DISCUSSION

WILLIAM BREWSTER: NEW ENGLAND NATURALIST

THE natural history of New England can not be found in any one book, and in many ways I am glad that it is so. For I think I shall always want to go to "Moby Dick" for cetacean lore; to "Walden" for such natural philosophy as may be educed from bean-fields, ponds and winter animals; to Frank Bolles's stanzas for vivid glimpses of Chocorua's wild tenants; to Forbush's "Birds of Massachusetts" for precise ornithology; and to other works equally unique.

There are some classic accounts of New England's nature that date back to colonial times. For an early first-hand record of the now extinct heath-hen of Martha's Vineyard, one may go to Thomas Morton's "New English Canaan" (1637), and to John Josselyn's "New England's Rarities Discovered" (1672) for an authoritative glimpse of that noble bird, the wild turkey, which for us has become an emblematic part of colonial New England, but which disappeared from Connecticut in 1813, from Vermont about 1842 and from Massachusetts in 1851.

New England, indeed, has had its share of illustrious naturalists. Perhaps one thinks first of Thoreau, the Concord hermit, and then of the great teacher and scientist, Louis Agassiz, who, though not a native son, was for many years (beginning in 1848) associated with Harvard College, and it was he who established a museum of zoological research at Harvard, now the Museum of Comparative Zoology.

Years later there worked at this same museum a man in whom was happily combined the indoor and the outdoor naturalist. His name was William Brewster, and he was one of the greatest of American ornithologists. He was a Yankee birdman unique in at least one respect: "No ornithologist has ever lived in America who could compare with Brewster as a master of simple, dignified English prose"—this on the authority of Dr. Thomas Barbour, the present director of Harvard's Museum.

During his lifetime Brewster was little known outside of his own profession. But it happened that during a great part of his life, which extended from 1851 to 1919, he kept voluminous diaries, which were full of bird lore and of Concord River lore, and out of these diaries have come three books, published posthumously, that are bringing Brewster's genius to the attention of the general reader to parallel the high esteem in which ornithologists have held him for many years. His technical bibliography is a long one, but I believe he would have been particularly gratified at the way his three last volumes have been received. His friend Daniel Chester French, the sculptor, remarked that Brewster "always regretted that he could not write popular articles on natural history as did some of his contemporaries."

"The Birds of the Lake Umbagog Region of Maine" is the first of these works to be mentioned. It is a 620-page volume, issued in four parts as a *Bulletin* of the Museum of Comparative Zoology: the first in June, 1924, the second in February, 1925, the third in November, 1937, and the fourth (compiled by Ludlow Griscom) in February, 1938. It represents field observations and collecting of birds around Lake Umbagog over a period of 38 years, beginning in 1871, when Brewster was only 20 years of age. It is all original work; there is scarcely a quotation in it. A great deal of it is supplemented by extracts from his detailed journals and notebooks written at the time the field work was in progress. But even in these there is no slipshod writing, and in every line there is evidence of the carefullest scientific observation but recorded in a way that betrays William Brewster's great love of nature and all its manifestations. It is straightforward and without sensationalism. On August 24, 1874, for example, he writes:

> Wearing a purple-and-yellow cardigan jacket, recently obtained from a country store in Upton, I was fishing this morning at a pool of Cambridge River, just below the Sluice, when a Hummingbird hovered for a moment within a few inches of the aforesaid garment, doubtless attracted by its gaudy coloring and probably suspecting that it might prove to be a bank of unfamiliar flowers. Precisely the same thing happened in another place several days ago. The bird did not fly away on either occasion until I startled it by moving slightly.

In 1891 Brewster bought an old farm of about 300 acres of woodland near Concord, about a mile and a half northwest of where the river bends around Balls Hill. This was in the old stamping grounds of Thoreau, and it was here that Brewster spent a great deal of his time studying the wild creatures and setting down the intimate details of their lives as he saw them first-hand. He fixed up the old farmhouse and named his sanctuary "October Farm."

And it was this expressive name, "October Farm," that became the title of the first volume of extracts from his Concord journals and diaries published in 1936 by the Harvard University Press and edited by his friend the late Rev. Smith Owen Dexter, of Concord. An introduction to the volume by Daniel Chester French, with whom Brewster grew up, is a real tribute, depicting the peculiar charm of William Brewster the man. Unpretentious and unheralded by publisher's

ballyhoo, the book was enthusiastically received by nature lovers and by many who had never heard before of its author. It went into a second edition, and an index was added. I believe it was advertised chiefly by word of mouth, the ideal way for news of a good book to spread.

Last year (1937) the Harvard Press followed "October Farm" with another volume from the Brewster journals called "Concord River." This was illustrated by a dozen plates, some in color, by the artist Frank W. Benson, who also had been a friend of Brewster's. The American Institute of Graphic Arts selected "Concord River" as one of the "Fifty Books of the Year" in its 1938 exhibition of American bookmaking.

The great simplicity and genuineness of these books are almost unbelievable in this day and age. They are books of the earth, but not of man's world. The entry for April 16, 1912, the day after the *Titanic* sank, reads:

> I saw two Great Blue Herons flying over the Farm towards the northeast at an elevation of fully a *mile*, one following closely in the wake of the other. For the most part they flapped their wings steadily and ceaselessly but twice I saw one of them sail for the distance of a few rods on set wings.

The same day he noted a flock of 36 Canada geese flying so high that they appeared no larger than bluebirds. "Rarely have I witnessed anything of the kind so impressive." Instead of man's noisy doings, Brewster wrote of bird songs, the tracks of foxes, the beauty of snowstorms, woods smoke and his beloved river. Thomas Barbour refers to him as the "modest and peerless recorder" and "utterly impersonal." "He wrote with no 'mission' in mind but simply because he had a warm, irrepressible urge to observe nature and set forth what he had seen but not what he thought about it."

Brewster's standing as a scientist probably will rest on his many other works and technical papers on ornithology, but as New England's great outdoor naturalist it will depend largely on the diaries and journals he left, and a most generous sampling of them has been given to us in the three volumes here described.

The details of Brewster's life have been adequately recorded elsewhere,[1] and my purpose here is merely to remind naturalists everywhere of these new chapters that have been added to the rich body of New England's natural history. Perhaps I may be pardoned if I add here my sonnet called "William Brewster: Man of Concord," which appeared originally in the *Washington Post* as a "review" of the book "Concord River." I believe it tells in another way what manner of man he was and why New Englanders should be proud that he was theirs.

> There by the river's bend he had his place.
> New England hills and hollows, fields, and springs
> Belonged to him, and he had sight and space
> To see uncommonness in common things.
> Up and down the Concord, paddling his canoe,
> He sought out nature's secrets like a sleuth;
> The flutter of a bird was oft a clue
> To bring him beauty and to show him truth.
>
> For serving God his meed was great and good:
> He touched a trembling vireo; unheard
> He watched a fox's cunning in the wood;
> To him the robin's rapture was transferred.
> How many men like Brewster do you know,
> Who'd find it joy to let a weasel go?

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[1] Sketch by Henry W. Henshaw in *The Auk*, January, 1920; and biography by Dr. Witmer Stone in the Dictionary of American Biography.

THE FERMENTATION TEST FOR THIAMIN

SCHULTZ, Atkin and Frey[1] refer to a note published in SCIENCE[2] from this laboratory and deny the implication that their fermentation test involves the *growth* of yeast. Such implication, if present in the note referred to, was erroneous. It is true, of course, that growth and fermentation can be dissociated (as has been done in the fermentation test), but on the other hand under many laboratory conditions they are closely related; so much so that the discovery of the *growth* essential "bios" by Ide[3] (Wildiers[4]) was based upon a *fermentation* test. The vitamin test of Bachman (1919) was likewise based upon fermentation (during growth). Substances which stimulate growth need not necessarily influence fermentation, but they often do so.

Our questioning of the specificity of the fermentation test for thiamin was based partly on experiments which may have involved cleavage products of the vitamin.[5] If this is so, it has been cleared up by the discoverers of the fermentation test.[6]

Other objections which are perhaps not crucial are based upon the fact that substances other than thiamin, notably pantothenic acid, and nicotinic acid (discovered to be an interference by the originators of the method),[7] have an influence. Duplicating the author's conditions as nearly as is possible using the Warburg technic, we have found that pantothenic acid, by stimu-

[1] A. S. Schultz, L. Atkin and C. N. Frey, SCIENCE, 88: 547, 1938.
[2] R. J. Williams, SCIENCE, 86: 349, 1937.
[3] R. J. Williams, SCIENCE, 88: 475, 1938.
[4] E. Wildiers, "La Cellule," xviii, 313, 1901.
[5] R. J. Williams and R. R. Roehm, *Jour. Biol. Chem.*, 87: 581, 1930.
[6] A. S. Schultz, L. Atkin and C. N. Frey, *Jour. Amer. Chem. Soc.*, 60: 3084, 1938.
[7] A. S. Schultz, L. Atkin and C. N. Frey, *Jour. Amer. Chem. Soc.*, 60: 1514, 1937.