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Todd Shallat

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TODD SHALLAT\*

## Water and Bureaucracy: Origins of the Federal Responsibility for Water Resources, 1787–1838

### ABSTRACT

*The water agencies of the executive branch, born in an ideological struggle between rival views of American government, are products of the formative conflicts that shaped the nation at large. During the early years of federal aid to water projects, 1787 to 1838, nationalists like Alexander Hamilton and Henry Clay called for a vigorous, commercial economy driven by financiers and united by a public network of navigation projects. The defenders of states' rights generally objected to outright subsidies for waterway construction, but they permitted indirect aid to navigation through scientific surveys. In 1824 the Monroe administration and Congress worked out a compromise that vastly expanded the federal jurisdiction. A powerful board of planners and engineers began to weigh the national importance of requests for public assistance. Federal water and construction agencies began working with shipping organizations in port cities and states. Congress suspended some water programs in 1838 but federal planning lived on. Water planners learned to diffuse political attacks with scientific arguments. Federal agencies learned to vie for jurisdiction by promoting the construction programs that broadened their own expertise.*

Critics of big government make two kinds of assumptions about the history of the federal water bureaucracy—both of them wrong. Some assume that the water agencies have traditionally danced on the leash of the port authorities, irrigation districts, and other local organizations that milk Congress for funds. Others see bureaucracy as the engine of centralization that has corrupted our federal system by abusing the rights of the states.

Actually the oldest and most influential of the federal water bureaus, neither servants nor masters of public policy, have worked both sides of the two-party system, moving from federalism to localism, from the need for national planning to the demand for community power.

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\*Associate Professor of History, Boise State University, Boise, Idaho. The author acknowledges a research fellowship from the Boise State College of Social Sciences and Public Affairs. John Freemuth, Errol Jones, and Milton Small provided vital assistance.

During the first era of congressional support for river and harbor projects, from 1787 to about 1838, the Federalists and later the American Whig Party pushed for a government system of canals, lighthouses, river and harbor works, and other navigation projects. Others wanted government restricted to few essential powers. In 1824, a pivotal year, Congress steered a middle course. Federal builders and planners began to study the possible links between large bodies of water. One agency investigated coastlines. Another specialized in large-scale waterway construction. A third helped maintain the major channels of inland navigation. A rising water bureaucracy, now a federal spokesman for costly internal improvements, broke a deadlock between national and local interests by pushing for government planning without challenging state control.

Today the federal bureaus still search for a middle ground. Although critics continue to fear a bloated, overly centralized bureaucracy, the big three water agencies—the Army Corps of Engineers, the Bureau of Reclamation, and the Tennessee Valley Authority—still bow to community power. A literature on the Corps shows how local groups work through Congress to sustain appropriations. Likewise, in Philip Selznick's classic study of compliant federalism, the TVA is a captive giant, its programs co-opted by local utilities and grassroots organizations.<sup>1</sup> The same can be said of federal reclamation. "Attempts to provide central direction always failed," wrote Donald Pisani, a student of western water. "Irrigation districts succeeded because they allowed fundamental water policies to be made at the community level."<sup>2</sup> This localism recalls a Jeffersonian passion still vital in modern times—a faith in the farm as the source of American virtue, a suspicion of big government and distant centers of power.<sup>3</sup>

Centralized water planning, an alternative tradition, is equally enduring and deep. Beginning, perhaps, with the commerce clause of the United States Constitution, Americans have pushed the executive branch to coordinate water projects.<sup>4</sup> In 1808, Treasury Secretary Albert Gallatin asked Congress for \$20 million to build a federal system of roads and waterways. Congressmen John C. Calhoun of South Carolina and Henry Clay of Kentucky revived the Gallatin plan, working with Presidents Monroe (1817–1825) and Adams (1825–1829) to broaden the peacetime role of military engineers. Under Van Buren (1837–1841), water planning

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1. P. Selznick, *TVA and the Grass Roots: A Study in the Sociology of Formal Organization* (1966).

2. Pisani, *Deep and Troubled Waters: A New Field of Western Historiography?*, 63 *N.M. Hist. Rev.* ee 311, 319 (1988).

3. L. Shabman, *Decision Making in Water Resources Development and the Potential of Multi-Objective Planning: The Case of the Army Corps of Engineers*, 42 Technical Report 113 (1972) (Cornell University Water Resource and Marine Science Center).

4. U.S. Const. art. 1, sec. 8.

gave way to a banking recession and political upheaval, but the Army's jurisdiction continued to grow, and a Gallatin-like plan for navigation improvement remained a central plank of the American Whig Party, a pro-business coalition.<sup>5</sup>

A national alliance for internal improvements reformed soon after the Civil War. With \$8 million from Congress in 1867, the first in a series of lavish river and harbor appropriations, an expanded Corps of Engineers began to rebuild the republic. Army engineers deepened the Delaware River and other shipping channels. They cleared western rivers, built locks and dams, studied levee construction, and worked on a plan to clear mud from the Mississippi Delta. Waterway appropriations became free-spending, logrolling agreements with provisions for many states. New civilian agencies—the Geological Survey (1879), the Reclamation Service (1902), the Forest Service (1906), and others—recruited efficiency experts to help distribute the spoils. Reformers had a name for the new approach: multipurpose planning.<sup>6</sup>

In our own century the planning ideal remained tied to the call for businesslike efficiency in government. Franklin Delano Roosevelt thought the consolidation of water, transportation, and land management programs "would put the physical development of the country on a planned basis for the first time."<sup>7</sup> Yet his planners noted the dangers of over-centralization. "Planning," according to Roosevelt's National Resources Board, "does not involve the preparation of a comprehensive blueprint of human activity to be clamped down like a steel frame on the soft flesh of the community." Wise management was "local selfgovernment under a central supervision."<sup>8</sup> But New Deal-style planning, like the New Deal itself, has played to mixed reviews. Many Americans have applauded water planning but faulted the federal government for not going far enough. Others continue to fear a despotic executive branch. Both views extend a 200-year-old debate over the scope of federalism, the role of engineers in government, and the leverage they can apply through technical expertise.<sup>9</sup>

5. Albjerg, *Internal Improvements Without a Policy, 1789–1861*, 28 *Ind. Mag. Hist.* 168 (1932); Schermerhorn, *The Rise and Progress of River and Harbor Policy in the United States* 139 *Franklin Inst.* 252 (1895); Nelson, *Presidential Influence on the Policy of Internal Improvements* 4 *Iowa J. Hist. & Pol.* 3 (1906).

6. Hart, *Biography of a River and Harbor Bill, May 24, 1887*, 3 *Papers of the American Hist. Ass'n* 180 (1888); S. Hays, *Conservation and the Gospel of Efficiency* 91–121 (1959).

7. O. Graham, Jr., *Toward a Planned Society* 53 (1976).

8. National Resources Planning Board, *A Plan for Planning*, 83–84 (1934).

9. C. McKinley, *Uncle Sam and the Pacific Northwest* (1952); and, G. McConnell, *Private Power and American Democracy* (1966) (for advocates of centralized water planning); D. Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (1985) (for the danger of centralization).

Why review this old debate? Because bureaucracy, like a Freudian child, matured through historical conflict, its character marked in formative years. Our study of the adult begins with the waking infant. During the first half century, 1787 to 1838, the federal responsibility for waterways became a factious, multi-agency activity—a jurisdiction divided by three kinds of dispute. First was the tension between national planning and decentralized control of river and harbor projects. A second point of contention was the rivalry among experts within the executive branch. Third was a dispute over scientific methods. Conflict—political, professional, and technological—became an enduring feature of the government's attempt to broaden federalism. Agencies survived relentless fire by retreating to traditional missions. Shifting with Congress, backing away from radical innovation, they learned to maneuver with caution while defending ancient turf.<sup>10</sup>

### TENTATIVE INVESTMENTS, 1789–1824

European visitors to young America found its public works ingenious but remarkably coarse. David Stevenson, a Scottish tourist, recorded this rough ingenuity in his *Sketch of the Civil Engineering of North America* (1838). Landing in the port of New York, Stevenson set foot on a "hastily constructed wooden jetty, which, in certain states of the weather, is deeply covered with mud."<sup>11</sup> The wharves had been built in a "rude" manner—their timbers unvarnished and seldom squared.<sup>12</sup> The harbor had been left in its natural state unprotected by a breakwater, and there was no dredge boat in sight. These facilities, moreover, were privately owned. They stood in astonishing contrast to the public docks of London or the spectacular man-made harbors at Plymouth, England, and Cherbourg, France. "I have little hesitation in saying," Stevenson concluded, "that the smallest of the post-office packet stations in the Irish Sea has required a much larger expenditure of capital, than the Americans have invested in the formation of harbour accommodations for trading vessels along a line of coast of no less than 4,000 miles, extending from the Gulf of the St. Lawrence to the Mississippi."<sup>13</sup>

Stevenson was wrong, but his poor estimate of American expenditures is consistent with the lasting confusion about early public works—especially the federal programs. Standard histories have minimized this kind of government aid. George Taylor's *The Transportation Revolution*

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10. Stinchcombe, *Social Structure and Organizations*, in *Handbook of Organizations* 154 (J. Marsh ed. 1965) (for the importance of an agency's formative years).

11. D. Stevenson, *Sketch of the Civil Engineering of North America* 20 (1838).

12. *Id.*

13. *Id.* at 19.

(1951) missed the treasury lighthouse program, neglected quasi-scientific projects such as lake and harbor surveying, and otherwise dismissed the millions spent on waterways as "indirect" and "much smaller" than the investment in roads.<sup>14</sup> Jamil Zainaldin's *Law in Antebellum Society* (1983) skipped the long-debated compromise that was, perhaps, the most critical piece of nineteenth century internal improvement legislation, the General Survey Act of 1824.<sup>15</sup> Likewise, many economic historians have accepted at face value the Jacksonian rhetoric about waste and corruption in federal engineering programs. Carter Goodrich, Edward Channing, and others blamed Jackson for killing government assistance. After 1830, Goodrich explained, "Congress appropriated no money for new improvements until after the Civil War."<sup>16</sup>

In fact the pre-Civil War government spent more on waterways than roads, and water projects were its first public works. Congress began on August 7, 1789 with "An act for the Establishment and Support of Lighthouses, Beacons, Buoys, and Public Piers."<sup>17</sup> With \$65,000 in 1791, the new Treasury Department Lighthouse Establishment financed a tall, octagonal lighthouse at Cape Henry near the mouth of Chesapeake Bay. Beacons, harbors, and "the security of navigation" remained the focus of federal spending until the early 1820s.<sup>18</sup> Thereafter, the funding was split roughly between coastal improvements and inland navigation. By 1838 the investment had reached \$19 million. Although tiny by later standards, perhaps a third as much as the states had loaned to canals, the aid funded surveys of every major river, and it laid claim to a vast jurisdiction for federal engineers.<sup>19</sup>

Certainly the \$19 million was a far cry from Stevenson's estimate. Had the Scotsman sailed to Philadelphia instead of New York, had he entered the Delaware River instead of Long Island Sound, he would have seen these dollars at work. He would have passed the federal breakwater at Cape Henlopen, Delaware, a \$2 million artificial harbor, one of the largest in the world. Upstream was a chain of timber piers that were probably

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14. G. Taylor, *The Transportation Revolution, 1815-1860* at 67 (1951).

15. General Survey Act of 1824, 4 Stat. 22; J. Zainaldin, *Law in Antebellum Society: Legal Change and Economic Expansion* 19-21 (1983).

16. The Government and the Economy 44 (C. Goodrich ed. 1967); Pulley, *Andrew Jackson and Federal Support of Internal Improvements: A Reappraisal*, 9 Essays in Hist. 48 (1963-64); E. Channing, 5 *A History of the United States* 397 (1921).

17. Acts of the First Congress 53.

18. H. Wheeler, 2 *History of Congress* 119 (1848).

19. Spending estimates include about \$1 million invested in canal company stock and \$2 million for piers and coast surveying before 1824. Chief of Corps of Engineers & Chief of Topographical Bureau, *Collected Secretary of War Reports* (published annually by Congress) (for project breakdowns); United States Treasury Dep't, *Statement of Appropriations and Expenditures*, S. Exec. Doc. No. 196, 47th Cong., 1st Sess. 521-22 (1882); Callender, *Early Transportation and Banking Enterprises in the States*, in *Economic Change in America: Readings in the Economic History of the United States* 522 (J. Lambie & R. Clemence eds. 1954).

the first river projects to receive congressional aid.<sup>20</sup> Some of these structures predated the American revolution. When the federal government had assumed the right to tax shipping, Congress, said Treasury Secretary Alexander Hamilton, had become responsible in part for the facilities that maintained safe navigation.<sup>21</sup> In 1802 the House of Representatives provided \$30,000 for an ice harbor at Chester, Pennsylvania, half the amount requested. Baltimore, under a similar arrangement, tapped a portion of the tariff for harbor improvements. Savannah used treasury funds to buy a dredge boat, remove a wreck, and seal off a pass of Black River.<sup>22</sup>

The legality of this kind of assistance remained a grey area between two readings of the U.S. Constitution. The framers had said little about waterways, but Federalists saw a solution. Returning to Hamilton's stand on behalf of the national bank, the party of Washington and Adams claimed that Congress had the necessary "implied powers" to provide for the general welfare.<sup>23</sup> The national government could remove a hazardous reef just as surely as Congress could outfit a campaign against pirates. Both protected public safety. Congress, moreover, could "regulate commerce among the several states."<sup>24</sup> If "commerce" included navigation—and Federalists insisted it did—then here was an invitation to build or at least subsidize all kinds of water projects. Finally, the Federalists fixed on constitutional provisions for a peacetime army.<sup>25</sup> These provisions implied the authority to map strategic waterways, dredge harbors for the Navy, move troops through canals, train officers in a national academy, and use these army experts to direct public works.<sup>26</sup>

Jeffersonian Republicans read a different Constitution. Looking south and to the heartland, they saw a decentralized republic where the financing of internal improvements was a power reserved for the states. Federalists, they feared, were plotting to remake America along Tory British lines. Hamilton's tariffs and his national bank would enrich private

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20. Secretary of the Treasury, *Piers in Delaware River*, H.R. Doc. No. 7, 5th Cong., 2d Sess. (1798).

21. Secretary of the Treasury, *Piers in the Delaware River*, H.R. Doc. No. 1, 2d Cong., 1st Sess. (1792).

22. Secretary of War, *Works of Internal Improvement*, H.R. Doc. No. 212, 24th Cong., 1st Sess. 35 (1836); Secretary of the Treasury, *Tonnage Money Received Under the Act of March 17, 1800, and Applied to the Improvement of the Harbor of Baltimore and Savannah River*, February 28, 1822, *American State Papers*, in 2 *Commerce & Navigation* 626–27 (1832–61).

23. A. Cox, *Court and Constitution* 73 (1987). Hamilton had convinced President Washington that, although the Constitution said nothing about the specific power of Congress to establish a national bank, Congress did have the authority to create the agencies it needed to carry out its constitution mandates. A bank, Hamilton argued, would help Congress levy taxes and raise an army.

24. U.S. Const. art. 1, § 8.

25. U.S. Const. art. 1, § 8; U.S. Const. art. 2, § 1.

26. Cox, *supra* note 23, at 84–92; C. Goodrich, *American Development Policy: The Case of Internal Improvements*, 16 *J. Econ. Hist.* 449 (1956); J. Larson, *A Bridge, A Dam, A River: Liberty and Innovation in the Early Republic*, 7 *J. Early Republic* 351 (1987).

monopolies. Federal aid to private canals would allow capitalists to profit at the expense of toiling farmers. Corrupt government, evil commerce—these images proved useful to the agrarian opposition, but in 1801 they haunted the new party in power. Jeffersonians now faced a choice between a strict reading of the Constitution and the pro-expansionist policies that opened agricultural markets. The safest course seemed the most indirect. Jefferson permitted small harbor and lighthouse improvements in the name of public safety. Citing authority of Congress to build postal roads, he granted land to the states and signed over \$48,000 for territorial highways. In 1807, Jefferson endorsed a treasury department plan for a United States Coast Survey. All the while the President argued the need for a constitutional amendment so that Congress, in prosperous times, might invest in public works.<sup>27</sup>

The famous Gallatin report showed a new tolerance for the doctrine of implied powers. Treasury Secretary Gallatin, a Swiss financier, was a patron of scientific projects and an admirer of the government-run transportation networks of continental Europe. In 1807, when the Senate ordered a study of "such means as are within the power of Congress" to open roads and canals, Gallatin reviewed local proposals and returned to Congress the following year with a comprehensive plan.<sup>28</sup> The report spoke like a Federalists' for "direct aid from government," an annual investment of \$2 million over the next ten years.<sup>29</sup> Still the proposal was the product of a Jeffersonian mind. Where the Federalists had emphasized Atlantic commerce, Gallatin proposed canals across the mountains and beyond to Louisiana. Gallatin, moreover, stressed the virtues of farming. Roads and inland navigation would "enable every industrious citizen to become a freeholder, to secure indisputable titles to the purchasers, to obtain a natural revenue, and above all to suppress monopoly."<sup>30</sup> While admitting the possible need for a constitutional amendment, Gallatin suggested a more immediate action: government surveyors could plan a national system of transportation projects.

Meanwhile the rise of army engineering made Gallatin's last suggestion a logical step. Since Revolutionary times the Army had looked to France for a model of the scientific builder—an officer with a degree from a prestigious academy. The John Adams administration thought these builders might be useful in directing public works. In 1802, while Jefferson

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27. Jefferson, Road from Washington to New Orleans, H.R. Doc. No. 18, 8th Cong., 2d Sess. (1805); A. Dupree, *Science in the Federal Government: A History of Policies and Activities* 29–33 (1986); R. Kelley, *The Cultural Pattern in American Politics: The First Century* 109–40 (1979) (for the essential ideological distinction between Hamiltonian Federalists and Jeffersonian Republicans).

28. A. Gallatin, Report of the Secretary of the Treasury on the Subject of Roads and Canals 3 (1808).

29. *Id.* at 6.

30. *Id.* at 71.



was cutting the peacetime army, Congress left room for a new French-style Corps of Engineers. The Corps would train at the United States Military Academy at West Point, New York. It would study French, math, and generally "the changes that have taken place on the surface of our globe, their causes and effects."<sup>31</sup> Jefferson set the tone by appointing a scientist to command the new academy. He was Major Jonathan Williams, a cousin of Benjamin Franklin and the author of a technical treatise on navigation. "Hydraulics," Williams explained, "make a very important branch of military science."<sup>32</sup> Soon the study of rivers and harbors was the Corps' special concern. West Point became a forum for Gallatin's proposals, harbor investigations, and reports from the interior on inland navigation.<sup>33</sup>

The War of 1812 sparked a nationalism that transformed the party system and kept Gallatin's ambitions alive. Henry Clay, a Kentucky Republican, called loudly for tariffs, a national bank, and federal internal improvements. Congressman John Calhoun drafted a plan to fund public works with dividends from the government's stock in the new Bank of the United States. Known as the Bonus Bill, the plan moved slowly through Congress in February 1817. Congressman Thomas Wilson of Pennsylvania hoped federal improvements would "perpetuate the republic" by fostering "an indissoluble community of interests, habits, and attachments."<sup>34</sup> For Congressman Henry St. George Tucker, the issue was defense. Recalling "the embarrassments of the nation during war," he blamed a weak Navy, an exposed coastline, and especially "the want of an internal water communication."<sup>35</sup> Tucker, a Virginia cavalry man, said the constitutional authority to declare war and raise an army gave Congress the power to finance public works.<sup>36</sup>

Military aspects of the Bonus Bill returned the attention of Congress to West Point engineering. Calhoun, now Monroe's Secretary of War, called for "a good military system of roads and canals," a system surveyed by army topographers, built by peacetime troops, and designed by the elite force of scientific builders.<sup>37</sup> West Point hired a French scholar to teach construction. Another Frenchman planned coastal improvements through a fortifications board. Corps topographers, a small force of trans-

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31. Paper by Lieut. Col. Williams (Oct. 4, 1806) (available in Minutes and Records, United States Military Philosophical Society, New York Historical Society, New York).

32. *Id.*

33. T. Shallat, *Structures in the Stream: A History of Water, Science, and the Civil Activities of the U.S. Army Corps of Engineers, 1700-1861* at 122-58 (1985) (Ph.D. dissertation, Carnegie-Mellon University).

34. Wilson, *Roads and Canals*, H.R. Doc. No. 69, 14th Cong., 2d Sess. 6 (1817).

35. Tucker, *Roads and Canals*, H.R. Doc. No. 72, 15th Cong., 1st Sess. 7 (1817).

36. U.S. Cong., *Annals of Congress of the United States, 1789-1825*, 14th Cong., 2d Sess. 851-70 (1817); C. Wiltse, *John C. Calhoun: Nationalist, 1789-1828* at 134-36 (1944); C. Goodrich, *Government Promotion of American Canals and Railroads, 1800-1890* at 37-38 (1960).

37. Calhoun, *Roads and Canals*, H.R. Doc. No. 80, 16th Cong., 2d Sess. 1 (1819).

portation surveyors, searched for promising connections to the Ohio Valley. Reporting to Congress in 1817, the topographer Stephen Long said inexpensive "sluices" near the Chicago River would allow boats to pass from Lake Michigan down the Illinois to the great Mississippi.<sup>38</sup> That year the topographer James Kearney set off a wave of enthusiasm in the South with a plan for a deep-water canal from Chesapeake Bay to Albemarle Sound.<sup>39</sup>

Engineers exposed the link between waterways and defense, but the call for federal action still mired on legal ground. James Madison vetoed the Bonus Bill on March 3, 1817, his last act in office.<sup>40</sup> A constitutional purist, Madison said the power to regulate commerce was not the license to subsidize overtly commercial projects. President Monroe wavered, admitting the need for federal financing, insisting on state control. Congress resorted to indirect, Jeffersonian tactics. It extended the pier and lighthouse program. It allowed the Army to work on the National Road. It funded waterway exploration. In 1822, when the Army confirmed the military need for a Delaware breakwater, Congress spent \$22,000 on a feasibility study. Meanwhile a germ of small investors seeded public works through state and municipal "mixed" enterprises. New Yorkers, twice denied federal assistance, raised \$7 million in state revenues and bonds for the 363 mile waterway from the Hudson to Lake Erie.<sup>41</sup>

Suddenly, as the Erie neared completion in 1824, the waterway issue caught fire. "Seventy-five miles of canals is all that is needed" said Philadelphians, projecting a line from the Susquehanna to Lake Seneca, the Great Lakes, the Mississippi, the Missouri, and beyond to the Columbia drainage.<sup>42</sup> Anything seemed possible. Construction began on a locked canal across the Delaware peninsula. Virginians chartered a larger enterprise, the Chesapeake and Ohio. New Jersey, Ohio, Indiana, and Illinois launched ambitious projects, and Pennsylvania hoped to command "the whole inland trade."<sup>43</sup> What was needed, according to a bill taking shape in the House, were "surveys, plans, and estimates, to be made of the routes of such roads and Canals as he [the President] may deem of national importance in a commercial or military point of view."<sup>44</sup> Clay

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38. Long, Canal to Connect Illinois River and Lake Michigan, H.R. Doc. No. 81, 16th Cong., 1st Sess. 4 (1819).

39. A. Brown, *Juniper Waterway: A History of the Albemarle and Chesapeake Canal* 23 (1981); Beers, *A History of the U.S. Topographical Engineers, 1813-1863*, 34 Military Engineer 287 (1942).

40. 30 Annals of Cong. 1062 (1817).

41. Monroe, Views of the President on the Subject of Internal Improvements, H.R. Doc. No. 127, 17th Cong., 1st Sess. (1822); J. Rubin, *An Innovating Public Improvement: The Erie Canal*, in 15 Canals & Am. Econ. Dev. (C. Goodrich ed. 1961); E. Mason, *The Veto Power* 94-96 (1890).

42. A. Harlow, *Old Towpaths* 71 (1926).

43. *Id.*

44. 41 Annals of Cong. 570-571 (1824).

went further. Taking advantage of a sweeping political realignment, the congressman from Kentucky, now a presidential candidate and Speaker of the House, promised a strong "American system" of tariffs and federal aid to public works.<sup>45</sup>

The United States Supreme Court was quick to respond. On March 2, 1824, Chief Justice John Marshall made a popular decision in a pivotal case, *Gibbons v. Ogden*.<sup>46</sup> The case stretched back to 1808 when the New York legislature had granted steamboat monopoly rights to the inventor Robert Fulton and his backer Robert R. Livingston. In 1811 the Fulton-Livingston company had extended its control to the lower Mississippi. A portion of the New York business was leased to Aaron Ogden who, claiming an exclusive privilege to run steamers from New Jersey to Manhattan, secured a restraining injunction against his competitor, the ferryman Thomas Gibbons. Gibbons sued, lost, and hired a famous attorney, Daniel Webster, to appeal to the federal courts.<sup>47</sup>

Webster reduced *Gibbons v. Ogden* to a straightforward question of national supremacy. No state monopoly, Webster maintained, could infringe on the authority of Congress to regulate trade. The Marshall court agreed. "The power over commerce, including navigation, was one of the primary objects for which the people of America adopted their government," the Chief Justice explained.<sup>48</sup> That power barred states from regulating or otherwise interfering with "the deep streams which penetrate our country in every direction" and "pass through the interior of almost every State in the Union."<sup>49</sup> Did the power belong exclusively to Congress? Could the states, for example, pass pilotage laws? Could they regulate some kinds of fares and tax some kinds of products? These points remained open debates in 1824. Still, the immediate impact of the case was a blow for *laissez-faire*. Crushing state monopolies, it freed investment and launched an era of fierce competition among hundreds of steamboat lines. *Gibbons v. Ogden* also sent a message to Congress: the great thoroughfares of inland navigation were federal jurisdiction.<sup>50</sup>

The steamboat monopoly case helped Congress avoid constitutional restrictions. In February 1824, while Webster was still addressing

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45. F. Hill, *Roads, Rails, and Waterways: The Army Engineers and Early Transportation* 42-47 (1957) (for studies of the canal); R. Shaw, *Erie Water West: A History of the Erie Canal, 1782-1854* (1966); R. Shaw, *Canals for a Nation: The Canal Era in the United States 1790-1860* (1990); H. Scheiber, *Ohio Canal Era* (1968); J. Rubin, *Canal or Railroad? Imitation and Innovation in the Response to the Erie Canal in Philadelphia, Baltimore, and Boston* (1961).

46. 9 *Weaton* 1-34.

47. C. Warren, *The Supreme Court in United States History* at 601-15 (1926); M. Baxter, *The Steamboat Monopoly: Gibbons v. Ogden, 1824* (1972).

48. 9 *Weaton* 8.

49. *Id.*

50. Cox, *supra* note 23, at 84-92; D. Pisani, *Promotion and Regulation: Constitutionalism and the American Economy*, 74 *J. Am. Hist.* 740, 742-44 (1987).

the Court in the dimly lit basement of the United States Capitol Building, the House was redrafting a transportation bill. Sponsored by Congressman Joseph Hemphill of Pennsylvania, the bill had two parts: it authorized the President to spend \$30,000 on road and canal surveys, and the bill called for a board of engineers to administer the program. Monroe and the Senate Republicans generally endorsed the legislation, although some feared the expanding power of federal engineers. Thomas Hart Benton of Missouri, an outspoken expansionist, quoted Gallatin's assertion that "the National Legislature alone" was "superior to every local consideration" and therefore "competent to the selection of such national objects."<sup>51</sup> On February 10 the House passed the Hemphill bill, 115 to 86, its resistance from New York and New England, its greatest support from the West. The Senate passed the bill 24 to 18. On April 30, with Monroe's signature, the bill became "An Act to procure the necessary Surveys, Plans, and Estimates, upon the subject of Roads and Canals"—the general survey act of 1824.<sup>52</sup>

The general survey act was a far-reaching compromise that took advantage of the commerce clause but compelled Congress to share power. Shrewdly, the Act stressed projects "of national importance," and it invited the chief executive to decide which projects were more worthy than others. The President would employ "two or more skilful [no sic] engineers, and such officers of the corps of engineers. . . as he may think proper."<sup>53</sup> In May, 1824, Monroe appointed three distinguished builders to a Board of Engineers for Internal Improvements. Working through the Corps and its topographical bureau, the board set out to determine the most feasible canal route from the Chesapeake to the Ohio. Congress then extended the waterway program with two appropriations: \$75,000 to clear sand and debris from the Ohio and Mississippi; \$40,000 for pier improvements at two sites. These were the first army-directed river and harbor construction acts in federal law.<sup>54</sup>

The events of 1824 helped government centralize, professionalize, and solidify its power. While Hamiltonians held out for direct subsidies to private corporations, and Jeffersonians continued to fear a "pernicious copartnership" between builders and the executive branch, a divided Congress used construction specialists to encourage water projects.<sup>55</sup> Their science broke the deadlock between Monroe and the 18th Congress.

51. Hill, *supra* note 45, at 47.

52. 41 Annals of Cong. 998–99; Clay, *Speech on Internal Improvements*, in 3 *The Papers of Henry Clay* 572–93 (J. Hopkins & M. Hargreaves eds. 1963); Way, *The Mississippi Valley and Internal Improvements, 1824–1840*, 4 *Miss. Valley Hist. Ass'n Proc.* 153, 168 (1910–11).

53. Wheeler, *supra* note 18, at 178–89. In April 1824, the Senate rejected two amendments to the survey act: one to increase the pay of army engineers on civil assignment; another to allow the states to veto federal aid.

54. *Id.* at 188.

55. Goodrich, *National Planning of Internal Improvements*, 63 *Pol. Sci. Q.* 16, 41 (1948).

Now, under the terms of the new agreement, a board of internal improvements would prepare estimates and budgets. A corps of engineers would take on large improvements. A topographical bureau would clear hazardous stretches of river. Lighthouse boards and a coast survey would resume the harbor investigations that aided the maritime trade. In these ways the technical agencies would broker financial assistance. Advising the President, recommending action to Congress, a growing, more aggressive bureaucracy would manage public works.

### SCIENCE AND NATIONAL PROJECTS, 1824–1838

Bureaucracy blurred the line between lawmaking and program implementation, shaping government from within. During the era of the general surveys, 1824 to 1838, the Army took the lead in internal improvements through unofficial powers. Army science upgraded water projects. Its field superintendents made technical decisions that focused spending. In Washington, D.C., top officials proposed projects and rejected others according to their own careful assessment of benefits and costs. Professionally, technically, and administratively the new bureaucracy found a voice in the policy-making process. It spoke for a Hamiltonian system of waterway improvements—new kinds of piers, dikes, levees, jetties, and canals; projects that broadened the peacetime activities of military bureaus.

John Quincy Adams cheered the nationalist program. In 1825 the new President referred to the “spirit of [internal] improvement” that brought science into government and modernized the republic.<sup>56</sup> He also gave eager support to the Board of Engineers of Internal Improvements, the army’s planning tribunal. At the head of that powerful board was a remarkable Frenchman, General Simon Bernard. A top graduate of the Ecole Polytechnique in Paris, a baron of the French empire, an aide to Napoleon at Waterloo, the famous Bernard had come to America in 1816 to plan fortifications. Junior board member Joseph G. Totten, a lieutenant colonel, was an early West Pointer and future chief engineer. In seven years of joint command, 1824 to 1831, Bernard and Totten sent about 35 engineers and several civilian surveyors on more than 80 waterway assignments. In 1826 they helped Congress piece together the first omnibus river and harbor act—\$86,000 for improvements at 20 sites. The board also studied at least 28 proposed canals, rejecting 20. By the final year of Adams administration, 1829, the board’s top four canals had received

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56. Adams, *First Annual Message*, in 2 *A Compilation of the Messages and Papers of the Presidents* 882 (J. Richardson ed. 1897).

nearly two million federal dollars.<sup>57</sup>

Canal feasibility studies were an early test of the Corps' ability to influence public policy<sup>58</sup> through ideology and science. Textbook waterways became models for army projects that sometimes exceeded the resources of American corporations. Bernard and Totten spoke of a fiscal responsibility higher than "the standard of money," making a distinction between canals that depended on public assistance and those that did not.<sup>59</sup> Some improvements were "like all commercial speculations." But elsewhere "the revenue from a canal may be much less than that on ordinary investments, and yet the benefits amount to much more." Canals were objects of national pride. "Revenue," the army engineers maintained, was "a secondary object."<sup>60</sup>

A case in point was the 14-mile cut that became one of the world's busiest waterways, the Chesapeake and Delaware (C. & D.) Canal. Bernard and Totten, working with two civil engineers in 1824, had rejected a popular plan and recommended in its place a shorter but more costly project. The army's construction estimate, \$1.3 million, sent investors into shock. The C. & D. company panicked. Stock plunged. But the Corps called the project essential and, with \$300,000 from Congress in 1825, construction proceeded. Four years later the completed canal was critically over-budget. Again, the Corps gathered technical information that helped the stockholders lobby for funds. When the Corps sent an engineer to examine the hazardous western approach to the canal, shallow Back Creek, C. & D. President Robert M. Lewis "politely" joined the tour. The engineer's report of April 3, 1830, drew from company documents. Citing "the utility and importance of the canal in a national point of view," the report outlined a \$40,000 channel improvement plan.<sup>61</sup> In May, Congress added Back Creek to a lighthouse improvement bill. The bill, however, fell to Jackson's pocket veto.<sup>62</sup>

57. 4 Stat. 175 (1826); Harrison, Jr., *Simon Bernard, the American System, and the Ghost of the French Alliance*, in *America: The Middle Period 145-67* (J. Boles ed. 1973); J. Barnard, *Eulogy on the Late Joseph G. Totten*, 16 Occasional Papers, Engineer School 112 (1904); *Corps of Engineers*, Niles Weekley Register, Oct. 22, 1825, at 131-22.

58. U.S. Engineer Dep't, Survey of the Muscle Shoals, H.R. Doc. No. 284, 20th Cong., 1st Sess. 18 (1828).

59. Goodrich, *supra* note 16, at xvi-ii.

60. Letter from Bt. Lt. Col. Stephen Long to General Charles Gratiot (Apr. 3, 1830), in U.S. Engineer Dep't, Harbor of Delaware City, and the Navigation of Back Creek, H.R. Doc. No. 199, 25th Cong., 3d Sess. 1 (1839).

61. R. Gray, *The National Waterway: A History of the Chesapeake and Delaware Canal, 1769-1985* at 47-48, 75-76 (1989); Chesapeake and Delaware Co., Memorial of the Presidents and Directors of the Chesapeake and Delaware Canal Company, H.R. Doc. No. 23, 18th Cong., 2d Sess. 1 (1824); 6 Cong. Deb. 1149 (1830).

62. U.S. Engineer Dep't, Report from the Board of Engineers. . . Concerning the Proposed Chesapeake and Ohio Canal, H.R. Exec. Doc. No. 10, 19th Cong., 2d Sess. 66 (1826).

Science drove this campaign for public funding. Reporting on the proposed Chesapeake and Ohio (C. & O.) Canal, the army's improvement board used trigonometry, hydrology, fluid mechanics, and soil analysis to show that no shallow Erie-type canal would meet the needs of a great waterway across Appalachia. The C. & O., a plan to link the Potomac River to the headwaters of the Ohio, was one of America's most ambitious projects and a test of the army's new authority under the General Survey Act. Three brigades of topographical engineers began gathering data for Bernard and Totten in 1825. After a two-year investigation, General Bernard insisted on a deep, stone-lined canal with massive aqueducts and 100-foot locks. Although the cost seemed astronomical—Bernard said \$22 million for a waterway from the District of Columbia to Pittsburgh—the general argued the bigger picture. "When a nation undertakes a work of great public utility," Bernard told Congress, "the revenue is not the essential object to take into consideration: its views are of a more elevated order."<sup>63</sup> The glory of the union outweighed fiscal concerns.<sup>64</sup>

The Chesapeake and Ohio became a thorn of sharp debate between scientific officers and informally trained canal engineers. Congressman Charles F. Mercer, a friend of the canal, demanded a new survey by practical civilians, and in 1827 two Erie Canal engineers produced a streamlined budget—about \$4 million, less than half the Army's figure. But the subsequent history of the great national project seemed to vindicate Bernard. The cost of materials, labor problems, law suits, and competition from the nation's first railroad kept the canal on the verge of bankruptcy. When the C. & O. company abandoned the cut at Cumberland, Maryland, about halfway to Pittsburgh, the bottom line (about \$11 million) was remarkably close to Bernard's original estimate.<sup>65</sup>

These events confirmed the value of army science. They also revealed a rift in civil engineering, a contest of cultures and values. Civilians stressed the economy of frontier methods. The Corps emphasized the long-range benefits of permanent construction. "We were planning a work for the nation," Bernard reported to Congress; "it did not belong to us to curtail the cost, in order to derive from the capital a greater interests . . . to the detriment of durability and conveyancy."<sup>66</sup> Bernard, perhaps drawing from the French example, assumed the nation would spend freely on facilities large enough to handle heavy traffic. To the extent that the C. & O.

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63. W. Sanderlin, *The Great National Project: A History of the Chesapeake and Ohio Canal 51-52* (1946); U.S. Engineer Dep't, Report of . . . the Board of Engineers, with a View Toward Internal Improvement, S. Doc. No. 32, 18th Cong., 2d sess. 1 (1825).

64. U.S. Engineer Dep't, *Chesapeake and Ohio Canal*, H.R. Rep. No. 141, 29th Cong., 1st Sess. 1 (1828); U.S. Engineer Dep't, *Estimates of Cost of Making a Canal from Cumberland to Georgetown*, H.R. Doc. No. 192, 20th Cong., 1st Sess. (1828); *Chesapeake and Ohio Canal Company, Report to the Stockholders 82-83* (1851).

65. U.S. Engineer Dep't, Report from the Board of Engineers, *supra* note 62, at 23.

66. G. Ward, *The Early Development of the Chesapeake and Ohio Canal Project 75* (1899).

company did listen to Bernard—enlarging the canal at his recommendation, elevating construction to scientific standards—army planning depleted corporate resources, helping to ensure that the costly project would die short of the Ohio.<sup>67</sup>

Here the model of the impartial bureaucracy—the agency insulated from politics by the objectivity of science—did not fit the Corps. Its officers spoke expansion, the language Clay and Calhoun. They appealed to “pride” and the “scientific glory” of stately canals built with federal dollars.<sup>68</sup> They mastered the bureaucratic art of weighing options and examining alternatives only to recommend a single course of action in the final section of the report.

Engineering science, then, had a political agenda, a bias that varied according to agency mission and clientele. The Coast Survey, a captive of New York and Federalist New England, spent its first 30 years on a methodical investigation of the North Atlantic. Southerners who organized the board of internal improvements directed its attention to Florida, the Carolina coastline, and Chesapeake Bay. Even within a single agency there could be contests among experts that transformed public works. The Army, for example, was a house divided between two kinds of builders. While senior officers of the Corps planned canals and coastal improvements, the ten topographical officers gradually took over waterway maintenance operations. Their special constituency was the trans-Appalachian West. Army trained, exposed also to frontier civilian techniques, the topographers marked out a middle ground between professional extremes. Their innovations broadened federal assistance and transformed public works.<sup>69</sup>

Scientific experimentation gave topographers a voice in the policy process through control of construction details. Under the first river acts, for example, the Army could identify hazards and select the appropriate sites for sandbar excavation. Bernard and Totten recommended experiments with French-style jetties and dams that scoured sandy deposits, and in 1825 the topographer Long completed the first of these structures, a “wing-dam” at Henderson Island in the Ohio. Gradually the dam seemed to work. Long, however, began to question the value of dam experiments that seemed to deepen a short stretch of river while the sand bars

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67. Report from the Board of Engineers, *supra* note 62, at 65; Hill, *supra* note 45, at 33.

68. Shallat, *Engineering Policy: The U.S. Army Corps of Engineers and the Historical Foundation of Power*, 11 *The Pub. Historian* 7 (1989); G. Ryan, War Department Topographical Bureau, 1831–1863 at 32–72 (1968) (Ph.D. dissertation, The American University).

69. S. Bernard & J. Totten, Report of the Board of Engineers on the Ohio and Mississippi Rivers, H.R. Doc. No. 35, 17th Cong., 2d Sess. 914 (1822); Letter from S. Long to Chief Engineer A. Macomb (July 17, 1824) (Textual Records of the Office of the Chief of Engineers, Letters Received, 1819–1825, Entry 14, Record Group 77, Nat'l Archives, Washington, D.C.); H. Bache, Report of the Engineer Appointed to Make a Survey of the River Thames in Connecticut, H.R. Doc. No. 125, 21st Cong., 1st Sess. (1830).



reformed downstream. He joined topographer Hartman Bache, James Kearney, and others in calling for cost-effective alternatives to heavy construction—the dredging of sand and gravel, the blasting of dangerous rocks with underwater powder, the “snagging” of dangerous logs by ramming them with steamboats.<sup>70</sup>

Western river assignments helped the topographical officers vie for civil works jurisdiction. Major Isaac Roberdeau, the senior topographer in Washington, D.C., called for an independent civil-works agency. He also petitioned for control of the U.S. coast survey. Speaking before the Columbian Institute of New York on December 9, 1826, Roberdeau said the treasury department’s surveyors had made little progress in 20 years. Ferdinand Hassler, a Swiss scientist, the man appointed by Gallatin to head the coast survey, published an angry response. “This branch of knowledge,” Hassler maintained, “is actually, neither their business, nor within their reach.” He claimed, moreover, that “blind and ever ignorant obedience and strict discipline, may suffice for common military purposes,” but in a great work such as the coast survey “only actual zeal and scientific interests for the objects in view decide the fitness of the man.”<sup>71</sup> Here Hassler struck a nerve: to dispute the Army’s science was to challenge the source of its power.<sup>72</sup>

Topographers countered with their own elastic mission. Roberdeau, citing the great names in British hydrography—Cook, Des Barres, Anson, and others, said the mapping and study of waterways was historically a military responsibility. This logic bore fruit for Roberdeau’s successor, Major John J. Abert. Abert, a West Pointer with legal training, drafted memorials to Congress, and in 1829 he wrote confidentially to the new Secretary of War. He said “public interest” demanded a “separation of duties and command” that would give topographers more direct access to the White House.<sup>73</sup> On June 22, 1831, the topographers became a distinct office of the War Department—a specialized transportation bureau. Abert became responsible for western harbor programs, snag-boat operations, and the waterway activities once administered by the Board of Engineers for Internal Improvements. The new topographical bureau found

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70. I. Roberdeau, *Observations on the Survey of the Sea Coast of the United States* 21 (1826) (Columbia Institute, Library of Congress Rare Book Room).

71. U.S. Cong., *American State Papers*, in 3 *Military Affairs* 184–87; T. Manning, *U.S. Coast Survey vs. Naval Hydrographic Office: A 19th-Century Rivalry in Science and Politics* (1988) (for the enduring rivalry among government surveyors).

72. Letter from J. Abert to Secretary of War P. Porter (Feb. 12, 1829) (Letters Sent by the Topographical Bureau, 1829–1863, Entry 310, Record Group 77, Nat’l Archives).

73. Secretary of War, *Topographical Engineers*, H.R. Rep. No. 95, 24th Cong., 1st Sess. 1 (1836); 2 Memorandum from the Secretary of War on Decisions, Orders, and Regulations 23–24 (Records of the Office of the Secretary of War, Record Group 107, Nat’l Archives); *Legislative History of the General Staff of the Army of the United States* 502–03 (R. Thian comp. 1901).

ways to shift funds, negotiate disputes, and consolidate projects. In 1838 the reward for aggressive administration was an act of Congress that clarified duties, promoted Abert, and upgraded the bureau to an expanded Corps of Topographical Engineers.<sup>74</sup>

The rise of topographical engineering suggested a shift from heavy construction to snagging and dredging operations that maintained important channels at minimal cost. It also reflected a political shift in Jacksonian America—a search for alternatives to the Whig American system, a concern for flexible, decentralized waterway administration. Scientific officers, although “a species of god” in army circles, elsewhere appeared in caricature “with white vests and pantaloons and an eyeglass dangling from their coats.”<sup>75</sup> These men of lofty stature seemed out of step with the times. President Jackson showed frontier contempt for entrenched “public officers” whose tenure in bureaucracy outlasted politicians. “I can not but believe,” Jackson told Congress, “that more is lost by the long continuance of men in office than is generally gained by their experience.”<sup>76</sup> Jackson’s distaste for professional bureaucracy was shared by critics of the Corps and West Point. In 1830 an anonymous pamphlet exposed a “monarchical” and “corrupting” influence in Washington, “a privileged order of the very worst kind—a military aristocracy.”<sup>77</sup> State assemblies in Ohio, Connecticut, Maine, and New Hampshire called for the abolition of the Military Academy. Backwoodsman Davy Crockett said West Pointers were effete soldiers too soft for frontier life. Civil engineers also resented competition from army builders and surveyors. In 1834 two railroad engineers petitioned against the loan of army officers to private corporations, a provision of the 1824 general survey act. The prohibition became law in 1838.<sup>78</sup>

The attack on government engineering was most damning of all. In 1836, for example, the House Ways and Means Committee found 25 “useless” and “fallacious” construction budgets, schemes that exceeded army estimates by up to 300 percent.<sup>79</sup> “Unfortunately for the public treasury,” reported the committee on February 10, “some accident has interposed, some foundation stone in the edifice has been displaced—some unexpected change in the current of surrounding waters has been

74. Letter from C. Atwater to Chief Topographer J. Abert (July 15, 1850) (Letters Received, 1832–1865, Records of the Topographical Bureau, Record Group 77, Nat’l Archives).

75. R. Rouke, *Bureaucracy, Politics, and Public Policy* 17 (1976); M. Crenson, *The Federal Machine: Beginnings of Bureaucracy in Jacksonian America* (1975) (for the Jacksonian attack on bureaucrats).

76. *Americanus* [pseud. A. Partridge], *The Military Academy at West Point, Unmasked* 1 (1830).

77. 5 Stat. 257; E. Denton, III, *The Formative Years of the United States Military Academy, 1775–1833 at 246* (1954) (Ph.D. dissertation, Syracuse University).

78. Smith, *Harbors and Rivers*, H.R. Rep. No. 297, 24th Cong., 1st Sess. 1, 2 (1836).

79. *Id.* at 3.

detected, or some pelting violence of wind or ice, or other resistless power has occurred, and just in season to disappoint the long deferred hope of both government and agents, and to cause, or threaten, the downfall of the structure."<sup>80</sup> The implication was that the Corps was in league with private builders to profit at public expense. In March, 1837, Jackson claimed victory over "unconstitutional expenditure," "corrupt influence," and unnamed "powerful interests."<sup>81</sup> A year later the Corps' chief engineer, General Charles Gratiot, was under indictment for fraud.<sup>82</sup>

In 1838 a new mood in Congress brought an end to a free-spending era. Historians attribute the change to many factors—a severe financial panic in 1837, a sectionalism that crippled the Whig Party coalition, an uprising of Seminole Indians that called West Pointers to combat, new kinds of railroads and river steamers that soured support for publicly financed canals. Another explanation was that bureaucracy had trespassed. It stood accused of the Whiggish conspiracy to drain the federal treasury and erode the rights of states. Army experts, moreover, had taken jobs from civilians. On July 11, 1838, the Secretary of War barred officers from "employment on civil works" and "the service of incorporated companies."<sup>83</sup> That year Congress suspended the general appropriation for rivers and harbors.<sup>84</sup>

Elder statesman John Quincy Adams was quick to pronounce bureaucracy's early demise. "With me fell," he feared, "never to rise again in my day, the system of internal improvement by means of national energies."<sup>85</sup> What fell, in fact, was the Army's spectacular vision—a network of federal projects, grand objects of pride. What stood in its place was a chastised but smarter executive branch still split into rival factions. Improvement boards, a corps of engineers, a corps of topographical engineers, a coast survey—each made do with piecemeal appropriations, but each retained some powers of program implementation. Their experts still used science to set construction standards. Their license to plan was still the authority to weigh options for Congress, promote government funding for science, and shelter critical programs from tides of fiscal restraint.

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80. Jackson, *Annual Message* (1837), in 1 *Papers & Messages of the Presidents 1518-19* (J. Richardson ed. 1897).

81. U.S. Treasury Dep't, General Charles Gratiot, H.R. Doc. No. 77, 2th Cong., 3d Sess. 1 (1839); L. White, *The Jacksonians: A Study in Administrative History, 1829-1861* at 28-33 (1954).

82. War Dept. Circular (July 11, 1838) (Letters Sent to Others than the Secretary of War, Topographical Bureau, Entry 310, Record Group 77, Nat'l Archives).

83. Hill, *supra* note 45, at 91-95.

84. Goodrich, *supra* note 36, at 17.

85. H. Scheiber, *Federalism and the American Economic Order, 1789-1910*, 10 *Law & Soc'y Rev.* 58 (1975).

### CONFLICT, COMPROMISE, AND BUREAUCRATIC POWER

During the turbulent infancy of the water agencies, 1787 to 1838, federal aid to rivers and harbors bridged three kinds of dispute. The first, a political struggle, pitted the plea for central planning against the demand for local control. The second, a jurisdictional contest, was a battle among factions and bureaus of government experts. The third, a technological conflict, was an attack on engineering itself. If, as Hamilton put it, the Constitutional experiment was "necessarily a compromise of dissimilar interests and inclinations," then bureaucracy extended that compact.<sup>86</sup> Its science balanced the needs of fiercely competitive groups.

Today, in our time of billion dollar budgets and 1,000-mile aqueducts, the origins of bureaucracy may seem remote. Scholars now speak of the "professional state" as if the role of experts in government was a twentieth century innovation.<sup>87</sup> Matthew A. Crenson, Don K. Price, and others stress distance between "prehistoric" Jacksonians and the specialized, scientific administrators of later eras.<sup>88</sup> "From the Jacksonian period on through the nineteenth century," wrote Price in "The Profession of Government" (1988), "the dogmas of direct democracy made it difficult to enforce any government regulation or to maintain standards in any public institution."<sup>89</sup> Not until civil service reform, the conservation movement, and the rise of scientific management did the politics of efficiency seem to reorder the executive branch. Revolution is often the word for the radical transformation, as in "the managerial revolution," "the scientific revolution," or the Progressive era "revolt of the engineers" that led to the big-government "social revolution" of the 1930s.<sup>90</sup>

Doubtless the influence of bureaucracy has swelled in our lives, but the history of water policy is evidence of gradual, seldom radical, transition. It shows credentialed experts in government a century before the first degrees in public administration. Scientific management, statistical reporting, and other tools of implementation were antebellum tactics,

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86. F. Mosher, *Democracy and the Public Service* 99-103 (1968).

87. Crenson, *supra* note 75, at 5.

88. Price, *The Profession of Government Service*, in *The Professions in American History* 163, 165 (N. Hatch ed. 1988).

89. D. Bell, *The Coming of the Post-Industrial Society* (1973); D. Price, *The Scientific Estate* 15-16 (1965); E. Layton, Jr., *The Revolt of the Engineers: Social Responsibility and the American Engineering Profession* (1986); Moehring, *Space, Economic Growth, and the Public Works Revolution in New York*, in A. Keating, *Infrastructure and Urban Growth in the Nineteenth Century* 29 (1985); C. Condit, *American Building: Materials and Techniques from the First Colonial Settlements to the Present* 262 (1967).

90. C. O'Connell, Jr., *The Corps of Engineers and Modern Management, 1827-1856*, in *Military Enterprise & Technological Change: Perspectives on the American Experience* 87 (M. Smith ed. 1985) (for Corps scientific management in 19th century railroad engineering).

the Whig-Hamiltonian response to cut throat localism and chaos in public works.<sup>91</sup>

This historic attempt to manage decentralization lends 19th century perspective to a sometimes stark debate. At one extreme are government's staunch defenders, those who refer to "the public good" and "the general welfare" as if program implementation was politically neutral, as if planning was impartial, as if the instrument of bureaucracy was, as Samuel Florman put it, "exquisitely tuned to work the will of the people."<sup>92</sup> At the other extreme are the decriers of engineering as a tool of technocracy and despotic consolidation. Both positions underestimate the legacy of conflict within the executive branch. Historically, the Jacksonian experience suggests, political division has fueled the sectional and jurisdictional combat that derails national planning. And if bureaucracy became, in Thorstein Veblen's phrase, "a somewhat fantastic brotherhood of over specialized cranks," the technocrats themselves were seldom united.<sup>93</sup> Every class of federal experts had ambitious rivals. Every bureaucracy had counterbureaucracies staking disputed terrain.<sup>94</sup>

Another widely held but ahistorical supposition is that the fear of bureaucracy is more intense in modern times. Anti-federal environmental protest may be a new angle of attack, but the image of government out of control was basic to Jacksonian politics. Just as critics now denounce the "institutionalized rip-off" of pork-barrel construction, a House committee in 1836 found "degeneracy" and "general habits of extravagance and listlessness in the administration of public affairs."<sup>95</sup> This kind of hyperbole puts bureaucrats beside Wall Street and oil companies in our spook house of scapegoats. Faceless yet domineering, masters of water resources yet servants of powerful Congress—the indictment mixes contradictions, and it discredits the notion that scientific planners once spoke for the nation at large. Generally the suspicion of technical bureaucracy has divided the American voters and precluded a lasting consensus on federal public works.<sup>96</sup>

Successful agencies fight back with their deepest traditions. Goals change, programs mature, but historic identity survives. The civilian Corps, still commanded by West Pointers, clings to the old connection

91. S. Florman, *Blaming Technology: The Irrational Search for Scapegoats* 46 (1981).

92. T. Veblen, *The Engineers and the Price System* 139–40 (1963).

93. N. Drescher, *Engineers For the Public Good: A History of the Buffalo District* (1982); Rourke, *supra* note 75, at 203–09 (for the rivalry among bureaucracies).

94. F. Powledge, *Water: The Nature, Uses, and Future of Our Most Precious and Abused Resource* 269 (1982); Smith, *supra* note 78, at 1–2.

95. Kaufman, *Fear of Bureaucracy: A Raging Pandemic*, 41 *Pub. Admin. Rev.* 1, 7 (1981) (Kaufman, neglecting the Jeffersonian and Jacksonian attack on big government, says bureaucracy is a "late entry" among America's favorite scapegoats).

96. Lt. Gen. Heiberg, III, *Supporting the Army, Strengthening the Nation: The U.S. Army Corps of Engineers*, 67 *Constructor* 26, 31 (1985).

between waterways and defense. "Our water resources mission and our work for other agencies help keep us trained and flexible, and directly support our mobilization mission," said Lt. Gen. Elvin R. Heiberg, III, the current Chief of Engineers.<sup>97</sup> This is the enduring "army" in army engineering, its military mystique.

By contrast the Bureau of Reclamation was born at a time when newly professionalized civil engineers were breaking the Corps' monopoly over river regulation. Desert irrigation, its 1902 mission, meshed well with the recovery through public works emphasis of the New Deal. By the 1950s, however, the best sites had been developed, and the Bureau's move in new directions was contested by its rival. Dam building became a scrimmage for funding, a tense sequel to the 19th century contest between soldiers and civilians. If the Corps seems to be winning—benefiting from new kinds of user fees and cost-sharing agreements, gaining the trust of many environmentalists while the Bureau remains a pariah—it may be because the army engineers have a considerable head start. Their influence long predates big dam reclamation. Building on the diversity of past assignments, the Corps shifts easily from navigation to flood control to clean-up and research activities without straying from a flexible mission. As government backs away from massive construction, the Bureau loses focus, but the Corps still profits from an ancient claim on hydraulic science.

And so federalism evolved without losing sight of its past. Whiggish compromise promoted centralization. Jacksonian resistance kept the water planners from overwhelming the policy process. Since 1787 the weight of historical experience has swung in both directions, from localism to nationalism, from caution to change.

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97. J. Nienaber Clarke & D. McCool, *Staking Out the Terrain: Power Differentials Among Natural Resource Management Agencies* 92–107 (1985); M. Reisner, *Cadillac Desert: The American West and its Disappearing Water* 176–221 (1986); A. Maass, *Muddy Waters: The Army Engineers and the Nation's Rivers* 208–59 (1951) (for the rivalry between the Bureau of Reclamation and the Corps of Engineers over California's King River project).