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Endangered Science: The Regulation of Research by the U.S. Marine Mammal Protection and Endangered Species Acts

ABSTRACT

The Marine Mammal Protection Act and the Endangered Species Act have been cornerstones of federal wildlife conservation policy in the United States since their enactment in the early 1970s. These laws prohibited the taking of members of protected populations without a permit, where “taking” was defined so broadly as to include harassment or disturbance, as well as capture or killing. Because most forms of biological research on protected species involved some sort of taking, and because such research was deemed vital to the achievement of conservation goals and the advancement of human knowledge, the laws established procedures under which proposed scientific takes could be permitted after review by federal regulators, scientists, the public, and, in some cases, the courts. Although there was relatively little controversy over the need for or nature of these permit procedures during the debates leading up to the enactment of the laws, they became the source of concern on the part of many zoologists, biologists, and ecologists as soon as federal agencies began to implement them. From these scientists’ perspective, certain forms of environmental regulation undermined their professional autonomy and threatened to hamper the production of the very knowledge necessary for effective environmental protection. Their efforts to block, weaken, or work around such regulation brought

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The following abbreviations are used: AOU, American Ornithological Union; ASM, American Society of Mammalogists; ESA, Endangered Species Act of 1973; FWS, Fish and Wildlife Service; *JM*, *Journal of Mammalogy*; *JHB*, *Journal of the History of Biology*; MMC, Marine Mammal Commission; MMPA, Marine Mammal Protection Act of 1972; NMFS, National Marine Fisheries Service; SIA 7357, American Society of Mammalogists, Records, 1919–1993 and Undated, Record Unit 7357, Smithsonian Institution Archives, Washington, DC; ZOOACT, Zoological Action Committee.

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them into conflict with environmental and animal rights activists, regulators, and other members of the scientific community and resonated with a broader backlash against environmental regulation.

KEY WORDS: environmental regulation, wildlife conservation, research freedom, United States, Marine Mammal Protection Act, Endangered Species Act, marine mammalogy, ornithology, zoology, ecology

Scientists who study organisms and ecological relationships in museums and in the field have historically been at the forefront of efforts to conserve natural diversity. In the United States, their efforts have resulted in legal protections ranging from the patchwork of state and local laws of the late nineteenth century regulating the taking of fish and game to the broad-ranging federal environmental laws of the 1960s and 1970s, including the Marine Mammal Protection Act (MMPA) of 1972 and the Endangered Species Act (ESA) of 1973. Scientists helped to legitimate the creation of an elaborate governmental apparatus for managing the natural world, which in turn bolstered their professional standing. Not all scientists who studied wild animals were committed to conservation, and some were engaged in activities, such as the eradication of predators and pests, that would eventually be condemned by most conservationists. Nonetheless, on the whole, scientists' passion for nature, their interest in the continued existence of the natural entities and phenomena they studied, and the heavy reliance that conservation laws often placed on their expertise brought their professional aims and the goals of conservation into alignment.¹

1. On zoologists' role in wildlife conservation in the United States, see Mark V. Barrow, Jr., *Nature's Ghosts: Confronting Extinction from the Age of Jefferson to the Age of Ecology* (Chicago: University of Chicago Press, 2009); Mark V. Barrow, Jr., *A Passion for Birds: American Ornithology after Audubon* (Princeton, NJ: Princeton University Press, 1998); Mark V. Barrow, Jr., "Dragons in Distress: Naturalists as Bioactivists in the Campaign to Save the American Alligator," *JHB* 42, no. 2 (2009): 267–88; Thomas R. Dunlap, *Saving America's Wildlife: Ecology and the American Mind, 1850–1990* (Princeton, NJ: Princeton University Press, 1988); Frederick Rowe Davis, *The Man Who Saved Sea Turtles: Archie Carr and the Origins of Conservation Biology* (New York: Oxford University Press, 2007); Robert M. Wilson, *Seeking Refuge: Birds and Landscapes of the Pacific Flyway* (Seattle: University of Washington Press, 2010); Peter S. Alagona, "Biography of a Feathered Pig: The California Condor Conservation Controversy," *JHB* 37, no. 3 (2004): 557–83. For broader studies of wildlife conservation in the United States, see Louis S. Warren, *The Hunter's Game: Poachers and Conservationists in Twentieth-Century America* (New Haven, CT: Yale University Press, 1997); John F. Reiger, *American Sportsmen and the Origins of Conservation*, 2nd ed. (Norman: University of Oklahoma Press, 1986); Jennifer Price, *Flight Maps: Adventures with Nature in Modern America* (New York: Basic Books, 1999); Peter Coates, *American Perceptions of Immigrant and Invasive Species: Strangers on the Land* (Berkeley: University of California Press,

The environmental movement that emerged in the second half of the twentieth century strengthened this connection, but it also created new tensions between science and conservation and led to some surprising realignments. The reaction of Karl W. Kenyon to the passage of the MMPA is a case in point. Born in 1918 in La Jolla, California, Kenyon was one of the leading American marine mammalogists from the 1940s to the 1970s. He studied at Pomona College and Cornell University in the 1930s, served as a naval aviator in the Second World War, and taught zoology at Mills College for two years before taking a position with the U.S. Fish and Wildlife Service (FWS) in Seattle. Although best known for his research on sea otters, Kenyon also published influential studies of seals, sea lions, walruses, and seabirds. Over the course of his career, he was a consistent advocate of measures to prevent the extinction or needless slaughter of the species and populations he studied. However critical he may have been about the way conservation had been implemented in particular cases, there is no doubt that Kenyon saw his values and those of mainstream conservationists as congruent.²

With the enactment of the MMPA, however, Kenyon believed that conservation in the United States had taken a large and misguided step from the path along which he and other scientists had been attempting to guide it. In a letter to a fellow marine mammalogist in 1974, he explained that he had chosen to retire the previous year at the age of 55 because under the new law “most required work would be irrelevant to the real problems facing marine mammals & humans as well.” Instead of doing original research, scientists were now forced to spend their time writing reports “to inform either the public or a b[ur]eaucratic structure too ignorant and/or too lazy to look into the already available factual material in the scientific literature.” When marine mammalogists did find time for research, they were hamstrung by the need to seek permits under the “extremely restrictive provisions” of the MMPA, which made it difficult even to collect small numbers of marine mammals for scientific purposes. In this hostile environment, Kenyon told his colleague, he believed any further scientific efforts would

2007); Julianne Lutz Newton, *Aldo Leopold's Odyssey: Rediscovering the Author of a Sand County Almanac* (Washington, DC: Island Press, 2006). See also Peter S. Alagona, “Introduction: Fifty Years of Wildlife in America,” *Environmental History* 16, no. 3 (2011): 391–97, and the accompanying collection of essays on U.S. wildlife history.

2. Mark J. Rauzon, “Memories: Karl Walton Kenyon, 1918–2007,” *Marine Mammal Science* 23, no. 4 (2007): 997–1000; Karl W. Kenyon, *The Sea Otter in the Eastern Pacific Ocean* (New York: Dover, 1975).

be a waste of time; instead he was focusing his energies on renovating a house on the Oregon coast.³

Though few joined him in early retirement, many of Kenyon's colleagues shared his concern about the effect on research of new laws and regulations and the increasingly strict enforcement of existing measures. Rather than dropping off the scientific grid, however, they organized committees, passed resolutions, testified at congressional hearings, lobbied legislators, negotiated with regulators, assembled handbooks on wildlife law, developed so-called "benign" or "noninvasive" research techniques, and drafted professional standards and codes of ethics in order to demonstrate their commitment to conservation and to animal welfare and forestall further external regulation of research on protected species.⁴ Where scientists were unable to block or change laws and regulations not to their liking, they learned to work within the system—to operate what Clyde Hill, curator of conservation at the Zoological Society of San Diego, described to a frustrated colleague in 1978 as the "great paper machine of rules and regulations."⁵ In this they were not dissimilar from scientists whose work relied on biomedical studies of vulnerable human or animal subjects, experiments with recombinant DNA, research on embryonic and fetal materials, and other controversial areas of research that came under intensive scrutiny in the 1970s.⁶

Regardless of whether they resisted or adapted to the new regulatory regime, all scientists working with protected species found the nature of their work transformed. Where it may once have sufficed to gather sufficient funding, staff, and materials in order to carry out research, it was now also necessary to win the approval of federal regulators and of a public increasingly

3. Karl [W. Kenyon] to Ian [Stirling], 13 Mar 1974, SIA 7357, Box 139, Folder 1.

4. See Elena McCarthy and Flora Lichtman, "The Origin and Evolution of Ocean Noise Regulation under the U.S. Marine Mammal Protection Act," *Ocean and Coastal Law Journal* 13, no. 1. (2007): 1–46; Amy Samuels and Peter L. Tyack, "Flukeprints: A History of Studying Cetacean Societies," in *Cetacean Societies: Field Studies of Dolphins and Whales*, ed. Janet Mann, Richard C. Connor, Peter L. Tyack, and Hal Whitehead (Chicago: University of Chicago, 2000), 9–44; Matthew A. Axtell, "Bioacoustical Warfare," *Minnesota Review*, nos. 73–74 (2009/10): 205–18.

5. Clyde A. Hill to Hugh H. Genoways, 24 Feb 1978, SIA 7357, Box 130, Folder 6.

6. See, e.g., Laura Jeanine Morris Stark, "Morality in Science: How Research Is Evaluated in the Age of Human Subjects Regulation" (PhD dissertation, Princeton University, 2006); Zachary M. Schrag, *Ethical Imperialism: Institutional Review Boards and the Social Sciences, 1965–2009* (Baltimore: Johns Hopkins University Press, 2010); Larry Carbone, *What Animals Want: Expertise and Advocacy in Laboratory Animal Welfare Policy* (New York: Oxford University Press, 2004); Sheila Jasanoff, *Designs on Nature: Science and Democracy in Europe and the United States* (Princeton, NJ: Princeton University Press, 2005).

opposed to the idea of killing or injuring animals for the sake of knowledge, especially when those animals were members of charismatic endangered species. Scientists generally supported broadened federal protections for the species they studied, but they also sought to maintain their own freedom of action. James Morton Turner has argued that American wilderness activists and environmentalists in the 1960s and 1970s succeeded by associating their efforts with a tradition of reform liberalism in which the federal government was understood as the protector of the public interest. In the following decades, however, this strategy made them vulnerable to criticisms grounded in a positive understanding of individual property rights and liberties and a skeptical view of state power.⁷ Scientists were among the architects of the environmental regulatory regime that emerged in the 1960s and 1970s, but by the mid-1970s some of them also saw themselves as its victims. Defending their professional autonomy as well as their conviction that the free exercise of science was essential to effective conservation, they mounted an attack on the competence and wisdom of the federal government. They thus contributed to an antiregulatory shift in American politics in the late twentieth century, which would see increasing numbers of Americans losing faith in the ability of the federal government to solve environmental (or other) problems.

RESTRICTING SCIENCE FOR THE SAKE OF CONSERVATION, 1971–1973

Although it has received less attention than the ESA, the MMPA set important precedents and helped to shape the terms of debate for its more far-ranging and controversial successor, and it continues to structure U.S. marine mammal policy today.⁸ Interest in marine mammal protection emerged in the 1960s and 1970s at the intersection of a number of loosely connected areas of

7. James Morton Turner, “‘The Specter of Environmentalism’: Wilderness, Environmental Politics, and the Evolution of the New Right,” *Journal of American History* 96, no. 1 (2009): 123–48.

8. Michael J. Bean and Melanie J. Rowland, *The Evolution of National Wildlife Law* (Westport, CT: Praeger, 1997), 109–47; Donald C. Baur, Michael J. Bean, and Michael L. Gosliner, “The Laws Governing Marine Mammal Conservation in the United States,” in *Conservation and Management of Marine Mammals*, ed. John R. Twiss, Jr., and Randall R. Reeves (Washington, DC: Smithsonian Institution Press, 1999), 48–86.

concern: the apparently inhumane clubbing of infant harp seals for fur; the bycatch of dolphins in purse-seine tuna fisheries; the possibility that the great whales would be driven to extinction by commercial exploitation; the display of small cetaceans and sea lions in amusement parks; the trophy hunting of polar bears in Alaska; and conflicts between California's sea otters and its shellfisheries and offshore oil facilities—most notably off the coast of Santa Barbara, where an oil spill galvanized environmental activists in 1969. It also drew on a series of transformative environmental measures that had been enacted beginning with the Wilderness Act of 1964 and extending through the National Environmental Policy Act of 1969 and the major amendments to the Clean Air and Water Acts in 1970 and 1972, as well as on the growing strength of the animal welfare movement, which was reflected in the passage of the Laboratory Animal Welfare Act in 1966 and its amendment in 1970. The early 1970s were thus a propitious time for Congress to act on behalf of charismatic creatures that seemed to have been treated both inhumanely and unsustainably.⁹

In 1971, dozens of bills addressing some or all of the diverse issues affecting marine mammals (or “ocean mammals,” as they were sometimes called) were introduced in the U.S. Congress.¹⁰ One bill in particular quickly became the focal point of debate and, for some marine mammalogists, of serious concern. Introduced to the Senate in 1971 by Fred Harris, a Democrat from Oklahoma, and to the House by David Pryor, a Democrat from Arkansas, the bill sought

9. On the U.S. environmental movement and legislation of the 1960s and 1970s, see Hal Rothman, *The Greening of a Nation? Environmentalism in the U.S. since 1945* (Fort Worth, TX: Harcourt Brace, 1998); Samuel P. Hays, *A History of Environmental Politics since 1945* (Pittsburgh, PA: University of Pittsburgh Press, 2000). On postwar antivivisection activism in the United States and the Animal Welfare Act, see Diane L. Beers, *For the Prevention of Cruelty: The History and Legacy of Animal Rights* (Athens: Ohio University Press, 2006), 147–96; Carbone, *What Animals Want* (ref. 6); Harriet Ritvo, “Plus ça Change: Anti-Vivisection Then and Now,” *Science, Technology, and Human Values* 9, no. 2 (1984): 57–66.

10. On the origins of the Marine Mammal Protection Act, see Barrow, *Nature's Ghosts* (ref. 1), 331–36; Gregg Mitman, *Reel Nature: America's Romance with Wildlife on Film* (Cambridge, MA: Harvard University Press, 1999), 157–79; Arthur F. McEvoy, *The Fishermen's Problem: Ecology and Law in the California Fisheries, 1850–1980* (Cambridge: Cambridge University Press, 1986), 238–40; Bean and Rowland, *Evolution of National Wildlife Law* (ref. 8), 109–11; David M. Lavigne, Victor B. Scheffer, and Stephen R. Kellert, “The Evolution of North American Attitudes toward Marine Mammals,” in *Conservation and Management of Marine Mammals*, ed. Twiss and Reeves (ref. 8), 10–47; Samuels and Tyack, “Flukeprints” (ref. 4); Beers, *Prevention of Cruelty* (ref. 9), 191–94; Roderick F. Nash, *The Rights of Nature: A History of Environmental Ethics* (Madison: University of Wisconsin Press, 1989), 172–74.

to establish a nearly complete prohibition on the “taking” of marine mammals.¹¹ Because the Harris-Pryor bill defined “to take” to mean “to harass, pursue, hunt, shoot, dynamite, capture, collect, kill” or to attempt to do so, it prohibited virtually all commercial or recreational uses of marine mammals, including, to the extent that they resulted in harassment, even such “non-consumptive” uses as whale-watching or nature photography.¹² Scientists such as Carl L. Hubbs of the Scripps Institution of Oceanography sent letters and telegrams to their congressional representatives claiming that the bill, if passed, would not only hinder research and place unsustainable regulatory burdens on the public display industry of zoological parks, aquariums, and oceanariums, but also put an end to “sane management” and “sound conservation.”¹³ Drawing on tropes that dated back to the American conservation movement of the early twentieth century, they implied that these prudent practices were at risk of being replaced by insane or unsound “protection” or “preservation.”¹⁴

To these critics, the Harris-Pryor bill, which was the subject of hearings in the House in the autumn of 1971 and in the Senate early in 1972, epitomized the triumph of an irrational and uninformed enthusiasm for nature. Like Hubbs, albeit for different reasons, Kenyon was appalled by the Harris-Pryor bill’s approach to conservation and by the alarmist tone of much of the media coverage of marine mammal issues. Both Hubbs and Kenyon worried about the law’s potential impact on conservation, but whereas Hubbs’s core concerns lay with the public display industry, Kenyon’s focus was on science. As the long-standing chairman of the marine mammal committee of the American Society of Mammalogists (ASM), Kenyon oversaw the writing of the committee’s report for 1970–1971, which warned that “much energy is being wasted by

11. The exceptions included scientific or medical research, the replacement of deceased or ailing animals in nonprofit zoos, hunting by Indians, Aleuts, and Eskimos using “customary” methods, and the temporary continuation of the fur seal fishery on the Pribilof Islands until international agreements were in place to prevent the slaughter of seals at sea; U.S. House, *Marine Mammals: Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries*, 92nd Cong., 1st sess., 1971, Serial no. 92-10, 4–7.

12. U.S. House, *Marine Mammals* (ref. 11), 4. On the history of the term “take” in American wildlife law, see Bean and Rowland, *Evolution of National Wildlife Law* (ref. 8), 76–83, 116–19, 213–24.

13. Carl L. Hubbs to Alan Cranston, 12 May 1971, Scripps Institution of Oceanography Archives, La Jolla, CA, Carl Leavitt Hubbs Papers, Box 17, Folder 4.

14. The classic accounts of conservationism and preservationism are Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890–1920* (Pittsburgh, PA: University of Pittsburgh Press, 1959); Roderick Nash, *Wilderness and the American Mind* (New Haven, CT: Yale University Press, 1967).

apparently well-meaning people and organizations on irrelevant efforts to ‘preserve’ marine mammals. . . . By opposing regulated wildlife management programs, these efforts could prove disastrous to conservation measures now in effect.”¹⁵ The following year Kenyon’s committee again warned of the threat of uninformed activism driven by sensationalist advertising campaigns from organizations such as the Friends of Animals and expressed the hope that “some sound legislation providing for in-depth studies and conservation may eventually emerge.”¹⁶

Recognizing that the popular enthusiasm for marine mammal protection could not be ignored, scientists and the federal agencies rallied around an alternative bill drafted with the assistance of the White House’s Council on Environmental Quality and introduced in the House by Democrat Glenn Anderson of California and Republican Thomas Pelly of Washington. Unlike the Harris-Pryor bill, the Anderson-Pelly bill allowed for the continued killing of marine mammals for commercial or conservation purposes, whether as the primary activity (e.g., the killing of seals for fur) or as an incidental side-effect of other activities (e.g., the bycatch of dolphins in tuna fisheries). It focused on scientific “management” rather than supposedly unscientific “protection” and sought to establish a regulatory rather than a prohibitive regime. For the most part, that is, instead of specifying prohibited activities in the text of the law, the Anderson-Pelly bill gave federal regulators and their scientific advisors broad authority to determine when “taking” was and was not in the best interest of marine mammal populations and the ecosystems of which they were a part.¹⁷

Although the Harris-Pryor and Anderson-Pelly bills took radically different approaches to marine mammal conservation, they were alike in one important respect: they both carved out a space of exception for science, which they identified as a uniquely valuable activity for which the taking of marine mammals was sometimes necessary. The Harris-Pryor bill specified that “nothing herein shall be construed to be a prohibition against the humane capture of a

15. “Report of the Standing Committee, Marine Mammals, 1970–71, Submitted to the 51st Annual Meeting of the American Society of Mammalogists at Vancouver, British Columbia, 20–24 June 1971,” SIA 7357, Box 138, Folder 7.

16. “Standing Committee, Marine Mammals, 1971–72, Submitted to the 52nd Annual Meeting of the American Society of Mammalogists at Tampa, Florida, 18–22 June 1972,” SIA 7357, Box 74, Folder 1.

17. For the text of the Anderson-Pelly bill (House Resolution 10420) as it stood in September 1971, see U.S. House, *Marine Mammals* (ref. 11), 13–19.

select number of these species of ocean mammals for certifiable [*sic*] scientific and/or medical research” and gave the Secretaries of Commerce and Interior broad discretion in determining when such capture was justified. The Anderson-Pelly bill included virtually identical language empowering the Secretaries to authorize and regulate humane capture for “legitimate scientific or medical research,” with the additional provision that anyone issued a permit to capture a marine mammal would be required to submit a report on the results of the permitted activities.¹⁸ Neither bill specified in any detail how the process of evaluating research permits would work, and both focused on the capture of marine mammals for laboratory research rather than on the kinds of taking necessary for field biology or museum zoology.¹⁹

The brevity and similarity of the scientific clauses in the versions of the Harris-Pryor and Anderson-Pelly bills debated in the fall of 1971 suggests that the issue was viewed as important but relatively uncontroversial. The potential for conflict between scientific research and wildlife conservation had been a subject of significant discussion throughout the twentieth century. Although state fish and game regulations had usually been the most pressing concern for scientists, a number of federal conservation laws and treaties, including the Lacey Act of 1900, the North Pacific Fur Seal Convention of 1911, the Migratory Bird Treaty Act of 1918, and the Bald Eagle Protection Act of 1940, had brought the scientific collecting of and trade in certain species under federal control.²⁰ Most recently, the Endangered Species Act of 1969—one of two predecessors to the Endangered Species Act of 1973 that were passed in the 1960s—had restricted the importation of endangered species from foreign countries into the United States and their transport across state lines. These limits directly impinged on the ability of researchers to collect living or dead specimens and to transfer them from one laboratory, museum, or zoo to another. The bill included an exception “for zoological, educational, scientific, or propagation purposes, under such terms and conditions as the Secretary of Interior may prescribe,” but it is clear from the legislative history that Congress did not intend to give scientists *carte blanche*. In its report recommending passage of the bill, the Senate Committee on Commerce noted

18. On the Harris-Pryor bill’s provisions, see U.S. House, *Marine Mammals* (ref. 11), 4–5; on the Anderson-Pelly bill’s provisions, see *ibid.*, 17.

19. The MMPA’s permit process is described in Bean and Rowland, *Evolution of National Wildlife Law* (ref. 8), 138–41.

20. Barrow, *Passion for Birds* (ref. 1); Kirkpatrick Dorsey, *The Dawn of Conservation Diplomacy: U.S.–Canadian Wildlife Protection Treaties in the Progressive Era* (Seattle: University of Washington Press, 1998); Bean and Rowland, *Evolution of National Wildlife Law* (ref. 8).

that “stringent limitation” of even well-justified scientific taking was necessary because of “the unfortunate abuses of exemptions for scientific study perpetrated under present law.”²¹

Although they may have had qualms about the details of implementation, many scientists recognized that the conservation goals that they supported could not be achieved without some kind of regulatory system governing the collection, possession, and distribution of members of endangered species or products derived from them. They accepted that such a system would inevitably encompass scientific activities along with other, perhaps less noble pursuits. Hubbs, for example, who protested against the Harris-Pryor bill’s prohibitive approach to conservation and urged fellow marine mammalogists to join the battle against irrational protectionism, had also fought to limit the harassment of gray whales in their breeding lagoons in Baja California both by tourists and by unscrupulous, incompetent, or overeager scientists. Hubbs’s preferred means of preventing scientific harassment seems to have been to discourage funding agencies from supporting unacceptable research projects, but he recognized that the ability of the federal government (in this case Mexican) to require permits and to declare certain areas as wildlife refuges could be a valuable tool for disciplining researchers who strayed beyond community norms of acceptable practice.²²

Whereas advocates of laboratory research on living animals had vigorously resisted any attempts to regulate their activities since the nineteenth century, the marine mammalogists who testified at hearings on marine mammal protection in the House and Senate in 1971–1972 generally supported some kind of federal oversight of scientific practice.²³ G. Carleton Ray, a marine mammalogist at Johns Hopkins University who supported the Anderson-Pelly bill, suggested at the House hearing that scientific takes should be allowed “only under permit, only under restriction.” It would be “utterly inappropriate,” he argued, to kill any number of humpback, right, or blue whales even for research purposes given their highly endangered status; on the other hand, in light of the apparent rebound of the gray whale population of the eastern Pacific and the little that was known

21. U.S. Senate, *Endangered Species*, Report of the Committee on Commerce [to Accompany HR 11363], 91st Congress, 1st sess., 1971, Report no. 91-526, 12.

22. See, e.g., Carl L. Hubbs to John Kanwisher, 17 Jan 1966, Scripps Institution of Oceanography Archives, Carl Leavitt Hubbs Papers, Box 56, Folder 30.

23. For the American case, see Beers, *Prevention of Cruelty* (ref. 9), 59–90; Bernard Oreste Unti, “The Quality of Mercy: Organized Animal Protection in the United States 1865–1930” (PhD dissertation, American University, 2002).

about the species, it would probably be acceptable to kill two or three hundred individuals. In any case, Ray argued, the key to an effective permit system was that it be implemented in close consultation with scientists.²⁴

This last point was the essential one: a regulatory system, even a fairly stringent one, was acceptable to scientists such as Ray inasmuch as it was to be based on the advice of scientists. The Anderson-Pelly bill appeared to fulfill this criterion by creating a Marine Mammal Commission (MMC) with an independent Committee of Scientific Advisors that would review and advise on federal marine mammal matters and fund research that the regulatory agencies could not or would not support. The arrangement promised to provide a new source of research funding and to give scientists a voice in the implementation of any regulations, thereby softening the threat of placing all marine mammal research under federal control. Kenneth Norris was a former student of Hubbs's, a key player in the postwar expansion of the American marine park and oceanarium industry, and one of the scientists who had helped draft the Anderson-Pelly bill. At the fall 1971 House hearings, Norris argued that the most effective means of achieving the laws' conservation goals would be "the institution of a merit system in which everyone who is concerned with taking mammals is required to go through the review procedure and constant surveillance of a permit."²⁵ Six months later, he told the Senate that "[w] herever human activities impinge upon these animals, such activity should be regulated. This includes [commercial takes as well as] the capture and keeping in captivity of marine mammals by commercial or scientific concerns or by individual citizens, their use in experimentation, or situations in which the natural activities of marine mammals conflict with those of man."²⁶ Like Ray, Norris expected that the implementation of this permit system would be guided by scientific advice.

While Ray, Norris, and other scientists expressed no doubts about the value of science for conservation, other witnesses at the hearings were more skeptical. Tom Garrett, for example, testified before the House on behalf of the Friends of the Earth, an organization that had been founded several years earlier as a radical alternative to the Sierra Club.²⁷ Garrett argued that most research on

24. U.S. House, *Marine Mammals* (ref. 11), 417.

25. *Ibid.*, 422. On Norris's involvement in marine mammal protection legislation, see Randall Jarrell, ed., *Kenneth S. Norris: Naturalist, Cetologist and Conservationist, 1924–1998* (Santa Cruz: Regional History Project, University Library of the University of California, Santa Cruz, 1999), 53.

26. U.S. Senate, *Ocean Mammal Protection: Hearings before the Subcommittee on Oceans and Environment of the Committee on Commerce*, 92nd Cong., 2nd sess., 1972, 358.

27. On the founding of Friends of the Earth, see Robert Lamb, *Promising the Earth* (New York: Routledge, 1996), 18–27.

marine mammals to date had been “trivial, unimaginative and repetitive to the point of absurdity; based solely on killing and dissection and often dependent on commercial operations for funding, and for supply of victims; predicated on the assumption that commercial exploitation should be continued or resumed.” In the late 1960s, the federal government had authorized the killing of hundreds of gray whales under a “special scientific permit” despite the fact that the whales were still considered endangered by U.S. law and by the International Whaling Commission. The slaughter had been carried out by an American whaling company, the Del Monte Company of Richmond, California, which had subsequently sold the meat as pet food.²⁸ Such collusion between commercial interests and government regulators had been all too common, Garrett suggested. What was needed instead was further exploration of the “possibility of establishing a cooperative relationship with marine mammals in mutually beneficial projects,” as in studies with dolphins recently conducted by the U.S. Navy, which had launched its Marine Mammal Program in the early 1960s to train sea lions, dolphins, and other marine mammals to support naval operations.²⁹

Despite their skepticism toward marine mammal research as it had typically been practiced, Garrett and other protectionists did not dispute the value of and necessity for some kinds of research. The point of putting science under scrutiny was not to bring it to a halt, but to disentangle it from exploitative commercial interests. When Harris testified in support of his own bill in the Senate in February 1972, he, like Garrett, mentioned the killing of gray whales in the late 1960s under scientific permits as a sign of dangerous “collusion” among science, government, and industry, but he continued to support a scientific exemption to the bill’s proposed moratorium on taking.³⁰ Other supporters of the Harris-Pryor bill advocated a shift to observation in the field from experimentation in the laboratory and to understanding the needs of the

28. U.S. House, *Marine Mammals* (ref. 11), 520. These disputes over American scientific whaling foreshadowed those concerning Japan’s scientific whaling program, which was launched after the International Whaling Commission’s declaration of a global moratorium on commercial whaling in 1986; see Ray Gambell, “The International Whaling Commission and the Contemporary Whaling Debate,” in *Conservation and Management of Marine Mammals*, ed. Twiss and Reeves (ref. 8), 179–98, on 191.

29. U.S. House, *Marine Mammals* (ref. 11), 520–21. On the U.S. Navy’s work with marine mammals, see D. Graham Burnett, “A Mind in the Water,” *Orion* 29, no. 3 (2010): 38–51; Mitman, *Reel Nature* (ref. 10), 157–79; William E. Evans, *Fifty Years of Flukes and Flippers: A Little History and Personal Adventures with Dolphins, Whales and Sea Lions* (Sofia, Bulgaria: Pensoft, 2008).

30. U.S. Senate, *Ocean Mammal Protection* (ref. 26), 326.

animals from laying the groundwork for their future exploitation.³¹ But no one argued against the need to occasionally take marine mammals in order to increase human understanding and to benefit the populations concerned. Christine Stevens, the president of the Animal Welfare Institute, had been a regular participant in congressional hearings concerning animal welfare since the 1950s, and her sensitivity to issues of scientific freedom and responsibility had been honed during the debates leading up to the Laboratory Animal Welfare Act of 1966 and in subsequent efforts to strengthen the law.³² She told the Senate committee that “there has been a little too much feeling: Are you for science or against science? Well, what we have to be for is good science.”³³

For the most part, “protectionists” supported the same legislative solution to the risk of commercial abuse of science as their opponents in the “management” camp: careful regulation with advice by scientists and opportunities for public input. This consensus was reflected in the relatively noncontroversial status of the scientific exemption in the act that eventually resulted. By the spring of 1972, both the House and the Senate had passed bills that combined features of the Anderson-Pelly and Harris-Pryor bills. The support of scientists played a key role in allowing Congress to vote for a bill with significant “management” features in the face of impassioned opposition from a number of animal protection and environmental groups and from the editorial pages of major newspapers such as the *Washington Post* and *New York Times*.³⁴ As the House Committee on Merchant Marine and Fisheries explained in December 1971, “the Committee simply found itself unable to accept the thesis that a flat ban would inevitably operate to the benefit of the animals concerned. Experienced, independent scientists, not representing hunters, entrepreneurs or other interest groups, argued persuasively that animal populations may indeed require management in order to prevent them from exceeding the carrying capacity of their environment and thus destroying it and themselves

31. For example, Robert Horstman of the Sea Mammal Motivational Institute of Florida testified that “stringent, yet intelligent, restrictions must be placed upon the taking of these animals for purposes of research and display”; U.S. House, *Marine Mammals* (ref. 11), 386–87.

32. On Stevens’s leading role in postwar animal welfare activism in the United States, see Richard Dudley Ryder, *Animal Revolution: Changing Attitudes Toward Speciesism* (New York: Berg, 2000), 200–01; Vicki McKinney Daitch, “From Sympathy to Synergy: Humane Activism in the Modern Environmental Movement” (PhD dissertation, University of Illinois at Urbana-Champaign, 2000).

33. U.S. Senate, *Ocean Mammal Protection* (ref. 26), 301.

34. “An S.O.S. for Ocean Mammals,” *Washington Post*, 5 Dec 1971; “Not Much ‘Protection,’” *New York Times*, 6 Dec 1971.

in the process.”³⁵ Ultimately, Congress’s response to concerns about placing management decisions in the hands of the regulatory agencies was not to abandon the approach but instead to use scientific, public, and judicial review to highlight and correct any abuses that might arise.³⁶

The bill that emerged from the conference committee to resolve differences between the Senate and House versions was signed by Richard Nixon into law in October 1972. While it technically established a “moratorium” on the taking of marine mammals, it included numerous exceptions that would only increase over time as the law was amended. “To take” was defined as “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal”; to “collect” was no longer explicitly included, although it remained implicit. Exemptions for research and display were integrated into the same permitting system that governed other kinds of takes. Any permits issued by the Fish and Wildlife Service or the National Marine Fisheries Service for scientific research were required to specify the number and kind of animals to be taken, the location and manner of taking (which had to be “humane”), and the period of the permit’s validity. If the take involved capturing an animal, the permit also had to specify “the methods of capture, supervision, care, and transportation which must be observed pursuant to and after such taking.” Before any permit could be issued, notice of the application would be published in the *Federal Register* in order to provide opportunities for public comment and the application would be reviewed by the Marine Mammal Commission and its scientific advisory committee. Finally, any party dissatisfied with the outcome could seek judicial review.³⁷

The MMPA’s permitting system directly affected only a small proportion of field biologists, ecologists, and zoologists, but it would soon be complemented by a law that transformed the conditions of research for a much wider swath of scientists. Even as the bills that would become the MMPA were being debated, lawmakers were considering major revisions to the Endangered Species Act of 1969, which conservationists argued had given the federal government

35. U.S. House Committee on Merchant Marine and Fisheries, *Marine Mammal Protection Act of 1971: Report Together with Supplemental Views [To Accompany H.R. 10420]*, Report, 92nd Cong., 1st sess., 1971, Report no. 92-7071, 19.

36. *Ibid.*, 19–20.

37. U.S. House, *Marine Mammal Protection Act of 1972*, Conference Report, 92nd Cong., 1st sess., 1971, Report no. 92-1488. On the role of litigation in shaping the implementation of the MMPA, see Bean and Rowland, *Evolution of National Wildlife Law* (ref. 8), 132–33; Etienne Benson, *Wired Wilderness: Technologies of Tracking and the Making of Modern Wildlife* (Baltimore: Johns Hopkins University Press, 2010), 167–71; McCarthy and Lichtman, “Origins and Evolution” (ref. 4).

insufficient powers to accomplish its stated goals. In particular, the law made it difficult to protect species that were endangered in the United States but not throughout their entire worldwide range, and it applied only to importation, interstate transport, and the management of federal lands and waters, leaving endangered species largely unprotected on private lands. Numerous congressional hearings on strengthening the law were held in 1972 and 1973, involving hundreds of witnesses and resulting in thousands of pages of transcripts. Although only a small percentage of this flood of words was devoted to the potential conflict between science and conservation, the issue surfaced repeatedly and was the subject of a narrow but hard-fought battle.³⁸

The debate over the regulation of science by the MMPA, including the repeatedly deployed example of federal regulators' "collusion" with the whaling industry in the name of science, strongly influenced the discussion of scientific permits under the proposed endangered species law. The necessity of allowing scientific takes under some circumstances went virtually unopposed, as did the necessity for some sort of restrictions on science. The crucial questions concerned which circumstances and which restrictions. Conservationists and humane activists opposed versions of the bill that would have allowed for "zoological" (i.e., public display) and educational takes of endangered species. Their favored bill allowed takes of endangered species only for scientific research and for propagation of the species in captivity, and only when such takes would not adversely affect the survival of the species.³⁹

For all except die-hard defenders of the freedom of zoological parks and aquariums, this was a noncontroversial proposal, supported even by the most conservative advocates of wildlife management. But representatives of a number of humane and conservation organizations argued that the conditions for scientific takes needed to be tightened even further. Such takes, they argued, should be allowed only when the research would positively benefit the species concerned. Garrett, for example, testified that the Friends of the Earth believed that "the only justification for taking an endangered species should be that such taking was designed to benefit the species."⁴⁰ In addition to new environmental groups such as the Friends of the Earth, the organizations supporting such a

38. On the legislative history of the ESA, see Bean and Rowland, *Evolution of National Wildlife Law* (ref. 8), 194–200; Steven Lewis Yaffee, *Prohibitive Policy: Implementing the Federal Endangered Species Act* (Cambridge, MA: MIT Press, 1982).

39. U.S. Senate, *Endangered Species Act of 1973: Hearings before the Subcommittee on Environment of the Committee on Commerce*, 93rd Cong., 1st sess., 1974, 97–98.

40. *Ibid.*, 105.

provision included animal protection groups such as the Fund for Animals and the Committee for Humane Legislation, more traditional conservation organizations such as the Sierra Club and the National Audubon Society, and hybrid groups such as the Defenders of Wildlife. In contrast, no prominent scientist argued that species or populations should always be benefited by research; the combination of a valid scientific justification and a lack of demonstrable harm was sufficient. Despite this lack of scientific support, the groups advocating for a stricter provision were largely successful. The version of the bill that was signed into law in December 1973 permitted the taking of a member of an endangered species for scientific purposes only when the research would further the aims of the act—that is, when it would actively help prevent (and not simply fail to contribute to) the extinction of protected populations.⁴¹

Together with the MMPA, the new ESA established a complex regulatory system governing much of the work of field biologists, ecologists, and zoologists. This system joined existing federal systems governing the taking of and trade in migratory birds, bald eagles, and injurious wildlife as well as regulations specific to each state and to protected areas (e.g., national parks, wildlife refuges, and wilderness areas). The result was a sometimes bewildering thicket of overlapping regulations. Although the legislative provisions that made this regulatory expansion possible did not go undebated, they were mostly uncontroversial. The majority of scientists, environmentalists, and animal protection activists agreed both that continued scientific takes were necessary for effective conservation and that they needed to be carefully regulated. Review by scientific advisory committees and by the public was seen as essential to preventing the abuse of the system. How the new laws would actually affect zoological research, however, would only become clear as they were put into practice.

ORGANIZING IN DEFENSE OF RESEARCH FREEDOM, 1973–1978

Samuel P. Hays has argued that the enactment of the environmental laws of the late 1960s and early 1970s marked not an end to combat but rather a change of arena from Congress to the executive agencies and the courts.⁴²

41. U.S. House, *Endangered Species Act of 1973*, Conference Report, 93rd Cong., 1st sess., Serial no. 93-740, 14.

42. Samuel P. Hays, “The Politics of Environmental Administration,” in *The New American State: Bureaucracies and Policies since World War II*, ed. Louis Galambos (Baltimore: Johns Hopkins University Press, 1987), 21.

This is certainly true of the MMPA and ESA's regulation of scientific research, especially if one notes that the legislative branch did not cease to be an arena for combat simply because the executive and judicial branches also became zones of contestation. In the summer of 1973, as the discussion of a major overhaul of federal endangered species law was nearing its conclusion, the Department of Interior urged Congress to ensure that the permit requirements for scientific takes under the new laws would be compatible. Scientists working on endangered species that happened also to be marine mammals should be able to apply for a single permit rather than going through two different reviews of the same research proposal. Ultimately the two laws' provisions were very similar and were administered by the same agencies, with the Fish and Wildlife Service having jurisdiction over birds, terrestrial animals, freshwater fishes, and some marine mammals (polar bears, sea otters, walruses, and manatees) and the National Marine Fisheries Service covering most marine organisms (including seals, sea lions, dolphins, and whales).⁴³

Because the MMPA had been signed into law more than a year before the ESA, marine mammalogists became the guinea pigs for this new regulatory system. According to the law, the regulatory agencies were required to forward permit applications to the MMC for review, but neither the commission nor its scientific advisory committee had been established when the law went into effect at the beginning of 1973. In the meantime, the agencies were authorized to issue temporary exemptions to applicants who could demonstrate "economic hardship."⁴⁴ While Norris and a few other scientists were able to obtain hardship exemptions allowing them to continue their research, others were forced to cancel or postpone their studies. Kenyon was not alone in finding this result unacceptable. In Alaska, the state with the nation's most active marine mammal research and management program, the backlash was particularly strong. At congressional oversight hearings in January 1974, Francis H. Fay, a specialist on walruses speaking on behalf of the Alaska Chapter of the Wildlife Society, complained that decisions to hold public hearings on permit applications seemed completely arbitrary and that regulations requiring a permit before a dead animal could be collected from the beach were simply "ludicrous." Such regulations, Fay argued, which appeared to have been

43. U.S. Senate, *Endangered Species Act of 1973: Hearings before the Subcommittee on Environment of the Committee on Commerce*, 93rd Cong., 1st sess., Serial no. 93-67, 71.

44. McCarthy and Lichtman, "Origin and Evolution" (ref. 4), 6-7.

established solely for the sake of convenience of enforcement, “often are totalitarian and always fail.”⁴⁵

While it would be a mistake to overestimate the significance of inflammatory terms such as “totalitarian” in the debates over marine mammal and endangered species protection, the broader political currents that such terms evoke were never far from the surface. Karl Popper’s and Michael Polanyi’s arguments about the relationship between free scientific inquiry and a free society were never cited in congressional testimony on marine mammal protection, but the basic sentiment—that no bureaucrat could know better than scientists themselves which studies were worth carrying out—was pervasive. The debates also raised perennial American concerns about federalism. When the MMPA stripped the states of their authority to manage marine mammals, Alaskans and others worried that they were losing control of their environments and their livelihoods to a distant, centralized bureaucracy.⁴⁶

The concerns of most scientists were, however, much more practical and immediate than this. They wanted to be able to continue carrying out their research as they and their colleagues saw fit and worried that the new laws would make it impossible to do so. In 1973, the first year that the MMPA was in force, their frustration was exacerbated by a long delay in setting up the new permit system. This was due partly to neglect from Nixon’s White House, which had more pressing concerns than marine mammal conservation, but also to a struggle over the interpretation of the law between Congress and the commission’s first chairman, Victor B. Scheffer. The White House had selected Scheffer, a former FWS biologist and author of popular books about marine mammals, as a professional who would appeal both to “managers” and to “protectionists.” Once he was in place, however, Scheffer began making public statements indicating that his sympathies lay mostly with the latter and with what he consistently referred to as “the public,”

45. U.S. House, *Marine Mammal Protection Oversight: Hearings before the Subcommittee on Fisheries and Wildlife Conservation and the Environment of the Committee on Merchant Marine and Fisheries*, 93rd Cong., 1st and 2nd sess., 1974, Serial no. 93-24, 128.

46. Karl R. Popper, *The Open Society and Its Enemies* (London: G. Routledge & Sons, 1945); Michael Polanyi, “The Republic of Science: Its Political and Economic Theory,” *Minerva* 1, no. 1 (1962): 54–74. On links between anticommunism and antienvironmentalism in the United States, see Naomi Oreskes and Erik Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (New York: Bloomsbury, 2010).

which he believed was in favor of strict controls over the taking of marine mammals even when such taking might be “sustainable” in scientific terms.⁴⁷

Scheffer’s stance brought him into conflict not only with many of his colleagues but also with the House oversight committee responsible for marine mammal protection. The conflict centered on the so-called “question of the comma,” which became a focus of dispute in the months leading up to the January 1974 oversight hearings. The question concerned a clause in the MMPA that seemed to require the MMC to consult with its scientific advisory committee on all matters that came under its consideration. If a single comma was removed from the text, however, the advisory committee would be limited to advising on strictly scientific matters, such as permits and funding for research. Scheffer argued that the law, which included several other obvious typos, could not have been intended to compel the MMC to consult with its advisory committee on its every decision; the comma must therefore have been a mistake.⁴⁸ At least one member of the scientific advisory committee, William Schevill of the Woods Hole Oceanographic Institution, was skeptical of Scheffer’s interpretation and wrote to the House committee late in 1973 for clarification, setting off a flurry of correspondence over Congress’s original intent and the possibility of typographical errors in legislation.⁴⁹

Behind this quibble over punctuation was a serious disagreement over the relative positions of experts and laypeople in the implementation of the law. Restricting the MMC’s scientific advisory committee to scientific matters was part of a broader effort by Scheffer to position the commission as a representative of “public opinion” in the policy process, an effort which came to an inglorious end at the January 1974 hearings. After delivering his prepared testimony, Scheffer was browbeaten by subcommittee chairman John

47. For Scheffer’s accounts of his career and of the modern environmental movement, respectively, see Victor B. Scheffer, *Adventures of a Zoologist* (New York: Scribner, 1980) and Victor B. Scheffer, *The Shaping of Environmentalism in America* (Seattle: University of Washington Press, 1991). Statements of Scheffer’s protectionist sympathies can be found in Victor B. Scheffer, “The Future of Wildlife Management,” *Wildlife Society Bulletin* 4, no. 2 (1976): 51–54; Victor B. Scheffer, “The ‘Protectionist’ in Conservation,” *BioScience* 26, no. 3 (1976): 169.

48. U.S. House, *Marine Mammal Protection Oversight* (ref. 45), 441. Scheffer’s position, though dismissed as fanciful by the House subcommittee, was not entirely unfounded in the legislative history. The report on the bill from the Senate Committee on Commerce had omitted the comma in its section-by-section summary; U.S. Senate, *Marine Mammal Protection Act of 1972*, Report of the Senate Committee on Commerce on S. 2871, 92nd Cong., 2nd sess., 1972, Report no. 92-863, 24.

49. Schevill’s letter was not printed, but the response from committee chairman John D. Dingell can be found in U.S. House, *Marine Mammal Protection Oversight* (ref. 45), 468–69.

D. Dingell and counsel Frank Potter, Jr., into admitting that the MMC's role was not to represent the public but rather to ensure that the judgments of independent experts were well represented in the regulatory process.⁵⁰

Faced with the rejection of his interpretation of the law and the possibility that the MMC would be abolished if it did not operate as the House expected it to, Scheffer seems to have abandoned his advocacy of the commission as a mediator between the public and the government. Still, his sympathies for the protectionists and the regulatory agencies' hesitancy to issue scientific hardship exemptions and permits during the first year or two that the MMPA was in force gave those who sought tighter restrictions on taking reason to cautiously celebrate. Milton Kaufman of Monitor, a coalition of environmental and humane groups, was among those who testified at the January 1974 oversight hearings. He told the committee that the Monitor coalition had been impressed at the extent to which NMFS had gone beyond its statutory obligations to involve the public in its deliberations and that it was hopeful it would continue to reach out to nonexperts.⁵¹ The Animal Welfare Institute's Stevens testified that she and her colleagues were especially pleased at NMFS's denial of a scientific research permit to Dale Rice, an NMFS employee, for research that would have involved the taking of sperm whales with explosive harpoons, even though NMFS had made its decision reluctantly and solely because of procedural issues. As she had in the hearings preceding the passage of the MMPA, Stevens emphasized that her organization was not against research; it was only against research that was inhumane or designed solely to serve commercial interests.⁵²

Of course, the denial of Rice's permit application and the extensive public outreach that Kaufman lauded as a sign that the regulatory agencies were taking their responsibilities seriously were the same phenomena to which some scientists pointed as evidence of bureaucratic incompetence and obstructionism. This schism remained as the regulatory agencies formalized their policies regarding scientific research and public display permits in 1974 and 1975. At a second round of congressional oversight hearings in 1975, scientists echoed Kenyon's and Fay's earlier complaints about vital research that had been delayed by red tape. They argued that the regulatory agencies had chosen to place

50. *Ibid.*, 439–48.

51. *Ibid.*, 422, 426.

52. For Stevens's comments on the Rice permit application, see *ibid.*, 407–08; for her comment on support for science, see *ibid.*, 417. NMFS's decision to deny the permit request despite approval from the MMC and its advisory committee is documented in 39 *Federal Register* 2615 (23 Jan 1974): 2615–16.

stricter constraints on scientific practice than lawmakers had intended and had taken an unreasonably long time to process permit applications. Even Scheffer complained to the House oversight committee about the “woefully inadequate” implementation of the scientific permitting process. On behalf of the Marine Mammal Commission, he urged the agency to adopt a graduated system of review that would speed proposals with little potential for harm through the system. For proposals of least concern, he argued, some of the public review requirements of the act could safely be omitted.⁵³

Although this and subsequent efforts by scientists to simplify the permitting system were unsuccessful in the 1970s, they would eventually bear fruit. Marine mammalogists were not the only ones, nor indeed the most vocal ones, to claim to have been the victims of inept regulation under the new marine mammal and endangered species protection laws. By 1975, the public display industry of zoological parks, oceanariums, and aquariums had mobilized to defend itself against attacks from radical environmentalists and the emerging animal rights movement. The largest and most professionalized of the public display institutions—those which were most likely to have either scientists on staff or to engage in extensive collaborations with researchers—often used arguments about scientific freedom to defend their right to put endangered species and marine mammals on display. In its promotional materials from the mid-1970s, for example, the Zoological Action Committee (ZOOACT), a lobbying organization established by members of the American Association of Zoological Parks and Aquariums, accused federal regulators of capitulating to “humaniacs” and inhibiting both free scientific inquiry and free enterprise through overzealous implementation of the law.⁵⁴

The sometimes apocalyptic language of zoo advocates exaggerated the connection between exhibition and science, but it was not without basis. Zoos and other public display facilities had often provided scientists with their only opportunities to study the behavior, physiology, and anatomy of members of exotic species, while scientists, in turn, had provided guidance to zoos on capturing, maintaining, and breeding unfamiliar animals. Marine mammalogists such as Norris, for example, had learned much of what they knew about the physiology and behavior of small cetaceans and sea lions from studying them in oceanariums and aquariums and had helped establish

53. U.S. House, *Marine Mammal Protection Oversight* (ref. 45), 6–7.

54. See, for example, the pamphlet *Your Zoo May Be Next* (Washington, DC: Zoological Action Committee, n.d. [1975?]), SIA 7357, Box 130, Folder 2.

and manage Sea World and other marine parks.⁵⁵ But the interests of the scientific community and the public display industry were not entirely congruent. Some scientists had little or no connection to the industry and others, though a vanishingly small proportion of the whole, were adamantly opposed to it.

Scientists therefore took their own steps, independent of the public display industry, to fend off further regulation of their research. Among the most active in this regard were ornithologists, who had long struggled with the tension between scientific collecting and conservation and between professional researchers and amateur birdwatchers.⁵⁶ In the early 1970s, concerns about constraints on collecting seemed to take on new urgency, not only because of the passage of the ESA and the signing of the Convention on International Trade in Endangered Species but also because of intensified enforcement of existing laws such as the Lacey Act of 1900. Among other things, the Lacey Act prohibited the import of specimens obtained in violation of the laws of foreign countries. Evidence that these laws were being enforced with new strictness came in 1974, when the Fish and Wildlife Service fined the prominent Yale ornithologist Charles G. Sibley \$3,000 for importing egg whites from members of endangered species that had been illegally collected in the United Kingdom. Without denying that the collection and importation of the eggs had violated the letter of the law, Sibley defended his work as being scientifically valuable and ultimately harmless to the species concerned, and a number of colleagues, though certainly not all, rallied to his defense.⁵⁷ With the Watergate scandal then at high

55. On the history of the modern zoological park, see Nigel Rothfels, *Savages and Beasts: The Birth of the Modern Zoo* (Baltimore: Johns Hopkins University Press, 2002); Elizabeth Hansen, *Animal Attractions: Nature on Display in American Zoos* (Princeton, NJ: Princeton University Press, 2002). On oceanariums, see Mitman, *Reel Nature* (ref. 10), 157–79; Susan G. Davis, *Spectacular Nature: Corporate Culture and the Sea World Experience* (Berkeley: University of California Press, 1997); Randall R. Reeves and James G. Mead, “Marine Mammals in Captivity,” in *Conservation and Management of Marine Mammals*, ed. Twiss and Reeves (ref. 8), 412–36.

56. See Barrow, *Passion for Birds* (ref. 1).

57. On the case against Sibley, see Clive Gammon, “The Case of the Absent Eggs,” *Sports Illustrated* 40, no. 25 (24 Jun 1974), <http://sportsillustrated.cnn.com/vault/article/magazine/MAG1088695/> (accessed 23 Sep 2011); W. R. P. Bourne, “Egg Collector Collected,” *Nature* 249, no. 5460 (28 Jun 1974): 793. On the response by ornithological associations, see Fred Ferretti, “Fining of Bird Scholar Stirrs Colleagues,” *New York Times*, 13 Jul 1974; W. R. P. Bourne, “New Code for Bird Collectors,” *New Scientist* 64, no. 926 (5 Dec 1974): 737. On the place of the Lacey Act case in Sibley’s career, see Frederick R. Davis, “The History of Ornithology at Yale University and the Peabody Museum of Natural History,” in William E. Davis, Jr., and Jerome A. Jackson, eds., *Contributions to the History of*

pitch—Nixon was to resign his presidency only a few months after Sibley was fined—comparisons between the misdeeds of scientists and politicians came easily. The *New York Times* editorialized that whatever the scientific value of Sibley's work may be, it did not put him above the law.⁵⁸

It was in this highly charged context that the American Ornithological Union (AOU) assembled an ad hoc Committee on the Scientific and Educational Use of Wild Birds with a threefold mandate: to explain why scientific collecting continued to be essential to the progress of ornithology, to outline a code of ethics for collectors and researchers, and to report on the current status of laws and regulations affecting research on birds.⁵⁹ In his foreword to the committee's report, released in the summer of 1975, the president of the AOU explained that ornithological collecting had become increasingly difficult in recent years both because of concerns about disease transmission across national borders and because “[p]ublic interest and sensitivity concerning the protection of wild animals are increasing at a greater rate than ever before. Legislative bodies are responding by enactment of further protective measures, and administrative bodies often place more restrictive interpretations on existing legislation.”⁶⁰ The report admitted the need to regulate collecting, particularly in the case of rare and endangered species and “extralimital” specimens (i.e., individuals appearing outside the species' normal geographical range), but it argued that the “high standards of ethics and judgment” of researchers were more likely to reduce conflicts between conservation and collecting than any kind of formal regulation.⁶¹ The committee's report would later be described as “one of the first responses to the tightening of policy and regulations on collecting permits.”⁶²

By the end of 1975, after several years of increasing concern among its members and leadership, the American Society of Mammalogists had also formally

North American Ornithology, vol. II (Cambridge, MA: Nuttall Ornithological Club, 2000), 83–121; Kendall W. Corbin and Alan H. Brush, “In Memoriam: Charles Gald Sibley, 1917–1998,” *The Auk* 116, no. 3 (1999): 806–14. I am grateful to Mark Barrow for bringing this case to my attention.

58. “For the Birds,” *New York Times*, 17 Jul 1974.

59. George E. Watson, “Charge to the Committee on the Scientific and Educational Use of Wild Birds,” *Auk* 91, no. 4 (1974): 817.

60. “Report of the American Ornithologists' Union Ad Hoc Committee on Scientific and Educational Use of Wild Birds,” *Auk* 92, no. 3 suppl. (1975): 1A–27A.

61. *Ibid.*, 11A.

62. Richard C. Banks, “In Memoriam: John Warren Aldrich, 1906–1995,” *Auk* 114, no. 4 (1997): 751.

mobilized in defense of scientists' research freedom. As with ornithology, the effect of conservation laws on mammalogical research was not an entirely new area of concern, but the increase in regulation in the early 1970s seemed to demand new forms of action. The ASM's first step was to organize an ad hoc Committee on Legislation and Regulations. Under the chairmanship of ASM president Sydney Anderson, the committee began collecting information about existing wildlife conservation regulations and lobbying Congress and the regulatory agencies to simplify or eliminate those that affected mammalogists.⁶³

Unlike the AOU's ad hoc committee, which was dissolved after it had completed its report, the ASM's Committee on Legislation and Regulations was soon converted into a standing committee with the regulation of research as its main focus.⁶⁴ The committee did not immediately publish a code of ethics or guidelines for mammal collecting, but it did attempt to rally mammalogists in defense of their freedom of research and to influence the legislative process. In the fall of 1975, having learned about the House oversight hearings on the ESA too late to testify in person, Anderson submitted a written statement affirming that mammalogists "wholeheartedly endorse the intent of the Endangered Species Act" and other conservation laws and had willingly offered their services to the government to help enforce them. At the same, he argued, they were becoming increasingly concerned about the proliferation of cumbersome and insensitive rules and regulations governing research. These new burdens threatened to leave them with only two choices, in his opinion: "(1) ignore the perplexing regulations and risk prosecution, or (2) spend half our time in red tape instead of biology." While some scientists were undoubtedly "careless or downright devious," Anderson admitted, the vast majority wished to abide by the law, and it was in the best interest of endangered species for the regulatory agencies to help them to do so.⁶⁵

The ornithologists' and mammalogists' efforts are only two examples of the responses of scientists in the 1970s to a perceived intensification of the regulation of their research activities. The AOU's and ASM's efforts were not formally

63. Sydney Anderson to Ad Hoc Committee on Legislation and Regulations, 30 Sep 1975, SIA 7357, Box 130, Folder 1.

64. It was listed among the ASM's standing committees in the *Journal of Mammalogy* in November 1976, with Hugh H. Genoways as chairman; see front matter, *JM* 57, no. 4 (1976).

65. Sidney Anderson to James W. Spensley, 7 Oct 1975, SIA 7357, Box 130, Folder 2; U.S. Senate, *Endangered Species Oversight: Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries*, 94th Cong., 1st sess., 1975, Serial no. 94-17, 314-15.

linked, but neither were they entirely independent; the leadership of the ASM was in regular communication about regulatory issues with the AOU's leadership and with that of a number of other scientific associations, including the Association of Systematics Collections, the American Society of Ichthyologists and Herpetologists, and the American Institute of Biological Sciences, as well as with leaders of the public display industry.⁶⁶ Not all of their efforts were directed at the federal level; in fact, scientists often complained most vociferously about the welter of inconsistent state laws governing scientific collecting. But federal laws, by virtue of being national in scope, provided a common focus and helped forge consensus across the community of researchers. Before 1972, individual states could be more or less friendly to researchers, and those working in a state where good relations prevailed might have been hesitant to alienate their government counterparts by aggressive antiregulatory activism. After 1972, all scientists studying marine mammals or endangered species had to deal with the same centralized federal agencies.⁶⁷

Federal regulators and policymakers were not unaware that the enforcement of conservation laws had led to significant resentment among scientists, and at least a few expressed sympathy with their concerns. In 1975, FWS director Lynn Greenwalt admitted in an "Open Letter to [the] Scientific Community" that although wildlife conservation laws had been vital to protecting American wildlife since the beginning of the twentieth century, they had become so restrictive in recent years as to make even the issuance of routine permits difficult. The result, Greenwalt noted, had been "much concern in the scientific community, most of it well justified." In response, Greenwalt announced the formation of a special team consisting of FWS researchers, enforcement staff, and wildlife managers, which would review the permit process and suggest ways of simplifying it. The team's broader goal would be to "bring our permit system back on its intended course of facilitating, not impeding, the flow of knowledge in the scientific community."⁶⁸

Greenwalt's initiative eventually resulted in the creation of a new Federal Wildlife Permit Office, described hopefully in the *Journal of Mammalogy* in 1976 as a mechanism to "ease the plight" of scientists and others burdened by

66. Clyde A. Hill to Sidney Anderson, 21 Oct 1975, SIA 7357, Box 130, Folder 6; Sydney Anderson, Memo to Ad Hoc Committee on Legislation and Regulations re "Recent Events," 30 Dec 1975, SIA 7357, Box 130, Folder 5.

67. Bean and Rowland, *Evolution of National Wildlife Law* (ref. 8), 109–11.

68. Lynn G. Greenwalt, "Open Letter to Scientific Community," 13 Jun 1975, SIA 7357, Box 130, Folder 5.

permitting requirements.⁶⁹ But even this promising step did not put an end to scientists' concerns or to their antiregulatory advocacy. Bureaucracy was bureaucracy, however simplified it might be; and even if FWS consolidated its permit process—and it did not succeed in simplifying it nearly as much as the scientific community had hoped—there were still a number of other agencies that had to be dealt with. Moreover, no matter how accommodating of researchers' needs Greenwalt and his counterpart at NMFS might want to be, they also had obligations to other parties. Although protectionist groups had initially praised the agencies for their willingness to include the public in the permit process, the relationship had become much more confrontational by 1975. At congressional oversight hearings held that year, Carol Koury of the Fund for Animals noted that “those of us whose main concern is the quality of life for animals in captivity have very little official input into the granting of permits and a great deal of frustration making what input we can.”⁷⁰ Convinced that they had been prevented from playing their statutorily guaranteed role, animal welfare and rights activists and some of the more radical environmental groups such as Greenpeace and Friends of the Earth turned to the courts and to direct action.⁷¹ These groups would eventually win several key federal cases over the use of “invasive” research techniques ranging from biopsy darting to live capture.⁷²

Lawsuits and the threat of lawsuits thus kept the regulatory agencies from acceding to the demands of scientists for regulatory relief as quickly or as fully as they might have otherwise. In any case, conversations between scientists and regulators in the 1970s often resulted in frustration on both sides. In 1978, Hugh Genoways, a mammalogist at Texas Tech University who served as chair of the ASM's Committee on Legislation and Regulations after Anderson, met with FWS officials in Washington to discuss ways of reducing the impact of environmental regulations on scientific collecting. After the meeting Genoways

69. “Federal Wildlife Permit Office Established,” *JM* 57, no. 4 (1976): 807–08.

70. U.S. House, *Marine Mammal Protection Oversight: Hearings before the Subcommittee on Fisheries and Wildlife Conservation and the Environment of the Committee on Merchant Marine and Fisheries*, 94th Cong., 1st sess., 1975, Serial no. 94-16, 324–25.

71. An example of direct action regarding marine mammal research: In 1977, two dolphins were released from the laboratory at the University of Hawaii in which they were being studied (under a valid MMPA permit) by two research assistants, Kenny LeVasseur and Steve Sipman; Roderick Nash, *Rights of Nature* (ref. 10), 186.

72. For example, see Etienne Benson, *Wired Wilderness: Technologies of Tracking and the Making of Modern Wildlife* (Baltimore: Johns Hopkins University Press, 2010), 171; McCarthy and Lichtman, “Origin and Evolution of Ocean Noise Regulation” (ref. 4), 21–24.

sent a packet of memos to Clyde Hill, the San Diego Zoo curator who was one of the leaders of the public display industry's antiregulatory efforts, describing his frustration with the permit system and the intransigence of FWS staff. Given his record of advocacy, one might have expected Hill to urge Genoways on to greater efforts, but instead he cautioned him against overstating his case. In the current environment, Hill suggested, adaptation was ultimately as or more important than resistance:

Permit empires have been built and they are difficult to dislodge, let alone destroy. The reality of the situation is that zoos, universities, museums, and their ilk will have to learn how to adapt to the giant paper machine of rules and regulations. To be sure, we shouldn't give up the idea of a central permit office and need to work hard to establish one. Nevertheless, we must learn to work with the regulations if we are to survive. Welcome to our nightmare.⁷³

Hill's advice reflected the pragmatic orientation of most of those affected by the new regulations. Scientists might find conservation regulations frustrating or absurd when they were applied to their own research practices, but few had the desire or ability to devote much of their time to fighting them. Instead they learned to operate within the new system and to negotiate with regulators over specific cases. With a few exceptions—Kenyon being a notable example—most scientists, like their colleagues in the public display industry, learned to live with new forms of oversight and regulation, however strongly they may have protested against them at first. Even as they continued to resist encroachment on their professional autonomy by the expansion of environmental regulation, scientists also developed new tools and strategies for coping with existing constraints, ranging from the publication of handbooks of relevant laws and regulations to extensive public consultation efforts aimed at nipping future conflict in the bud. They could not dismantle the edifice of environmental regulation that they had helped to construct, and few would have wanted to. Instead they tried to create as much flexibility for their own work within its structure as possible. Skillful handling of potentially controversial permit applications became, like good grantsmanship, an essential component of a successful scientific career.

In the absence of a comprehensive survey of marine mammal and endangered species research from the 1960s to the present, it is difficult to say exactly

73. Clyde A. Hill to Hugh H. Genoways, 24 Feb 1978, SIA 7357, Box 130, Folder 6. Genoways's letter is missing from the file but is partly described in Hill's response.

how research practices were affected by the new regulations. Nonetheless, a few broad trends seem clear.⁷⁴ First, although relatively few permit applications for scientific research were denied, many if not most permit issuances demanded significant changes in the procedures used, the number, species, or location of animals taken, or other aspects of the proposed research. Second, the permit process forced scientists to plan their research farther in advance than before, made it more difficult for them to change their methods opportunistically in the field, and often demanded that they report regularly to the regulatory agencies. Third, the expectation, justified or not, that particular types of studies would not be approved or, if approved, would be challenged in the courts, in the press, and through direct action led scientists to rely on less controversial methods. Rather than killing animals themselves, for example, they salvaged animals that had died from other causes, or they replaced brands, tags, and other artificial marks used to identify individuals in a population with photographic databases of natural markings that did not require handling animals directly.⁷⁵ Science did not retreat to the “dark ages,” as one spokesman for the public display industry warned Congress in 1975 that it would if humane activists got their way, but it did not persist unchanged.⁷⁶

CONCLUSION

The regulatory “nightmare,” to use Hill’s hyperbolic term, that confronted field biologists, ecologists, and zoologists in the mid-1970s was specific to the field of endangered species protection, but in broad outline it closely resembled contemporary developments in many other areas. Even as large sectors of the economy were being deregulated in strictly economic terms, new environmental, health, and safety regulations maintained or expanded the role of the

74. In the absence of such a survey, the following sketch is based on a reading of permit application and issuance notices published in the *Federal Register*, testimony at Congressional hearings to amend the MMPA, and scientists’ published statements or comments to the press; see, e.g., Katherine Ralls and Robert L. Brownell, Jr., “Protected Species: Research Permits and the Value of Basic Research,” *BioScience* 39, no. 6 (1989): 394–96; Mike Carlowicz and Andrea Baird, “Caught in the Middle of the Marine Mammal Protection Act,” *Oceanus* (29 Mar 2006), <http://www.who.edu/oceanus/viewArticle.do?archives=true&id=11275> (accessed on 29 Sep 2011).

75. For an example, see Etienne Benson, “A Difficult Time with the Permit Process,” *JHB* 44, no. 1 (2011): 103–23.

76. U.S. House, *Marine Mammal Protection Oversight* (ref. 71), 153.

federal government in the everyday operations of American businesses.⁷⁷ Scientists were not immune to this development; on the contrary, they made for highly visible regulatory targets. In the well-known case of recombinant DNA research, promises of self-regulation by the scientific community forestalled, with some local exceptions, the imposition of government controls.⁷⁸ In other areas, self-regulation was complemented by formal external regulation. In the mid-1970s, for example, biomedical researchers were confronted by a new regulatory system established by the National Institutes of Health, which required “informed consent” for studies involving human subjects and mandated the establishment of Institutional Review Boards to evaluate proposed studies. A little more than a decade later, as a result of amendments to the Animal Welfare Act, analogous Institutional Animal Care and Use Committees were created to govern research on laboratory animals. The policy solutions for research on human subjects, laboratory animals, and endangered species were quite different in their details, but the basic dilemma was similar: how to protect objects of scientific research understood as vulnerable or endangered—either as individuals or as populations—while reaping the benefits of unfettered research.⁷⁹

The point of highlighting scientists’ efforts to escape the imposition of external regulation is not to insinuate that their interest in the conservation of the species they studied, or even in the transparency and accountability of scientific practice, was not genuine. Surely some were being disingenuous, but there is no reason to doubt that Kenyon, for example, sincerely believed that damage caused by the MMPA to marine mammal conservation, aside from any impact it had had on his own career and research program, outweighed its benefits. Like members of all professional communities—scholars in the humanities and social sciences not excluded—researchers studying endangered species had a legitimate interest in creating a favorable policy environment for

77. Martha Derthick and Paul J. Quirk, *The Politics of Deregulation* (Washington, DC: Brookings Institution, 1985), 212–18; Susan Wright, *Molecular Politics: Developing American and British Regulatory Policy for Genetic Engineering, 1972–1982* (Chicago, IL: University of Chicago Press, 1994).

78. Paul Berg, David Baltimore, Sydney Brenner, Richard O. Roblin III, and Maxine F. Singer, “Asilomar Conference on Recombinant DNA Molecules,” *Science* 188, no. 4192 (6 Jun 1975): 991–94; Paul Berg and Maxine F. Singer, “The Recombinant DNA Controversy: Twenty Years Later,” *Proceedings of the National Academy of Sciences of the United States of America* 92, no. 20 (26 Sep 1995): 9011–13.

79. See Stark, “Morality in Science” (ref. 6); Schrag, *Ethical Imperialism* (ref. 6); Carbone, *What Animals Want* (ref. 6); Jasanoff, *Designs on Nature* (ref. 6).

work whose value was, to them, indisputable on the whole, even if in specific cases it could be questioned.⁸⁰ Moreover, scientists such as Norris who adamantly opposed the Harris-Pryor bill and criticized what they saw as the pernicious influence of radical environmental and animal rights groups on science and conservation nonetheless argued convincingly for the need for some kind of public oversight. Even in the narrow domain that affected them most, that of scientific research, they did not seek to overturn the system but rather to reduce its impact to a manageable minimum. Their argument that formal regulation was more costly and less effective than professional standards and expert judgment might seem self-serving, but that does not mean that it was not sincere or could not, under some circumstances, also be true.⁸¹

The point, rather, is to identify a key moment in the relationship among scientists, the federal government, and environmental and animal protection activists, when the grounds of debate shifted for all of the actors concerned. To varying extents, field biologists, ecologists, and zoologists had been concerned throughout the twentieth century with the potential for wildlife conservation measures to hinder their scientific work.⁸² In this regard the new regulations of the 1970s were merely an incremental development in a long history of the involvement of the federal government in the regulation of research on protected species, one that parallels the nationalization of the commons in wildlife described by Louis Warren.⁸³ In another sense, however, the 1970s marked a turning point. Whereas previous regulations had governed scientific practices only at certain places or times and often as a mere byproduct of regulations governing hunting, the new wave of regulation was much broader in spatial and temporal scope and much more specifically targeted at scientific research. Moreover, partaking of the drive toward transparency that was characteristic of the reform legislation of the period, the new regulatory procedures were far more open to public scrutiny than

80. For accounts of resistance to new regulations in the social sciences and in oceanography at around this time, see, respectively, Schrag, *Ethical Imperialism* (ref. 6), 96–119; Jacob Darwin Hamblin, *Oceanographers and the Cold War: Disciples of Marine Science* (Seattle: University of Washington Press, 2005), 249–50.

81. On the ethical limits of formal regulatory schemes in laboratory animal research, see Donna Haraway, “Sharing Suffering,” in *When Animals Meet* (Minneapolis: University of Minnesota Press, 2008), 69–93.

82. Barrow, *Passion for Birds* (ref. 1).

83. Warren, *Hunter’s Game* (ref. 1). See also McEvoy, *Fishermen’s Problem* (ref. 10); Karl Jacoby, *Crimes Against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley: University of California Press, 2001).

before.⁸⁴ This combination of comprehensiveness and openness meant that grappling with regulators and with the public over research methods became an integral part of the science of endangered species. Some scientists embraced the new system; many tolerated it; a few became outspoken opponents.

The latter contributed, in their small way and despite what their more general political or environmental stance may have been, to an antiregulatory turn in American politics that characterized the last decades of the twentieth century. For these scientists, to paraphrase Ronald Reagan, government regulation of research was the problem rather than the solution.⁸⁵ This antiregulatory activism sometimes made for strange bedfellows, as an FWS handbook on endangered species permits filed among the papers of the ASM's Committee on Legislation and Regulations suggests. On the cover of the handbook, a cartoon depicts Moses descending from Mount Sinai with tablets in hand; as he comes into the view of two Israelites waiting below on the path, one of them exclaims, "More rules and regulations!" Below the cartoon and its caption is a line stating that it has been reprinted with the permission of the Mobil Corporation. The handbook was primarily oriented toward the kinds of private, commercial interests traditionally targeted by conservation activists—mining and logging companies, real estate developers, the oil and gas industry—but it also mattered deeply to mammalogists, who found themselves enmeshed in the very same regulatory system.⁸⁶ Viewed through the prism of the regulatory system, the concerns of scientists and those of oil and gas corporations can seem more similar than they are different.

This unexpected resonance suggests one of the unexpected transformations of the political landscape that followed the environmental reforms of the 1960s and 1970s: namely, an increasing skepticism toward state power on both the left and the right and a tendency to understand government action as a zero-sum game in which every increase in the reach of the federal government was balanced by a loss of individual liberty. Rhetorical oppositions between regulatory burden,

84. On the strategies and consequences of the congressional reforms of the 1960s and 1970s, see Julian Zelizer, *On Capitol Hill: The Struggle to Reform Congress and Its Consequences, 1948–2000* (New York: Cambridge University Press, 2004).

85. On Reagan and the rise of the conservative movement in the 1980s, see Meg Jacobs and Julian E. Zelizer, *Conservatives in Power: The Reagan Years, 1981–1989: A Brief History with Documents* (Boston, MA: Bedford/St. Martin's, 2011), 1–40.

86. U.S. Fish and Wildlife Service, *Handbook for the U.S. Fish and Wildlife Service Endangered Species Permit Workshop* (Washington, DC: U.S. Fish and Wildlife Service, n.d. [1975?]), SIA 7357, Box 130, Folder 2.

red tape, and inefficient bureaucracy, on one hand, and freedom, innovation, and opportunity, on the other, came to be deployed with as much conviction and enthusiasm by some leading scientists—who were also environmentalists—as they had been by the *bêtes noires* of the environmental movement.⁸⁷ From a structural perspective, this resonance is not particularly surprising. Scientists and the representatives of oil and gas companies both worked in highly subsidized and regulated industries; both sought to protect their own interests by framing them as congruent with the greater good; both used well-worn American political tropes of antistatism and liberty to advance their causes at a time when the federal government was taking on an unprecedented set of responsibilities and powers; both sought to reduce the opportunities for public oversight of professional practice that had been so central to the governmental reforms of the 1970s. That the affinities between their positions have not been more apparent perhaps reflects the extent to which science continues to be held to a different standard than other kinds of activities with the potential for harm.⁸⁸

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87. See Derthick and Quirk, *Politics of Deregulation* (ref. 77), 212–18. On the intersection of science and regulation during this period, see Chandra Mukerji, *A Fragile Power: Scientists and the State* (Princeton, NJ: Princeton University Press, 1989); Sheila Jasanoff, *The Fifth Branch: Science Advisers as Policymakers* (Cambridge, MA: Harvard University Press, 1990); Brian Balogh, *Chain Reaction: Expert Debate and Public Participation in American Commercial Nuclear Power, 1945–1975* (New York: Cambridge University Press, 1991); Oreskes and Conway, *Merchants of Doubt* (ref. 47).

88. For the opposing argument, that the harms of science have been exaggerated while those of industry have been largely neglected, see McCarthy and Lichtman, “Origin and Evolution of Ocean Noise Regulation” (ref. 4); Elena McCarthy, “Ocean Noise, Scientific Uncertainty, and the Paradox of the Precautionary Principle,” *Journal of International Wildlife Law and Policy* 10, nos. 3–4 (2007): 233–42. On the uses of secrecy in expert advice to government, see Stephen Hilgartner, *Science on Stage: Expert Advice as Public Drama* (Stanford, CA: Stanford University Press, 2000). On ideas of freedom and liberty in American political life, see Eric Foner, *The Story of American Freedom* (New York: W.W. Norton, 1998).