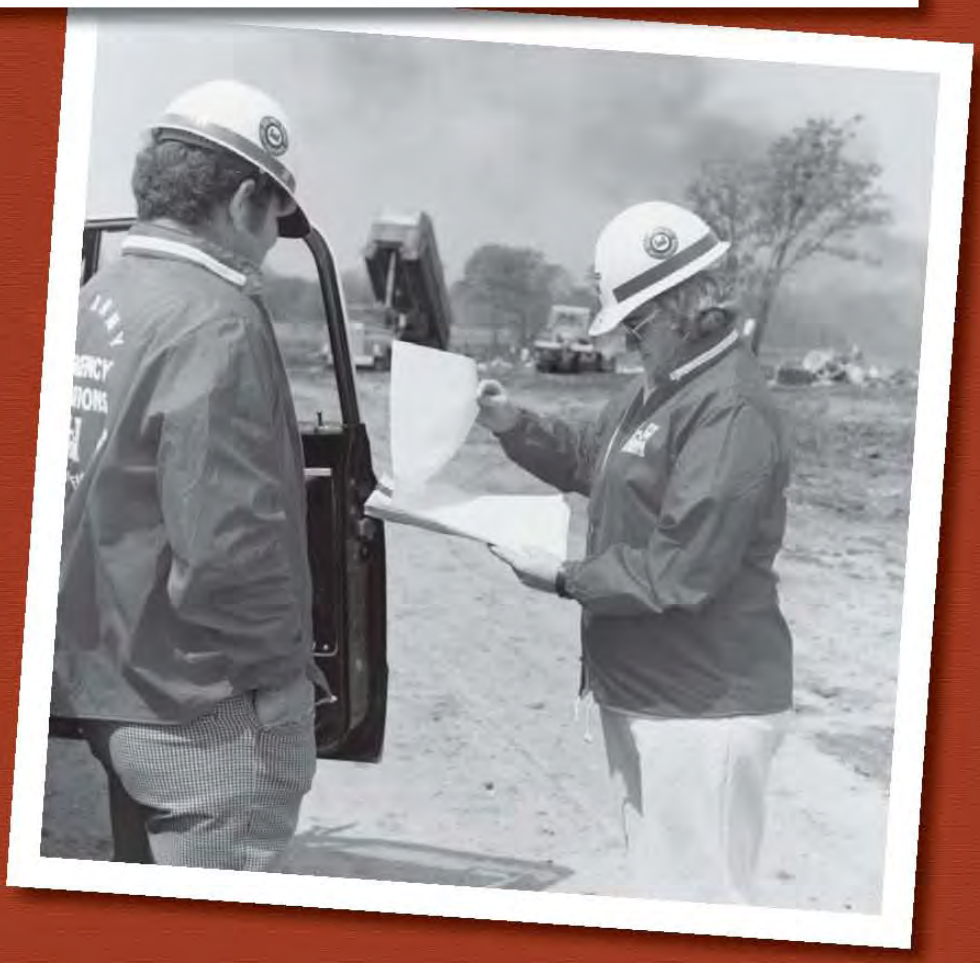

Two Corps employees discussed debris removal at Cabot, Arkansas, which was devastated by tornadoes in 1976.

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Summary

Reviews of federal disaster assistance frequently list 1803 as the date of the first disaster relief law enacted by Congress, a date taken from the 1950 Library of Congress list of disaster relief legislation. Because of the legal circumstances surrounding the early legislation, however, any precedents cited that predate 1865 are questionable as to legislative intent. Before 1865 Congress provided disaster relief in special circumstances under its foreign relations and territorial prerogatives, and it did not clearly assert any federal power to assist disaster victims.

Federal disaster assistance actually began just after the Civil War in efforts to help the former slaves of the South survive Mississippi River flooding of the late 1860s. Once disaster relief had been extended to the former slaves, it became increasingly difficult for Congress to resist providing similar assistance to other citizens on the grounds of constitutional objections.

Federal disaster relief, beginning in the South, retained a southern flavor through the 1940s because the South, subject to earthquakes, floods, tornadoes, hurricanes, and various combinations thereof, simply experienced more disasters than other sections of the nation. It was in the South that the Corps of Engineers performed its first disaster relief mission during the Mississippi River flood of 1882 in support of the Army Quartermasters' emergency ration distribution program.

With equipment and trained personnel stationed along American waterways, the Corps' civil works team was the best suited among all federal or military agencies for conducting rescue and providing relief during floods. By the end of the nineteenth century, the term "flood fight" automatically aroused public visions of the Army Engineers managing immense labor forces chucking thousands of sandbags into place on the levees or steaming up the bayous to pluck refugees from treetops and floating houses.

The special training, experience, and expertise of the Corps soon brought it additional disaster assistance missions. Preparing damage surveys, installing temporary bridges, fighting urban conflagrations—these tasks and more were assigned to the Corps by the president, secretary of war, Army department commanders, and by ratifying acts of Congress.

While the Corps' first disaster missions involved transporting quartermaster emergency rations to refugee camps, by 1913 its officers had come to question this form of disaster assistance, chiefly because they needed labor for the levee flood fights and had trouble obtaining it when refugees could secure free food and shelter in the camps administered by the Red Cross. The Corps advocated substituting a "no work, no rations" policy for the free rations program, and in 1916 Congress extended the Corps an opportunity to test its concept. Briefly in 1916 the Corps replaced the Quartermasters as the primary federal agency involved in disaster assistance, implementing its work relief program that foreshadowed the federal employment agencies created to combat the Great Depression.

A fire in remote Bethel, Alaska, in 1978 left the town without water and sewer service. The Corps of Engineers designed and built an emergency above-ground replacement system so innovative that it won an engineering design award. Office of History

The promising start made with the work relief concept proved abortive, however, when the Army in 1917 reorganized its disaster relief responsibilities. The Army transferred command and control in disaster crises to its departmental or corps area officers, who typically funneled disaster assistance through the American Red Cross. Although the Corps retained its duty to preserve navigation and flood control structures, it acted at the behest of Army department or corps area commanders and in support of the Red Cross during the rescue, relief, and recovery phases of natural disasters.

Some great disasters far exceeded the resources of the American Red Cross, however, and during the devastation of the 1927 Mississippi River flood the president appointed the first disaster assistance coordinator, Herbert Hoover, who managed the services offered by the Red Cross, the Army, the Corps, and all participating federal agencies. During the Depression of the 1930s, federal relief efforts found reinforcement from work relief agencies such as the Civilian Conservation Corps and Works Progress Administration.

After experiencing the challenges presented by the 1937 floods on the Ohio and Mississippi rivers, the Corps initiated efforts to improve its emergency response. It undertook advance planning and improved its communications networks, thus perceptively improving its

readiness both for natural disasters and for war. These steps reaped benefits during the Second World War, when the Corps supplemented its meager forces with combat engineer troops and prisoners-of-war to achieve success during flood fights and other emergencies. This improvement also became apparent in postwar disasters such as the Texas City explosion and Operation Snowbound.

By 1950 the Corps had an established reputation for swift, effective responses to all kinds of emergencies. Its geographically dispersed civil works organization staffed by highly trained specialists brought it disaster relief missions of a wide variety. Indeed, a few Corps officers would have supported making the total federal program of disaster assistance a Corps responsibility, but the Army's General Staff, fearing that disaster relief assignments might interfere with national defense capabilities, disapproved of involving the Army in what it viewed as a civil function. The Corps, nevertheless, preserved its role as the leading federal agency during flood disasters, and the Housing and Home Finance Agency, which in 1951 assumed the mission of federal disaster relief coordination, soon learned to rely on the Corps to respond to any emergency with its traditional *Essayons* spirit.

Lessons Learned

Although it is admittedly risky to generalize about disaster relief operations so varied as those performed by the Corps from 1882 to 1950, identifiable patterns do emerge. After every disaster mission, after-actions reviews are required by regulation to contain a list of lessons learned. It is through study of these lessons that the Corps improves its emergency management skills. The history of Corps performance during disasters up to 1951 reveals some general lessons:

Decentralization: The Corps has a well-established tradition of being the first federal agency to reach disaster sites to provide assistance and to conduct damage assessments. This tradition resulted from the Corps' geographically decentralized civil works organization, with field offices generally much closer to disaster sites than other federal organizations. The availability of trained personnel and equipment useful during emergencies at installations scattered across the nation is a feature that brought the Corps its earliest disaster relief assignments and has stood it in good stead since. The Corps has been able to respond quickly to every major flood disaster and at least has been near the locations of disasters of every kind.

Personnel: Many disaster recovery tasks were assigned to the Corps because it had personnel available with special talents and experience. The Corps had employees skilled in hydraulic engineering, structural engineering, demolition technology, temporary bridge construction, and other specialty fields. Its employees could manage complex operations, handle boats in rough waters, and perform other tasks while also complying with government regulations and responding to command instructions.

Liaison: Emergency responses require the Corps to deal directly with the public, the media, state and local officials, elected federal representatives, and various public and private relief agencies. Recovery from disaster is enhanced if liaison has been established in advance so that mutual confidence prevails. No finer example of the benefit of good relationships is found

"…a trained and experienced military organization actually working and living on the ground,…has a better chance of successfully fighting a major flood than any civilian organization that could possibly be put together."

than a congressman's opposition during the 1890 Mississippi River flood to any limits on the Corps' response because he knew the Mississippi River Commission's president personally and trusted him implicitly. Emergency response effectiveness can always be improved through advance contacts with appropriate officials so that mutual confidence exists when disasters strike.

Planning: The advance planning for emergency contingencies that the chief of engineers initiated in 1938 reduced response times, decreased confusion and delays, and encouraged aggressive action by Corps field personnel. Rather than passively waiting for victims to request aid, Corps field teams moved into disaster areas to offer all the assistance available under existing law and regulations.

Uniforms: The demoralized people of Johnstown were given hope in 1889 when uniformed engineer troops arrived, and the engineers marching into San Francisco streets in 1906 were cheered by the earthquake victims. The appearance of a single Corps officer at an 1896 disaster site quelled public panic.

Leadership: As participants in emergency response efforts before 1950 often noted, disaster assistance missions and combat engineering are similar. Military training in adverse conditions can enhance the response to natural disasters; experience during disasters can develop combat capabilities. Disaster missions often require close liaison with National Guard and Regular Army units, and the Corps' military leadership provides that liaison.

Demolition: In 1904, 1906, 1931, and on other occasions the Corps was called upon to manage demolition during urban conflagrations. During other types of disasters, demolition technology also was used to break ice jams in rivers, remove ammunition and explosives from disaster sites, and manage ammonium nitrate threats. The Corps certainly will maintain demolition capabilities for combat engineering, which will be available if needed in response to disaster.

Flood fights: Since the beginnings of the Corps' flood protection and flood control missions in the 1880s, the Corps has managed flood fights because it has expertise and resources unavailable to other agencies. A central control is often vital to successful management of emergency measures necessary to reduce flood damages.

Reviews: After-action reviews of Corps disaster recovery missions often contain recommendations for equipment and management improvements based on experiences during actual operations. Post-disaster reports, for example, made useful recommendations on bridging equipage after the 1903 Kansas River flood, on construction equipment after the 1921 Pueblo flood and 1948 Florida flood, and on Army cold weather operations after 1949's Operation **Snowbound**.

These then are the obvious lessons learned of the Corps disaster relief operations before 1950; there were many others pertaining to unique situations that can be traced through examination of the contemporary after-action reviews. Such a course was followed in 1950

Navy divers from the Mobile Diving and Salvage Unit operated from the Corps crane barge *Wade* during search and recovery efforts following the collapse of the I-35 bridge in Minneapolis, 8 August 2007.

U.S. Navy photograph (MCSN Joshua Adam Nuzzo)

when Maj. Gen. (soon to be Lt. Gen.) Lewis Pick, Chief of Engineers, sought to prevent the transfer of Corps civil works missions to another agency. He prepared a publication that described the history of Corps disaster assistance efforts together with related missions to outline the reasons why civil works should remain an Army responsibility. Pick collected supporting information from retired Corps officers to include in his publication. Among the materials gathered was a communication from Lt. Gen. Eugene Reybold, the former chief of engineers who had managed, masterfully, the 1937 flood fight on the Mississippi River. "In my judgment," Reybold summarized, "a trained and experienced military organization actually working and living on the ground, with key personnel talking the same language, has a better chance of successfully fighting a major flood than any civilian organization that could possibly be put together."[1]

Note

1. Eugene Reybold to Lewis Pick, 22 Dec. 1949, in *The Chief of Engineers' Memorandum to the Secretary of the Army on the Hoover Commission Proposal to Transfer Civil Works from the Corps of Engineers* (Washington, D.C.: U.S. Army Corps of Engineers, 1950), Section 4:5.


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U.S. Army. Corps of Engineers. Office of the Chief of Engineers. The Technical Library in 1981 stored many technical reports, including printed and mimeographed after-action reviews of Corps disaster relief operations. The Technical Library has since become the Headquarters/HECSA Library.

U.S. Army. Corps of Engineers. Office of the Chief of Engineers. National Archives, Record Group 77. This large and complex collection of the Chief of Engineers' retired records contains correspondence and after-action reports on Corps disaster relief missions. The DeGrange Index accesses the earliest records prior to 1866; for 1867 to 1893 each year's letters sent and received are separately indexed; "General Correspondence, 1894–1923" (Entry 103) covers the years stated, and "Civil Works, 1923–1942" (then at Washington National Records Center, Suitland, MD) includes the Rivers and Harbors files and District files including Bulkies. For records since 1942, accession numbers must be obtained. The files of specific Corps Divisions and Districts may be found in various Federal Regional Records Centers or at the originating offices until the records are retired.

U.S. Department of State. National Archives, Record Group 59. Dispatches from U.S. Consuls in La Guaira, Venezuela, 1810–1906. Microfilm 84, 23 rolls. Roll 1, September 6, 1810, to December 12, 1827, contains the dispatches of Robert Lowry and Alexander Scott, who administered the disaster relief extended to victims of the Venezuelan earthquake of 1812.

U.S. Federal Works Agency. National Archives, Record Group 162. In 1981 the records of this agency, 1930–1950, were in the Natural Resources Branch of the National Archives. They contain the General Philip B. Fleming papers and records of the Bureau of Community Facilities, which administered disaster relief under the 1947 Aiken Act.

U.S. War Department. Adjutant General Office. National Archives, Record Groups 94 and 407. This voluminous collection contains copies of correspondence and after-action reports on Army and Corps disaster relief missions. It is especially valuable for the period after 1917 when the Army's Corps area commanders became responsible for disaster assistance in assigned geographic areas of the United States.

Congressional Documents

In addition to congressional debates and actions as recorded in the *Annals, Debates, Globe,* and *Record*, and in committee prints of hearings, the following materials were consulted in this study.

U.S. Congress. House. Committee on Foreign Affairs. *Alexander Scott*. Report prepared by Edward Everett. 20th Cong., 2d sess., 1829. H. Rept. 72. A claim by the American consul who distributed provisions to Venezuelan earthquake victims in 1812.

U.S. Congress. House. *Report of the Secretary of War.* 42d Cong., 3d sess., 1872. H. Exdoc. 1. Reports Army activities during 1871 Chicago fire but does not mention the Corps of Engineers.

———. Committee on Appropriations. *Supplies to Sufferers from Overflow of Southern Rivers*. Report prepared by William W. Belknap. 43d Cong., 2d sess., 1874. H. Exdoc. 14. Report on issue of Army supplies to flood victims along Mississippi, Tombigbee, Warrior, and Alabama rivers under act of Congress, 23 April 1874. Discusses abuse of Quartermaster ration issues; it does not mention the Corps of Engineers.

———. Committee on Foreign Affairs. *Relief for the Irish People*. Report prepared by Jacob Dolson Cox. 46th Cong., 2d sess., 1880. H. Rept. 465. Recommends relief of famine in Ireland in 1880; discusses legislative precedents for disaster relief appropriations and concludes there should be no constitutional objections to extending relief to Ireland.

———. Senate. Committee on Military Affairs. *Reports…Relative to Amount of Supplies…for Relief of Sufferers by the Overflow of the Mississippi River.* Report prepared by Robert T. Lincoln. 47th Cong., 2d sess., 1882. S. Exdoc. 144. Secretary of War reports on relief furnished to flood victims by the Army during the 1882 Mississippi River flood.

———. House. Committee on Appropriations. *Destitution Caused by the Overflow of the Mississippi River.* Report prepared by Robert T. Lincoln. 47th Cong., 2d sess., 1882. H. Exdoc. 126. Secretary of War reports on damages of flooding in 1882 and work of the Army supplying the disaster victims.

———. House. *Report of the Secretary of War.* 47th Cong., 2d sess., 1882. H. Exdoc. 1. Contains information on 1882 Mississippi River flood.

———. Committee on Rivers and Harbors. *Floods in the Mississippi River.* Report prepared by Redfield Proctor. 51st Cong., 2d sess., 1890. H. Exdoc. 281. Army Signal Officer reports on flood fight on Mississippi River in March 1890.

———. *Floods upon the Mississippi River.* Report prepared by Redfield Proctor. 51st Cong., 2d sess., 1890. H. Exdoc. 291. Chief of Engineers and President of Mississippi River Commission report on the flood fight on Mississippi River in 1890.

———. Committee on Appropriations. *Affairs in the Overflowed Districts of Louisiana*. Report prepared by Redfield Proctor. 51st Cong., 2d sess., 1890. H. Exdoc. 342. Army Quartermaster report on 1890 flood emergency in St. James and Ascension parishes, Louisiana.

———. Senate. *Sufferers by the Recent Floods in the Mississippi Valley*. Report prepared by William McKinley. 55th Cong., 1st sess., 1897. S. Doc. 25. President William McKinley recommends Congress offer disaster relief to 1897 Mississippi River flood victims.

———. *Report on Introduction of Domestic Reindeer into Alaska*. Report prepared by Sheldon Jackson. 55th Cong., 3d sess., 1898. S. Doc. 34. Report on using reindeer to deliver relief supplies to destitute miners in the Klondike; no Corps of Engineers involvement.

———. Committee on Public Buildings and Grounds. *Government Buildings Damaged in San Francisco.* Report by Leslie M. Shaw. 59th Cong., 2d sess., 1905. S. Doc. 433. Secretary of Treasury lists damages to government buildings by earthquake and heroic work of Lt. C. C. McMillan of Revenue Cutter *Bear* during the disaster; no Corps of Engineers involvement.

———. House. Committee on Appropriations. *Army Supplies at San Francisco.* Report prepared by Theodore Roosevelt. 59th Cong., 1st sess., 1906. H. Doc. 781. Secretary of War asks $500,000 to pay for Army disaster relief after the earthquake.

———. *Repair and Preservation of Fortifications in San Francisco Harbor.* Report prepared by Leslie M. Shaw. 59th Cong., 1st sess., 1906. H. Doc. 851. Chief of Engineers asks $5,000 to repair fortifications damaged by earthquake.

———. *Relief for San Francisco.* Report prepared by Theodore Roosevelt. 59th Cong., 1st sess., 1906. H. Doc. 714. Secretary of War asks $1 million for disaster relief and includes reports by Army Quartermaster, Commissary, and Medical corps.

———. Senate. Committee on Foreign Relations. *Appreciation of…Sympathy Shown by Foreign Individuals, Corporations, Municipalities, and Governments with Reference to the Recent Disaster at San Francisco.* Report prepared by Theodore Roosevelt. 59th Cong., 1st sess., 1906. S. Doc. 427. Lists aid furnished San Francisco by foreign nations.

———. House. *Flood Sufferers in the Mississippi and Ohio Valleys*. Report prepared by J. E. Normoyle. 62d Cong., 2d sess., 1912. H. Doc. 1453. Quartermaster report on relief to 1912 flood victims; includes maps and photos.

———. House. Committee on Appropriations. *Appropriations for the Relief of Sufferers from Floods in the Mississippi and Ohio Valleys.* Report prepared by John Joseph Fitzgerald. 62d Cong., 2d sess., 1912. H. Rept. 631. Recommends $697,179 for Army relief to 1912 flood victims.

———. *Estimate of Appropriation on Account [of] Mississippi River Floods.* Report prepared by Franklin MacVeagh. 62d Cong., 2d sess., 1912. H. Doc. 704. Chief of Engineers, Quartermaster General, and Commissary General report on need for flood fight and disaster relief funding during the 1912 flood.

———. *Subsistence of Flood Sufferers along the Mississippi River.* Report prepared by Franklin MacVeagh. 62d Cong., 2d sess., 1912. H. Doc. 711. Army estimates needs of 83,000 flood refugees in 1912.

———. Senate. *Mississippi River Floods*. Report prepared by C. McD. Townsend. 63d Cong., 1st sess., 1913. S. Doc. 204. President of Mississippi River Commission thinks levees are only practical means of preventing flood damages in lower Mississippi valley.

———. House. *Elements of Flood Control*. Report prepared by C. McD. Townsend. 63d Cong., 1st sess., 1913. H. Doc. 51, President of Mississippi River Commission advocates "levees only" program for flood protection.

———. *Rescuing Flood Victims in the Middle Western States.* Report prepared by S. I. Kimball. 63d Cong., 1st sess., 1913. H. Doc. 94. Life Saving Service reports rescues during 1913 Ohio floods.

———. *Report of Ohio Flood Board*. Report prepared by William T. Rossell. 63d Cong., 1st sess., 1913. H. Doc. 246. Special Corps of Engineers board studies flood damage causes during 1913 Ohio floods and recommends extending federal jurisdiction over navigable waterways to include all waters, thereby preventing encroachments on stream channels.

———. Committee on Rivers and Harbors. *Prevention of Damage by Floods*. Report prepared by Lindley M. Garrison. 63d Cong., 2d sess., 1914. H. Doc. 914. Ohio Flood Board discusses flood protection methods.

———. Committee on Flood Control. *Flood Protection and Prevention*. Report prepared by Newton D. Baker. 64th Cong., 2d sess., 1916. H. Doc. 1792. Ohio Flood Board recommends surveys for flood protection and federal regulation of encroachments on stream banks.

———. Committee on Military Affairs. *Relief of Flood Sufferers in Southern States*. Report prepared by Stanley Hubert Dent, Jr. 64th Cong., 2d sess., 1916. H. Rept. 1070. Secretary of War reports damages from Southern floods in July 1916 and the need for disaster assistance.

———. *Relief of Destitute Persons in Districts Overflowed by the Mississippi River.* Report prepared by William Jason Fields. 64th Cong., 2d sess., 1916. H. Rept. 162. Committee on Military Affairs recommends Secretary of War be authorized to furnish disaster relief to victims of the Mississippi River flood of the spring of 1916.

———. Senate. Committee on Appropriations. *Floods in the Mississippi Delta*. Report prepared by Joseph Taylor Robinson. 64th Cong., 2d sess., 1916. S. Rept. 106. Committee recommends Secretary of War furnish tent shelter to victims of the spring 1916 flood on the Mississippi River.

———. Committee on Military Affairs. *Relief of Sufferers from Floods in Vicinity of Fabens and El Paso, Tex., in September, 1925.* Report prepared by James Wolcott Wadsworth, Jr. 69th Cong., 2d sess., 1926. S. Rept. 1193. Secretary of War reports on Army relief furnished to Rio Grande flood disaster victims; no mention of Corps of Engineers.

———. Committee on Appropriations. *Flood Relief, Mississippi River.* Report prepared by Calvin Coolidge. 70th Cong., 2d sess., 1928. S. Doc. 56. Bureau of Budget asks $1.5 million to reimburse Mississippi River Commission for costs of 1927 flood fight.

———. *Estimate for Flood Relief in Vermont and New Hampshire.* Report prepared by Calvin Coolidge. 70th Cong., 2d sess., 1928. S. Doc. 78. Recommends $3.3 million to restore roads damaged by November 1927 flood.

———. House. Committee on Roads. *Vermont Flood Relief.* Report prepared by John Marshall Robinson. 70th Cong., 2d sess., 1928. H. Rept. 952. Recommends appropriation to restore roads destroyed by November 1927 flood.

———. *Relief of the State of Kentucky*. Report prepared by John Marshall Robinson. 70th Cong., 2d sess., 1928. H. Rept. 907. Recommends appropriation to restore roads damaged by the 1927 flood in eastern Kentucky.

———. Senate. Committee on Military Affairs. *Relief of Sufferers of the Mississippi River Flood of 1927.* Report prepared by David Aiken Reed. 71st Cong., 3d sess., 1931. S. Rept. 1360. Secretary of War asks funds to reimburse Army expenses during 1927 flood fight.

———. Senate. *Relief of Flood Sufferers, 1937.* Report prepared by C. B. Baldwin. 75th Cong., 1s sess., 1937. S. Doc. 84. Resettlement Administration reports grants to rehabilitate 1937 flood victims.

———. Senate. Committee on Commerce. *Emergency Flood Control Works.* Report prepared by John Holmes Overton. 78th Cong., 1st sess., 1943. S. Rept. 360. Recommends $10 million to repair damages to flood control structures in 1943.

———. House. Committee on Flood Control. *Emergency Repairs to Flood Control Works.* Report prepared by William Madison Whittington. 78th Cong., 1st sess., 1943. H. Rept. 596. Recommends $10 million to repair damages to flood control structures resulting from 1943 floods.

———. Senate. Committee on Commerce. *Emergency Repairs to Flood Control Works.* Report prepared by Joel Bennett Clark. 78th Cong., 2d sess., 1944. S. Rept. 882. Recommends $12 million appropriation to restore flood control structures damaged by 1944 floods.

———. House. Committee on Flood Control. *Emergency Repairs to Flood Control Works.* Report prepared by William Madison Whittington. 78th Cong., 2d sess., 1944. H. Rept. 1444. Recommends $12 million to restore flood control structures; includes flood damage report by Chief of Engineers.

———. *Emergency Repairs to Flood Control Works.* 79th Cong., 1st sess., 1945. H. Rept. 581. Report prepared by William Madison Whittington. Recommends $12 million to restore flood control structures; includes report on 1945 flood damages by Chief of Engineers.

———. Senate. Committee on Commerce. *Emergency Flood Control Relief Act.* Report prepared by John Holmes Overton. 79th Cong., 1st sess., 1945. S. Rept. 245. Recommends $12 million to restore flood control structures damaged by 1945 floods.

———. Committee on Appropriations. *Appropriation for Emergency Flood Control Work.* Report prepared by Kenneth Douglas McKellar. 79th Cong., 1st sess., 1945. S. Rept. 327. Lists 1945 flood damages and recommends $12 million to restore flood control structures.

———. House. Committee on Appropriations. *Appropriation for Emergency Flood Control Work.* Report prepared by Clarence Andrew Cannon. 79th Cong., 1st sess., 1945. H. Rept. 652. Recommends $12 million for restoration of flood control structures.

———. Senate. Committee on Expenditures in the Executive Departments. *Alleviation of Damage from Flood or Other Catastrophe.* Report prepared by George David Aiken. 80th Cong., 1st sess., 1947. S. Rept. 435. Recommends enactment of bill allowing distribution of war surplus property to disaster victims (Aiken Act).

———. House. Committee on Expenditures in the Executive Departments. *Alleviation of Damage from Flood or Other Catastrophe.* Report prepared by Clare Eugene Hoffman. 80th Cong., 1st sess., 1947. H. Rept. 959. Recommends enactment of bill allowing distribution of war surplus property to disaster victims (Aiken Act).

———. Senate. Committee on Public Works. *Coordinating Emergency Activities of Federal Agencies in Disaster Areas: Hearings on S. 2831.* 80th Cong., 2d sess., 1948. Study of creating a permanent federal policy on disaster assistance and a coordinating agency; includes testimony by R. C. Crawford for Corps of Engineers.

———. House. Committee on Appropriations. *Disaster Relief in Storm Stricken Areas: Hearings, Jan. 26, Feb. 1, 1949.* 81st Cong., 1st sess., 1949. Hearings on funding Army disaster force in snowbound states.

———. House. Committee on Public Works. *Authorizing Federal Assistance to States and Local Governments in Major Disasters.* Report prepared by William Madison Whittington. 81st Cong., 2d sess., 1950. H. Rept. 2727. Recommends enactment of Federal Disaster Relief Act of 1950.

———. Committee on Public Works. *Aid to States and Local Governments in Major Disasters: Hearings, 18–19 July 1950.* 81st Cong., 2d sess., 1950. Testimony on establishing a permanent federal policy on disaster relief; includes information about the Red River of the North flood of 1950.

———. Senate. Committee on Public Works. *Authorizing Federal Assistance to State and Local Governments in Major Disasters.* Report prepared by John Little McClellan. 81st Cong., 2d sess., 1950. S. Rept. 2571. Recommends enactment of Federal Disaster Relief Act of 1950.

———. House. Committee on Public Works. *Disaster Relief: Hearings, 18–19 June 1950.* 81st Cong., 2d sess., 1950. Testimony on the need for establishing a permanent federal policy on disaster relief.

———. Senate. Committee on Public Works. *Amending Section 5 of the Flood Control Act of August 18, 1941.* Report prepared by Dennis Chavez. 84th Cong., 1st sess., 1955. S. Rept. 540. Recommends funding for advance flood preparations and deleting word "maintenance" from 1941 Flood Control Act. (This investigation led to enactment of PL 99-84.)

Government Publications and Pamphlets

Branyan, Robert L. *Taming the Mighty Missouri: A History of the Kansas City District Corps of Engineers, 1907–1971.* Kansas City, Mo.: U.S. Army Engineer District, 1974. Well-researched history that reviews Missouri River flooding and Kansas City District's flood fights.

Cincinnati Relief Committee. *The Flood in the Ohio, February, 1884.* Cincinnati: Chamber of Commerce, 1884. Pamphlet. Describes private relief efforts at Cincinnati during the 1884 flood. No mention of the Corps of Engineers mission.

Citizens' Relief Committee. *Report of the Citizens' Relief Committee Appointed after the Great Baltimore Fire, February 7 and 8, 1904.* Baltimore: Relief Committee, 1904. Pamphlet. Lists charitable disbursements after 1904 Baltimore fire—485 families received assistance. No mention of the Corps of Engineers mission.

Citizens' Relief Committee of Pittsburgh. *The Flood of 1884 in the Ohio Valley*. Pittsburgh, 1884. Pamphlet. Summary of charitable relief activities during the 1884 flood in the upper Ohio River basin. Discusses assistance supplied by Army Quartermasters.

Clay, Floyd. *A History of the Little Rock District*. Little Rock: U.S. Army Engineer District, 1971. Standard official history with minor treatment of emergency operations.

Cowdrey, Albert E. *The Delta Engineers: A History of the United States Army Corps of Engineers in the New Orleans District.* New Orleans: U.S. Army Engineer District, 1971. This District history includes extensive discussions of flood fights and flood disasters on the lower Mississippi River.

Follansbee, Robert, and Edward F. Jones. *The Arkansas River Flood of June 3–5, 1921.* Water Supply Paper 487. Washington, D.C.: U.S. Geological Survey, 1922. A hydrologic investigation of the 1921 Pueblo flood that includes interviews with eyewitnesses and excellent flood and damage pictures.

Galveston Engineer District. "Reports and Correspondence of the Texas City Disaster, April 16–17, 1947." Galveston: U.S. Army Engineer District, 1947. Bound mimeographed report. An after-action report that contains interesting discussion of the authorities under which action was taken.

Henry, Alfred J. *The Flood of 1913 in the Rivers of the Ohio and Lower Mississippi Valley.* Bulletin Z. Washington, D.C.: Department of Agriculture, Weather Bureau, 1913. Hydrologic investigation of the spring 1913 floods.

Johnson, Leland R. *Engineers on the Twin Rivers: A History of the Nashville District, Corps of Engineers, United States Army, 1769–1978*. Nashville: U.S. Army Engineer District, 1978. A district history that discusses flooding and Corps disaster assistance missions in the Cumberland and Tennessee river basins.

———. *The Falls City Engineers: A History of the Louisville District, Corps of Engineers, United States Army*. Louisville: U.S. Army Engineer District, 1975. This history includes discussions of flooding and Corps disaster assistance missions in the lower Ohio River basin.

———. *The Headwaters District: A History of the Pittsburgh District, Corps of Engineers, U.S. Army, 1754–1977.* Pittsburgh: U.S. Army Engineer District, [1979]. This district history includes discussions of flooding and Corps disaster assistance missions in the upper Ohio River basin.

———. *Men, Mountains and Rivers: An Illustrated History of the Huntington District, U.S. Army Corps of Engineers, 1754–1974*. Huntington, W. Va.: U.S. Army Engineer District, 1977. This district history includes discussions of flooding and Corps disaster assistance missions in the middle Ohio River basin.

Louisiana Relief Commission. *Report of the Relief Commissioners of the Overflowed Districts, State of Louisiana.* New Orleans: Times-Democrat Print, 1882. Pamphlet. Includes a list of disbursements and recipients of disaster assistance after the 1882 Mississippi River flood; the commission distributed supplies furnished by the Army Quartermasters.

Lumsden, L. L. *Sanitation of Flood-Stricken Towns and Cities, with Special Reference to Conditions Observed in River Towns and Cities of Kentucky*. Public Health Service Report 131. Washington, D.C.: USPHS, 1913. Investigation of sanitary problems after the 1913 flood at Catlettsburg, Maysville, Paducah, Columbus, and Wycliffe, Kentucky, and measures taken by Public Health Service and Red Cross; includes damage photographs.

McGlashan, Harvey D., and R. C. Briggs. *Floods of December 1937 in Northern California*. Water Supply Paper 843. Washington, D.C.: U.S. Geologic Survey, 1938. Hydrologic investigation of floods of December 9–12, 1937, in the Kaweah, Pit, and Trinity river basins of California, with maps and disaster damage photographs.

Manitoba. Department of Mines and Natural Resources. *Notes on Red River Floods with Particular Reference to the Flood of 1950.* Winnipeg, Man.: C. E. Leech, 1950. Describes 1950 flood fight at Winnipeg.

Mississippi River Commission. *Expenditure of Emergency Funds for Flood Protection.* Printed for use of Senate Committee on Commerce, 62d Cong., 2d sess., 1912. A nine-page report that describes the 1912 flood fight on the Mississippi and explains emergency expenditures.

Morrill, Park. *Floods of the Mississippi River.* Bulletin E. Washington, D.C.: Department of Agriculture, Weather Bureau, 1897. Describes precipitation patterns and flooding in the Mississippi valley during the 1897 flood and includes weather maps and disaster photographs.

New Hampshire. Disaster Emergency Committee. *Flood and Gale, September 1938*. Concord: Disaster Emergency Committee, 1938. State agency record of the September 1938 hurricane that describes storm, damages, and relief measures and includes maps of damaged areas.

Office of Emergency Preparedness. *Federal Disaster Assistance Program Handbook*. Circular 4000.78. Washington, D.C.: OEP, March 1971. This pamphlet reviews federal policies of 1971 on disaster assistance and offers a brief history of such policies.

Orange, Massachusetts. *Enterprise and Journal. A Story in Pictures of the Hurricane and Flood of September 21, 1938.* Orange: Enterprise and Journal, 1938. Pamphlet. A souvenir of the 1938 flood disaster at Orange that includes photographs of the flood.

Risch, Erna. *Quartermaster Support of the Army: A History of the Corps, 1775–1939.* Washington, D.C.: Quartermaster General, 1962. This standard history of the Quartermaster Corps contains a brief discussion of the Quartermaster role in the early federal program of disaster assistance.

Scheufele, Roy. *The History of the North Pacific Division, U.S. Army Corps of Engineers, 1888 to 1965*. Portland, Ore.: U.S. Army Engineer Division, 1969. This history discusses the 1948 Vanport disaster, the 1964 Alaska earthquake, and the 1964 Christmas floods in Oregon and Washington.

Troxell, Harold C. *Floods of March 1938 in Southern California.* Water Supply Paper 844. Washington, D.C.: U.S. Geological Survey, 1942. Hydrologic study of the March 1938 floods from San Diego north to San Luis Obispo including damage estimates, streamflow measurements, and flood photographs.

Turhollow, Anthony F. *A History of the Los Angeles District, U.S. Army Corps of Engineers, 1898–1965.* Los Angeles: U.S. Army Engineer District, 1975. This history discusses flood disasters within the district and includes damage photographs.

Tweet, Roald. *A History of the Rock Island District, Corps of Engineers.* Rock Island, Ill.: U.S. Army Engineer District, 1975. This history briefly mentions the Corps disaster relief mission of 1882 and discusses other flood disasters.

U.S. Army. Chief of Ordnance. *Reports, 1860–1889.* Vol. 3. Washington, D.C.: Government Printing Office, 1890. This third volume of reports contains descriptions of the disastrous explosion at Washington Arsenal in 1863.

———. Corps of Engineers. *The Chief of Engineers' Memorandum to the Secretary of Army on the Hoover Commission Proposal to Transfer Civil Works from the Corps of Engineers.* Washington, D.C.: Chief of Engineers, 1950. Bound mimeographed study. In this document, the Chief of Engineers maintains that military training was valuable during natural disaster operations, and, in support of his thesis, he submits letters from J. C. H. Lee, Eugene Reybold, and other Corps officers who describe their experiences during disasters.

———. Corps of Engineers. Engineer School. *Information Handbook for Disaster Recovery Course*. Fort Belvoir, Va.: Engineer School, 1956. Training text for emergency planning and disaster recovery operations. Discusses Corps response to the Texas City explosion, the 1955 California floods, and Operation Noah.

———. Fifth Army Disaster Force Snowbound. *Snowbound: Nebraska, Wyoming, South Dakota, and North Dakota. 29 January–March 1949.* Omaha: Fifth Army Disaster Force, 1949. Bound mimeographed report. After-action report by commander of Fifth Army Disaster Force that includes correspondence, photographs, newspaper clippings; it perhaps is the best after-action report ever written on a disaster recovery mission.

———. Headquarters, Fifth Army. *History: Operation Snowbound, 29 January–15 March 1949.* Chicago: Fifth Army, 1949. An after-action report by Fifth Army on the relief rendered during the Great Plains blizzards of 1949 that includes copies of correspondence and many photographs.

U.S. War Department. Chief of the Militia Bureau. *Annual Reports*. Washington, D.C.: Government Printing Office, 1921–1932. These annual reports describe National Guard disaster operations; the reports later became the annual report of the Chief of the National Guard Bureau.

———. Corps of Engineers. *Annual Report of the Chief of Engineers* (*ARCE*). Washington, D.C.: Government Printing Office, 1867–1950. This serial set describes Corps emergency responses, especially in connection with flooding.

Articles, Pamphlets, and Dissertations

Abair, Joseph G. *The Flood of November 3 and 4, 1927, Montpelier, Vermont*. Montpelier: author, 1928. Pamphlet. Popular account of the 1927 Vermont flood disaster that includes photographs; it mentions the Red Cross's role in disaster relief but not the Corps of Engineers'.

Andersson, K. S. "Soo Bascule Bridge Failure." *Military Engineer* 34 (May 1942): 242–44. Describes failure of the bridge over St. Mary's Falls Canal locks on 7 October 1941 and the consequent loss of a train, followed by body recovery, channel clearance, and bridge restoration; includes operations pictures.

"The Army in Flood Time." *Quartermaster Review* 15 (Mar.–Apr. 1936): 33–35. Describes the Army response to 936 floods in the northeastern states, the Quartermaster disaster relief efforts, and Corps flood fights; includes a photograph of the Potomac River flooding in Washington, D.C.

Bain, George C. "The St. Louis Disaster." *Harper's Weekly* 40 (6 June 1896): 570. News account of the tornado disaster at St. Louis, Missouri, on 27 May 1896; no mention of the Corps of Engineers.

Bartlett, Leroy, Jr. "Demolition in Civil Conflagration." *Military Engineer* 27 (May–June 1935): 17–81. Lieutenant Bartlett describes demolition methods used by engineers at San Francisco in 1906 and at Managua in 1931 and suggests improved methods of demolition to stop fires; includes pictures of demolition at San Francisco and Managua.

Bassford, Homer. "What a Cyclone's Attack on a Great Community Means." *Harper's Weekly* 40 (13 June 1896): 594. Eyewitness report of tornado disaster at St. Louis, Missouri, on 27 May 1896.

Bell, J. Franklin. "Flood Control on the Sacramento." *Military Engineer* 21 (Jan.–Feb. 1929): 6–9. Colonel Bell discusses the history of storms and flooding in the Sacramento River basin, California; includes map and photographs.

Beretta, J. W. "Emergency Ponton Bridge at Hidalgo, Texas." *Military Engineer* 33 (May–June 1941): 239–43. Captain Beretta describes hasty construction of ponton bridge over the Rio Grande, replacing one that collapsed on 12 November 1939. Beretta, a reserve officer who built the bridge, used wooden pontons assembled at the site. The article includes diagrams and photographs.

"A Birdseye View of Conditions in the Ohio Flood Districts." *Engineering News* 69 (17 Apr. 1913): 794–98. Reporters describe the 1913 floods in the Ohio River basin; includes excellent flood and damage pictures.

Boyle, Freda N. "The Army in Disaster Relief." *Army Information Digest* 9 (Apr. 1954): 47–52. Reviews the Army's roles.

Brandt, Lilian. "Rehabilitation Work in San Francisco." *Charities and the Commons* 17 (Oct. 1906): 25–46. Discusses the activities of Red Cross and local relief committees for 1906 earthquake victims, with photographs of relief work.

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"Bridling the Mississippi." *Literary Digest* 44 (20 Apr. 1912): 798–99. News reports about the 1912 Mississippi River flood; includes disaster photographs and a cartoon.

Burgess, Carter L. "The Armed Forces in Disaster Relief." *Annals of the American Academy of Political and Social Science* 309 (1957): 71. Social analysis of Army role.

Chambers, J. S. "Quartermaster Activities in the Mississippi Flood." *Quartermaster Review* 7 (May–June 1928): 14–20. Quartermaster officer discusses the operations during the 1927 Mississippi River flood and in Vermont and Kentucky; includes copies of correspondence and disaster photographs.

Clemens, George R. "The Mississippi Meets the 1937 Flood." *Civil Engineering* 7 (1937): 379–83. Account of Memphis Engineer District's flood fight in 1937 by an engineer who helped build mudboxes at the Cairo, Illinois, floodwall; includes flood fight pictures.

Dains, Mary K. "The St. Louis Tornado of 1896." *Missouri Historical Review* 47 (Apr. 1972): 431–50. History and photographs of the tornado and damages at St. Louis on 27 May 1896; no mention of federal assistance.

Deakyne, Herbert. "Bridging the Kaw River in the 1903 Flood." *Military Engineer* 20 (May–June 1928): 198–200. Deakyne recalls his service during the Kansas River flood of June 1903 when constructing a temporary bridge at Kansas City.

Deweese, Tex, and Rudy Moc. *Lorain Tornado: Souvenir and Memorial Book*. Lorain, Ohio: authors, 1924. Pamphlet. Thrilling account of the June 28, 1924, tornado and post-disaster cleanup with excellent photographs and a list of casualties; no mention of the Corps of Engineers mission.

Ely, Frank D. "An Earthquake Chronicle: Feeding Stricken San Francisco." *Journal of the Military Service Institution* 39 (1906): 197–204. Captain Ely describes the relief dispensed by the Army to victims of the 1906 earthquake.

Eschrick, John. "He Knows the Fury of War and Floods." *Louisville (Ky.) Courier-Journal* (7 April 1946). An interview with B. B. Talley mentions his work during the 1937 Ohio River flood.

Eyre, Jehu. "Colonel Eyre's Journal of His Trip from New York to Pittsburgh, 1762." *Western Pennsylvania Historical Magazine* 27 (Mar.–June 1944): 37–50. British engineer reports on flood at Pittsburgh in 1762.

Finch, Henry A. "Personal Experiences on Flood Duty." *Military Engineer* 15 (Sep.–Oct. 1923): 398–400. Captain Finch recalls his emergency service at Hamilton, Ohio, and Helena, Arkansas, during 1913 floods. He discusses the "no work, no rations" policy; includes flood fight photographs.

Fogle, Fred. "It Happened to Jeff." *Quartermaster Review* 16 (Mar.–Apr. 1937): 17–19, 63–66. Quartermaster officer reviews the 1937 flood at Jeffersonville Quartermaster Depot on the Ohio River; includes photographs of the flood.

"Four Stages of the Flood." *Survey* 58 (1 July 1927): 357. Discussion of Red Cross coordination with five federal agencies under the Mississippi Flood Committee headed by Herbert Hoover during the 1927 Mississippi River flood.

Funston, Frederick. "How the Army Worked to Save San Francisco." *Cosmopolitan Magazine* 41 (July 1906): 239–48. Memoir by Funston, who directed Army efforts to secure the city and stop the fire after the earthquake; includes disaster relief photographs.

Garriot, F. B. "The West Indian Hurricane of September 1–12, 1900." *National Geographic* 11 (Oct. 1900): 384–92. Weather Bureau officials describe the hurricane that devastated Galveston, Texas, on 8 September 1900 and provide maps showing the storm's course.

Ginsberg, Stephen H. "The Police and Fire Protection in New York City, 1800–1850." *New York History* 52 (Apr. 1971): 133–50. A survey that mentions the fire of 1835 and prints an illustration but does not mention Joseph Swift's role in stopping the fire.

Glenn, Mary N. "A Task for Fortitude and Delicacy." *Charities and the Commons* 17 (1906): 626–29. Personal memoir by a disaster recovery worker following the 1906 San Francisco earthquake.

Godfrey, Stuart C. "Notes from a Mississippi Flood Diary." *Military Engineer* 19 (Nov.–Dec. 1927): 489–93. Selections from Major Godfrey's diary, 19 April to 1 June 1927, detailing the Corps flood fight and rescue efforts along the Mississippi; includes flood, rescue, and relief photographs.

Grant, James A. "Engineering Aspects of the New England Hurricane of September, 1938." *Military Engineer* 19 (Mar.–Apr. 1939): 79–86. Placing the storm in historic perspective, Grant discusses storm meteorology and flood damages, providing weather maps, barometer reading graph, and damage photographs.

"The Great Earthquake." *Public Opinion* 1 (11 Sep. 1886): 431–34. Prints a selection of newspaper reports on the August 1886 earthquake at Charleston, South Carolina.

"The Great Floods." *Harper's Weekly* 26 (11 Mar. 1882): 135, 156, 203. Series on the 1882 floods in the Ohio and Mississippi river basins that includes excellent sketches by staff artists of the floods and damage.

Greely, Adolphus W. "The Mississippi Floods." *North American Review* 102 (May 1890): 618–30. Army Chief Signal Officer attempts to explain causes of the 1890 Mississippi River flood.

Harger, Charles M. "The Recent Floods of the Middle West." *Review of Reviews* 28 (July 1903): 74–78. Account of the 1903 floods at Topeka, Kansas City, and St. Louis with pictures of the floods and damage.

"High Water, High Marks." *Survey* 73 (Mar. 1937): 73–74. Red Cross personnel at Cincinnati, Louisville, and Frankfort report on the 1937 flood disaster.

Holbrook, Stewart. "The Mythmakers." *New Yorker* 24 (31 July 1948): 35–38. Reporter describes rumors of secret body disposal by federal agencies arising after the 1948 Vanport disaster and attempts to determine the rumors' origins.

Holcombe, W. H. "Flood Fight on the Lower Mississippi." *Military Engineer* 19 (Sep.–Oct. 1927): 384–91. Holcombe, who was New Orleans District commander during the 1927 flood, buttresses his eyewitness account with excellent flood pictures.

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