birds will, if a halt be not speedily called by enlightened public opinion, overtake scores of our song-birds, and the majority of our graceful and harmless, if not somewhat less 'beneficial,' sea and shore birds."[99]

Why should anyone worry about the fact that "many species, and even genera, of birds are fast disappearing from our midst?" Deploying aesthetic and utilitarian arguments that would remain central to the bird protection movement for decades, Allen challenged the pervasive belief that nature was simply a boundless storehouse of economically valuable resources waiting to be exploited. In addition to whatever economic value they might possess, Allen proclaimed, birds also enjoyed an aesthetic value that rendered them "among the most graceful in movement and form, and the most beautiful and attractive in coloration, of nature's many gifts to man." At the same time, they were vivacious, charming creatures, with melodious voices. Allen seconded the opinion of a recent writer who claimed that the prospect of a countryside without songbirds was simply too horrible to contemplate—like "a garden without flowers, childhood without laughter, an orchard without blossoms, a sky without color, roses without perfume."[100]

For those who remained unmoved by an appeal to the living bird's aesthetic charms, Allen also offered a more practical rationale for bird protection: "The great mass of our smaller birds, numbering hundreds of species, are the natural checks upon undue multiplication of insect pests."[101] So-called economic ornithologists had been developing this basic argument for years. Having analyzed the food remains found in the stomachs of numerous avian species and swayed by the long-held assumption that nature remains in overall balance, naturalists hastily concluded that birds represented the primary agent in countering the potentially explosive growth of insect pests.[102] Allen remained confident the U.S. Department of Agriculture's recently created Division of Economic Ornithology and Mammalogy (the institutional precursor to the Bureau of the Biological Survey and the Fish and Wildlife Service) would confirm the central role that birds played in maintaining nature's balance.[103]

While the AOU's bird protection committee felt its primary mission was to educate the public about the problem of bird destruction, it also recognized the need for effective protective laws. To further that goal, it produced text for state legislation—the so-called AOU model law—aimed at protecting nongame birds.[104] Under the terms of this law, anyone who killed, purchased, or sold any nongame bird, its nest, or eggs would be subject to a fine of five dollars and up to ten days in jail for each offense. The only nongame species the committee specifically exempted from its protective umbrella was the English or European house sparrow, a recent introduction that faced increasingly strong condemna-

tion from American ornithologists as it expanded its range across the United States. The model law also included a provision that authorized the collection of birds "for scientific purposes" through a special permit system.

Just as the AOU bird protection committee was moving into high gear, the patrician naturalist and editor George Bird Grinnell founded the first Audubon Society.[105] After earning his A.B. from Yale in 1870, Grinnell joined the army of students who amassed fossils for the preeminent American paleontologist O. C. Marsh, and three years later he became Marsh's assistant at the Peabody Museum. While J. A. Allen was writing his series of articles lamenting the decline of North American fauna, Grinnell was independently reaching a similar conclusion. As had been the case for Allen, westward travels—including stints as a naturalist on Custer's 1874 Black Hills Expedition and William Ludlow's 1875 reconnaissance of Yellowstone National Park—proved critical in the development of Grinnell's conservation consciousness. As he announced in a letter that accompanied his report, the latter experience convinced Grinnell that "the large game still so abundant in some localities will ere long be exterminated."[106] After earning his doctorate in paleontology in 1880, Grinnell became editor-in-chief and owner of *Forest and Stream*, a preeminent sporting and natural history periodical. He would occupy both positions for the next thirty-five years, thereby consolidating the magazine's position as a leading voice in condemning the commercial exploitation of wildlife.[107]

For a brief period, Grinnell also assumed a key leadership position in the fledgling Audubon movement before moving on to other conservation causes. In 1883, the same year he became a charter member of the AOU, he published the first in a series of editorials that sharply condemned the millinery trade's destruction of songbirds.[108] A year later, he became an active member on the AOU bird protection committee. In early February 1886, less than two weeks before that committee issued its first bulletin, Grinnell published an editorial proposing the formation of an "Audubon Society" dedicated to the "protection of wild birds and their eggs."[109] In a series of follow-up publications, he noted that recently the scale of bird destruction had expanded to the point it was "seriously threaten[ing] the existence of a number of our most useful species."[110] The choice of name for the proposed society seemed a natural one for Grinnell: not only had he once attended a school run by Audubon's widow but the famed artist's anthropomorphic and widely reproduced bird portraits often moved viewers to see wild creatures more sympathetically.

Membership in the new Audubon Society was open anyone who pledged not to kill nongame wild birds, destroy their nests, or wear their feathers. The national society was to be organized into a series of local chapters, to which Grin-

nell promised to provide circulars and other printed information promoting the cause. By the end of the first year, he boasted over three hundred local chapters and nearly eighteen thousand members.[111] In an effort to finance the increasingly burdensome workload associated with the enterprise, in 1887, Grinnell introduced *Audubon Magazine*, which featured news of the society, popular articles on birds, children's stories, diatribes against feather fashions, and a serialized version of one of the earliest field identification guides. One article chronicled the plight of the great auk, which, "like the Dodo of Mauritius and some other birds, has wholly ceased to exist because exterminated by the cruelty of man." If the predations of plume hunters remained unchecked, the anonymous author (probably Grinnell) warned, other birds would soon experience the same "melancholy fate" as these lost species.[112] In addition to ongoing concern about the cruelty of using feathers to decorate hats, Grinnell and the many supporters of the first Audubon Society clearly felt unease with the looming prospect of extinction.

After a burst of activity, however, the movement faltered. By December 1889, Grinnell claimed more than fifty thousand members for his Audubon Society, a remarkable accomplishment.[113] However, few of those who joined the movement proved committed enough to pay the modest subscription fee for its affiliated magazine, so he stopped publication with the January 1889 issue and abandoned the organization altogether soon thereafter.[114] The AOU bird protection committee experienced a similar fate. After securing the passage of versions of the model law in New York in 1886 and Pennsylvania in 1889, the committee languished. Many AOU members—resentful of the increasing restrictions on their ability to collect wild birds—seemed relieved at its apparent demise.

A NEW BEGINNING

The Audubon movement's more enduring revival came a few years later, just as the larger progressive reform movement was taking off and not long after the plight of the passenger pigeon and bison began reaching public consciousness. In February 1896, the Boston society dame Harriet Lawrence Hemenway and her cousin Minna B. Hall called the first meeting of the Massachusetts Audubon Society.[115] The stated purpose of the new organization was to discourage the use of bird feathers in hats and to otherwise "further the protection of wild birds."[116] After choosing the ornithologist William Brewster as president, the society began issuing a steady stream of pamphlets to bring its protectionist message before the public. Anxious reformers in dozens of other states quickly followed Hemenway and Hall's lead. As was the case in Massachusetts, male naturalists occupied most leadership positions within Audubon Societies, while females comprised

the majority of the membership. The newly revived societies lobbied for protective legislation, hired wardens, promoted birdwatching, and championed nature study in the nation's schools.[117]

One force pushing state Audubon Societies to action was the naturalist and insurance salesman William Dutcher, who assumed chairmanship of the AOU bird protection committee late in 1895.[118] Dutcher's interest in natural history began as a sportsman in 1879, when he shot a bird on Long Island that he failed to recognize—a female Wilson's plover that turned out to be a new record for the area. Following that discovery, he began systematic study of the region's avifauna. His growing interest in ornithology led him to become associate member of the AOU at the time of its creation and treasurer of the organization between 1887 and 1903. After remobilizing the bird protection committee, Dutcher worked tirelessly to promote the creation of state Audubon Societies, to obtain passage of protective legislation, and to champion educational efforts aimed at publicizing the plight of birds. In November 1900, Dutcher called the first informal meeting of representatives of the various state Audubon Societies that had been organized up to that point. Five years later, he orchestrated the creation of the National Association of Audubon Societies, which was based out of New York City. He ran the new organization until 1910, when he suffered a debilitating stroke from which he never fully recovered.

Among the long string of conservation victories that Dutcher helped secure was the Lacey Act.[119] Signed into law on May 25, 1900, that pioneering wildlife legislation authorized the federal government to fund the restoration of wild bird populations, to regulate the importation of foreign animals, and most importantly, to prohibit the interstate shipment of "wild animals and birds" taken in violation of state laws. The final form of the bill, which emerged following four years of congressional consideration, was drafted in close consultation with the ornithologist T. S. Palmer, a bird protection committee member and chief assistant of the Bureau of the Biological Survey. The Audubon coalition of naturalists, humanitarians, and nature lovers fought for the bill's passage, but critical support also came from recreational hunters, especially G. O. Shields and his League of American Sportsman, who were working to eliminate the sale of all game.

Encouraged by the Lacey Act victory, in 1901 Dutcher and Palmer mounted an aggressive campaign to secure passage of the AOU model law.[120] Prior to that time, only five states had enacted satisfactory laws protecting nongame birds. Working closely with the AOU bird protection committee, state Audubon Societies, and sport hunting organizations, the two naturalists lobbied state legislatures up and down the eastern seaboard. As a result of their tireless efforts, by

year's end, eleven states passed new or improved laws, and by 1903, twenty-nine states had adopted some version of the AOU model law.

Dutcher and Palmer also played a key role in the creation of the nation's first federal wildlife refuge.[121] On March 14, 1903, President Theodore Roosevelt signed an unusual executive order establishing Pelican Island—a four-acre site on Florida's Indian River that was home to a large nesting colony of brown pelicans—as a "preserve and breeding ground for native birds." The action came after the ornithologist and conservationist Frank M. Chapman began urging protection of the island's beleaguered inhabitants after several visits to the site. In 1902, Dutcher hired a warden to monitor the island during breeding season and filed paperwork to purchase the site from the federal government on behalf of the AOU bird protection committee. When the transaction became bogged down in bureaucratic red tape, a General Land Office employee suggested that Pelican Island might simply be declared a federal bird reservation. Roosevelt, who had long been interested in bird collecting and watching and a strong supporter of conservation initiatives, found the idea appealing. It also thrilled Dutcher and Palmer, who with Frank Bond, an Audubon official and General Land Office agent, began pressing Roosevelt to declare additional reservations. The president seemed quite willing to accommodate their requests, and before leaving office in 1909, he created fifty additional wildlife reservations, including several that were aimed at protecting big game animals.

In addition to his role in establishing the first national wildlife reservation, Chapman also proved central to numerous other bird conservation initiatives.[122] As a child, he had enjoyed exploring, hunting, and collecting birds in the countryside surrounding his home in Englewood Township, New Jersey, then a sparsely populated bedroom community for New York City. In 1888, the twenty-four-year-old Chapman abandoned a promising banking career to take up a position as an assistant to J. A. Allen, who served as an important father figure and mentor. He would remain at the American Museum of Natural History for the next half century, rising to the level of curator of the Department of Ornithology and establishing a reputation as one of the nation's preeminent ornithologists for his pioneering research on the biogeography and ecology of South American birds.

In addition to substantial accomplishment as a museum administrator and scientist, the indefatigable Chapman also pursued the equivalent of a second career as a bird popularizer and conservationist. His lectures, often illustrated with his own photographs and motion pictures, proved a hit with audiences across the nation, while his innovative field guides were best sellers. An active and early member of the AOU bird protection committee, Chapman helped found the

New York Audubon Society in 1897 and served as a longtime board member and chair of the National Association of Audubon Societies. Even more time consuming was his work for *Bird-Lore*, a popular bimonthly magazine of popular ornithology that he founded in 1899 and edited until 1934. Not only was the magazine brimming with useful information for bird enthusiasts of all ages, levels, and degrees of interest, it was also the official organ of the Audubon movement. As such, the magazine played a critical role in promoting a collective sense of identity among Audubon members across the nation.

Allen, Grinnell, Dutcher, Palmer, and Chapman were unusual only in the intensity of their devotion to the Audubon movement, which continued to expand well into the twentieth century. Along with many of their colleagues, these naturalists shared an abiding interest in science, a deep concern about the fate of American wildlife (especially birds), and a strong sense of obligation to act on that concern. Haunted by the specter of extinction, they sought to mobilize the public to save threatened species. Their campaign achieved remarkable success in securing a place for vanishing species on the nation's political and social agenda. The publicity drives they mounted, state and federal laws they promoted, and wildlife refuges they secured reversed the steep decline that many sea, shore, and wading birds had experienced at the hands of the millinery trade. Yet, for those species that had reached critically low levels, these measures remained insufficient to pull them back from the brink of extinction. To rescue the most endangered species, some conservationists began arguing for the more intensive, interventionist approach that fish culturalists had long embraced: artificial propagation.

CHAPTER FOUR

NATIONALISM, NOSTALGIA, AND THE CAMPAIGN TO SAVE THE BISON

The wild buffalo is practically gone forever, and in a few more years . . . nothing will remain of him save his old, well worn trails along the water-courses, a few museum specimens, and regret for his fate. If his untimely end fails even to point to a moral that shall benefit the surviving species of mammals which are now being slaughtered in a like manner, *it will be sad indeed.*

WILLIAM TEMPLE HORNADAY, 1886

It takes millions of years to produce beautiful and wonderful varieties of animals which we are so rapidly exterminating. Unless we can create a sentiment which will check this slaughter, and devise laws for those who do not respect this sentiment, the bones of our now common types will soon be as rare as those of the dodo and the great auk; and man will be practically the sole survivor of a great world of life.

WILLIAM TEMPLE HORNADAY, 1897

A CONSERVATION CONVERSION

In early 1886, William Temple Hornaday, the chief taxidermist at the U.S. National Museum, had bison on the brain. A decade before, the species that had come to symbolize the Great Plains had been all but obliterated from the southern portion of its once extensive range. Now increasingly frequent predictions about its demise in the north seemed to be coming to pass. After several months of correspondence about the status of the species, Hornaday reached a grim conclusion: fewer than three hundred bison remained throughout the entire United

States. Vast herds had once darkened the prairies with their thunderous, teeming masses, transforming the landscape during their seasonal migrations and filling those who witnessed them with a profound sense of awe; now the once-abundant species was teetering on the brink of extinction. "Could any war of extermination be more complete or far-reaching in its results!" Hornaday exclaimed.[1]

The impending demise of the bison greatly alarmed Hornaday, but most readers today are likely to find his initial response puzzling. When he discovered that the Smithsonian collection contained only a modest, motley assortment of old bison skins, skeletons, skulls, and mounted heads, Hornaday urged his boss, Secretary of the Smithsonian Spencer F. Baird, to sponsor a bison expedition while it remained possible. Taken with the idea, Baird urged Hornaday to collect enough specimens to supply not only the Smithsonian but also other smaller museums with examples of the increasingly rare beast. If they could still be found, Hornaday hoped to bring back as many as one hundred bison specimens, a prospect that apparently generated at least some pangs of guilt in the thirty-one-year-old taxidermist. "I am really ashamed to confess it, but we have been guilty of killing buffalo in the year of our Lord 1886," he later wrote in a widely circulated account of his expedition. "Under different circumstances nothing could have induced me to engage in such a mean, cruel, and utterly heartless enterprise as the hunting down of the last representatives of a vanishing race." But, Hornaday argued, he really had "no alternative." The species' days were clearly numbered, and it was far better for the remains of the final bison to be preserved for posterity than to "decay, body and soul, where they fell." It might strike us as odd today that Hornaday initially seemed more interested in preserving the remains of dead bison than of pursuing strategies to save the species as a living, breathing organism. But in doing so, he was following the dictates of natural history of his day, which was firmly rooted in collection and taxonomy. Never known for his modesty, Hornaday also believed that his taxidermy skills could render the bison "comparatively immortal," thereby helping to atone for humanity's reckless destruction of the species.[2]

That claim might sound like self-serving hubris, but at the time he approached Baird about funding the Smithsonian bison expedition, Hornaday had earned a reputation as one of America's leading taxidermists.[3] Born in Indiana in 1854 and raised in Iowa, he came of age amid a prairie that was still brimming with wildlife. Young William learned to hunt from an early age and soon became a crack shot with the rifle. During a visit with an older half-brother, he discovered a case of mounted ducks in a gun and fishing tackle store. The colorful specimens fired his imagination, and he entered Iowa State Agricultural College with the aim of becoming a professional naturalist, taught himself the rudiments of mounting

animals, and gained an appointment as taxidermist at the college museum. Two years later, he left to join the staff of Ward's Natural Science Establishment, in Rochester, New York.

As America's leading natural history dealer, Ward's provided an ideal environment for Hornaday to cultivate his taxidermy and field skills.[4] The owner of the enterprise, Henry A. Ward, dispatched him on several collecting expeditions, including a round-the-world trip that Hornaday later chronicled in *Two Years in the Jungle* (1885). This first book established his reputation as a popular wildlife and adventure writer. While working for Ward, Hornaday also began developing what he termed "artistic groups" of mounted animals, an idea that one historian has called "the beginnings of the museological evolution of the habitat diorama in America."[5] As part of this important innovation in museum exhibits, he pioneered a sculptural approach to taxidermy that involved securing animal skins on carefully fashioned clay-covered manikins, thus rendering them more lifelike than traditional methods using bones and wooden armatures crudely stuffed with straw or rags. To promote his ideas and to further the profession of taxidermy, Hornaday and his colleagues founded the American Society of Taxidermists in 1880. Hornaday himself won the organization's first annual competition for a sensationalized orangutan group he entitled "Fight in the Tree-tops." The exhibit, which the U.S. National Museum purchased, earned him a position as chief taxidermist there. It is not clear why his attention turned to the bison in 1886, but he seems to have been motivated primarily by his desire to create a striking group display of this increasingly rare creature.

After securing pledges of a military escort and logistical support from the U.S. secretary of war, in May of 1886 Hornaday and two assistants set out to Miles City, Montana, near where a small herd of bison had reportedly been sighted. When the expedition party arrived, they encountered local residents who expressed skepticism about claims of live bison in the area and a landscape littered with bison remains. Row upon row of bleached skeletons provided an eerie reminder of what had been lost. Hornaday realized that any living bison he might find during this time of the year would probably be shedding its winter plumage, thus making it unsuitable as a museum specimen. But he hoped to find at least a few specimens that were still in reasonable shape, and he wanted to reconnoiter the area for a possible later expedition. Much to his delight, the expedition party managed to capture a month-old, light-colored calf, dubbed Sandy, which they transported back to Washington and put on display.

Hornaday and an assistant returned to Montana in late September 1886. With three cowboy guides and a four-man military escort, the party spent two months in the field before inclement weather forced their retreat. During this period,

FIGURE 19. William T. Hornaday and bison calf "Sandy," 1886. This young calf, which Hornaday captured alive during a western expedition to obtain bison specimens for the Smithsonian Institution, became a source of the inspiration for the U.S. National Zoo. Hornaday originally conceived of the institution as a way to preserve vanishing forms of North American wildlife. Courtesy of the Smithsonian Institution Archives, Record Unit 95, image no. 74-12338.

Hornaday's party secured twenty-five bison skins, one head skin, sixteen fresh and dry skeletons, fifty-one dry skulls, and two bison fetuses. On the final day in the field Hornaday even managed to bring down a massive old bull, "a truly magnificent specimen," that weighed about 1,600 pounds and measured five feet, eight inches at the shoulder, a full two inches taller than any other in the Smithsonian collection.[6] When Hornaday skinned the specimen, he discovered four old bullets lodged in its body.

Hornaday was ecstatic and soon after returning to Washington began designing a large exhibit incorporating the specimens as a proper "monument to the American bison."[7] Such an exhibit would provide an ideal opportunity to demonstrate the possibilities of the artistic groups he had been promoting while memorializing one of the West's most characteristic species. After receiving the requisite permissions, he selected six bison for the group, including not only the massive old bull, but also Sandy, the young calf that had lived on the mall in Washington for two months before its untimely death. He mounted the specimens using carefully constructed manikins for support, placed the group on a naturalistic setting that included material from the bison's habitat, and enclosed it in a massive mahogany and glass case. Among those who came to visit Hornaday while he was assembling the exhibit was General Phil Sheridan, who had once

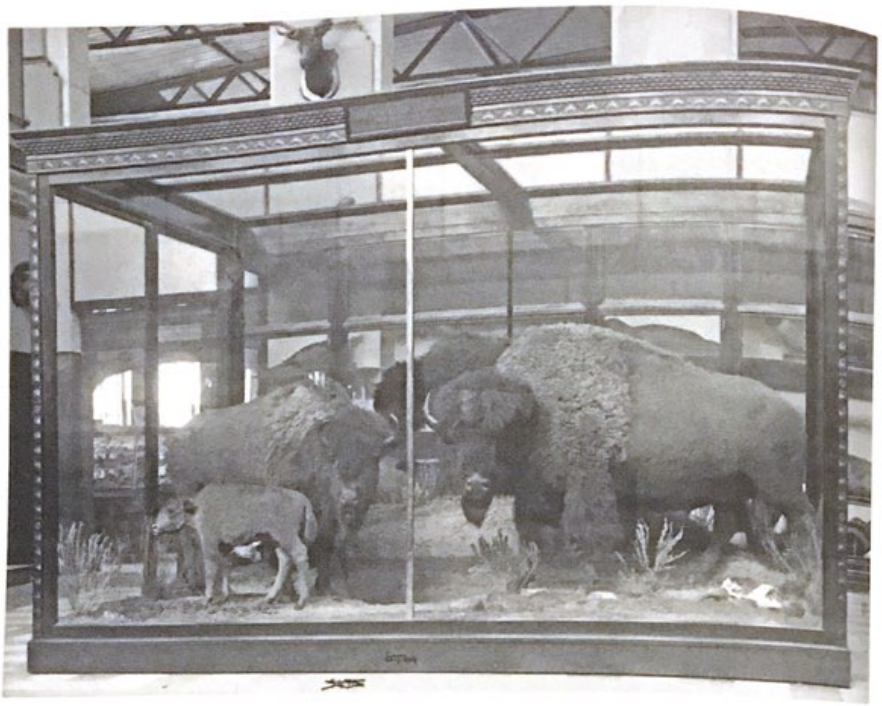

FIGURE 20. William T. Hornaday's bison group, 1886. Hornaday created this impressive exhibit both to commemorate the bison, which was teetering on the brink of extinction, and to demonstrate his considerable taxidermy skills. The large male featured in the center would repeatedly be used as a model for stamps, coins, and insignia. Courtesy of the Smithsonian Institution Archives, Record Unit 95, image no. NHB-5470.

promoted the extermination of the bison as a means to pacify the Plains Indians; another enthusiastic visitor was Theodore Roosevelt, already a nationally recognized political figure. The two men spoke for an hour during their first meeting, found they had much in common, and became lifelong friends.[8]

Hornaday's bison group opened to much fanfare in early 1888. A local newspaper declared the exhibit a great success, a "picturesque . . . bit of the old wild west" transplanted to Washington.[9] Not surprisingly, Hornaday's boss, the director of the U.S. National Museum George Brown Goode, proclaimed his handiwork a "triumph of the taxidermist's art" that "surpassed in scientific accuracy and artistic design and treatment, anything of the kind yet produced."[10] Goode also confirmed plans for a series of similar exhibits of American mammals, each with its own case and natural accessories typical of the species' habitat. Hornaday's bison exhibit remained a favorite at the Smithsonian for the next seventy years, and the large male that towered over the other five specimens became the model for the buffalo-head nickel, a ten-dollar bill, several commemorative stamps, and the seal of the secretary of the interior.[11]

At some point after he returned from Montana, Hornaday realized that it was not enough simply to commemorate the bison in a museum exhibit, no matter how magnificent that exhibit might be. Experiencing a conversion from zealous collector to ardent protector, he grew deeply concerned about the plight of the few bison that remained and determined to do something to rescue them. One product of Hornaday's shift was a lengthy publication, *The Extermination of the American Bison*, that initially appeared in 1889 as part of the annual report of the U.S. National Museum and was later published separately. Reflecting Hornaday's background and shifting motivations, the report is a complex mixture of genres—part scientific treatise, part hunting account, and part call to action. Within its two-hundred-odd pages, he presented one of the longest monographs up to that point covering any single form of North American wildlife, including extensive details about the bison's life history, the factors that led to its extermination, the Smithsonian expedition, and his prized group exhibit. In characteristically hyperbolic fashion, Hornaday minced few words as he blamed the near extinction of the bison on "the descent of civilization, with all its elements of destructiveness, upon the whole of the country inhabited by that animal. From the Great Slave Lake to the Rio Grande the home of the buffalo was everywhere overrun by the man with a gun; and, as has ever been the case, the wild creatures were the first to go."[12] Unless something were done soon to stem the slaughter, numerous other species were likely to fall victim to this same destructive impulse.

A second product of Hornaday's conversion experience was a series of experiments with the captive breeding of vanishing species. Hornaday played a key role in the creation of the National Zoological Park in Washington, D.C., an institution he originally envisioned as a site to preserve and raise endangered North American species, especially mammals. At the time, naturalists and civic leaders had already opened some two dozen American zoos, mostly in northeastern cities, with the primary aim of providing entertainment and education for visitors. Zoo exhibits revealed the order and wonder of nature, offered tangible symbols of America's global reach, and provided a source of civic pride.[13] Hornaday considered these objectives important to garner the continued financial and political support zoos needed to survive, but he also thought they might play an important role in rescuing vanishing species. When his initial plans for the National Zoological Park were thwarted, he moved to New York State, where he was soon was recruited to help establish the New York Zoological Park (more popularly known as the Bronx Zoo). As the first director of that institution, Hornaday worked on techniques to raise and breed several declining mammals with mixed results. He enjoyed the most success with the bison, and in conjunction

with the American Bison Society, he and his colleagues repopulated several western sites with the progeny from early experiments with this charismatic species.

He was not so fortunate with other species facing extinction. Some, like the pronghorn antelope, not only proved more difficult to ship and to maintain in captivity but also less appealing to the public. Other endangered species—like the passenger pigeon and the Carolina parakeet—seemed beyond the pale entirely. Both might have been saved through captive breeding programs if the same attention and care had been devoted to them as to the bison. But naturalists at the time seemed more interested in gathering up the last examples of these beleaguered birds for museum collections—just as Hornaday had done earlier with the bison—than in initiating systematic attempts at captive breeding. And nationalistic, nostalgic appeals to rescue the bison found more resonance with the American public than calls to save the passenger pigeon and the Carolina parakeet.

SAVING BISON, SAVING AMERICA

Shortly after his return from Montana in 1886, Hornaday issued a call for a Smithsonian-affiliated zoo that would shelter the breeding stock of endangered species and help educate the public about their plight.[14] The idea seems to have originated with the capture of Sandy, who remained on display in front of the U.S. National Museum for two months before the young calf finally perished. Several months after his return from his second trip to Montana, Hornaday approached Baird with the idea of creating a zoological park in Washington, but with Baird too ill to act, the idea initially languished. In October 1887, following Baird's death, Goode organized a Department of Living Animals as part of the U.S. National Museum, naming Hornaday as its curator. The ostensible rationale for the new department was to provide Smithsonian taxidermists with living models to observe, but Hornaday later wrote that he also viewed the experiment as a sort of trial balloon for his zoo idea. The first specimens for the new menagerie were gathered by Hornaday during a month-long western trip in the fall of 1887 and housed in a makeshift wooden structure just south of the original Smithsonian Building.

Upon his return, Hornaday began publicly promoting the idea of a full-fledged zoo in Washington, claiming that he was moved to action by the "fearful rapidity with which game is being killed in the West and the absolute certainty that in a few years many of the representative animals will be entirely extinct."[15] If these increasingly rare animals could be captured and successfully

bred, Hornaday argued, they might be rescued from oblivion. Not surprisingly, Hornaday was especially interested in saving the beleaguered bison and urged Goode to procure specimens as soon as practicable: "It now seems necessary for *us* to assume the responsibility of forming and preserving a herd of live buffaloes which may, in a small measure, atone for the national disgrace that attaches to the heartless and senseless extermination of the species in the wild state."[16] Within a year, Hornaday had his wish, and six bison were among the growing collection of animals that graced the Washington Mall, where they attracted a throng of admiring visitors.

The popularity of the menagerie convinced Samuel Pierpont Langley, Baird's successor as secretary of the Smithsonian, to back Hornaday's proposal for a National Zoo in Washington. Once the appropriate legislation had been introduced into Congress, Langley authorized Hornaday to devote part of his work week to fleshing out and promoting the proposal. Hornaday played a central role in virtually every aspect of bringing his idea to fruition, from selecting the 166-acre site at Rock Creek to negotiating the purchase of land and from drafting legislation to testifying before Congress. He even prepared detailed plans for the grounds and animal accommodations. Throughout this arduous two-year process, he repeatedly stressed that one of the main purposes of such a zoo would be to provide a "suitable place in which to preserve representatives of our great game animals before they are all exterminated."[17] A little more than year after the final legislation authorizing the establishment of the National Zoological Park became law in April 22, 1889, however, Hornaday abandoned his cherished project, resigning from the Smithsonian after experiencing sharp differences with Langley over his role in the fledgling institution. In the absence of his visionary leadership, the new zoo quickly became a recreational site for the citizens of Washington, D.C., rather than a place where threatened North American species might be rescued from the fate of extinction.

Disillusioned at the experience, he spent the next six years as secretary of a real estate firm in Buffalo, New York, where he found the time to complete a novel, *A Man Who Became Savage,* and a bestselling nature book, *The American Natural History.* Hornaday was finally drawn back into the world of wildlife conservation in 1896, after receiving a letter from the paleontologist Henry Fairfield Osborn, a professor of zoology and dean at Columbia University, head of the Department of Vertebrate Paleontology at the American Museum of Natural History, and later longtime president of that institution. Osborn wondered if Hornaday might be interested in assuming directorship of a new zoo in New York. The organization behind the planned facility was the New York Zoological

Society, which itself was an outgrowth of the Boone and Crockett Club, a group of well-heeled hunters, explorers, and conservationists, most of whom resided in the metropolitan New York area.

As early as 1884, George Bird Grinnell had published an editorial in *Forest and Stream* calling for an active national association devoted to protecting game species that might complement the many local, regional, and state game associations established over the last several decades.[18] A year later, he met Theodore Roosevelt after publishing a mixed review of his first book. The two men immediately hit it off, found they shared a deep interest in the outdoors, and began meeting regularly to swap stories about their western adventures. One outgrowth of their conversations was a decision to launch the Boone and Crockett Club, named after two of America's most renowned frontiersmen, in December 1887. The main purposes of the new organization were to "promote manly sport with the rifle" and "to work for the preservation of the large game of this country."[19] Regular membership was limited to one hundred men who had successfully bagged at least one representative of each of the three kinds of North America's big-game species, though individuals who had made a significant contribution to wildlife conservation could also be invited to become associate or honorary members. One of the new organization's first major conservation campaigns met with success in 1894, when Congress voted to make it illegal to kill wildlife in Yellowstone Park, imposing a fine of up to $1,000 and a jail sentence of up to two years.[20]

Roosevelt and other members of the Boone and Crockett tended to be deeply ambivalent about the forces of modernity that were transforming the American landscape.[21] On the one hand, they benefited financially from the exploitation of the nation's natural resources—the Roosevelt family, for example, made its fortune in railroads, which consumed vast quantities of wood, coal, and iron while facilitating the commercial slaughter of wildlife throughout the United States. At the same time, these same individuals often lamented the decline of native animals, especially game mammals, that had resulted from overhunting, habitat destruction, and displacement by nonnative and domesticated species. They also supported Roosevelt's call for Americans to embrace the "strenuous life" and viewed the activity of hunting as a means to counter the ill effects of an increasingly modern, urban, industrial society. Vigorous pursuit of animals in the wild provided an especially appropriate way for Americans to reconnect with their pioneer origins, they argued, to reinvigorate the character and values of the American way of life that the historian Frederick Jackson Turner had highlighted in his famous 1893 address on "The Significance of the Frontier in

American History."[22] Not coincidentally, many supporters of game conservation during the period also tended to be vehemently anti-immigrant.[23]

A prominent example was the patrician lawyer, sportsman, naturalist, and eugenicist Madison Grant, who joined the Boone and Crockett Club in 1893.[24] Although he had recently graduated from Columbia University law school, Grant was always "more interested in the pursuit of game than of the law."[25] Not long after joining the society, Grant wrote Roosevelt, who remained president of the Boone and Crockett Club after moving to Washington to serve as Civil Service Commissioner, requesting that he appoint a committee to establish a zoological park in New York City.[26] After receiving Roosevelt's assent, Grant chaired a committee responsible for shepherding a bill through the state legislature that incorporated the New York Zoological Society and authorized the newly established institution to create a zoo. Boone and Crockett men dominated the executive committee of the new society, with Grant serving as secretary. Henry Fairfield Osborn also proved central in developing the policies and plans for the new zoological garden. Both men would continue to play leadership roles in the institution for the next several decades.[27]

In November 1895, Osborn and C. Grant La Farge (an architect and Boone and Crockett member) crafted a preliminary plan for the proposed zoo. They envisioned placing animals in enclosures that resembled their "natural surroundings" as much as possible rather than the cramped iron cages typical of American and European zoos at the time.[28] Two months later, the executive committee recommended hiring "an officer of practical experience and acknowledged scientific standing" to help locate the site for the new zoo, develop its policies, and oversee its construction.[29] After receiving favorable recommendations from George B. Goode and C. Hart Merriam, head of the Bureau of the Biological Survey, Osborn offered Hornaday the job.

Jumping at the opportunity to once again bring his vision for a modern zoo to fruition, Hornaday began work in April 1896. Of the several potential sites for the new facility under consideration, he immediately fell in love with South Bronx Park, which was blessed with ample space and a wide variety of relatively undisturbed habitats. In a telling metaphor, Hornaday wrote that if Noah were to arrive at the site "with his arkful of animals and turn them loose . . . each species would promptly find there its own suitable place." In addition to gathering a miscellaneous collection of animals displayed to entertain and educate "the general public, the zoologist, the sportsman, and every lover of nature," the new zoo would also be a modern-day Noah's ark that would rescue the many "native animals of North America" struggling for survival. Indeed, the first priority of

the fledgling institution would be to collect "a liberal number" of the continent's notable animals threatened with extinction, for "nearly every wild quadruped, bird, reptile and fish is marked for destruction."[30] After an extensive tour of European zoos, Hornaday returned home to complete plans for, oversee construction of, and stock the new zoo, which finally opened to much fanfare in November 1899. As Hornaday and his colleagues originally envisioned it, then, the New York Zoological Park was to be a kind of hybrid institution, a mixture between a more traditional zoo stocked with a miscellaneous assortment of exotic creatures and a wild animal reserve for endangered North American species.

Obtaining a nucleus herd of bison to stock the twenty-acre range he had planned for the park's southeastern corner ranked high among Hornaday's priorities.[31] Following a series of inquiries, he negotiated to purchase four bison from Charles Goodnight in the Texas panhandle and three from Ed Hewens in Oklahoma. Hornaday also hoped to establish breeding herds of other large western mammals—antelope, caribou, mule deer, and other threatened species—but he experienced numerous difficulties achieving this goal. In its early years, for example, the zoo received sixteen pronghorn antelopes in two separate shipments, but all of them soon fell victim to disease or roaming dogs. Hornaday also initially struggled to maintain a self-perpetuating bison herd at the Bronx Zoo, one of the institution's most popular attractions in its early years. He blamed the frequent deaths of the species on gastroenteritis, which he thought was caused by eating rank grass, but the animals continued to die off regularly even after the grass was burned off, the terrain plowed, and the topsoil removed. Though soon forced to relinquish plans to raise large numbers of other North American game animals, Hornaday persevered with the bison. After repeated infusions of purchased or donated specimens, the zoo's bison herd eventually stabilized and then began to increase through the birth of new calves. The venture proved so successful it led to an ambitious project to begin restocking the West with animals from the New York Zoological Society collection.

BACK HOME ON THE RANGE

The popular nature writer and lecturer Ernest Harold Baynes first conceived of the idea of establishing a national society dedicated to preserving the critically endangered bison.[32] The notion apparently came to him sometime after June 1904, when he took up residence on the edge of Austin Corbin's Blue Mountain Forest Game Reserve, in western New Hampshire. Among the many game species confined within the remote, 24,000-acre site were 160 bison, a herd that had grown from twenty-two animals introduced nearly three decades earlier to be-

FIGURE 21. Ernest H. Baynes with bison team, 1928. After training a pair of young bison to harness, Baynes began exhibiting them publicly as a way to gain support for the American Bison Society. From Raymond Gorges, *Ernest Harold Baynes: Naturalist and Crusader* (1928), 82.

come one of the largest remaining populations of the threatened species. Baynes was greatly taken with the bison he witnessed at the site and even managed to train two of Corbin's calves to pull a cart, a feat that greatly amused the locals who questioned how much control he was actually able to exert on the pair. One wag was reported to have commented that Baynes "hitches 'em up, and they take them where they damned please."[33] Soon Baynes began writing popular articles, presenting lectures, and warning governmental officials about the desperate plight of the species.[34]

In March 1905, after hearing Baynes speak in New York, Hornaday received authorization to offer the federal government twelve bison from the New York Zoological Society's modest herd.[35] The hope was to place these animals on the Wichita National Game Reserve in Oklahoma Territory that Roosevelt had established on a former Indian reservation recently opened to settlement.[36] Hornaday and his colleagues now admitted that zoo-confined animals, "even where the enclosures were as large as the New York Zoological Gardens," would inevitably fail to perpetuate the species over the long haul. They also feared that privately held herds could be sold at any time or crossed with cattle. The only way to maintain the bison as a purebred species "in full vigor for the next two hundred years, or more" would be by establishing a series of herds on public lands "in ranges so large and diversified that the animals will be wild and free." Under

such conditions, Hornaday repeatedly asserted that the animals would not suffer any ill effects from inbreeding.[37] After securing permission from the society's executive committee, Hornaday offered a nucleus herd of twelve buffalo to the secretary of agriculture on the condition that Congress appropriate the funds to fence the area.

Baynes, who felt slighted by Hornaday's effort to introduce bison to the Wichita Game Reserve without consulting him, continued to push for the creation of a national society devoted to the species' preservation for "historical, sentimental, and practical reasons."[38] After several months of dragging their feet on the issue, Hornaday and Grant finally agreed to support the proposed organization. In December 1905, a small group of interested men (fourteen to be exact) gathered in the zoo's Lion House to found the American Bison Society. Theodore Roosevelt agreed to serve as honorary president of the new organization, Hornaday as president, and Baynes as secretary. Eventually, the society would grow to more than four hundred members, the vast majority of whom were wealthy males from the eastern United States.[39]

A publicity pamphlet the society issued shortly after its creation reveals much about its members' motivations. From the opening sentences, nationalism and nostalgia loom large in the four-page appeal: "The American Bison or Buffalo, our grandest native animal is in grave danger of becoming extinct; and it is the duty of the people of today to preserve, for future generations, this picturesque wild creature which has played so conspicuous a part in the history of America. We owe it to our descendants, that all possible effort shall now be made, looking to the perpetual increase and preservation of this noble animal, whose passing must otherwise be a matter of universal and lasting regret." While most remaining bison were now in private hands, the only way to ensure the long-term preservation of "our national animal" was through the creation of several government-owned herds in widely separated locations. The bison possessed definite commercial value, but it also has a "far better and stronger hold on the American people than can be estimated in dollars and cents." The species was "the most conspicuous that ever trod the soil of this continent," and its history was intimately interwoven with that of the American people. As such, it remained central to the nation's identity, and its extinction would not only represent "an irreparable loss to American fauna" but also a "disgrace to our country." In a relatively brief period, a creature that had once numbered in the "countless millions" had been reduced to a critically low point. Now was the time for action: "The least we can do now to partly atone for this ruthless slaughter, is to join in measures to prevent what must otherwise be the final result of perhaps the greatest wrong ever inflicted by man upon a valuable animal."[40]

FIGURE 22. Crating bison to ship west, 1907. Hornaday (*far left*) oversees shipment of the bison bred in the Bronx Zoo to the newly established Wichita National Game Reserve in Oklahoma Territory. This was the first in a series of federal bison reserves that the American Bison Society promoted as a way to repopulate the beleaguered species in the West. © Wildlife Conservation Society.

In other lectures and publications, representatives of the American Bison Society also stressed how the organization promoted and made possible continued beneficial contact with the natural world. For example, in 1914, the naturalist, museum director, and longtime vice president of the American Bison Society Franklin W. Hooper warned that modern Americans faced an increasing danger of losing "our respect and love for the animal life of the field and forest": "Blind to the great lessons of nature, we may so lose ourselves in the artificial maze and swirl of city life as to have no longer the stars to guide our course, the sturdy oak and the tall tapering pine to give us strength and inspiration, the flowers of the field to teach us beauty and humility, and birds of the air and the animals of the forest, companions of men for countless ages, to indicate to us how by diligence has come to pass the rising scale of life up to man." The American Bison Society was "bringing man back to nature," and one lesson to be found in observing wildlife like the bison was a "future wholesome and higher development of man; man not as master, but as servant, companion, and co-laborer of all created things."[41]

The first order of business for the newly founded society was completion of the Wichita bison reintroduction project.[42] Following a visit to the site, in February 1906, J. Alden Loring, a naturalist and former New York Zoological

Society curator, issued a report recommending an area of about twelve square miles on the western portion of the reserve as the most suitable range for the species.[43] Congress then unanimously appropriated the funds to erect a fence around this portion of the reserve, a project that was completed in 1907. In October of that year, Hornaday supervised the difficult process of loading fifteen bison into crates that were shipped cross-country from New York by rail and then hauled twelve miles by wagon to the newly established reserve. Ever mindful of the value of publicity, Hornaday made sure that photographers were on hand to document the move.[44]

The creation of the Wichita National Bison Herd, the first of several similar projects, was layered with irony. With the support of the American Bison Society, a New York zoo was exporting the buffalo back to its native western habitat in the Great Plains, to reservation lands that had been confiscated from the Apache, Comanche, and Kiowa Indians. The federal government, which only a few years earlier had actively encouraged the slaughter of the bison as a strategy to achieve final victory over the Plains Indians, was now appropriating money to rescue the beleaguered species. The same railroads that had facilitated the near extinction of the bison by linking hide-hunters to markets were now providing free transportation for live bison back to the West. And all this activity was being coordinated by a group of well-to-do easterners who viewed the species as a symbol of the untamed past that they hoped somehow to perpetuate. They were attempting to preserve the "wild" bison, however, by confining it to relatively small, fenced areas, where it was subject to nearly constant supervision and manipulation.

During this same period, members of the American Bison Society learned that Michel Pablo was trying to dispose of the bison herd that he had been grazing on Montana's Flathead Indian Reservation for more than two decades. Pablo and another half-Indian, Charles Allard, had apparently purchased fourteen bison in the early 1880s as an investment, and by 1907, the herd had grown to more than six hundred head, despite numerous sales in the interim.[45] When the federal government began opening up the Flathead Reservation to white settlement, Pablo realized that soon he would no longer enjoy access to free range. Congress refused to appropriate the money to buy the Pablo herd, so he approached the Canadian government hoping to negotiate a favorable lease for grazing land. Canadian officials responded by offering him $200 per head to purchase his bison. Once Pablo signed the contract, he began rounding up the creatures, which by all accounts proved a challenging ordeal. Between 1907 and 1912, he shipped 708 bison to an area known as Buffalo Park, near Wainwright, Alberta.

The sale of the Pablo herd to Canada stung the pride of Hornaday and other leaders of the American Bison Society. In response, the organization initiated a

campaign to secure part of the Flathead Reservation as a federal bison preserve and to raise the funds needed to stock it. Overtly nationalistic appeals loomed large in letters urging Congress to authorize the purchase and fencing of suitable land on the site: "The loss of the Pablo-Allard herd, through its purchase last year by the Canadian government, was to all patriotic Americans a source of surprise and regret; but it is still possible for that loss to be made good, provided action is taken immediately."[46] Nationalism also featured prominently in letters soliciting donations to purchase animals for restocking (although at least one western recipient of the society's solicitation letter apparently mistook it for a fraudulent investment scheme!).[47] With the backing of President Roosevelt, in 1908, Congress authorized creation of the National Bison Range and provided the funds needed to fence the thirteen-thousand-acre area that was later chosen by representatives from the Biological Survey, the Forest Service, and the Bureau of Indian Affairs. With the more than $10,000 raised through popular subscription, mostly from wealthy easterners, Hornaday purchased thirty-four bison from Alicia Conrad in Montana, whose husband had earlier obtained his bison from Allard's heirs. The society also received several donations of bison from the Corbin and Goodnight herds.[48] However, Hornaday refused to negotiate with Pablo, who was still technically the owner of about seventy-five bison that had eluded capture. Apparently, he wanted nothing to do with the "half-breed Mexican-Flathead" who had sold bison to Canada.[49]

By 1910, Hornaday declared that the basic mission of the society had been accomplished. With the establishment of federal bison herds at Yellowstone, Wichita, and Montana, "the future of the American Bison, as a species" was "now secure."[50] He offered to resign his position as president but was convinced to stay on for a final year. Some of Hornaday's colleagues clearly felt more needed to done to ensure that the bison was truly safe, and in 1913, the society successfully lobbied for the establishment of a fourth federal herd at the Wind Cave National Park, in South Dakota. Once again, the New York Zoological Society provided a nucleus herd to stock the new reserve, shipping fourteen animals.[51] By that point, the society's annual bison census revealed a total of more than three thousand pure-blooded bison in North America, including five hundred "wild" bison, mostly in government hands. Madison Grant and Henry Fairfield Osborn, now president of the American Bison Society, began urging that the organization extend its activities to preservation of the pronghorn antelope, another western mammal whose range largely overlapped that of the bison, but they could never generate the same interest in this species.[52] Two years later, the society split in a vote over whether to disband entirely.[53] While enthusiasm for bison preservation waned in the face of apparent success, not until 1936 did the society quit collect-

ing dues from its members. By that point, there were more than twenty-thousand bison in North America.

LOST OPPORTUNITIES

The success of the bison restoration efforts contrasted greatly with story of the passenger pigeon. At the annual meeting of the American Ornithologists' Union in 1909, the naturalist C. F. Hodge, of Clark University, wondered out loud: Has a "scientifically adequate search" been made to locate possible remnants of the once abundant species that might still be hanging on in the wild? When he received a resounding "no" in reply, he and William Beebe, a curator at the New York Zoological Society, raised a reward totaling more than $1,000 for anyone who could locate a nesting colony or even a single undisturbed nest of the species.[54] To aid in what they hoped would be an intensive nationwide search, the taxidermists and field-guide publishers Charles K. Reed and Chester Reed produced a widely distributed pamphlet with a color plate featuring the bird; Dutcher and the National Association of Audubon Societies also prepared colored plates of the passenger pigeon and mourning dove for circulation. In addition, Hodge spread word about the project through the popular press. Although the search was renewed for two subsequent seasons, none of the many reported sightings Hodge received panned out; most turned out to be the common mourning dove. Disappointed, by October 1912, he declared an end to the project. At that point the only passenger pigeons known to exist were an aging pair at the Cincinnati Zoo.

The passenger pigeon might have been saved through a systematic captive breeding program, but there were no sustained, organized attempts to do so, as there had been for the bison. There were, however, a handful individuals and institutions that dabbled with raising the species. In 1887, for example, the Milwaukee bird fancier David Whittaker obtained four passenger pigeons from a Native American who had captured them in northeastern Wisconsin. One of the birds died and another escaped, but the remaining two bred successfully in an outdoor cage he kept near his house. By the time the ornithologist Ruthven Deane visited Whittaker in 1895, the flock had grown to fifteen birds.[55] Over the next two years, he sold all of his passenger pigeons to the University of Chicago biologist Charles O. Whitman, who soon returned seven of them back to him. By 1909, all remnants of Whittaker's original group had perished.[56]

Whitman, who had raised domesticated pigeons as a boy, purchased Whittaker's birds primarily because he was interested in the light the species might shed on avian evolution and behavior.[57] The passenger pigeons were part of an

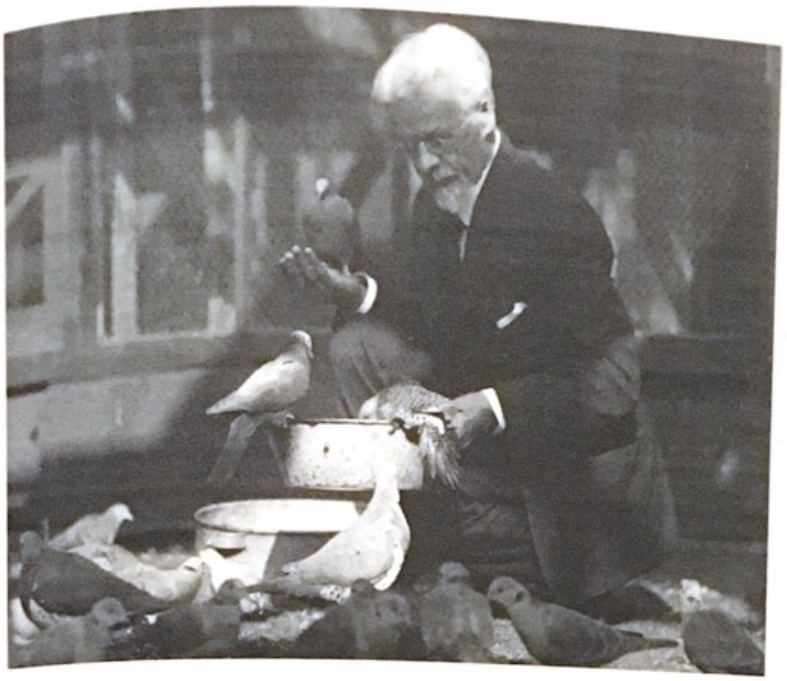

FIGURE 23. Charles O. Whitman in his columbarium, 1908. Whitman, who raised pigeons to study their evolution and behavior, seemed cavalier about the passenger pigeons that were part of his extensive collection. Although he once owned as many as fifteen of the endangered species, all of them had perished by the time this photograph was taken. Courtesy of the Special Collections Research Center, University of Chicago Library, ASAS-00316.

extensive bird colony—eventually numbering about 550 pigeons and doves, representing thirty species—that he kept at his home beginning around 1895. Nearly every summer for the next two decades, he shipped the entire colony by rail from Chicago to Cape Cod, Massachusetts, and back, so he could continue his studies without interruption while serving as director of the Marine Biological Laboratory at Woods Hole. Although he was undoubtedly aware of the passenger pigeon's endangered status, its preservation seemed less pressing to him than his scientific research. He failed to warn the public about the plight of the species, and, as the forced annual migration of his birds suggests, he seemed rather cavalier about the exceedingly rare specimens he possessed. Part of his response may have been related to his knowledge that his flock, all descendants from a single pair, seemed to be suffering from the ill effects of inbreeding. They would not survive over the long haul without the infusion of new blood, a prospect that seemed increasingly unlikely with each passing year. By 1907, all of Whitman's passenger pigeons were dead, save for two hybrids between that species and the common ring dove. Both were infertile males.

In 1902, Whitman did donate one female passenger pigeon to the Cincinnati