Phycological Trailblazer No. 13 Marshall Avery Howe

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Marshall Avery Howe was a botanist with broad interests and with a strong field component to his research. He avidly set out on numerous collecting trips, especially to the tropics, and his body of work reflects that first-hand knowledge that comes about only from being in the field. His species descriptions are exceedingly detailed and can serve as models on how they should be written. They include an input derived from his many excursions into tropical waters and his acute powers of observation.

Setchell (1938) provided a formal biographical memoir on Howe, with an account of Howe's scientific contributions and his very productive administrative career. Setchell's essay also included a full bibliography listing all of Howe's numerous publications not only in the area of phycology but hepaticology and his interest in horticulture, especially the propagation of dahlias. This more informal examination of Howe's life (as a "phycological trailblazer") examines his field work and his quest for algae on expeditions to Bermuda (1900), Nova Scotia and Newfoundland (1903), the coast of Florida (on several trips: 1903, 1904, 1909, and 1914), Puerto Rico (1903 and 1915), the Bahamas (1904 and 1908), Jamaica (1907 and 1909) Panama and Colon (1904 and 1909-10), and Cuba (1915). He was also instrumental in acquiring several significant algal collections which added considerable prestige to the holdings of the New York Botanical Garden's Herbarium (= NY).

Marshall Avery Howe - 1867-1936
Photo: The Archives of The New York Botanical Garden

Marshall Avery Howe was born in Newfane, Vermont, on June 6, 1867, a member of an old Vermont family. He received his undergraduate degree in 1891 at the University of Vermont and then spent the next five years at the University of California in Berkeley working as an instructor in cryptogamic botany, familiarizing himself with both hepatics and marine algae. These two plant groups were to occupy his research attention for the duration of his scientific career, with the greater amount of attention becoming marine algae in his later life. He returned to the east coast in 1896 and started his graduate studies at Columbia University, earning the Ph.D. in 1899, and staying on as curator of the herbarium until 1901. The summer of 1901 was spent carrying out botanical exploration in Nova Scotia and Newfoundland in the company of his brother, Clifton D. Howe. It was during that same summer of 1901 that he assumed a position at the relatively newly established New York Botanical Garden. He spent his entire career at that institution, for a long time as assistant director. Eventually he assumed the directorship only 15 months before his death in 1936.

In a report to Dr. Nathaniel L. Britton, Director-in-Chief of the New York Botanical Garden, Howe (1903) related the facts of one of his collecting trips to Puerto Rico,

where he spent almost 8 weeks. He used most of the time there to collect marine algae, but he also used the opportunity to obtain photographs of general botanical interest. His longest stop was made at Santurce, a suburb of San Juan. This site yielded a large number of species thanks to a great variety of habitats: coral reefs, heavily exposed littoral rocks, sand beaches, mangrove swamps, and protected bays and lagoons. The water was sufficiently warm to permit Howe to make his collections by the "bathing-suit method". He did not attempt any dredging but did use a long-handled rake to retrieve some sublittoral forms. He proceeded west to Aguadilla, Point Borinquen, Rincón, and Point Jiguero on the western side of the island, which he found to be less diversified than San Juan. He travelled by steamer from Aguadilla to Ponce on the south coast, which proved to be disappointing. Then by train he backtracked westward to Guánica, a site of historical interest because it was the landing place for the invading U. S. Army led by General Miles in July, 1898, during the Spanish American War. U.S. money had been invested in the region to develop the sugar industry, and there was a newly built factory, tributary railroads, and a wharf to accommodate ships for exporting the sugar. Howe found the harbor of Guánica and nearby islands to turn up several species which had not been previously seen in Puerto Rico. Howe was pleased to have a large work room provided by the factory people. By rail and "stage" Howe worked his way back to San Juan, with stops at Mayagüez, Aguadilla, and Camuy. He spent two days in Mayagüez consulting with the staff at the Agricultural Experiment Station. A total of 900 numbers of marine algae (including many duplicates) was the result of this effort. Prior to Howe's trip, the botanical collector Paul Sintensis from Germany collected algae in Puerto Rico from late 1884 to mid-1887, and Hauck (1888) published on these collections.

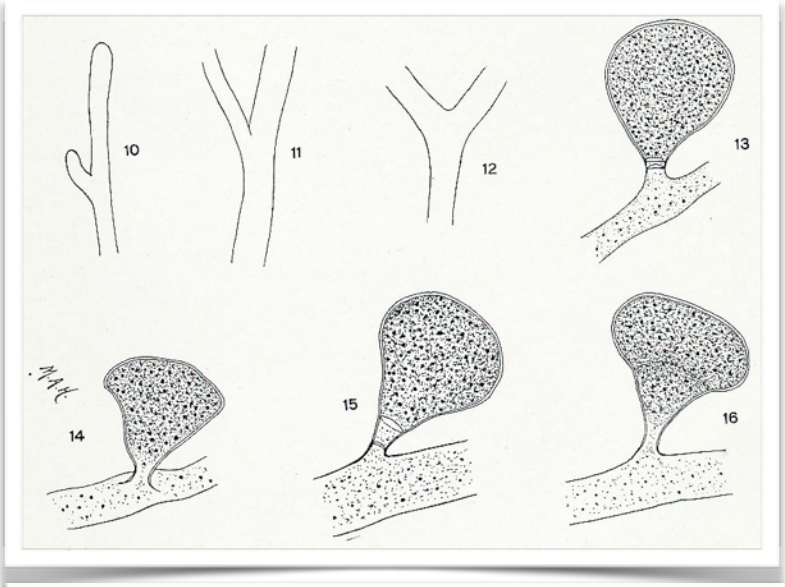

Fig. 1. *Derbesia turbinata* M. Howe & Hoyt (figs 10-16 in Howe & Hoyt, 1916.]

Howe set sail for Europe in early June, 1904, for the purpose of visiting herbaria and museums which held historical "types" of American marine algae. He took more than 300 photographs of type specimens and deposited these photos in the Herbarium of the New York Botanical Garden. It is worthwhile to relate some of his findings on these historical collections. Howe's first stop was the Herbarium of Trinity College in Dublin, where he found about 100 types of American algae described by Harvey. Howe proceeded on to London where he divided his time visiting three herbaria: the Natural History Department of British Museum on Cromwell Rd., the Royal Botanic Gardens at Kew, and the Linnaean Herbarium located in the rooms of the Linnean Society in Burlington House. The BM contained collections of J. E. Gray, Dickie, and a set of Guadeloupe (French West Indies) collections distributed by Mazé. At that time Dawson Turner's collection and material from the Challenger Expedition were deposited in Kew (but since transferred to the BM). Howe found the Linnaean material to be difficult to work with in terms of locating types, but he nonetheless felt a sense of awe in poring

over specimens that once had been used by Linnaeus. Howe also made a quick side-trip up to Oxford to check out the Dillenian Herbarium. Moving on to France, Howe's first stop was at Caen, where the Institut Botanique housed the important Lamouroux collections. Again, he experienced a sense of awe when observing the specimens used by Lamouroux in illustrating his *Essai*. Next, Howe was off to Paris, where the Museum National d'Histoire Naturelle (PC). Here were the herbaria of Montagne, who was responsibile for the descriptions of many new species from the West Indies, and Bachelot de la Pylaie, who had described a number of new taxa in the Fucales and Laminariales based on his trips to St. Pierre, Miquelon, and Newfoundland, in 1816 and in 1819. Although Howe examined a set of the second edition of Mazé and Schramm's *Algae of Guadeloupe* (1878), he was unable to examine the actual algae because they were in the possession of M. Edouard Bornet, who happened to be away from Paris at that time. Howe next traveled to Eerbeck in eastern Holland to meet with Madame Anna Weber-van Bosse. She had in her possession the herbaria of both Kützing and Hauck. These important collections and those of Weber-van Bosse were later moved to the Rijksherbarium in Leiden. Howe's next stop was Oldenburg in Germany to examine the herbarium of A. W. Roth, the author of *Catalecta Botanica* (1797-1806). Howe found the material in excellent shape and noted that the specimens were accompanied by full data and with species diagnoses written out in Roth's own hand. This left Howe most impressed. Additional stops included the Botanical Institute in Hamburg, which contained some Binder material, and the Botanical Museum in Copenhagen, where he found a few specimens attributable to Lyngbye and Vahl. The longest stop-over (of a month's duration) was spent by Howe in Lund, in southern Sweden. The Botanical Museum of the University of Lund contains the Agardhian Herbarium (which is a sub-set of the whole), an extremely valuable collection of more than 50,000 specimens. This includes more than 200 specimens from North America and the West Indies, thus of special significance to anyone working on these floras. Howe noted that the algal holdings in LD are the richest in the world in terms of types of marine species. This fact is the result of the long total career of father (C. A. Agardh) and son (J. G. Agardh), their cumulative publication career running from 1810 to 1901. In Stockholm Howe found that Areschoug's collections from Brazil were to be found in the Museum of the Royal Academy of Sciences.

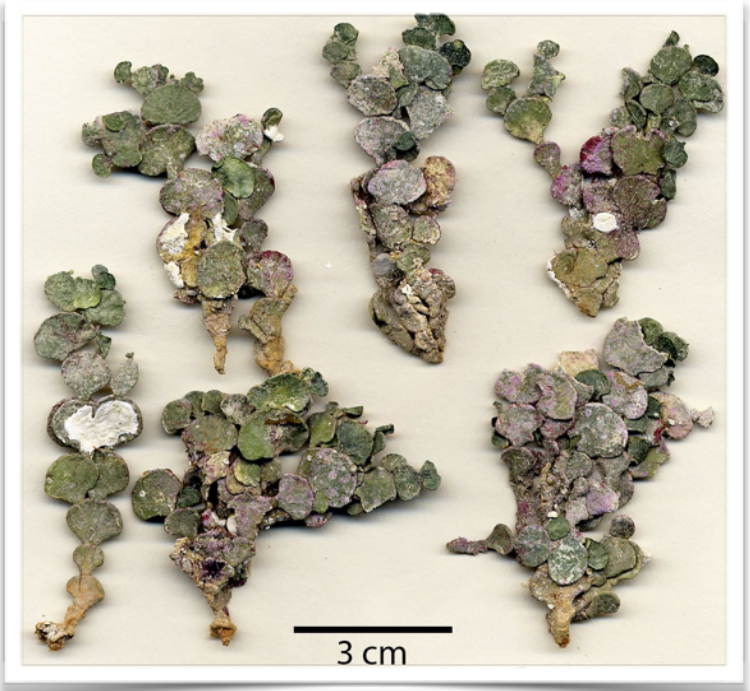

Fig. 2. *Halimeda scabra* M. Howe. From Florida Keys, Coll. M. Wynne 10016 (in MICH).

During the winter of 1906-07, Howe spent 6 weeks on a collecting trip to Jamaica. Once he reached Kingston after a 6-day voyage from New York on the *Prinz August Wilhelm*, he was given a workroom in an office building near the waterfront. Algae in the harbor were minimal; beds of the seagrass *Thalassia testudinum* seemed to totally dominate the

bottom of the harbor to the exclusion of everything else. So he hired a couple of local boatmen and their dug-out canoe, provided with sails. Howe had a daily routine of using the dug-out canoe to venture out in the morning and forenoon each day to make his collections because the sea was calm then (in December) and using the afternoons to process the specimens. Within the harbor he collected the usual inhabitants of the mangrove areas, such as *Catenella* and *Bostrychia* , as well as the rather rare *Acicularia schenckii*. On the outer beach of the "Palisades", which was an 8-mile-long tongue of land that protected Kingston Harbor, he found some deepwater genera such as *Haloplegma* and *Dictyurus* in abundance. Once out to the low islands and barely covered reefs lying 5 or 6 miles off shore, he found the seaweed diversity to be much improved. He collected various species of lime-encrusted *Galaxaura* as well as several species of *Caulerpa*. Only on a couple days of his 3-week stay in Kingston were the seas "boisterous", making it too risky to venture outside the harbor.

Howe next went to Montego Bay on the northwest coast of the island, reaching there by rail. His 10 days there were profitable because he found a number of species that had not been seen at Kingston. A carriage was used to explore the shoreline, for a distance of 14 miles to the west and 11 miles to the east of the town at Montego Bay. Howe's scheduled itinerary, which were to visit Port Antonio and "Hope Gardens" in Cinchona in the Blue Mountains (the tropical station of the New York Botanical Garden), was abandoned when an unexpected event occurred on Jan. 14th. As Howe was preparing to move on to Port Antonio, a major earthquake rumbled across Jamaica. Although the earthquake resulted in little damage to Montego Bay, the effect in Kingston was substantial--the city was ruined. A series of telegrams from other parts of the island gave conflicting reports on how those areas had been impacted by the earthquake. After several days of uncertainty and having his goods all packed and ready to pull out at any moment, Howe heard from his colleagues in Cichona. They advised him to cancel that leg because although uninjured, they were homeless. So one week after the earthquake Howe took the train toward Kingston, spending the night in Spanish Town. The following morning, from the vantage point on the train, Howe was able to take in the sights of devastation. The main part of Kingston had been devastated both by the earthquake and by subsequent fires, with 90% of the town and suburban residential areas destroyed. Fortunately, Howe's collections, which he had left in a building that the fires had not reached, were unscathed. Leaving ship-board on the morning of Jan. 24th, 10 days after the earthquake, Howe observed how near Port Royal a group of coconut palms now were submerged in sea-water with only their crowns and upper parts of the trunks above the water.

Another venture into the tropics was taken by Howe and his wife in winter of 1909-1910. He held a long cherished desire to study the marine algae of Panama. This goal was fulfilled when he and Mrs. Howe left New York on the steamer *Tagus* of the "Royal Mail" line. En route they had a full day lay-over in Kingston, Jamaica, and used the opportunity to visit colleagues at Hope Gardens outside Kingston. The ship reached Colon on Dec. 5th, and they proceeded by rail to the city of Panama, thus crossing the Isthmus, which was a 48-mile trip.

In addition to his own many collecting trips, Howe was the recipient of the collections made by others. This permitted him to become knowledgeable of the floras of regions around the globe. These collections came from Cuba (1918c), the Philippines (1932), China (1924, 1934), Uruguay (1931), Hawaii (1934), Hudson Bay, Canada (1927), Brazil (1931, with W. R. Taylor), Brazil & Barbados (1928), Baja California, Mexico (1911). They also included freshwater collections made by Mr. L. J. K. Brace from Bermuda and the Bahamas (1924). Honors that were bestowed upon Howe include an honorary degree of Sc. D. from the University of Vermont and his election in 1923 to the National Academy of Sciences.

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