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@DisdainingT

Roads, rails & waterways; the Army engineers and early transportation by Forest Hill, 1957
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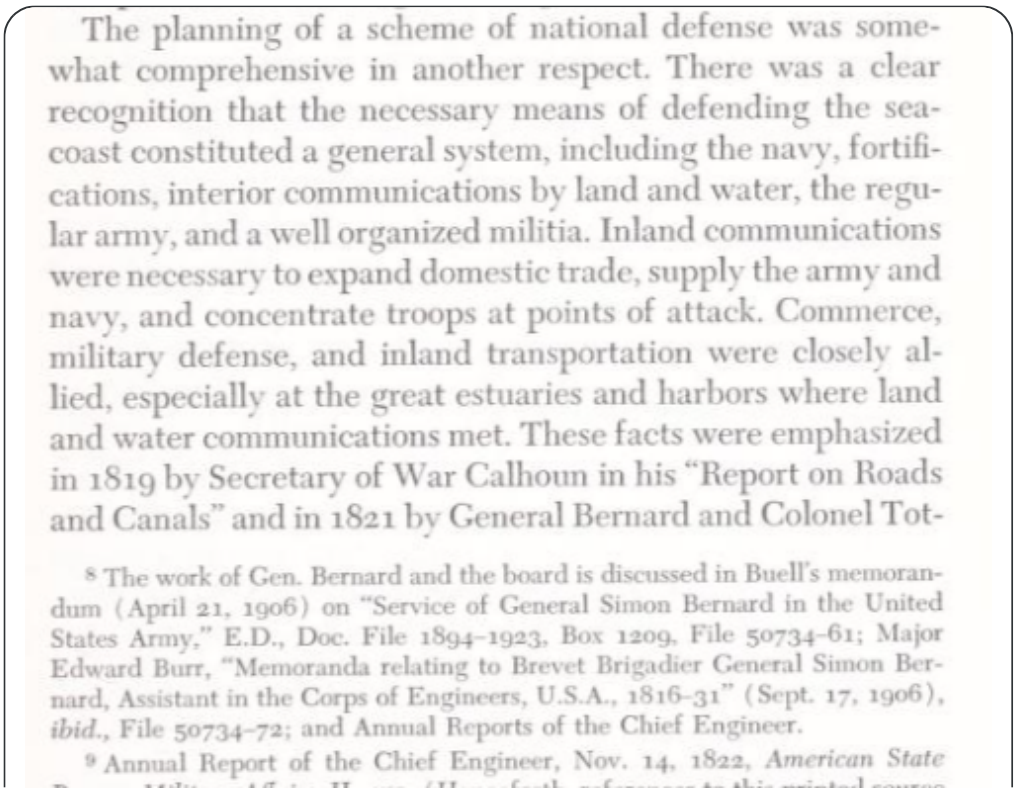
Taste @DisdainingT · Jul 24
Commerce, military defense, and inland transportation were closely allied, especially at the great estuaries and harbors where land and water communications met



The planning of a scheme of national defense was somewhat comprehensive in another respect. There was a clear recognition that the necessary means of defending the seacoast constituted a general system, including the navy, fortifications, interior communications by land and water, the regular army, and a well organized militia. Inland communications were necessary to expand domestic trade, supply the army and navy, and concentrate troops at points of attack. Commerce, military defense, and inland transportation were closely allied, especially at the great estuaries and harbors where land and water communications met. These facts were emphasized in 1819 by Secretary of War Calhoun in his "Report on Roads and Canals" and in 1821 by General Bernard and Colonel Tot-

[8] The work of Gen. Bernard and the board is discussed in Buell's memorandum (April 21, 1906) on "Service of General Simon Bernard in the United States Army," E.D., Doc. File 1894-1923, Box 1209, File 50734-61; Major Edward Burr, "Memoranda relating to Brevet Brigadier General Simon Bernard, Assistant in the Corps of Engineers, U.S.A., 1816-31" (Sept. 17, 1906), *ibid.*, File 50734-72; and Annual Reports of the Chief Engineer.

[9] Annual Report of the Chief Engineer, Nov. 14, 1822, *American State*

Papers, Military Affairs, II, 459. (Henceforth, references to this printed source will be abbreviated *ASP, MA;* and Annual Report and Chief Engineer will appear as A.R. and C/E.) Cf. "Report of the Board of Engineers on the Defence of the Seaboard," Feb. 7, 1821, *ASP, MA*, II, 308, 310–11.

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1 2 10 248

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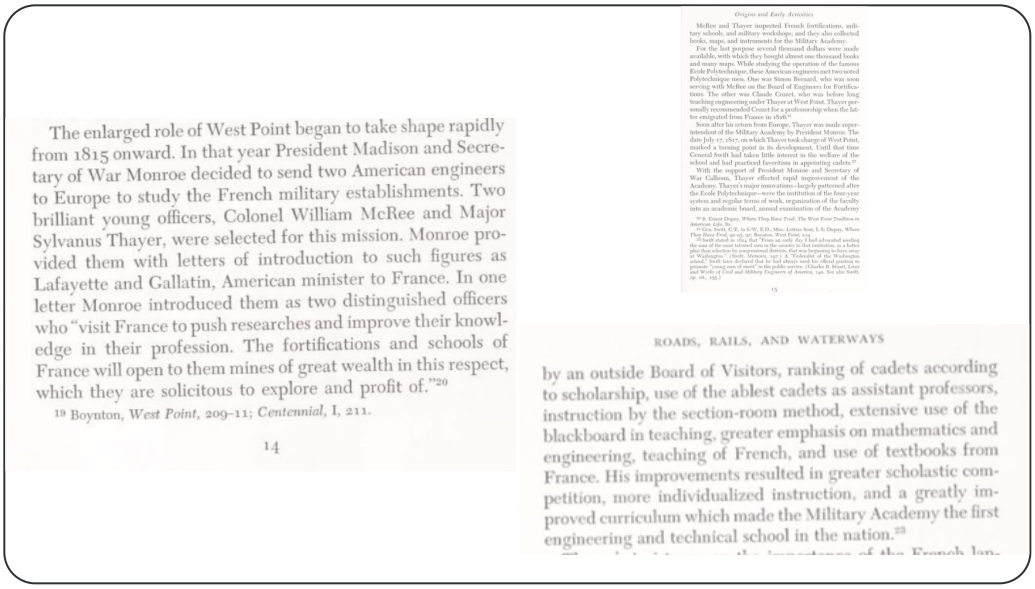
Americans William McRee and Sylvanus Thayer sent to France to study their military establishments. Thayer is later put in charge of West Point by Monroe, greatly improves the school, making it the nation's first engineering and technical school



The enlarged role of West Point began to take shape rapidly from 1815 onward. In that year President Madison and Secretary of War Monroe decided to send two American engineers to Europe to study the French military establishments. Two brilliant young officers, Colonel William McRee and Major Sylvanus Thayer, were selected for this mission. Monroe provided them with letters of introduction to such figures as Lafayette and Gallatin, American minister to France. In one letter Monroe introduced them as two distinguished officers who "visit France to push researches and improve their knowledge in their profession. The fortifications and schools of France will open to them mines of great wealth in this respect, which they are solicitous to explore and profit of."[20]

[19] Boynton, *West Point*, 209–11; *Centennial*, I, 211.

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ROADS, RAILS, AND WATERWAYS

by an outside Board of Visitors, ranking of cadets according to scholarship, use of the ablest cadets as assistant professors, instruction by the section-room method, extensive use of the blackboard in teaching, greater emphasis on mathematics and engineering, teaching of French, and use of textbooks from France. His improvements resulted in greater scholastic competition, more individualized instruction, and a greatly improved curriculum which made the Military Academy the first engineering and technical school in the nation.[23]

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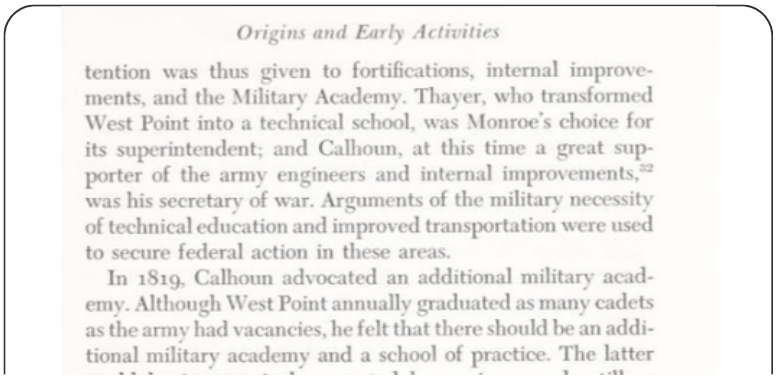
Taste @DisdainingT · Jul 27

Calhoun advocated for West Point being transferred from the Corps of Engineers to the army at large, arguing that only the patronage of the government could make military science flourish



Origins and Early Activities

tention was thus given to fortifications, internal improvements, and the Military Academy. Thayer, who transformed West Point into a technical school, was Monroe's choice for its superintendent; and Calhoun, at this time a great supporter of the army engineers and internal improvements,[22] was his secretary of war. Arguments of the military necessity of technical education and improved transportation were used to secure federal action in these areas.

In 1819, Calhoun advocated an additional military academy. Although West Point annually graduated as many cadets as the army had vacancies, he felt that there should be an additional military academy and a school of practice. The latter

could be inexpensively operated by engineer and artillery officers.[33] In 1820, he proposed that West Point be transferred from the Corps of Engineers to the army at large and that a separate school of application and practice be established to cultivate the higher branches of science essential to artillery and engineering. He feared that the nation would neglect military science: "It has become so complicated and extensive as to require for its acquisition extensive means, and much time to be exclusively devoted to it. It can only flourish under the patronage of Government, and without such patronage it must be almost wholly neglected." To overcome this neglect would be both inexpensive and beneficial, for "officers would be trained who would be masters of every branch of knowledge connected with their profession, and who, by their science, would be not only highly useful, but an ornament to their country."[34]

[32] In later years Calhoun was a strong states-rights advocate and opponent of federal internal improvements.

[33] "Letter in Relation to an Additional Military Academy," Jan. 15, 1819, *The Works of John C. Calhoun*, edited by Richard K. Cralle, V, 54-57. General Bernard and Colonel McRee of the Board of Engineers for Fortifications agreed that an adequate system of military education required a school of application and a second basic school similar to West Point. (*ASP, MA*, I, 834-36.)

[34] "Report on the Military Academy at West Point," Feb. 23, 1820, Calhoun, *Works*, V, 79.

19

1 3 7 685

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Calhoun made his own Report on Roads and Canals in 1819, proposing that military engineers survey and construct important roads and canals

ROADS, RAILS, AND WATERWAYS

that this part of the country exceeded all others in opportunities and inducements for constructing a public system of roads and canals.

Meanwhile, other topographical engineers were busy with surveys relating to coastal defenses. In 1817, the Chief Engineer informed officials in North Carolina that no engineer officer could be spared for surveying the sounds of that state to obtain plans for improving their navigation "beyond what may be involved in an examination for military purposes."[42] A few weeks later the Chief Engineer informed President Monroe that he and General Bernard would be able to inspect the site where commissioners of the state of North Carolina planned to improve the navigation of Albemarle Sound. Since the proposed improvement was quite important, the engineers would examine it after studying proposed fortifications on Chesapeake Bay.[43]

The assistance which the Board of Engineers for Fortifications gave to local sponsors of improvement projects began to increase at this time. The commissioners of the Albemarle Sound improvement received additional aid in 1818. Calhoun instructed General Swift to aid these North Carolina officials by examining Albemarle Sound and "digesting a plan for the improvement of its navigation."[44] A few months later Calhoun approved Major Long's steamboat exploring plan. Long was authorized to build a small steamboat for exploring the western and southwestern parts of the country.[45] Calhoun's "Report on Roads and Canals" in 1819, proposing that military engineers survey and construct important roads and canals,

[42] May 6, 1817, E.D., Misc. Letters Sent, I, 20–21.

[43] May 22, 1817, *ibid.*, I, 23-24.

[44] Jan. 6, 1818, E.D., Doc. File B, Misc. Letters, 1813-18, No. 42.

[45] Letter from Calhoun, Sept. 1, 1818, *ibid.*, No. 46. Long reported in 1821 that with the "United States Steam Boat *Western Engineer*" he had explored the Ohio, Mississippi, and Missouri rivers. He discussed the navigability of these rivers and the nature of their obstructions. ("Report of Col. Stephen H. Long's Western Expedition," Feb. 20, 1821, E.D., Bulky File, No. 107.)

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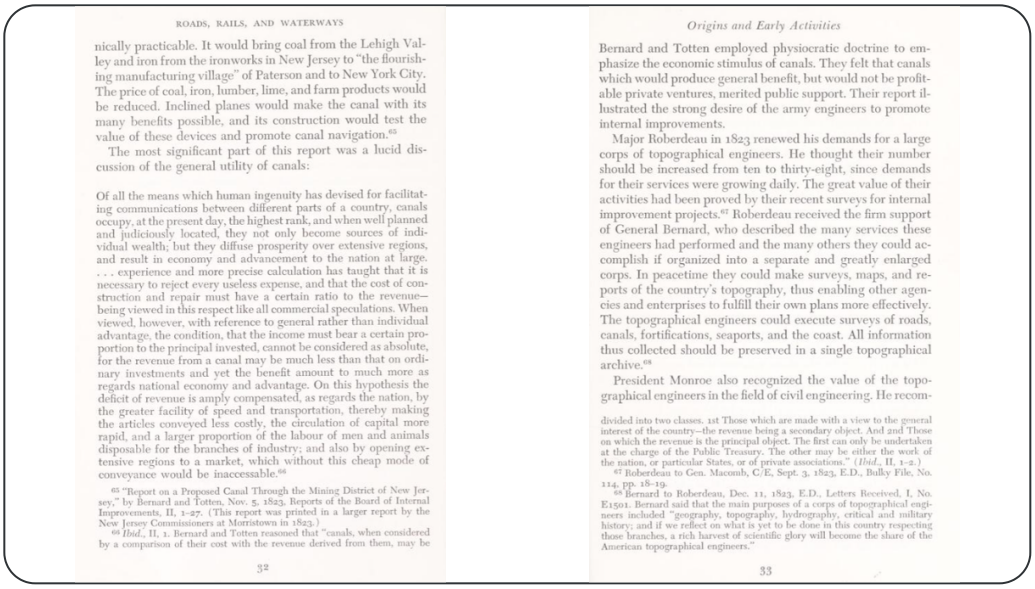
High ranking engineers Bernard and Totten argue that canals, when viewed with reference to general rather than individual advantage, must have their revenues be considered as secondary objects



ROADS, RAILS, AND WATERWAYS

nically practicable. It would bring coal from the Lehigh Valley and iron from the ironworks in New Jersey to "the flourishing manufacturing village" of Paterson and to New York City. The price of coal, iron, lumber, lime, and farm products would be reduced. Inclined planes would make the canal with its many benefits possible, and its construction would test the value of these devices and promote canal navigation.[65]

The most significant part of this report was a lucid discussion of the general utility of canals:

Of all the means which human ingenuity has devised for facilitating communications between different parts of a country, canals occupy, at the present day, the highest rank, and when well planned and judiciously located, they not only become sources of individual wealth; but they diffuse prosperity over extensive regions, and result in economy and advancement to the nation at large. . . . experience and more precise calculation has taught that it is necessary to reject every useless expense, and that the cost of construction and repair must have a certain ratio to the revenue—being viewed in this respect like all commercial speculations. When viewed, however, with reference to general rather than individual advantage, the condition, that the income must bear a certain proportion to the principal invested, cannot be considered as absolute, for the revenue from a canal may be much less than that on ordinary investments and yet the benefit amount to much more as regards national economy and advantage. On this hypothesis the deficit of revenue is amply compensated, as regards the nation, by the greater facility of speed and transportation, thereby making the articles conveyed less costly, the circulation of capital more rapid, and a larger proportion of the labour of men and animals disposable for the branches of industry; and also by opening extensive regions to a market, which without this cheap mode of conveyance would be inaccessable.[66]

[65] "Report on a Proposed Canal Through the Mining District of New Jersey," by Bernard and Totten, Nov. 5, 1823, Reports of the Board of Internal Improvements, II, 1–27. (This report was printed in a larger report by the New Jersey Commissioners at Morristown in 1823.)

[66] *Ibid.*, II, 1. Bernard and Totten reasoned that "canals, when considered by a comparison of their cost with the revenue derived from them, may be

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Origins and Early Activities

Bernard and Totten employed physiocratic doctrine to emphasize the economic stimulus of canals. They felt that canals which would produce general benefit, but would not be profitable private ventures, merited public support. Their report illustrated the strong desire of the army engineers to promote internal improvements.

Major Roberdeau in 1823 renewed his demands for a large corps of topographical engineers. He thought their number should be increased from ten to thirty-eight, since demands for their services were growing daily. The great value of their activities had been proved by their recent surveys for internal improvement projects.[67] Roberdeau received the firm support of General Bernard, who described the many services these engineers had performed and the many others they could accomplish if organized into a separate and greatly enlarged corps. In peacetime they could make surveys, maps, and reports of the country's topography, thus enabling other agencies and enterprises to fulfill their own plans more effectively. The topographical engineers could execute surveys of roads, canals, fortifications, seaports, and the coast. All information thus collected should be preserved in a single topographical archive.[68]

President Monroe also recognized the value of the topographical engineers in the field of civil engineering. He recom-

divided into two classes. 1st Those which are made with a view to the general interest of the country—the revenue being a secondary object. And 2nd Those on which the revenue is the principal object. The first can only be undertaken at the charge of the Public Treasury. The other may be either the work of the nation, or particular States, or of private associations." (*Ibid.*, II, 1-2.)

[67] Roberdeau to Gen. Macomb, C/E, Sept. 3, 1823, E.D., Bulky File, No. 114, pp. 18-19.

[68] Bernard to Roberdeau, Dec. 11, 1823, E.D., Letters Received, I, No. E1501. Bernard said that the main purposes of a corps of topographical engineers included "geography, topography, hydrography, critical and military history; and if we reflect on what is yet to be done in this country respecting those branches, a rich harvest of scientific glory will become the share of the American topographical engineers."

33

1 1 5 203

Taste @DisdainingT · Aug 3

3 misplaced posts:

> **Taste** @DisdainingT · Aug 1
>
> Replying to @DisdainingT
>
> The engineering aid under the Survey Act eventually lost its national character, as it began to be used for encouraging smaller, scattered, individual improvements

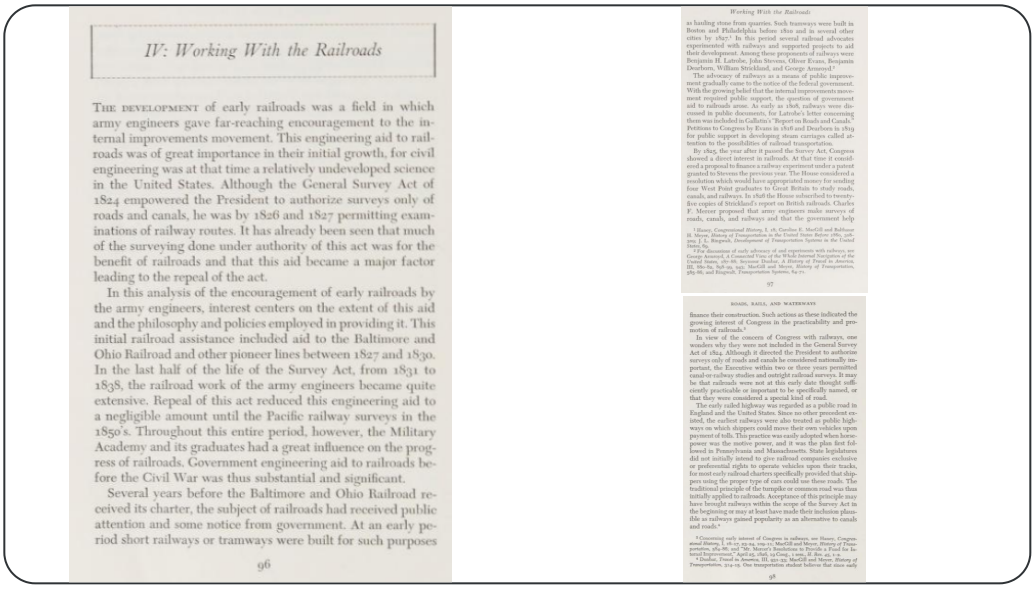
The government attempted to spread its engineering services evenly among the states and satisfy the demands of leading contenders. It tried to provide more surveying in the South and to prevent a concentration of assistance in New England and the central states. The President had the impossible task of trying to distribute the work of the engineers so as to avoid sectional jealousies and charges of favoritism. These conflicts of state and sectional interest increased the demand for aid under the Survey Act. They were also a major cause of the failure to adopt a national system of internal improvements based on investigations authorized by the act.[42]

Getting Down to Work

A national system for executing and financing major projects was never established; consequently, much of the incentive and justification for national planning disappeared. The government lost its chance to guide, but not its ability to assist the internal improvements movement. Congress remained jealous of the President's broad power under the General Survey Act. There were charges of logrolling and favoritism

Taste @DisdainingT · Aug 3

Early railroads in America. Government still needed because no basically no engineers outside military. Notable early rail supporters: Benjamin H. Latrobe, John Stevens, Oliver Evans, Benjamin Dearborn, William Strickland, George Armroyd, and Charles F. Mercer



IV: Working With the Railroads

The development of early railroads was a field in which army engineers gave far-reaching encouragement to the internal improvements movement. This engineering aid to railroads was of great importance in their initial growth, for civil engineering was at that time a relatively undeveloped science in the United States. Although the General Survey Act of 1824 empowered the President to authorize surveys only of roads and canals, he was by 1826 and 1827 permitting examinations of railway routes. It has already been seen that much of the surveying done under authority of this act was for the benefit of railroads and that this aid became a major factor leading to the repeal of the act.

In this analysis of the encouragement of early railroads by the army engineers, interest centers on the extent of this aid and the philosophy and policies employed in providing it. This initial railroad assistance included aid to the Baltimore and Ohio Railroad and other pioneer lines between 1827 and 1830. In the last half of the life of the Survey Act, from 1831 to 1838, the railroad work of the army engineers became quite extensive. Repeal of this act reduced this engineering aid to a negligible amount until the Pacific railway surveys in the 1850's. Throughout this entire period, however, the Military Academy and its graduates had a great influence on the progress of railroads. Government engineering aid to railroads before the Civil War was thus substantial and significant.

Several years before the Baltimore and Ohio Railroad received its charter, the subject of railroads had received public attention and some notice from government. At an early period short railways or tramways were built for such purposes

96

4 8 468

Future Citizen @Slavetoprayer1 · Jul 24

I'm trynna find the MAHAN of rail. Will follow with keen interest

1 7 408

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