INTRODUCTION

Toward a Cultural History of American Biology

Newspaper magnate Edward W. Scripps and biologist William E. Ritter had much to discuss. One Saturday morning in June 1919, Scripps drove the few miles from his southern California estate to the Scripps Institution for Biological Research, the starkly modern laboratory he and his sister Ellen had built on a hillside overlooking the Pacific, just north of the village of La Jolla. Ritter, Scripps's longtime friend and the institution's founding director, took his visitor to his large second-floor office. The two men—one a self-described "damned old crank," the other a gentlemanly scientist-philosopher—talked into the afternoon; as the coastal haze lifted, and they could see up and down the beach from the institution's balcony, they agreed to collaborate on a project in what they called "socio-biology."[1]

Scripps and Ritter's socio-biology was not the same as the "sociobiology" developed and promoted, some six decades later, by Harvard entomologist Edward O. Wilson. While the latter was fundamentally an interpretation of the continuities between animal and human nature, the former was above all a blueprint for culture—for the improvement of modern American life. It combined scientific understanding, philosophical convictions, organizational initiatives, and a national vision.

The two Californians' project originated from a particular concern. Only a few days earlier, the German government had accepted the terms of the treaty that President Woodrow Wilson and the Allies had crafted to shape the world after World War I. Scripps and Ritter anticipated that the global preeminence the United States was now claiming would oblige Americans to "carry responsibilities such as no other people in the history of the world have ever had to bear." In a twist on Wilson's famous phrase, Scripps argued that now that the world was "safe for democracy," the problem was "to make democracy safe for the world."[2]

Scripps and Ritter viewed this sociopolitical problem, however, from a broad biological perspective. They took seriously the fact that people were animals, and they were convinced that all human activities—including voting, newspaper publishing, and scientific investigation—ought to be comprehensible within a properly conceived science of biology. Improving democracy depended on making the human organisms residing in the United States

Figure 1–1

Scripps Institution for Biological Research, early 1910s. Ritter and Scripps are figures 8–1 and 8–2. Photograph courtesy of the Scripps Institution of Oceanography Archives, University of California, San Diego.

"more intelligent." Breeding for higher IQ was not what they had in mind; both men considered eugenics politically retrograde and probably futile. Rather, they conceived their socio-biological problem to be the search for a way to improve the breadth of knowledge and depth of understanding of millions of people.

Scripps and Ritter believed that, in the twentieth century, "more intelligence must consist largely in more intelligence about science." They understood that newspapers were the primary avenue through which adult Americans learned new things extending beyond the personal. They thus drew from their discussion a specific proposal: to create an "American Association for the Dissemination of Science," soon to be renamed Science Service. In the next months, Scripps would endow, and Ritter preside over, a news agency whose mandate was to increase and improve the presentation of science in the nation's press.

Science Service's originators anticipated that much of their organization's work would be expository in content and incremental in impact. But they expected that certain moments could be crucial. Thus, in 1925 Ritter was

ready to preside over Science Service's special program to send experts to Dayton, Tennessee, to shape press coverage of the trial of the biology teacher John T. Scopes. From Ritter's perspective, this paradigmatic American media event provided biologists an unparalleled opportunity to explain evolution to millions, to advocate scientific attitudes, and thus, Ritter hoped, to make people "more intelligent." It was one step in biologists' efforts to improve American life.

Three generations later, Scripps and Ritter's convictions—that the promotion of democracy and the reinforcement of American global power were biological problems, that a biological solution to these problems should be the creation of a newspaper bureau devoted to science popularization and advocacy, and, more broadly, that such national planning was part of the mission of an institution for "biological research"—seem strange. The aim of this book is to make those activities understandable. Certain aspects of their thinking—for example, their emphases on newspapers and on Wilsonian rhetoric—were peculiar to themselves and to the unique circumstances of 1919. But their deeper conviction—that biology provided a foundation for improving American life—had long motivated American biologists and their supporters. I want to recover the history of that conviction.

Throughout the nineteenth century, and well into the twentieth century, American biologists sought to influence national development. Their interests included determining what the extent and boundaries of the United States ought to be, exploiting the resources of the North American continent in the interest of the Euro-American population, defining American identity, and creating a sensibility among Americans appropriate to their position in the world—a sensibility that would be liberal, secular, and humanistic. Biologists' engagement with these problems was an important element in gaining support from national leaders in the development of biology, in shaping a national scientific network, and in orienting scientific work in particular directions. Although scientists' hopes were often more grandiose than their accomplishments, their accomplishments were not negligible. Interest in improving American life existed, however, in tension with other scientific desires, which were more individual and purely intellectual. At particular moments this tension broke biologists into openly competing groups.

The story of these efforts can be divided into three parts. The first interprets the development of natural history in the United States in the nineteenth century. There was initially a close identity among national development, efforts to organize naturalists across the nation, and the ability to think about

the continent's natural history and biological future. The earlier efforts, prior to the Civil War, centered on a private university—Harvard—and its two leading naturalists, Asa Gray and Louis Agassiz. After the war the center of activity shifted to the newly prominent federal government—to a group of naturalists who had come from the provinces to work under the creator of the National Museum, Spencer Baird. Their efforts peaked in the 1880s in an integrated republican program, centered on the aptly named Cosmos Club, in which natural resources, national development, and political advancement reinforced each other. This program continued into the twentieth century in a more technocratic form within the Department of Agriculture and the Bureau of Immigration, where scientific bureaucrats sought to shape the biotic and demographic future of the country.

Part 2 examines the appearance of a new academic culture of biology in the last quarter of the nineteenth century. Federal naturalists overreached in the 1880s: their organizational base was too limited, their intellectual aspirations too grand, and their scientific practice too tedious. The alternative was a multitude of endeavors that were specialized both geographically and intellectually. Attempts to organize the life sciences nationally and to integrate disciplines were decoupled from state power and national goals. Although this period has been characterized as a "search for order," searches for order in the life sciences were at most partly successful; both geographic dispersion and interdisciplinary competition were against them. Academic biologists, however, had one great success that was specific to their science: at Woods Hole, Massachusetts, they took advantage of the unique characteristics of their domain to project a single science of biology with national scope. By focusing exclusively on a cosmopolitan, universalizing quest for basic knowledge defined by academic standards, however, they separated themselves from American society and its problems.

Part 3 deals with the efforts of this national academic elite, organized around the science of biology, to reengage with American problems. Whereas in the nineteenth century this engagement occurred on the level of organisms, in the twentieth century it was focused on the more abstract level of biological functions. One place where the proponents of biology were notably successful—but in a way that is retrospectively so obvious that both scientists and historians have ignored its importance—was in schools. Biology, designed as a science that would bring children into self-conscious adulthood, became a near-universal experience for American middle-class adolescents. Grander efforts—epitomized in the Scripps-Ritter partnership—conveyed a scientific philosophy to the American people that was fundamentally progressive. In addition, biologists sought to direct and alter the "breeding" of American peo-

ple. Grand schemes for eugenic improvement failed, largely because they were incompatible with the new framework for academic research. Sexual biology, by contrast, was an area of triumph. The high school textbook writer and evolutionary biologist Alfred Kinsey profoundly influenced what Americans did in their most private lives.

What follows is, in essence, a cultural history of American biology, extending from the beginning of the nineteenth century to the middle of the twentieth century. However, it is neither antiquarian nor encyclopedic. The key terms here—biology, American, and cultural history—need to be understood in both the multiplicity of their meanings and in the exclusions they entail.

The word "biology" has, from its coinage in the early nineteenth century to the present, often referred to a broad sector of learning, synonymous with "life science." More specialized disciplines, ranging from cytology to ecology and from bacteriology to ornithology, have been included under such a biological umbrella. Simultaneously, however, biology has been a word around which particular research groups have rallied, in the belief that the seemingly chaotic agglomeration of scientific collectives dealing with organisms and their properties needed a coherent, essentially academic, core. The nature of that core has varied, with priority given to adaptation, evolution, the cell, or protoplasm, and, more recently, DNA and information. But advocates of academic biology have sought to conceive a subject that linked basic instruction with the most advanced research. One of the most important events in the history of American biology was the self-conscious effort in the late nineteenth century to make biology an academic nucleus. By preferentially following this academic group, I craft a narrative that reaches into the 1950s; at that point biology, even more than other American sciences, became so large and complex that the conceptual tools used here wear out. But, as chapter 3 indicates, the story is quite selective even earlier. I can only gesture toward the range of work done in agriculture, ecology, and medicine in the early twentieth century in the hope that others will explore the dimensions and significance of these enterprises.

"American" is not a word about which I can say anything new; I can only scratch the surface of reflections that other scholars have made. The linguistic presumption that residents of the United States exercised in appropriating a term dealing with the entire western hemisphere preferentially to themselves is widely recognized. The more focused issues involve its pairing with biology: "American biology" can mean a number of distinct but potentially linked entities. It can refer to the New World setting, the organisms either evolutionarily native to, or presently resident in, the American continents, or in the continental United States. Alternatively, it can describe the work of scientists

trained and employed in the United States, in contrast to those in Europe and elsewhere. Less obviously, it has meant a scientific network that extended beyond particular localities and regions to include the entire nation, or continent. American biology also refers to a national style of science, or to a particular set of problems identified with U.S. scientists. Finally, it could mean some explicitly national, and even nationalistic, American bioscientific project. This book tries to encompass all these meanings, but, as I have indicated, ultimately focuses most fully on the last. I will say the least about style. Some historians have used this notion to characterize national scientific communities to good effect, but the concept is limited in its static quality and its deemphasis on change and on outcomes. As such it obscures what I am trying to accomplish.

This book is a "cultural" history in a straightforward, although hardly undisputed, sense. My methodological starting point is that science is an activity that can be understood, to a significant degree, with the same interpretive tools historians apply to such domains as painting, philosophy, or political reform. My examination of American biologists moves from their geographic and social environments to their particular activities. It emphasizes the formation and interactions of small but communally structured groups, rather than the theories and experimental discoveries made by individuals. It seeks to interpret their plans and visions as much as possible in light of their immediate settings, and it emphasizes the degree of overlap—sometimes conscious, as in the case of Ritter, but sometimes not—between the ways they thought about their objects of study and the ways they thought about themselves.

I am particularly interested in the history of "culture," however, because the word expresses precisely what was most important about American biology in the nineteenth and early twentieth centuries, and what distinguished biology, broadly conceived, from every other human activity, including other scientific disciplines. If we put aside the mostly twentieth-century disputes over the anthropological and literary meanings of culture and return, with historicist sensitivity, to the usage accepted among educated Americans in the 1800s, we find that culture referred, above all, to the intersection of the biological and the technological. *The Century Dictionary*, one of the major American intellectual products of the late nineteenth century, defined culture first as "tillage," second as "the act of promoting growth in animals or plants, . . . specifically the process of raising plants with a view to the production of improved varieties," and, third, as a central element in the new science of bacteriology. It only then noted the recent extension of the word to encompass "the systematic improvement and refinement of the mind," and finally, citing British anthropologist E. B. Tylor and American biologist W. K. Brooks, equated culture with learning and civilization.[3]

I sought to capture this sequence and prioritization earlier, in using "culture" to characterize the aim of Scripps and Ritter's socio-biology. American biology, in sum, was an ongoing effort on the part of scientists in the United States to "culture" the western hemisphere and its organisms—to influence the distribution, reproduction, and growth of plants, animals, and humans, and to improve them. From this perspective, scientists' plans and actions become more important than theories and discoveries. We can interpret discussions about development and evolution not only as arguments about truth, but also—and sometimes most centrally—as a search for tools.

The meanings embedded in such a cultural history of American biology come together through the allusion in my title. Herbert Croly's *The Promise of American Life* (1909) was the central manifesto of the Progressive Era. This oracular book identified the promise of American life as the general realization of prosperity, freedom, "individual and social excellence," and, ultimately, "a larger amount of vitality."[4] The core of the text was a narrative of national history, from the end of the eighteenth century to the present, organized around the argument that progressive development was not providential or natural, but depended on intelligence and planning. Its conclusion emphasized that the fundamental problem for educated Americans in the twentieth century was to reach beyond the narrow desire for technical excellence and professional status to influence the public and improve the nation.[5]

American biologists were significant participants in the processes Croly sketched. They embodied clearly the tension he outlined between the ideals of professional competence and national engagement. More important, they were involved, in senses that were both broad and deep, in movements to understand "American life" and to realize its "promise," or possibilities. Biologists provided the scientific facts that formed the bases for secular thinking about organisms, including humans. More pointedly, they were identified with evolutionism, the theoretical complex that stood at the base of progressive philosophy. They also came to provide guidance concerning the human future. They could grasp (as we will see in part 3) Croly's call to improve "the methods whereby men and women are bred."[6]

My interest in linking biologists to this well-known statement of Progressive Era reform is, to a considerable extent, a matter of integrating history of science and American history, and, more specifically, of showing that biologists were important figures in American development. In recent decades, historians of biology, myself included, have produced detailed studies that have illuminated a variety of scientific changes. This work has connected scientists to other Americans' activities in only fragmentary ways. While granting the extent of diversity and disagreement among biological scientists, I focus on the

simple, continuing commitments of national leaders and spotlight the broader influences that particular groups of scientists had. If I persuade readers that a continuing network of biologists were significant participants in national movements that had consequences, I will be satisfied.

But I would like to do more. Historical writing on American biologists has involved an awkward juxtaposition. While monographers have pointed to significant scientific achievements in areas ranging from paleontology and taxonomy to embryology, cytology, physiology, and genetics, the overall image of the place of life science in American culture has been decidedly more negative. The most fully developed, and certainly best known, narrative of the history of American biology prior to the 1920s is a story, extending from Thomas Jefferson, through Samuel Morton and Louis Agassiz, to Nathaniel Shaler and Charles Davenport, that combines racism, sexism, social darwinism, and eugenics. My reading of American biology's past, however, is different. On the one hand, great American discoverers and clear observational or experimental achievements were few and far between. On the other, as I have indicated, the general narrative is one that includes limits and tragedy, but is ultimately a story of progress.

I link this thinking about history of biology with the larger reassessment, over the last decade, of the Progressive Era and progressive values more generally. Historians' distrust of American nationalism, elite visions, and progress—in their Progressive Era manifestations and more broadly—surfaced in the 1960s in conjunction with bipolar racial tensions and fights over American intervention in Vietnam. That era, however, is now as far in the past as the Depression was then. A decade after the end of the cold war, in a country that is rapidly returning to an ethnic complexity analogous to the situation that existed for a hundred years prior to the mid-twentieth century, it is not surprising to find efforts to reconnect in a positive way with the intellectual leaders of that time.

After an academic generation in which the Progressives were criticized as elitist, naive, and hypocritical, historians have returned to what these people in fact aimed for and achieved. Pragmatist philosophers such as William James and John Dewey have been the focus of efforts by such historians as David Hollinger, Robert Westbrook, and James Livingston to recover a vision that was sensitive to science, the complexity of modern experience, and the openness of the future.[7] Philosopher Richard Rorty and attorney Thomas Geoghegan have recently returned explicitly to Croly for a progressive vision applicable to the post–cold war, post-welfarist situation. Lastly, Michael Lind's *Next American Nation* can be seen as a sequel to *The Promise of American Life*—a polemical tract that forcefully reasserts the positive value of American

nationalism, provides a realistic yet progressive historical overview of the meaning of American national identity, and points toward a future that could be fundamentally egalitarian, free, and racially amalgamated.[8] My story of biologists fits within this framework. It describes efforts of small groups of Americans to build a prosperous, liberal, secular, and humane nation, composed in part of organisms that would reason and experiment.