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"In Behalf of the Science of the Country": The Smithsonian and the U.S. Navy in the North Pacific in the 1850s[1]

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ABSTRACT: During the early 1850s, the United States launched two major expeditions to the Pacific, as well as a series of surveys of the American West. Although the U.S. Army had developed a strong symbiotic relationship with the civilian scientific community, the U.S. Navy was still attempting to define its role in American science. This paper compares and contrasts the role of science, especially civilian science, in the U.S. Naval Expedition to Japan and the U.S. Naval Expedition to the North Pacific in the context of American military-civilian scientific cooperation during that period. Special attention is paid to the role of the Smithsonian Institution, the leading civilian scientific institution in the United States, in the two naval expeditions.

IN THE EARLY 1850s, the U.S. Navy launched two major expeditions to the Pacific. These were the U.S. Naval Expedition to Japan, better known as the Perry Expedition, which set sail in November 1852, and the U.S. Naval Expedition to the North Pacific, also known as the North Pacific Exploring Expedition or the Ringgold/Rodgers Expeditions, which departed the United States in June 1853. Although both expeditions had scientific components, the involvement of the Smithsonian Institution, the leading American scientific organization at the time, in the expeditions was quite different. The Smithsonian played a very peripheral role in the Perry Expedition, and then only after the expedition returned. In contrast, the Smithsonian was central to the North Pacific Exploring Expedition throughout the expedition's existence. In this paper I examine and compare these contrasting roles in the context of American military-civilian scientific cooperation during that period.

Coincidently in 1853, the U.S. Army began a series of important and successful surveys and scientific reconnaissances in the American West known as the Pacific Railroad Surveys. The primary objective of these surveys was to provide data to allow an informed decision as to the route for the transcontinental railroad. These surveys were the culmination of a number of pre–Civil War expeditions conducted by the army in the American West, including the Pacific coast.

The history of scientific exploration and surveying by the U.S. Army and the U.S. Navy is quite different (Goetzmann 1959, 1966, Kazar 1973, Ponko 1974). Civilian scientists did not accompany the first major army effort, the Lewis and Clark Expedition of 1803–1805, which went from the Mississippi River to the West Coast and back, surveying and exploring the newly acquired Louisiana Territory, but they were relatively easily integrated into later expeditions. Working relationships between civilian scientists and survey commanders, although not perfect, were relatively smooth and productive. For the most part, the collections gathered by these expeditions had been small in number and collected over a long period. There had been few disputes. The scientists accompanying the expeditions usually described the specimens, having worked out the issue of housing beforehand. Alternatively, the commanding officer of an expedition would send them to a particular scientist

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or scientific institution with whom he had a personal relationship for description and preservation.

In contrast, the navy started out with a major exploring expedition—the U.S. South Seas Exploring Expedition of 1838–1842, better known as the Wilkes Expedition. Its problems became legendary among American scientists. Captain Charles Wilkes, the expedition's commander, was a firm believer in the yet-unproven scientific abilities of naval officers. He reserved the physical sciences for the military and reluctantly accepted civilian scientists only when he was unable to find qualified naturalists among the navy's medical corps. The relationship between the needs of civilian scientists to collect and the naval officers to survey had not been well thought out. Wilkes always placed the needs of the navy first (Stanton 1975, Viola and Margolis 1985).

Despite its problems, the Wilkes Expedition returned with thousands of specimens from Australia, the West Coast of North America, and the islands of the Pacific. However, no provision had been made before the departure of the expedition for the care of the specimens, and they ultimately were placed under the curatorship of the National Institution for the Promotion of Science, a local scientific society in Washington, D.C., with considerable political influence, but little support among the national scientific community. The National Institution staff mishandled the collections, damaged or lost specimens, and ignored the need to keep specimens and identification labels together (Kohlsted 1971, Viola and Margolis 1985).

Adding to the scientific community's unhappiness, publication of the scientific results of the U.S. Exploring Expedition was under the control of Wilkes, who had his own ideas about scientific research and publication, ideas that conflicted with those of the scientists. There were two decades of clashes between the scientists analyzing the specimens and Wilkes over issues of format, use of Latin, and the need for foreign scientific input (Stanton 1975:316–377, Hibler 1989).

When the Smithsonian Institution was established in 1846, it was assumed by many that it would take responsibility for the Wilkes specimens and other national collections housed in the Patent Office Building. However, Joseph Henry, the first Secretary (i.e., Director) of the Smithsonian, rejected that assumption. He argued that maintaining national collections, such as scientific specimens returned by the military, was the financial responsibility of the government. The Smithsonian would be free with its advice, whether to government scientists, military officers, or cabinet members; it would happily help train government scientists and military officers conducting scientific collecting. But at least some out-of-pocket costs would have to be reimbursed (Reingold and Rothenberg 1985).

This was no obstacle for working with the army. For example, Henry and Jefferson Davis, who had been a Regent (i.e., trustee) of the Smithsonian before becoming Secretary of War in 1853, had worked out an arrangement for the Railroad Surveys in which the Smithsonian would serve as a temporary clearinghouse for the collections. The Smithsonian provided additional assistance to the surveys: "The instruments have been compared, implements constructed, and practical instruction given in the art of observation and the means of preserving specimens." Secretary Henry congratulated himself on the role of the Smithsonian in the exploration and surveying of the American West: "it has rendered important aid to physical geography and natural history by the facilities which it has afforded the several exploring parties which have been fitted out during the past year" (Smithsonian Institution 1853:24).

The relative success of the army and civilian scientists to cooperate for the cause of science can in part be credited to the training and status of army officers in the United States. During the first two-thirds of the nineteenth century, an American army officer could become a member of the scientific community. If trained at the U.S. Military Academy at West Point, which was founded in 1803, such an officer would have had excellent technical training in mathematics and practical astronomy. Many graduates had no

expectations of a military career. Ulysses S. Grant, destined to command the Union forces during the Civil War, went to the Military Academy in expectation of gaining the qualifications for a professorship of mathematics in a civilian college (Grant 1885:40). Army officers could and did pursue research, publish in scientific journals, and get elected to learned societies such as the American Academy of Arts and Sciences. Most of these officers were eventually assigned by the army to its elite Corps of Topographical Engineers (Anonymous 1868, Goetzman 1959).

Adding to the status of army officers, alumni of the Military Academy held important positions in the scientific community and civilian life. For example, Alexander Dallas Bache, class of 1825, was director of the U.S. Coast Survey from 1843 until his death in 1867 and became the first president of the National Academy of Sciences in 1863. One of Bache's Military Academy classmates was Jefferson Davis. Taking charge of the survey of the northernmost route was Isaac I. Stevens, the governor of Washington Territory, whom Henry described in a letter to an English scientist (Henry 1853*a*) as both "a graduate of West Point" and "much interested in the promotion of science."

The situation was much different for naval officers. Even as late as 1853, most naval officers were the products of a shipboard apprentice system. Those who went to the naval equivalent of the Military Academy were few and poorly trained. The naval academy at Annapolis was not established until 1845, and it did not provide a four-year curriculum equivalent to that of the Military Academy until 1850–1851. Because science was not held in high regard at the naval academy, the scientific training offered there was inferior to its army counterpart (Bruce 1988:161, 209, Ponko 1974:15–16).

These differences between the army and the navy did not result in the complete absence of naval officers in the scientific community. Naval officers could receive scientific training before 1845 by taking a leave of absence to attend college or be tutored by a scientist (Davis 1899, Ponko 1974:15). Another alternative was duty with the U.S. Coast Survey. Although a civilian agency, the Coast Survey utilized naval personnel, providing them with training in hydrography and geodesy (Bruce 1988:172). That these alternatives worked for highly motivated individuals is indicated by the parity between active army officers and active naval officers among the 50 founders of the National Academy of Sciences. There were four of each (in addition to two former army officers and three civilian employees of the navy). However, it required considerably more initiative for a naval officer to become actively involved in science. One consequence of these circumstances was that some of the naval officers most committed to raising the level of scientific expertise in their service felt the need to prove to the civilian community that they could do science without civilian assistance (Dupree 1986:97). Others, however, felt comfortable with a partnership in which the navy was subordinate to civilian scientists. The commanders of the Perry and North Pacific Exploring Expeditions took these opposing approaches.

THE PERRY EXPEDITION

On 24 November 1852, Commodore Matthew C. Perry, the recently appointed commander of the East India Squadron, set sail from Norfolk, Virginia. The primary mission of his expedition was the opening of Japan to American trade. A secondary mission was the advancement of scientific knowledge.

Science was not supposed to be incidental to the mission. Indeed, it has even been suggested that one of the reasons Perry was selected for the command was his sympathy for science. During the Mexican War he had collected natural history specimens (Kazar 1973:158). Yet science turned out to be very peripheral to this expedition. In part at least, this was due to Perry's desire to prove that naval officers were just as capable of doing science as West Point graduates. He fought every suggestion to have civilian scientists accompany his expedition and bragged about

it to his officers (Perry 1968:9). In the end, the only civilian component of the scientific side of the expedition was James Morrow, an agriculturalist employed by the State Department, but he was not a research scientist. Collecting and observing in geology, ethnology, zoology, and botany was to be done by naval officers, supplemented by the two naval surgeons who accompanied the expedition and the naval chaplain.

The experiences of the chaplain, George Jones, provide insight into the status of science on the Perry Expedition. Jones was officially the expedition's geologist, although he had not studied geology in the 30 years since he had graduated from Yale in 1823 (Rothenberg 1974:90). In any case, Jones got sidetracked after a conversation with James Dana, the professor of geology at Yale. He took up Dana's suggestion that he "would have good opportunities for observations on the Zodiacal Light" (Jones 1856:ix). The zodiacal light became his passion, despite a lack of training and preparation. Jones' only equipment was "a nine-inch-celestial globe"; his library was restricted to "an odd number of the American Journal of Science, containing some remarks by Professor Olmsted ... and two of Nichol's works on Astronomy" (Jones 1856:x).

The third volume of Perry's report consisted of 340 plates showing Jones' observations. Jones also developed a theory of zodiacal light that he first published in the *American Journal of Science.* He argued that the light was caused by a "nebulous ring with the earth for its centre, and lying within the orbit of the moon" (Jones 1855:139). The theory was extremely controversial. Although some Americans applauded his work, Europeans were more skeptical. Piazzi Smyth claimed that "Jones had never seen the zodiacal light at all" (Anonymous 1870:285).

Jones' lack of training and lack of preparation was the norm for the expedition. The naval officers were not up to the responsibilities placed upon them. Fortunately, Morrow proved to be a good collector and came back with excellent collections of reptiles and plants.With the return of the Perry Expedition in 1855, came the same question that had to be answered for the Wilkes Expedition: how were expedition collections to be described and by whom? Perry decided on a modification of the Wilkes model. He wanted to include the scientific findings in his narrative, with Chaplain Jones providing oversight. Jones, however, was only interested in his zodiacal light observations. The collections were eventually farmed out to specialists for description: four botanists, including Asa Gray; the ichthyologist J. Carson Brevoort; and the ornithologist John Cassin. There were clashes between Perry and the scientists over the time necessary to analyze the collections properly, as well as over Perry's desire to publish the results in his narrative report versus the scientists' desires to publish in scientific journals. The State Department and the navy had jurisdictional disputes over the collections. The scientists complained that the lack of trained collectors resulted in insufficient information about the collections. Overall, the contribution to science by the Perry Expedition was limited (Kazar 1973, Ponko 1974).

The Smithsonian's role was also limited. When the expedition returned, Henry offered the assistance of the Smithsonian, an offer Perry apparently accepted. However, the extent of that assistance is uncertain. All that is known for sure is that some of the Perry collections did come to the Smithsonian (Smithsonian Institution 1858).

THE NORTH PACIFIC EXPLORING EXPEDITION

The North Pacific Exploring Expedition was a surveying and exploring expedition. Its objective was the increase of knowledge. The political justification was the need of American whalers and ships engaged in the China trade to have accurate surveys of the North Pacific Ocean, the Bering Straits, and the China Sea. But its officers were also expected "to combine with its primary nautical aspect as much exploration in the field of natural History as the opportunities of the cruise might allow" (Ponko 1974:207). Initially led by Lt. Cadwalader Ringgold, a veteran of the Wilkes Expedition, the North Pacific Ex-

ploring Expedition was supposed to demonstrate what the navy and the nation had learned from the earlier venture to the Pacific. Neither Ringgold, removed from command in 1854 after a mental breakdown, nor his second in command (and ultimate successor) Lt. John Rodgers, nor Secretary of the Navy William Graham were insecure about the navy's ability to further the cause of science. They would cooperate with civilian scientists, much as the army did.

In fact, the navy's approach to civilian science in the Ringgold Expedition was similar to the army's approach in the Pacific Railroad Surveys. Initially, the navy worked closely with the Smithsonian, as representative of the American scientific community, in the selection of scientists to accompany the expedition, the distribution of collections, the selection of the reference library, and publication plans. The Smithsonian would serve as the scientific clearinghouse. It agreed to "take charge" of the collections, "see to their preservation, and if thought necessary, will procure scientific descriptions which will enable an account of them to be published as soon as the expedition returns." It was understood, however, that the navy agreed to defray the expenses of the Smithsonian (Henry 1853*b*).

A dozen civilian scientists were taken on the expedition, backed by another dozen back in the United States. Leading the scientific contingent on board was Charles Wright, Asa Gray's assistant and the most experienced botanical collector in the United States. Also on board was William Stimson, then an assistant to Louis Agassiz and destined to become a leading invertebrate zoologist.

All of this was orchestrated with Secretary of the Navy Graham and his successor, John Pendleton Kennedy. But by the time the first scientific collections were returned in late 1853, a presidential election had occurred, and a different political party was in power. Yet a third Secretary of the Navy was in charge, James C. Dobbin, a Democrat, replacing his Whig predecessors. The careful arrangements made for the North Pacific Exploring Expedition were threatened. The problem arose when Henry asked for the funds when the first specimens came back: "Three cases of specimens of natural history, sent home by the exploring expedition under the charge of Capt. Ringgold, have been received at this Institution. They are accompanied with the request that they may be examined and put in a condition for permanent preservation and scientific description.... We have however been informed that the sum of one thousand dollars, was set aside out of the appropriation made by Congress for the expedition, to meet the expenses above mentioned, and I write to ask whether the Institution can draw on the Navy Department for the expenditures on account of the specimens, and if so, what forms are to be observed" (Henry 1853*b*).

Henry was shocked by Dobbin's reply: "that it was not the intention of the Navy Department that the specimens should be sent to the Smithsonian Institution, Commander Ringgold having been directed to send all such specimens to the Navy Department to be disposed of in a suitable manner" (Dobbin 1853). He wanted the specimens back in the hands of the navy. Henry fired back: "In reply I beg respectfully to state in explanation of my previous letter, that there has been some mistake either on the part of the Smithsonian Institution, or the Navy Department with regard to this matter. The Smithsonian Institution does not desire these specimens on its own account. It however desires as far as possible with its limited means to promote every branch of knowledge, and in no case has it refused to render the government any aid which might be required in this line." Henry then reviewed the relationship between the North Pacific Expedition and the Smithsonian, repeatedly disavowed any desire to keep the collections on a permanent basis, and then subtly reminded Dobbin of what had gone wrong with the Wilkes Expedition: "In behalf of the science of the country I beg leave to add that unless the specimens are properly preserved by persons well skilled in operations of this kind, they will be destroyed before the return of the expedition. If after this exposition of facts you still desire the return of the specimens, or if there be no funds appropriated to defray

the necessary expenses, I will direct Prof. Baird to send the boxes to the Navy Department" (Henry 1853*c*).

While Henry and Dobbin exchanged letters, the Smithsonian went to Kennedy for support. He in turn wrote Dobbin, reiterating the curatorial failures of the National Institute, highlighting the help the Smithsonian had already supplied to the navy, and arguing that utilizing the Smithsonian was in the best interest of the nation, even though such an arrangement was not explicitly included in the bill authorizing the expedition (Kazar 1973:206–207). Dobbin capitulated and wrote Henry that the navy would "avail itself of the skill and science of the Smithsonian" for the care and preservation of the specimens, providing funds until "circumstances may constrain me to abandon the effort" (Dobbin 1854).

Yet the expedition faced rough times ahead. Congress lost interest in the expedition as sectional politics loomed larger and larger in the American consciousness. Rodgers was frustrated in his efforts to obtain sufficient funding to publish the results in an expedition series before the Civil War's outbreak in 1861. With the coming of war, the publication was abandoned. The expedition was also haunted by extreme bad luck. Stimson lost most of the collections in the great Chicago fire of 1871.

Yet by combining the strengths of the Smithsonian and the civilian scientific community with that of the navy, the North Pacific Exploring Expedition was able to make major contributions to science. Specimens of over 5000 species of fauna and thousands of plant species were collected and returned to the Smithsonian, to be analyzed by a variety of scientists whose results appeared in the journal literature (Smithsonian Institution 1856).

The most important result of the expedition lay in its contribution to the work of Asa Gray on the geographical distribution of plant species, based on Charles Wright's field notes. In turn, this material was incorporated by Charles Darwin in *The Origin of Species* (Dupree 1968:233–263). However, the North Pacific Exploring Expedition was also one of the principal factors in the creation of the U.S. National Museum. Thanks to that expedition, and the concurrent Railroad Surveys, the number of scientific specimens belonging to the government increased some four-fold. The quantity and quality of these specimens persuaded Joseph Henry to work with the government to establish a publicly funded national museum in the United States, the forerunner of the Smithsonian museum complex that sits today on The Mall in Washington, D.C. (Reingold and Rothenberg 1985).

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