Verticillium wilt. The variety was characteristically rough and the powdery scab pustules were not easily detected; in fact only one specimen was noticed at the time the tubers were being cut when examination was made for the other trouble. This specimen was laid aside and examination was not made for several days, when the identity of the disease was established, April 26, 1915. On reexamination several other specimens were found in this lot.

A rather hasty survey of Tillamook County was made at once (May 3–8, 1915) and, except on the farm from which the specimens above noted had been sent, only one specimen was found. This specimen was picked up in a grocery store in Tillamook with no possible chance of tracing it to the grower. At the farm from which the first lot was received about two dozen specimens were found on examining about three bushels of potatoes.

The fact that the district is isolated and that potatoes are not raised in sufficient quantity for export possibly has been a natural means of preventing a more general dissemination of the disease.

F. D. BAILEY

AGRICULTURAL EXPERIMENT STATION,
CORVALLIS, OREGON,
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SCIENTIFIC BOOKS

Spencer Fullerton Baird. A Biography. Including selections from his correspondence with Audubon, Agassiz, Dana and others. By WILLIAM HEALEY DALL, A.M., D.Sc. J. B. Lippincott Company. 1915. 8vo, 462 pages, 19 plates.

Dr. Dall has conferred a distinct and lasting benefit on American science and letters by his presentation of the life of one of America's most eminent and beloved men of science. In the twenty-eight years that have elapsed since death terminated the career of Spencer Fullerton Baird, his fame has not diminished, the respect in which he was held as a man and scientist has not abated, and his example has been an inspiration to thousands. For no previous biography has anything approaching completeness been claimed; and it is safe to say that posterity will demand nothing more than is herein contained, for no subsequent biographer will have access to any essential facts or data that were not available to and utilized by Dr. Dall. Chief among the sources of information were Professor Baird's journal, extending, with certain breaks, from 1838 to 1887; letters selected by his daughter, which for the period prior to 1865 are mostly from his correspondents, as the official archives and Baird's own official letters were destroyed in the burning of the Smithsonian building in that year; reminiscences written from Miss Baird's dictation; and a mass of miscellaneous documents and notes that had been collected by Mr. Herbert A. Gill, who for many years had been associated with Professor Baird in the work of the Fish Commission.

The volume is with great propriety dedicated "To the memory of a devoted daughter, Lucy Hunter Baird," the only child of Professor Baird. It was she who began the collection of material on which she intended to base a memoir of her father; and it was she who, finding that she would be unable to complete that task, devised her own and her father's papers to the executor of her will with the request that the "memoir be completed by a suitable and competent person."

The task and the honor of writing a biography of Professor Baird could have been entrusted to no person more competent and sympathetic than Dr. Dall, who, as stated in his preface, had known Professor Baird since 1862, had had the benefit of his teaching and example from 1865 to the time of his death, had enjoyed the hospitality of the Baird home, and from 1869 had knowledge, at the time of its occurrence, of much that is recorded in the biography.

The biographer makes no attempt to enumerate or analyze Professor Baird's voluminous publications, which have already been covered by Professor G. Brown Goode's exhaustive bibliography. The author's "chief aim has been to show the man as he lived and worked; with glimpses of his relations to his contemporaries, to the promotion of science, and to great, and as yet hardly appreciated, public services."

The genealogical and family notes with which the memoir opens are followed by chapters on Childhood and Youth; Life at Carlisle; The Young Professor; The Smithsonian Institution; Life in Washington; 1850 to 1865; 1865 to 1878; The Secretary, 1878 to 1887; The U. S. National Museum; The U. S. Commission of Fish and Fisheries; and Appreciations.

The following epitome covers the principal events in the life of Spencer Fullerton Baird: He was born in Reading, Pa., February 3, 1823. His father died in 1833, and his mother then moved to Carlisle, Pa., where in 1835 he attended the grammar school, an adjunct of Dickinson College. In 1836, at the age of thirteen, he entered that college, of which his father had been a member of the academic senate and his two brothers were already students. After receiving the degree of A.B. in 1840, he began the study of medicine, and in 1841 and 1842 attended lectures at Bellevue Hospital, New York. This subject proving distasteful, he returned to Carlisle in 1842, and resumed his academic studies, taking the degree of A.M. in 1843. In 1845 he was made honorary professor of natural history at Dickinson, and in the following year became full professor, a position held until 1850. His salary, which at the outset was $400 a year, was increased to $650 at the end of the first term and to $1,000 in 1848. The first named salary being regarded as sufficient "to make a start," he married Miss Mary Helen Churchill, of Carlisle, on the strength of his professional appointment. In 1850, following letters written in his behalf by Audubon, Marsh, Dana and Agassiz, and on the nomination of Professor Joseph Henry, Baird, at the age of twenty-seven years, was elected assistant secretary of the Smithsonian Institution. This position was held until the death of Professor Henry in 1878, when Baird was immediately and unanimously chosen as his successor by the board of regents. Meanwhile in 1871, the position of commissioner of fish and fisheries had been created and Baird was appointed thereto by the President. On Baird's presentation of the need for and value of a suitable despository for the government collections, Congress in 1879 appropriated money for a fireproof building for that purpose, and Baird became the ex-officio director of the National Museum. The three positions—secretary, commissioner and director—were held until his death in 1887.

At a very early age Baird evinced a predilection for natural history that was to shape his career and make him one of the greatest systematic and economic biologists that has ever lived. The part of the work which gives the best insight into his early aims, ambitions, traits and habits of thought, as well as into his later plans, methods and aspirations, is the verbatim correspondence between Baird, the members of his family, and scientific and public men. These letters number about 225, and extend from 1831 to 1887. Especially interesting is the intimate correspondence between Baird and Audubon which began in 1840, when the young naturalist ventured to write the most distinguished ornithologist of the United States regarding two flycatchers he could not identify, and continued actively for more than seven years.

This and other correspondence show that Baird's capacity for making and retaining worth-while friendships was due to his zeal, candor and accurate knowledge of his subject, combined with great modesty and a dignified manner. Among the prominent scientific men with whom he became acquainted while still in his teens were, in addition to Audubon, George N. Lawrence, James De Kay, J. P. Giraud, John Torrey, Thomas Nuttall, Samuel G. Morton, T. A. Conrad, James D. Dana, John Cassin, Titian R. Peale and Isaac Lea. This acquaintance and association undoubtedly influenced and strengthened the trend of Baird's studies, which, before his twenty-fifth year, were confirmed and broadened by intercourse with John and Joseph Le Conte, Joseph Leidy, Thomas M. Brewer, Amos Binney, Oliver Wendell Holmes, Asa Gray, A. A. Gould, D. H. Storer, the Sillimans, James Hall, Sir Charles Lyell, George P. Marsh, J. P. Kirtland, Joseph Henry and Louis Agassiz. Especially noteworthy are the series

of letters reproduced in the memoir passing between Baird and Louis Agassiz, James D. Dana, George P. Marsh and Joseph Henry.

The early interest which Baird manifested in fishes increased with age and ultimately was responsible for the genesis and organization of the federal fishery service with which his name is ineffaceably associated. In 1848 specimens of the fishes from his collection were sent to Louis Agassiz, and arrangements had been made for a joint work on American fishes; this, however, owing to Agassiz's more pressing projects, never materialized and, after a few years, was abandoned by mutual consent. In 1854 we find Baird spending a summer vacation on the New Jersey coast and making there a collection of fishes which served as a basis for a noteworthy report. As early as 1863 Baird visited Woods Hole, Mass., and was impressed with the richness of the local marine fauna, and during the next few years he became greatly interested in the fisheries of the Atlantic coast and realized the need for a comprehensive investigation of the causes underlying the reported decrease of certain fishes. A comparison between conditions found in southern New England waters in 1863 and during a visit in 1870 strengthened his desire for authoritative investigation which would supplement the inquiries that had been undertaken by the various states. The psychological time having arrived; Baird having submitted a plan to Congress; the American Fish Culture Association having espoused the idea of federal aid to the fisheries; and state and national legislators, the general public and the fishery interests being in accord, Congress in February, 1871, passed a joint resolution drawn up by Professor Baird and Senator George F. Edmunds which made provision for a commissioner of fish and fisheries and for investigations to be conducted under his direction. President Grant did the obvious thing in appointing Baird to the newly created office, and there were thus imposed on an already busy man additional duties and responsibilities which yearly became more onerous and pressing and ultimately claimed a large proportion of his attention and time.

In 1871 Woods Hole became the headquarters of the commission, and then and there were laid the foundations of the first permanent marine laboratory in America. While the investigations were still in their incipiency, Baird formed the plan of inviting zoological students to visit Woods Hole to avail themselves of the large amount of material daily brought in that did not bear directly on the work of the commission, and he arranged for table and other facilities and cheap board. Thereafter Baird regularly spent his summers on the New England coast directing the local investigations while administering the business affairs of an organization that yearly acquired new functions and extended its activities into new regions. Woods Hole was the scene of his principal activities as it was the spot of his warmest regard. It was there that, advised and aided by men like George Brown Goode, Jerome H. Kidder, Theodore Gill, Richard Rathbun, Z. L. Tanner, H. C. Chester, A. E. Verrill, Alpheus Hyatt, W. G. Farlow, John A. Ryder and Sydney Smith, he planned and inaugurated those noteworthy biological, fishery and fish-cultural operations which soon brought the United States into the forefront of the nations in all such matters.

Long-continued overwork, more particularly that imposed by his unsalaried services as fish commissioner, began to tell on Professor Baird's strength, and in 1885 his cares were aggravated by unscrupulous newspaper attacks on the activities and personnel of various scientific bureaus of the government, including the fish commission. In July, 1886, after consultation with Dr. Weir Mitchell and Dr. William Osler, he went to Woods Hole, and remained there until late October. Fully aware of his physical condition, he presented his case to the board of regents at the 1887 meeting, and made arrangements for the election of his successor as secretary of the Smithsonian Institution. In July, 1887, he again went to Woods Hole; and there, "the scene of his hardest labors and most striking economic successes," the place that typified that governmental bureau in which he took such pride and which

was peculiarly his own in conception and organization, he died on August 19, 1887.

In selecting material for the chapter on Appreciations from the large assortment of available data, Dr. Dall has exercised admirable discrimination. It may not be inappropriate to quote therefrom an extract from a biographical memoir presented to the National Academy of Sciences by Dr. John S. Billings in 1889:

"The two men who have exerted the strongest influence upon natural history studies in this country are Louis Agassiz and Professor Baird. In many respects they were very unlike; circumstances gave them widely different fields, and they worked on different plans and by different methods. They began their public career in this country almost together; but Agassiz was already famous, as the result of seventeen years' work, while Baird was an almost unknown youth. Agassiz was a born teacher, a fascinating lecturer, gifted with eloquence which won its way everywhere; Baird could only speak freely in the presence of a few, and for the most part taught only by the pen and by example. Each of them created a great museum in spite of many obstacles, the first winning the means largely from private contributions, which were a tribute to his eloquence; the second gaining his end more indirectly, through his connection with the Smithsonian Institution and the government. Each of them gathered around him young men who were stimulated and encouraged by his example, who followed his methods, have continued his work, and have taught others, so that there are now observers and workers almost everywhere. The first made great use of the microscope and of embryology; the second very little, for he had to use the material available. The first had a vivid imagination which led him to frame many theories and hypotheses to be verified or disproved by future investigation and research; the second classified the facts before him, but theorized very little. Professor Baird's career as an original investigator was hampered and finally stopped by his administrative work, but in proportion as this latter increased he was able to furnish materials and opportunities for others. The pupils of Agassiz and Baird are the working naturalists of to-day and the teachers of those who are to come, and the two methods of study are being combined and developed to produce results of which we already have good reason to be proud, and the end of which no man can see.

"Upon the roll of the illustrious dead of the National Academy of Sciences his name stands out as that of a scientific man of high attainments, uniform purpose and indomitable energy, whose work has already added to the comfort and pleasure of hundreds of thousands of his fellow men, and bids fair to be a most important factor in supplying the necessities of millions yet unborn."

The merit, the charm, the permanent literary and historical value of this noteworthy volume can not be told in a review such as this. The work is no mere formal biography. It is a sympathetic analysis of the aspirations and labors of one friend by another; it is an appreciation of the work of one scientist by another; it is a simple, dignified, forceful narrative by one whose personal knowledge of the man and his times gave him a right to supplement the statement of facts with authoritative comment and criticism.

To those who knew Professor Baird, the volume of Dr. Dall comes as a delightful memento. To those contemporaries who had no personal acquaintance with him, it serves as a faithful record of one whose name and work are well known to all. To the generation that has come into being and reached maturity since Professor Baird's death, it is a fascinating history and an inspiring revelation.

Hugh M. Smith

Woods Hole, Mass.,
August, 1915

Chemical Technology and Analysis of Oils, Fats and Waxes. By Dr. J. Lewkowitsch. Edited by George H. Warburton. Fifth edition, entirely rewritten and enlarged. Volume III. New York and London, Macmillan and Co., Ltd. 1915. Pp. 483. Price, $6.50.