PIONEERS IN ECONOMIC ORNITHOLOGY

BY MRS. H. J. TAYLOR

This paper permits only brief sketches of the men who made economic ornithology a scientific and important field of study; its scope does not extend to all who played a part in this pioneer work. Townend Glover and Samuel Aughey were forerunners, while F. E. L. Beal, Stephen A. Forbes, and F. H. King were outstanding leaders. Glover's work was done chiefly in Washington. Aughey, Beal, Forbes, and King were men of the middle west; their respective fields were Nebraska, Iowa, Illinois, and Wisconsin.

"The insectivorous habits of birds have been matters of common observation for centuries, but their scientific demonstration has been reserved for more modern times", said Beal. ("Birds as conservators of forests", page 237.) For many years the farmer and fruit grower faced the difficult problem of finding a remedy for the loss in his crops. Birds were believed to be partly guilty. The early movement for bird protection was largely a sentimental one. The farmer, who saw the birds eating his grain and fruit, was not deterred by the pleas of those who enjoyed the song and color of the bird. But problems are a challenge to investigation. Investigation must be along the lines of sound sense and logic. There, reason will discover truth for itself and action will follow.

Townend Glover, 1813-1883

According to C. R. Dodge[1], "Prof. Townend Glover, the first entomologist of the U. S. Department of Agriculture, was born at Rio de Janeiro, February 20, 1813. . . His mother dying after a few days illness; when he was about six weeks old he was sent to his relatives in England; and upon the death of his father, which occurred some six years later, he was taken in charge by his paternal grandmother and maiden aunt in Leeds, [England]." Glover came to the United States at the age of twenty-three years. In 1863 he was appointed United States Entomologist in the recently established Department of Agriculture.

I have asked a number of persons for their estimate of Glover. A composite of their replies would read somewhat like this: "He made a contribution of value, but few men would work with him and I don't know anyone who could live with him." From that we may judge that he had a striking personality—that he was an outstanding individual—unlike most people.

[1]Life and entomological works of the late Townend Glover, by C. R. Dodge, U. S. Dept. Agr. Div. Ent., Bull. 18. 1888.

Dodge,[2] who was for a time assistant to Glover, says, "By nature the boy Townend was of a reserved disposition, making few close friendships. . . Indifference to country or home, distrust of mankind and of the motives of people about him, self-reliance and wish to be his own master . . . appear on many pages [of his diary] . . . he sailed for America June 24 of that year [1836] . . . married in September, 1840.

FIG. 42. Townend Glover, 1813-1883

"Glover's life was for many years that of a recluse . . . [while in Washington he occupied] a single room . . . in which from choice he ate, slept, wrote, sketched, engraved . . . [it contained] his engravings and writing tables, his bookcases (constructed from boxes), trunks, toolchest, and insect cases, in addition to stove and regular bedroom furniture. . . One who knew him intimately for twenty or more years said of him, 'In his personal habits and intercourse he was peculiar.' He was peculiar even to the verge of eccentricity. In middle life, after a residence of five years in Washington, he said of himself, 'Acquaintances I have made many, but friends none' . . . his self interest was so absorbing that it left no heed for the interest of others. . . In his habits of living he chose to be untrammelled by conventionalities of custom, attending to necessities of existence in a way that offered the least personal inconvenience to himself. So the man who from having moved in the cultured society of his home on the Hudson, had in the performance of duty come to 'herd with negroes and Indians in Demerara, where a white man is as good as a darkey'."

Glover prepared a large number of copper plate engravings of insects. Upon the recommendation of Messrs. Baird and Riley these plates were purchased by the Government for $7,500.

The Report of the Commissioner of Agriculture for the year 1865 contains, pages 33-45, the "Report of the Entomologist" [Glover] in which are made the following remarks upon the basis of which we may include this author among the pioneer economic ornithologists: "The birds mounted in the museum number nearly six hundred, the greater

[2] *Ibid.*

part of them being insectivorous birds of this country. A knowledge of their nature and habits is of as much importance to the farmer and fruit culturist as is the science of entomology; hence the two studies are combined by attaching to each bird a card on which is stated, not only the scientific and common name, with reference to works on ornithology where their history may be found, but also the habits and food peculiar to each, so that the farmer may know his enemies from his friends. In addition to this, the contents of the stomachs of birds, taken at different seasons of the year, have been preserved, and are placed in small boxes beside the specimens . . ." A few pages further along in the same report Glover makes the following comments: "Now we come to the family of thrushes . . . I cannot make this report as full and complete as it should be, on account of the stringent laws here (in Washington) prohibiting the shooting of small birds. So conscientiously law-abiding were the officials, that I could not even get a permit to shoot specimens for examination preparatory to making this report. Yet, notwithstanding this, the markets here in spring are literally overstocked with strings of robins, thrushes, cedar birds, and even bluebirds, which are brought in and sold for food. . . The well known and favorite bluebird is exceedingly useful to the horticulturist and farmer. . . Small boxes put in the trees, or around the dwelling house will invariably attract bluebirds to build in them. They are sometimes turned out, however, by the small and more pugnacious wren, which, after driving off the rightful occupant, leisurely turns out the eggs, barricades the entrance, and takes possession."

Townend Glover worked incessantly. He took no vacation and no recreation. In time his health broke down. The last years of his life were uninteresting to himself and to everyone else. When he was no longer able to reside alone in Washington he reluctantly went to the home of his adopted daughter in Baltimore. She and his wife were at his bedside when he died September 7, 1883. He was buried in Loudon Park Cemetery, Baltimore.

Samuel Aughey, 1831-1912

Little has been written on Aughey. A letter received February 17, 1931, by the writer from Professor Aughey's daughter, Mrs. Helen Aughey Fulmer, states: "My fathers' library and records of work and publications after leaving Nebraska were all lost."

Samuel Aughey was born near Mifflin, Juanita County, Pennsylvania, on February 9, 1831. (Other biographies give February 8 as the date of birth, but the family Bible records it as February 9.) He

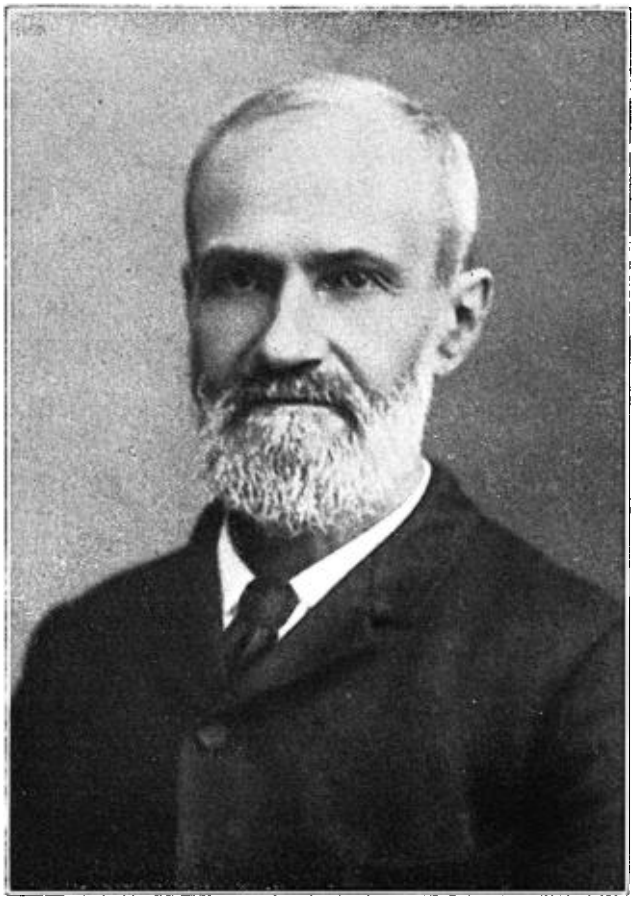

Fig. 43. Samuel Aughey, 1831-1912.

was graduated from Pennsylvania College[3] in 1856. His reports on the food of birds, and later his reports as geologist of territorial Wyoming, being among the earliest, are both interesting and valuable.

On October 15, 1930, I had the privilege of meeting "Nebraska's most distinguished citizen", as the University of Nebraska, in its Anniversary Book, calls Prof. Lawrence Bruner. Prof. Bruner gave me the following information concerning Professor Aughey. He said, "I was the second student to enroll in the University of Nebraska when it opened its doors in 1871. Professor Aughey was my first teacher. He taught the natural sciences as well as botany, German, chemistry, and geology. Students said that 'Aughey teaches the natural sciences and allied languages.'

"Aughey, like myself, was Pennsylvania Dutch. He was a hard worker. Along with his university work he continued to preach. He had a church in Dakota City, Nebraska, and also preached to other nearby congregations. From the time of his arrival in Nebraska, in 1864, he gave much time and study to the grasshopper plague. His work was earnest and sincere, but with so much put upon him, scientific exactness could scarcely be expected. While I was a student at the University Professor Aughey spent a week-end at my home in West Point, Nebraska. He was a lovable personality, and a man of fine quality."

Of Aughey's publications the most important one is entitled "Notes on the Nature of the Food of the Birds of Nebraska", which was published as Appendix II in the *First Annual Report of the United States Entomological Commission for the Year 1877 Relating to the Rocky Mountain Locust.* This report was published in 1878 under the auspices of the Geological Survey, a division of the Department of the Interior. At the time of its publication Aughey's work was reviewed by J. A. Allen, who wrote, ". . . although Mr. Aughey's paper bears especially upon the subject of birds as grasshopper destroyers, it forms at the same time a valuable faunal list of the birds of Southern Nebraska, containing notes relating to the relative abundance and season of occurrence of most of the species." (*Bull. Nutt. Ornith. Club*, IV, 1879, p. 110.)

Cyrus Thomas, writing to C. V. Riley, Chief of the U. S. Entomological Commission, says, ". . . I have been fortunate in obtaining . . . the assistance of Prof. Samuel Aughey, of Lincoln, Neb. . . Having been engaged for a number of years in studying the birds of his State

[3]Organized in 1832. Later the name of the institution was changed to Gettysburg College.

with special reference to their locust-eating habits, his report is quite full and complete. . . This record of the examination of the stomachs of birds is probably the most extensive ever made in this country. The list includes something over 630 specimens and 90 different species, and extends through a period of twelve years." (Page 13 of the Appendices.)

And in addressing Professor Thomas, Aughey writes as follows: "At your request I have reduced to order the somewhat random notes that I have been taking on the birds of Nebraska and their relations to insect life, during the last thirteen years. . . Being convinced from my studies that the preservation of birds is worthy of national attention, I have added to these notes other facts and considerations showing the need of the enactment and the enforcement of laws to protect them." (Page 13 of the Appendices.)

The grasshopper plagues of the sixties and seventies are still fresh in the minds of many in the middle west. The pioneer's all was in the planted field. Various attempts were made to cope with this pest, but they availed little. Dexter Hutchins, of Algona, Iowa, made a machine to catch grasshoppers. Often special prayer meetings were held. If the grasshoppers left it was evidence that divine Providence had stayed the plague. A minister related to me the destruction wrought by a grasshopper plague of the seventies and the effectiveness of prayer in driving them out. "How do you know that prayer did it?" I asked. "How do you know it didn't?" was his reply.

In November of 1930 I received a letter from a friend in Iowa which contained the following information:- "Mrs. W. G. Hatter, of Sioux City, moved to Elk Point, South Dakota, a year after the prayer meeting of fifty years ago. She says that the Catholics called their people together and paraded the streets with banners and prayed all day. Many Protestants joined them. The grasshoppers disappeared, and later three crosses were erected in the vacant lot next to the Montagne School. One of these crosses still remains."

In a paper prepared for the body of the Report of the Commission (*ibidem*, page 339) Aughey says: "Unfortunately the mass of the people have not and do not observe closely what the birds are doing. Hence they are still the victims of prejudice, and their character is rarely appreciated."

Professor Aughey sent out many letters to farmers in an attempt to gather together their observations on the work of the birds. One reply to such a letter is condensed as follows:- "During the last season [1877] I planted a tract . . . in corn. It was on new breaking,

where locusts had laid their eggs . . . the locusts began to hatch . . . and threatened to destroy all my corn. The blackbirds, however, in large numbers, commenced to feed on the locusts, and devoured them almost as fast as they hatched out . . . and I obtained a good crop.—Jacob Heikes, Dakota City, Nebr., October 3, 1877." (*Ibidem*, page 341.)

And later in the same article (pages 343-344) Aughey says, "When I first came to Nebraska, in December, 1864, there were many species of birds far more abundant than they have been during recent years . . . vast numbers were poisoned [by strychnine] around the cornfields. . . It was done under the mistaken notion that the blackbirds were damaging the crops, especially the corn. Great numbers of birds of other species were destroyed at the same time. . . In a single autumn, in Dakota County alone, not less than 30,000 birds must have been destroyed in this way . . . the subject of the protection of insectivorous birds must, or ought, sooner or later, to become not only national, but international."

On November 3, 1930, I received a letter from Professor Aughey's daughter, Mrs. Helen Aughey Fulmer, who writes as follows: "I have vivid memory of hearing my father, during the early years of my life, deplore the killing of birds. It was then the sport, the recreation of boys and men. He was so sure that birds were the farmers' friends that he undertook and carried on the observations and secured these facts. Then with them as a basis he lectured in towns, villages, and before groups of farmers throughout the state to persuade protection of birds in the interest of agriculture. . . Geology was his chosen field of science, but he was so tremendously interested in the new state of Nebraska, and in building up the state university and its museum, that he lent his energies in many directions while there. . . His death occurred in Spokane on February 3, 1912, just six days before reaching his eighty-first birthday. . . A year after his death my mother persuaded me to take his casket back to the old home near Patterson, Pa., where their first child was buried and where she now lies beside them."

Foster Ellenborough Lascelles Beal, 1840-1916

Professor Beal was born in South Groton, Massachusetts, on January 9, 1840. The most complete account of his life has been prepared by Mr. W. L. McAtee[4] from which the following lines are taken. His father "died of tuberculosis when his son was about 8 years of age . . . 'my mother had also contracted the disease . . . she took me [to]

[4]Life and writings of Professor F. E. L. Beal, by W. L. McAtee, *Auk*, July, 1917, XXXIV, pp. 243-264.

Nathaniel C. Day . . . who was her cousin once removed. . . He agreed to take care of me until I was of age. . . I lived with Mr. Day on this farm for the next fourteen years. . . After she [Miss Harriet L. Gray] had worked for him for about a year, they were married. This lady took some interest in me and my tastes. . . I had been so kindly treated by Mrs. Day, that having no other, I had come to look upon this as a home'."

Soon after enlisting in the Civil War Beal was discharged on account of illness. In 1867 he entered the Massachusetts Institute of Technology. At the close of the year he records in his diary, " 'I have been sitting alone studying all the evening, thinking of the past and trying to look forward into the dark, misty future, and wondering what another year has of joy or sorrow, in store for me; but joy or sorrow it matters little which, a few short years and both will be as naught in the light of a higher and nobler future'."

On receiving his degree from the school of Technology in 1872 he went to Crete, Nebraska, where he surveyed for the Burlington Railroad. The open prairie was new field for the study of nature. Of this McAtee writes, "Professor Beal often referred to his experience on this trip; one reminiscence, in particular I remember, related to nighthawks. The birds immediately availed themselves of the newly-laid rails as perches, upon which, according to their custom, they sat lengthwise. They were so abundant, Professor Beal says, that he was certain there were enough nighthawks immediately along the right-of-way, to make a continuous row of the birds on both tracks clear across the state of Nebraska."

In March, 1876, Beal took a position in the Iowa State College of Agriculture, at Ames. During his seven years at Ames he wrote many articles on the birds of Iowa. Most of these articles were published in newspapers, especially the *Iowa Homestead*. The economic value of birds now became his chief interest. He examined the contents of birds' stomachs, and discussed the food habits of various species. At this same time S. A. Forbes was also studying the food of birds in Illinois by examining the contents of the stomach. F. H. King was working on the same problem in Wisconsin. Beal continued this study through the remaining years of his life. It was he who made the oft-quoted estimate that the Tree Sparrows of Iowa annually destroy 196,000 bushels of weed seeds. In 1892 he took a permanent position with the United States Biological Survey, remaining in this service for twenty-four years, or until his death in 1916. During this time he examined the stomachs of 37,825 birds.

Among Professor Beal's published papers, one entitled "Some Common Birds in Their Relation to Agriculture", issued in the Farmers' Bulletin series of the Department of Agriculture, has been reprinted more than fifty times, including over a million copies. His most important non-official paper is, Mr. McAtee thinks, the "Birds as Conservators of the Forest", published in the report of the New York Forest, Fish, and Game Commission for 1902 and 1903. This paper is not only of great scientific value, but it also possesses literary charm.

Professor Beal also furthered economic ornithology by lecturing to various horticultural societies, granges, and ornithological clubs. We have a feeling of gratitude to Mrs. Day. Her mother heart made a home for a lonely orphan child. Her interest in him helped in no small way to give to the world the expression of the life of F. E. L. Beal. The founding of his own home and the inspiring companionship of Mrs. Beal made for him a rich personal life. He died in Branchville, Maryland, when the leaves were falling, on October 1, 1916.

Stephen Alfred Forbes, 1844-1930

The facts herein presented on the life of S. A. Forbes are derived chiefly from the sketch written by his son, Ernest Browning Forbes, at the time of his father's death at Urbana, Illinois, March 13, 1930. Forbes was born at Silver Creek, Stephenson County, Illinois, May 29, 1844.

I met Dr. Forbes but once, but I have talked with those who knew him, and whose interests brought them in close contact with him. Illinois was the place of his birth and his death. It was also the center of his field of labor through all the years of his long and useful life.

Dr. Forbes came from Scotch and Dutch parentage. Three of his forebears served in the War of the Revolution. When, in 1860, the country needed young men to defend the Union, Stephen Forbes responded to the first call and served throughout the war.

The Forbes family was one of Illinois' early pioneers. Theirs was one of the many one-roomed log houses that dotted the newly settled wooded states in the forties and fifties of the last century. Hardship and privation is the common lot of the early settler and the Forbes family was no exception. Was there ever a pioneer farm without the dreaded mortgage? That word and its burdens are an early recollection in the lives of many pioneer children. A college education was the aim of the parents for this family. The desire for an education was ingrained in the children to the point of their determina-

Fig. 44. Stephen Alfred Forbes, 1844-1930.

tion to secure it. A farm of 140 acres, heavily mortgaged, a one-roomed cabin furnished with a cookstove, a dining table, two beds, and a trundle bed, is the home and financial setting when the father died in 1854. Stephen Forbes was then ten years old. His brother, Henry, then twenty-one years old, had made his own way since he was fourteen years old, and was at this time working his way through college. These conditions tested and proved the Forbes family. The brother returned from college and took upon himself the care of the family. Dr. Forbes, looking back on these early years, calls him "our guardian angel".

At fourteen and fifteen years of age Stephen Forbes wrote two essays, "Do Noble Things", and "The Dignity of Reason". No set schoolhouse was needed to demonstrate that Stephen Forbes was a scholar. Wherever he found himself there was his school. He looked upon his four years of service in the Civil War as a course of instruction in a new field. During his four months in prison he studied Greek and Spanish.

Until the University of Indiana, in 1884, conferred the degree of Ph. D. he had no college degrees. In 1905 the University of Illinois conferred upon him the degree of LL. D. One year at Beloit, a year at Rush Medical, and a year at Illinois State Normal seems rather a piecemeal preparation for all that he accomplished. He never ceased his study. He entered the university of life and remained an active student to his last day. In this university Stephen A. Forbes received the degree that time evaluates for service rendered.

Professor Forbes was a zoologist, a botanist, an ornithologist, an entomologist, an ecologist, a limnologist, etc. There was no phase of natural history unfamiliar to him. He founded the Illinois State Laboratory of Natural History, and was its director from 1877 to 1917. From 1884 to 1930 he was a member of the faculty of the State University of Illinois. He once said, "I have never, in university or normal school, received one hour of formal instruction in any one of the subjects I have taught". (University of Illinois Memorial to Stephen A. Forbes.) "His continuous study of plant and animal life of the Illinois River system from 1894 on made the biology of this stream better known than that of any other in the world." (Cyclopedia of American Biography.)

His publications number over five hundred. Though varied in character all are conspicuous because the Forbes stamp of thoroughness and accuracy is apparent. In his study of birds he gives a wide range of data on the life of many species. It is here that he laid the

foundation for a thorough, comprehensive, scientific study of economic ornithology.

In his paper on "The Food of Birds" (*Bull. Ill. State Lab. Nat. Hist.*, Vol. I, No. 3, 1903, pp. 86-161) he says, "Excluding the inhabitants of the great seas, birds are the most abundant of the Vertebrata, occupying . . . the same prominent position that insects do among invertebrate animals . . . their power of flight . . . enables birds to choose their climates and their seasons . . . enables them readily to escape unfavorable conditions, and their immense activity and higher rate of life requiring for their maintenance an amount of food relatively enormous, give to birds in their relation to the pursuits and interest of man a significance which only here and there one seems ever fully to have realized . . . the knowledge we need is such that we shall be able to afford for every species a tolerably correct answer to the questions, What would be the main consequences if this species were exterminated? if it were reduced to half its present numbers? What if it were doubled in number? if it were quadrupled? When this is known, we shall evidently be able to act wisely and with the best results."

In referring to Professor Beal and Professor Forbes Mr. W. L. McAtee wrote, "These two are the founders of the scientific method of studying the economic value of birds." (*Auk*, 1917, page 249.)

Franklin Hiram King, 1848-1911

Townend Glover and Samuel Aughey, as pioneers, opened the field of economic ornithology. King was a contemporary of Beal and Forbes. Franklin Hiram King was born near Whitewater, Wisconsin, on June 8, 1848. He died at Madison, Wisconsin, on August 4, 1911.

King's contribution to economic ornithology is contained in his long paper, "Economic Relations of Wisconsin Birds", which was published in the "Geology of Wisconsin" (Survey of 1873-1879, Vol. I, Part II, pp. 441-610). In the preface he says: "The field work . . . was commenced . . . in July, 1873, and was prosecuted, as time could be devoted to it, until October, 1877. . . The facts recorded in the report were obtained from an examination of the contents of the stomachs of over eighteen hundred birds, sixteen hundred and eight of which contributed results which have been incorporated in the report. The contents of one-half of the stomachs were examined under the hand-lens on the day they were obtained, while the contents of seven hundred and fifty were transferred at once to small apothecary phials containing alcohol. . . The examination of the material which has been collected was completed in June, 1878. . . The valuable results obtained

by Prof. S. A. Forbes in regard to the food of birds of Illinois has been included, and the whole nomenclature has been made to conform with Dr. Coues' new 'Check List of North American Birds'. . . But had it been possible to identify specifically the 7,663 insects, etc., taken from the stomachs of the 1,608 birds, this would have been by far the smallest part of the task set, for then it would be required to command a full and broad knowledge of the economic relations of the insects eaten. . . Birds are insignificant in numbers when compared with the abundance of parasitic and predaceous insects, but their larger size, their active habits, their longer lives, the greater facility with which they move about, and the greater range of country over which they roam, go far toward compensating for smaller numbers."

In the *Bulletin of the Nuttall Ornithological Club* (Vol. VIII, 1883, p. 107) Dr. Elliott Coues, Associate Editor, makes the following comment, in a three-page review of King's paper: "Upon the heels of Prof. Forbes's paper . . . comes the very elaborate result of Prof. Kings' examinations of the food of birds in its bearing upon our agricultural interests. The question—one of great economic importance—seems to be only of late brought forward with sufficient prominence; and it is evident from what these two investigators have accomplished, that our ornithologists have hitherto taken it up, if at all, only after methods entirely inadequate to its solution. . ."

King's life service was given to his native state. "From 1888 to 1901 he was professor of agricultural physics in the University of Wisconsin, the first chair of its kind in America. (National Cyclopedia of American Biography, Vol. XIX, page 292). On the same page (*ibidem*, page 292) mention is made of King's work, "Farmers of Forty Centuries", and concerning it the National Geographic Society is quoted as follows: " 'The first award of the Society from the Grant Squires fund, relating to commerce and industries of the Orient, has been made to the author of "Farmers of Forty Centuries", Mr. F. H. King. This book is an exhaustive study of the methods by which a very populous nation have been so skillfully cultivating their lands for more than 4,000 years that the fields of China are today more fertile than when first cultivated by man'."

Pioneers are prophets in a true sense. From the present they read the dangers and the possibilities of the future. Through perseverance and tenacity they attain. We are their debtors. The debt of gratitude would lose its value if it could be paid. It may be acknowledged. We acknowledge our debt to these pioneers in economic ornithology.

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