

Biographical Sketch of Spencer Fullerton Baird¹

GEORGE BROWN GOODE

I. Outline of His Public Career.

Spencer Fullerton Baird was born in Reading, Pennsylvania, February 3, 1823. In 1834 he was sent to a Quaker boarding-school kept by Dr. McGraw, at Port Deposit, Maryland, and the year following to the Reading Grammar School. In 1836 he entered Dickinson College, and was graduated at the age of seventeen. After leaving college, his time for several years was devoted to studies in general natural history, to long pedestrian excursions for the purpose of observing animals and plants and collecting specimens, and to the organization of a private cabinet of natural history, which a few years later became the nucleus of the museum of the Smithsonian Institution. During this period he published a number of original papers on natural history. He also read medicine with Dr. Middleton Goldsmith, attending a winter course of lectures at the College of Physicians and Surgeons, in New York, in 1842. His medical course was never formally completed, although in 1848 he received the degree of M. D., *honoris causa*, from the Philadelphia Medical College. In 1845 he was chosen professor of natural history in Dickinson College, and in 1846 his duties and emoluments were increased by election to the chair of natural history and chemistry in the same institution. In 1848 he declined a call to the professorship of natural science in the University of Vermont. In 1849 he undertook his first extensive literary work, translating and editing the text for the "Iconographic Encyclopedia," an English version of Heck's *Bilder Atlas*, published in connection with Brockhaus's *Conversations Lexikon*.

July 5, 1850, he accepted the position of Assistant Secretary of the Smithsonian Institution, and October 3, at the age of twenty-seven years, he en-

tered upon his life work in connection with that foundation—"the increase and diffusion of useful knowledge among men."* His work as an officer of the Institution will be discussed more fully below. It was constant and arduous, but did not prevent the publication of many original memoirs, among the most elaborate of which are the "Catalogue of North American Serpents" (1853); the "Birds of North America" (1858); the "Mammals of North America" (1859); the "Review of North American Birds" (1864-'66); the "Geographical Distribution of North American Birds" (1865); the "History of North American Birds," in connection with Thomas M. Brewer and Robert Ridgway (1874), and the preparation of numerous official reports. From 1870 to 1878 he was scientific editor of the periodicals published by Harper Brothers, of New York, and the author of their yearly cyclopedia of science, entitled "The Annual Record of Science and Industry." In 1871 he was appointed by President Grant to the position of United States Commissioner of Fish and Fisheries, an unsalaried office, to the duties of which he has for eleven years devoted a large portion of his time. In 1876 he served as one of the Government Board of Commissioners to the International Exhibition at Philadelphia, and was also a member of the international jury. In 1877 he was present, as advisory counsel, at the session of the Halifax Fishery Commission.

In May, 1878, after the death of Professor Henry, he was, by the unanimous vote of the Regents, elected Secretary of the Smithsonian Institution.

II. Honors and Dignities.

Professor Baird, in 1856, received the degree of Doctor of Physical Science from Dickinson College, and in 1875 that of Doctor of Laws from Columbian

University. He was, in 1878, awarded the silver medal of the Acclimatization Society of Melbourne; in 1879 the gold medal of the *Societe d'Acclimatation* of France, and in 1880 the Erster Ehrenpreis of the *Internationale Fischerei Ausstellung* at Berlin, the gift of the Emperor of Germany. In 1875 he received from the King of Norway and Sweden the decoration of "Knight of the Royal Norwegian Order of St. Olaf." He was one of the early members of the National Academy of Sciences, and ever since the organization has been a member of its council. In 1850 and 1851 he served as permanent secretary of the American Association for the Advancement of Science, and since 1878 has been one of the trustees of the Corcoran Gallery of Art in Washington. He has been president of the Cosmos Club, and for many years a trustee of Columbian University. Among his honorary relations to numerous scientific societies of the United States and other countries are included those of foreign membership in the Linnaean Society of London, and the Zoological Society of London, honorary membership in the Linnaean Society of New South Wales, and corresponding membership in the *K. K. Zoologisch-botanische Gesellschaft*, Vienna; the *Sociedad de Geographia*, Lisbon; the New Zealand Institute; the *Koninklijke Natuurkundige Vereeniging in Nederlandsch Indie*, Batavia; the *Magyar Tudományok Akademia*, Buda-Pesth; the *Societe Nationale des Sciences Naturelles*, Chergourg; the *Academia Germanica Naturae Curiosorum*, Jena; the *Naturforschende Gesellschaft*, Halle; the *Naturhistorische Gesellschaft*, Nuremberg; the Geographical Society of Quebec; the Historical Society of New York; the *Deutsche Fischerei Verein*, Berlin.

The nomenclature of zoology contains many memorials of his connection with its history. A partial enumeration shows that over twenty-five species and one genus of fishes bear his name.

A post-office in Shasta County, California, located near the McCloud River Salmon Hatching Station of the United States Fish Commission, was named "Baird" by the Postmaster-General in 1877.

¹From Bull. U.S. Natl. Mus. 30:v-xiii (1883).

*The motto of the Smithsonian Institution and of its founder, James Smithson.

III. Ancestry and Development of Character.

His ancestry upon the one side was English, upon the other Scotch and German. His paternal grandfather was Samuel Baird, of Pottstown, Pa., a surveyor by profession, whose wife was Rebecca Potts. The Bairds were from Scotland, while the Potts family removed from Germany to Pennsylvania at the close of the seventeenth century. His great grandfather on the mother's side was the Rev. Elihu Spencer, of Trenton, one of the war preachers of the Revolution, whose patriotic eloquence was so influential that a price was set on his head by the British Government; his daughter married William M. Biddle, a banker, of an English family for many generations established in Pennsylvania, and identified with the banking interests of Philadelphia. Samuel Baird, the father of the subject of this sketch, established himself as a lawyer at Reading, Pennsylvania, and died when his son was ten years old. He was a man of fine culture, a strong thinker, a close observer, and a lover of nature and of out-of-door pursuits. His traits were inherited by his children, but especially by his sons Spencer and William. The latter, who was the elder, was the first to begin collecting specimens, and as early as 1836 had in hand a collection of the game-birds of Cumberland County. His brother soon became his companion in this pursuit, and six years later they published conjointly a paper entitled "Descriptions of two species, supposed to be new, of the Genus *Tyrannula* Swainson, found in Cumberland County, Pennsylvania."

There are still in the museum at Washington specimens of birds prepared by these boys forty-five years ago by a simple process of evisceration, followed by stuffing the body-cavities full of cotton and arsenical soap. The brother, William M. Baird, diverged into other paths, and at the time of his death in 1872 was United States collector of internal revenue at Reading.

The inheritance of a love of nature and a taste for scientific classification, the companionship of a brother similarly gifted, tended to the development of the young naturalist, and a still more impor-

tant element was the encouragement of a judicious mother by whom he was permitted to devote the five years immediately following his graduation to his own devices and plans instead of being pushed at once into a profession. In 1841, at the age of eighteen, we find him making an ornithological excursion through the mountains of Pennsylvania, walking 400 miles in twenty-one days, the last day 60 miles between daylight and rest. The following year he walked more than 2,200 miles. His fine physique and consequent capacity for work are doubtless due in part to his outdoor life during these years.

IV. Early Friendships and Their Influence.

An important stimulus to the efforts of this young naturalist was the friendship which he formed as early as 1838 with [John James] Audubon, with whom he was for many years in correspondence, and who, in 1842, gave to him the greater part of his collection of birds, including most of his types of new species. Young Baird contributed many facts and specimens for the "History of North American Quadrupeds" at that time in preparation [by Audubon], as well as to [Audubon's] "Ornithological Biography," and was only prevented by ill health from accompanying Audubon as his secretary on his six months' expedition to the Yellowstone in 1840. In those days were formed many of the friendships and partnerships with scientific men which influenced his after life. Among his early correspondents were George N. Lawrence (1841), John Cassin (1843), John G. Morris (1843), Thomas M. Brewer (1845), and S. S. Haldeman (1845). In 1847 he met [Louis] Agassiz, then just arrived from Switzerland in company with Desor and Girard. At this time or a year later was projected the work of Agassiz and Baird on "The Fresh-water Fishes of the United States," which was, however, never published, although a number of illustrations and some pages of text were elaborated. In 1843 he translated Ehrenberg's "Corals of the Red Sea" for J. D. Dana, who was then preparing his reports for the United States exploring expedition. As early as 1846 we find him engaged in the prepa-

ration of a synonymy of North American birds, and visiting Boston to consult the libraries of Amos Binney and the Boston Society of Natural History for works not possessed by the Philadelphia Academy of Natural Sciences. This material was utilized twelve years later in the "Birds of North America."

As professor of natural history in Dickinson College he taught the seniors in physiology, the sophomores in geometry, and the freshmen in zoology. He found time, however, to carry on the works begun in previous years, and to make in summer extended collecting expeditions: To the Adirondacks in 1847; to Ohio in 1848, to collect, in company with Dr. Kirtland, from the original localities of the types, the fishes described by him in his work on the fishes of Ohio; to the mountains of Virginia in 1849; and to Lake Champlain and Lake Ontario in 1850.

When in 1850, upon the urgent recommendation of the late George P. Marsh, he was elected an officer of the Smithsonian Institution, he brought with him to Washington methods of work, developed in his personal experience, which became at once the methods of the establishment, and are still employed in many of its departments.

V. Analysis of His Work and Its Results.

There may be noted in the career of Professor Baird several distinct phases of activity, namely, (1) a period of twenty-six years, 1843–1869, occupied in laborious investigation and voluminous publication upon the vertebrate fauna of North America; (2) forty years of continuous contribution to scientific literature, of which at least ten were devoted to scientific editorship; (3) five years, 1845–1850, devoted to educational work; (4) forty years, 1842–1883, devoted to the encouragement and promotion of scientific enterprises, and the development of new workers among the young men with whom he was brought into contact; (5) thirty-three years, 1850–1883, devoted to administrative work as an officer of the Smithsonian Institution, and in charge of the scientific collections of the government—twenty-eight as principal executive officer and five as Secretary and re-

sponsible head; (6) twelve years as head of the Fish Commission, a philanthropic labor for the increase of the food-supply of the world, and incidentally in promoting the interests of biological and physical investigation of the waters.

VI. Contributions to Science and Scientific Literature.

The extent of Professor Baird's contributions to science and scientific literature may be at least partially comprehended by an examination of the succeeding pages of the present work. The list of his writings is complete to the end of the year 1882, and contains 1,063 titles. Of this number 775 are brief notices and critical reviews contributed to the "Annual Record of Science and Industry," while under his editorial charge, 31 are reports relating to the work of the Smithsonian Institution, 7 are reports upon the American fisheries, 25 are schedules and circulars officially issued, and 25 are volumes or papers edited. Out of the remaining 200 the majority are formal contributions to scientific literature.

It seems scarcely necessary to remark that most of the official reports above referred to, as well as many of the brief articles in the "Annual Record," contain important original matter.

Nineteen of the descriptive papers were published conjointly with Charles Girard, while the most elaborate work, "The Birds of North America," was prepared in its first edition with the aid of Messrs. Cassin and Lawrence, and in its second with that of Messrs. Brewer and Ridgway.

Of the total number of papers enumerated in the list 73 relate to mammals, 80 to birds, 43 to reptiles, 431 to fishes, 61 to invertebrates (these being chiefly reviews), 16 to plants, 88 to geographical distribution, 46 to geology, mineralogy, and paleontology, 45 to anthropology, 31 to industry and art, 109 to exploration and travel.

While the number of new species described does not necessarily afford any clew [sic] to the value of the work accomplished, it may not be uninteresting to refer to it as an indication of the pioneer work which it was necessary to do even in so prominent a group as the ver-

tebrates. I note among mammals 49, birds 70, reptiles 186, fishes 56. Forty-nine of 220, or nearly one-fourth, of the mammals discussed in the "Mammals of North America," were there described for the first time. In the catalogue of serpents not more than 60 per cent. [sic] had been named, and in preparation for studying the specimens, each was carefully ticketed with its locality, and then the 2,000 or more individuals were thrown indiscriminately into one great pile, and the work of sorting them out by resemblances was begun. Not the least valuable have been the numerous accurate figures of North American vertebrates, prepared under Professor Baird's supervision. These include representatives of 170 species of mammals and 160 species of reptiles, besides still many hundreds of birds.

VII. Educational and Administrative Works.

Passing to the consideration of the influence of Professor Baird on the encouragement of scientific enterprise, it seems scarcely necessary to call attention to the manner in which this influence has been exerted, since the relation of the Smithsonian Institution to scientific exploration, particularly in the lines of natural history and ethnology, is a part of the scientific history of the country, and since this department of the work of the Institution was always from its inception under the direction of the assistant secretary. The first grant made by the Institution for scientific exploration and field research was in 1848 to Spencer F. Baird, of Carlisle, for the exploration of the bone caves and the local natural history of Southeastern Pennsylvania.

From the start the Department of Explorations was under his charge; and in his reports to the Secretary, published year by year in the annual report of the Institution, may be found the only systematic record of government explorations which has ever been prepared. From 1850 to 1860 several extensive government expeditions were sent to the western territories, and it became the duty of Professor Baird to enlist the sympathies of the commanders of these expeditions in the objects of the Institution,

to supply them with all the appliances for collecting, as well as with instructions for their use, and also in most cases to organize the natural history parties, nominate the collectors, employ and supervise the artists in preparing the plates, and in many instances to edit the zoological portions of the reports.

The fitting out of such expeditions was only a small part of the work; from the beginning until now there have been numerous private collectors, deriving their materials, their literature, and, to a considerable extent, their enthusiasm from the Smithsonian Institution, and consequently in correspondence with its officers. The Smithsonian "Instructions to Collectors," which has passed through several large editions, as well as numerous circulars written with a similar purpose, were prepared by Professor Baird in connection with this department of his work.

As a result of this extensive work of organization, a large number of young men have been trained as collectors and observers, and among them not a few have become eminent in various departments of science.

In addition to this special branch of his work, the assistant secretary had, from the start, the charge of certain departments of the routine work of the Institution; the system of international exchanges, for instance, which had ever been one of the leading objects of the Smithsonian Institution, was organized by him in its details. His first task, after entering upon his duties, was to distribute the second volume of the "Smithsonian Contributions to Knowledge." Already in connection with his private enterprises he had developed a somewhat extensive system of exchanges with European and American correspondents, and the methods thus established were expanded for the wider needs of the Institution. The main duty of the assistant secretary, however, was the development of the natural history collections. As has already been indicated, the private collection which he brought with him to Washington formed the nucleus of the Smithsonian museum. The only specimens in possession of the Institution at the time of his arrival were a few boxes of minerals and plants. The collections of the Wilkes Exploring Expedition,

which constitute the legal foundation of the National Museum of the United States, were at that time under the charge of the National Institute; and, although by the act of incorporation the Smithsonian Institution was the legal custodian of the national cabinet of curiosities, it was not until 1857 that the Regents finally accepted the trust and the National Museum was definitely placed under the control of the Smithsonian Institution and transferred to its building. Until this time Congress had granted no funds for the support of the Smithsonian cabinets, and the collections had been acquired and cared for at the expense of the endowment fund. They had, however, become so large and important in 1857 that the so-called "National Collection" at that time acquired were small in comparison.

The National Museum then had a double origin. Its actual although not its legal nucleus was the collection gathered in the Smithsonian building prior to 1857. Its methods of administration, which were in fact the very same that had been developed by Professor Baird in Carlisle as early as 1845, are those which are still in use, and which have stood the test of thirty years without any necessity for their modification becoming apparent. In the bibliography below [Goode, 1883] is reprinted from the fifth annual report of the Smithsonian Institution, now exceedingly rare, a report by the assistant secretary in charge of the natural history department for the year 1850, which enumerates the specimens belonging to the Museum on January 1, 1851, including a full account of his own deposit.

Having thus almost from the very outset been associated with Professor Henry in the organization of the Smithsonian Institution, his course since his accession to the secretaryship has been a consistent continuation of that which had for twenty-eight years been adopted.

VIII. Work as Commissioner of Fisheries.

The work of the Fish Commission, in one of its aspects, may perhaps be regarded as the most prominent of the present efforts of the government in aid of aggressive biological research.

On the 9th of February, 1874 [sic],

Congress passed a joint resolution which authorized the appointment of a Commissioner of Fish and Fisheries. The duties of the Commissioner were thus defined: "To prosecute investigations on the subject (of the diminution of valuable fishes) with the view of ascertaining whether any and what diminution in the number of food-fishes of the coast and the lakes of the United States has taken place; and, if so, to what causes the same is due; and also whether any and what protective, prohibitory, or precautionary measures should be adopted in the premises, and to report upon the same to Congress."

The resolution establishing the office of Commissioner of Fisheries required that the person to be appointed should be a civil officer of the government, of proved scientific and practical acquaintance with the fishes of the coast, to serve without additional salary. The choice was thus practically limited to a single man. Professor Baird, at that time assistant secretary of the Smithsonian Institution, was appointed and at once entering upon his duties soon developed a systematic scheme of investigation.

The Fish Commission now fills a place tenfold more extensive and useful than at first. Its work is naturally divided into three sections:

1. The systematic investigation of the waters of the United States and the biological and physical problems which they present. The scientific studies of the Commission are based upon a liberal and philosophical interpretation of the law. In making his original plans the Commissioner insisted that to study only the food-fishes would be of little importance, and that useful conclusions must needs rest upon a broad foundation of investigations purely scientific in character. The life history of species of economic value should be understood from beginning to end, but no less requisite is it to know the histories of the animals and plants upon which they feed or upon which their food is nourished; the histories of their enemies and friends, and the friends and foes of their enemies and friends, as well as the currents, temperatures, and other physical phenomena of the waters in relation to migration, reproduction, and growth. A necessary accompaniment to this division is the amassing of material

for research to be stored in the national and other museums for future use.

2. The investigation of the methods of fisheries, past and present, and the statistics of production and commerce of fishery products. Man being one of the chief destroyers of fish, his influence upon their abundance must be studied. Fishery methods and apparatus must be examined and compared with those of other lands, that the use of those which threaten the destruction of useful fishes may be discouraged, and that those which are inefficient may be replaced by others more serviceable. Statistics of industry and trade must be secured for the use of Congress in making treaties or imposing tariffs, to show to producers the best markets, and to consumers where and with what their needs may be supplied.

3. The introduction and multiplication of useful food-fishes throughout the country, especially in waters under the jurisdiction of the general government, or those common to several States, none of which might feel willing to make expenditures for the benefit of the others. This work, which was not contemplated when the Commission was established, was first undertaken at the instance of the American Fish Cultural Association, whose representatives induced Congress to make a special appropriation for the purpose.

IX. Epilogue.

Comment upon the facts presented in this biographical sketch seems to be unnecessary. Future historians of American science will be better able than are we to estimate justly the value of the contributions to scientific literature which are enumerated in the bibliography; but no one not living in the present can form an accurate idea of the personal influence of a leader upon his associates, and upon the progress of thought in his special department, nor can such an influence as this well be set down in words. This influence is apparently due not only to extraordinary skill in organization, to great power of application and concentration of thought constantly applied, and to a philosophical and comprehensive mind, but to an entire and self-sacrificing devotion to the interests of his own work and that of others.