THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XLII. JANUARY, 1925. No. 1.

WALTER BRADFORD BARROWS.

BY A. K. FISHER.

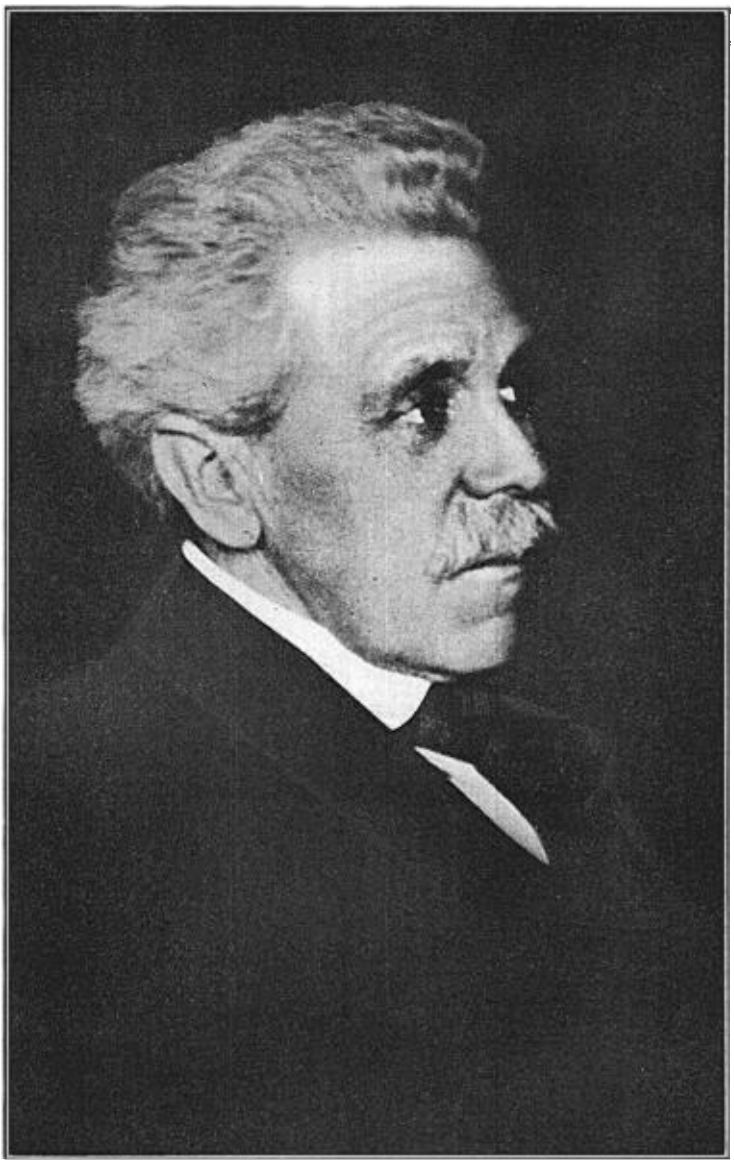
Plate I.

ON September 26, 1883, twenty-one ornithologists met in New York City, and, through their activities, the American Ornithologists' Union was founded. This association, which now has a membership of about 1,650 in the various classes, at the first meeting almost immediately added twenty-four to its number, and among the first elected was Walter Bradford Barrows, the subject of this paper, who died of apoplexy at East Lansing, Mich., the morning of February 26, 1923.

Barrows was born at Grantville (now Wellesley Hills), Mass., January 10, 1855. His mother, Elizabeth Adams Cate, taught at Bradford College (then Bradford Academy) and was president of Wheaton (Massachusetts) Female Seminary in 1849, before her marriage to his father, William Barrows, a Congregational minister and story writer.

In the romantic place of his birth other nature lovers first opened their eyes to the world. The rolling country, with its abundance of beautiful flowers and wealth of deciduous trees, an ocean of green hills, as Bradford Torrey would say, probably made an impression on his youthful mind which gently led him along nature's ways, so that later, through unconscious inspiration, he became an ardent student of biological subjects.

Comparatively small things, at times, change the course of streams, and similarly, unimportant thoughts or events will lead



Walter B. Barrows

men out of the dormant state, or, when realization comes, into one to their particular liking. Environment, therefore, at times may have a governing influence over many of us without our suspecting whence it came. At all events, Barrows' love of natural history was inborn and he never seemed happier than when following out some line of study that, when completed, would add to our knowledge of the subject.

His father was very tolerant and broad in his theological views, was passionately fond of fishing and shooting, and had a genuine interest in the great out-of-doors. He very wisely encouraged his boys to spend their leisure time in the woods and fields and on the lakes or streams, rather than in the village. Some of his stories, as "Seven Nights in a Hunter's Camp," show knowledge and appreciation of that kind of life. and his companionship with his son may have influenced the latter through an inherited tendency in following his future course.

His brother Herbert, three years his senior, had other interests, so that in the early beginnings of nature studies Walter and his younger brother Morton were almost always field companions. They never were embarrassed with ready money, but the alertness and ingenuity of healthy, interested boys enabled them to accumulate enough to buy needed but inexpensive equipment.

Walter used to laugh when telling a rather amusing incident of an experience he went through in early life which shows that rigid economy may, at times, be carried to an unnecessary extreme. His father had on the home place some apple trees that bore good and, for the needs, an abundance of fruit. To make the generous supply go as far as possible, the father instructed his children to eat only specked apples, as otherwise they might rot and be wasted. But try as they would, they never could catch up and have the pleasure and satisfaction of eating sound fruit. With this training vividly in his mind, Walter made the resolution that when his children came, they would be given sound fruit and that specked apples would be eaten only when no others were at hand.

At fourteen years of age Barrows began collecting birds' eggs, taking only one from each nest. He followed this plan for several years, so that the sets in his collection during the period were composite ones representing as many different nests as there were eggs.

Every school holiday was spent in the search for new specimens, and it required something more than a Scotch mist to keep the boys indoors. Distance did not weaken his enthusiasm and in the case of his first nest of the Olive-sided Flycatcher, a number of daily trips had to be made to a rather remote place before he was successful in locating his prize.

When about fifteen years old, he was lucky enough to receive some lessons in what was then called stuffing birds, as taxidermy was in those days almost an unknown term. With patience and practice he soon acquired local recognition and received small sums for mounting Blue Jays and other birds of bright plumage for decorative purposes. Although this occupation was not followed long or seriously, he became very skilful and some of his later work ranked well with that of more carefully trained specialists.

About 1872 there occurred, late in the autumn, a long, protracted and severe northeastern storm, and his neighbors brought to him dead specimens of an unknown bird found in the pastures bordering the town. Later these were identified as Little Auks. This was quite an event in the life of the young ornithologist and undoubtedly carried his thoughts to the mysterious realms of the region of ice and snow. His graduating thesis at the Massachusetts Institute of Technology was "The Auk," and very probably the selection of this subject was inspired by his previous experience with the specimens which were furnished to him by the storm.

Samuel's 'Birds of New England' was the only easily available work for identification and reference. He made, however, occasional trips to the Athanaeum Library in Boston, a long journey in those days, and verified his identifications by studying the plates of Audubon and Wilson.

All his early education was gathered from the public schools of Reading, twelve miles northwest of Boston. He graduated from the high school in 1872 and that autumn entered the Institute of Technology, graduating four years later with the degree of Bachelor of Science.

After graduating he went, on July 1, 1876, to Ward's Natural History Establishment at Rochester, N. Y. While there he was general assistant, devoting himself largely to the classification and arrangement of the invertebrates and in looking after correspond-

ence. The force included a genial crowd, a number of whom later made their mark along various lines of natural science. They also seemed to have absorbed from one another a trait of companionship and joking which are commendable qualities and help carry one over rough places and lighten the burdens of unstable life.

On one occasion, when the owner of the establishment was away and a number of collectors were in foreign countries, Barrows was left in charge but given little freedom in the disbursement of money. A notice of a cablegram with collect charges aggregating seventy-five dollars was sent to him with the statement that charges must be paid before the message would be delivered. This was a serious situation, for unless the information was especially valuable he would be criticized and would possibly have to bear the expense. He finally decided to act, and found the cablegram to read "Have secured seven oranges. Will get more." He was appalled at what seemed to him a costly joke but later, in looking over the correspondence, found that the cablegram had been sent by a man who expected to secure some good specimens of ourangs. He immediately experienced great relief.

About May 15, 1879, he resigned his place at Rochester and accepted the position of instructor in physics and chemistry in the Colegio Nacional Concepcion del Uruguay under a three-year contract with the Government of Argentina. In the early days of July he entered the waters of La Plata and, through the chilly mists, beheld great flocks of Gulls and Terns which, during the winter months, made this stretch of water their home. After considerable delay in completing arrangements, he landed two months later, in the darkness of early morning, on the muddy shore of the west bank of the Rio Uruguay at the old town of Concepcion, about 400 miles north of Buenos Aires. The inducement for this long trip and rather unremunerative work was that it gave a splendid opportunity to study the fauna of the country.

His long vacations were passed in excursions on the pampas and along the fringes of settlements. He had many interesting experiences and made rather extensive ornithological collections comprising rather less than 200 species. Late in January, 1881, he became one of a party delegated by the Argentine Government to make a provisional study of the fauna and flora of the Pampean

Sierras in the extreme southern parts of the Province of Buenos Aires, a region then imperfectly known and only recently vacated by hostile Indians. This expedition lasted about ten weeks but at least half the time was wasted on account of imperfect organization. The party went by rail over 200 miles southwest to Azul, thence 250 miles by stage coach to Bahia Blanca on the coast. During this trip about 800 miles of the pampas were hastily crossed and a greater part of the time spent among the desolate Sierras and the plains near by.

Most of the observations were made near Concepcion and formed the basis of his paper on the "Birds of the Lower Uruguay" published in Vol. VIII of the 'Bulletin of the Nuttall Ornithological Club,' 1883, and Vol. I of 'The Auk,' 1884. It is also to be assumed that some material from this southern country was used later in his paper on the "Birds of Prey," in the 'Standard Natural History.'

On his return to the United States in 1881 he was instructor in Science during part of that year and the one following in the Massachusetts State Normal School at Westfield. On June 29, 1882, he married Lizzie Maud Withall, at Rochester, N. Y., and in the autumn went to Middletown, Conn., where he became instructor in biology in Wesleyan University, and during his last two years was curator of the Museum. From 1884 to 1886 he also, on occasions, instructed in botany in Trinity College, Hartford, Conn.

Not very long after he reached Middletown he became acquainted with John H. Sage, who lived in Portland just across the river. This early acquaintance soon ripened into a friendship which lasted to the end. They often went on field excursions together in the neighboring country and passed many happy days in making observations and collecting material for future reference.

On July 1, 1886, Barrows came to Washington, D. C., and entered the Division of Ornithology and Mammalogy of the United States Department of Agriculture, which later developed into the Bureau of Biological Survey. Here he almost immediately took up lines of work in which he was deeply interested. The economic investigations which brought out in detail the relations of the food of birds to agriculture appealed strongly to him, and in due course of time he prepared the first publication in the Division touching on

this subject. This was Bulletin No. 1 on "The English Sparrow in North America" and contained over 400 pages and a carefully prepared map of the distribution of the Sparrow at the end of the year 1886. At this time the subject was a very vital one, as many persons, attracted by a previous animated controversy, were anxious to have information covering the real status of this introduced species.

When Barrows was gathering data in the preparation of the bulletin, he and the writer spent many interesting hours together on the Department of Agriculture grounds making observations on the habits of the species and collecting material for stomach examination. In these grounds Barrows had an excellent opportunity to observe the birds in their normal condition as they were found in the shrubbery along the drives, on the open lawns, in the experimental plots near the green-houses, and about the buildings. This opportunity to observe, under varied conditions, made him watchful for items of special interest for the forthcoming publication.

In the examination of stomach contents at that time, he and other members were terribly handicapped because the reference collections of seeds and other materials were just in the beginning of formation and, therefore, of little value. When an unknown seed came up for identification, as it often did, the student was forced to go afield and try to glean from nature's store-house the necessary ones for comparison. On rare occasions man's infirmities have proved to be of assistance to him. When the food of the Crow was first being taken up for study, great quantities of a certain seed were found in material being examined but could not be identified. Barrows thought if the seed had a peculiar taste or smell it might be determined. Accordingly, he bit one open and the next morning, as he was very susceptible to its toxic influence, his mouth was badly swollen from the effects of poison ivy. To verify absolutely this novel identification, the waxy coating of a fresh seed was then removed and it was found that he had the honor of identifying the seed even though at the price of much personal discomfort.

In the preparation of the bulletin on the Crow, published in 1895 as Bulletin No. 6 of the Division of Ornithology and Mammalogy, Barrows devoted much time to the study of Crow roosts, which at that period were of much local interest in the vicinity of Washington, and he made quite frequent visits to them for the purpose of

obtaining information relative to the habits and abundance of these maligned birds, paying particular attention to their food, so that, in summing up the evidence, Dr. J. A. Allen, in his review of the bulletin, states that the investigation "goes far to set off satisfactorily the economic status of a bird unrelentingly persecuted for crimes that are, to a large extent, imaginary, or, at least, grossly magnified."

From March to September, 1891, Barrows was Acting Chief of the Division while Dr. C. Hart Merriam, the Chief, was absent with the Death Valley party and, later by direction of the President, making a study of the fur seals on the Pribilof Islands, Alaska.

Resigning his position under the Federal Government, Barrows entered the Michigan Agricultural College, East Lansing, at the opening of the classes in 1894, as Professor of Zoology and Physiology, in which position he remained until his death. During the years 1897 and 1898 he extended his work and served as Entomologist at the Michigan Agricultural Experiment Station. He very soon became a member of the Michigan Academy of Sciences, was its secretary during the period from 1896 to 1901 and president in 1905. Of other societies relating to biology, he was a Fellow of the American Ornithologists' Union, a Member of the American Society of Mammalogists, of the Association of Economic Entomologists, and of the American Association for Advancement of Science.

His wife died, April 6, 1916, at East Lansing, and from that time until he passed away his daughter was his constant field companion, not only in Michigan but also at their old summer home in eastern Massachusetts, where during vacation periods he devoted much time to fishing and boating. Being on the water probably was a pleasure experienced through life for, while in Washington, we went out on the Potomac on several occasions to observe or collect specimens. We happened to go on one of the trips at the time of the migratory flight of Bonaparte's Gulls and Barrows thoroughly enjoyed watching the birds decoyed near the boat at close range as they hovered, circled, crossed, and re-crossed apparently in attempts to learn something of our motives or reasons for our presence.

He was preeminently a home man and when with members of his family rarely spoke of his scientific activities, or accomplishments, or indeed of himself. It was difficult, therefore, for those of a scientific trend of mind to glean much about him unless alone in his company. On such occasions he was an entertaining companion and was free to talk most interestingly on whatever zoological subject might come under observation or to mind.

He was an easy speaker and, through his combined fondness for children and birds, devoted considerable time to lecturing unofficially to young people throughout the State of Michigan hoping to stimulate their interest in birds by increasing their knowledge on the subject, and he was ever ready to help them solve their avian problems if advised of their troubles.

His close associates undoubtedly knew that, although preeminently an ornithologist, Barrows was also a general naturalist with a vast fund of knowledge of all the allied sciences.

Those who have delved among nature's varied forms as he did and who can hardly step without coming in contact with some familiar object of more than passing interest, often wonder whether their satisfaction and contentment, even though they are not recognized as authorities in any branch, are not far greater than that experienced by specialists in zoology whose activities are wholly centered in some small order of a given class.

The general naturalist of almost by-gone days carried on his field operations with great satisfaction, for he was certain that nature's book lying open before him had in full view a multitude of diverse forms continually to stimulate his interest and to broaden his knowledge of her varied treasures. He was the frontiersman who made it possible for many of more recent generations to learn and absorb biological truths. Even now, on occasion, to answer perplexing questions, we have to turn to his records which, by good fortune, have been left to us as a precious heritage.

The versatility and broad general knowledge of these old-time naturalists have made them important factors in leavening the loaf, and by judicious counsel and carefully made records they have aided many in reaching the highest pinnacle of advanced biology.

During the time Barrows was laying the foundation of his future work he was enthusiastic and keen to learn all he could regarding bird life. Along about 1871, when he heard of the colony of Night Herons at Barnstable marshes, he went from Reading to visit this already famous gathering. He walked many miles along the beach and through the dunes to the colony, where he had an opportunity to study at close hand a new bird acquaintance. This experience made such a vivid impression upon his mind that, in August, 1922, he was lured back to the old stamping ground. In company with his daughter and a friend, he went from his summer home at Cataumet across the Cape to Sandy Neck and walked down the shores of Cape Cod Bay, following the same route that the sixteen-year-old boy had taken when in search of the colony. He remembered the place perfectly and found the Herons in the same old locality in even greater abundance than formerly. The second trip may have been lacking a little in boyish excitement but was enjoyed as much as the earlier one and furnished material for future conversation.

Not knowing that anyone else was particularly interested, it might be said that the trip was continued into the winter, since 'The Auk' for January, 1923, contained the commencement of an admirable article on the same colony by Alfred O. Gross. This paper furnished Barrows many interesting details which it was impracticable for him to note during his necessarily limited trips. I am glad that he was able to see at least a part of this paper, for it is human nature to be deeply interested in that of which one has some knowledge.

After coming to Michigan, Barrows very soon began to take a deep interest in the birds of the State, and as time passed on, his large work on the birds of Michigan was evolved. After this notable volume appeared, in 1912, he published little on ornithology except occasional papers in 'The Auk.' In collecting and verifying material for the book, he visited every person in the State who was interested in birds and who had a collection of skins or eggs. He was painstaking in carefully examining questionable records or those of rarer species, so that his work might be as accurate as possible.

In the last ten years of his life he spent a considerable part of

May and early June in the field working out the distribution of Kirtland's Warbler and so far as possible determining the exact breeding range of the species. An account of this is given in 'The Auk' for 1921 (p. 116). In the spring of 1921 he sent a very cordial invitation to me to accompany him on one of these trips for he well knew the interest I had in this peculiarly distributed species. It was a disappointment that I could not accept, for as it subsequently turned out it was the last opportunity to go with him, and at our last meeting the following year he touched briefly on the pleasures I had missed.

He was very active in bird protection, and for many years kept in touch with the Michigan State Department of Conservation, assisting in its work, and he was authorized to impress any deputy wardens to aid him in carrying on research work in the field. He was always dependable in identifying game or fish whenever questions were raised in or out of court. He became quite absorbed and interested in the advancement of bird banding and, on the day before his death, was pleased to note that many of the leading papers in Michigan published a syndicated article on this subject.

Barrows was very much interested, too, in bird photography and during the period between 1916 and 1923 spent a good deal of time in this pursuit. He photographed all the winter birds that came to the suet or the feeding stations on his window sills, and his Cardinal and Blue Jay pictures and those of groups of Evening Grosbeaks and Bohemian Waxwings were truly artistic.

Ornithologists' instincts and dormant interests seem to follow them to the end, and Barrows, the morning before he passed away, called his daughter's attention, as they walked over the snow-clad fields, to the Horned Larks which passed with swift and erratic flight and to the increasing number of Crows as indications that spring was approaching. It might truthfully be said that, in mellowing fruit, the sweetness and flavor are present to the end.

Barrows's immediate surviving relatives are a daughter, Miss Marguerite Barrows; a son, Prof. William Morton Barrows, of the Ohio State University; and a brother, Morton Barrows, Esq., of St. Paul, Minn. He had a wide acquaintance throughout the country, especially in zoological circles, and many friends and acquaintances in Lansing and neighboring towns.

On March 4, 1923, public recognition of his life and character was given at a vesper memorial service in the Armory at the Michigan Agricultural College. Stepping as he did directly from an active, cheerful life across the Divide into the Unknown was a most ideal death.

Those of us who are still on the firing line will miss him. How can it be otherwise when a man of his fine character and cheerful companionship has gone?

The portrait which accompanies this paper is a modified enlargement of a photograph taken with a field camera in his study a few weeks (January 10) before his death by Mr. Walter E. Hastings, of South Lyon, Mich. Through his love for birds he had a great deal in common with Barrows and their association was most pleasant.

The bibliography of Barrows, which has been kindly prepared for me by Mr. Wm. H. Cheesman, an associate member of the Union, is appended herewith.

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GROWTH DEVELOPMENT AND REACTIONS OF YOUNG GREAT HORNED OWLS.

BY BESSIE P. REED.

Plates II–IV.

THE material upon which this study is based consisted of four young Great Horned Owls, two of which were known to have come from the same nest in two successive seasons. In the nesting season of 1919 a pair of Great Horned Owls (*Bubo virginianus virginianus*) was found nesting in a dead cottonwood tree about two miles from Lawrence, Kansas. This tree stands almost at the outer (western) edge of a piece of pasture timberland comprising about six acres. The plot contains almost no undergrowth; the trees are mostly cottonwoods and elms with a few hickories and hackberries. A small stream flows through the eastern part, its old channel forming a dry, shallow ravine at the western edge.