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SOME AMERICAN BOTANISTS OF FORMER DAYS*

By John Hendley Barnhart

A hundred and twenty years ago, when Richard Pulteney had written his "Historical and biographical sketches of the progress of botany in England", he put into his preface these apt words: "In tracing the progress of human knowledge through its several gradations of improvement, it is scarcely possible for an inquisitive and liberal mind, of congenial taste, not to feel an ardent wish of information relating to those persons by whom such improvements have severally been given: and hence arises that interesting sympathy which almost inseparably connects biography with the history of each respective branch of knowledge." And it is as true as ever, that, if one would understand the progress of science, he must study the personality of the men whose labors have resulted in that progress.

Our theme this evening, "Some American botanists of former days", is a very limited one. The term "American botanists" is intended in its narrow sense, as referring only to those whose scientific work has been accomplished, at least in part, within the bounds of the United States as they were before our recent period of expansion. And when we say "botanists of former days" we must in fairness omit all reference not only to workers now living but to all who would be living if they had not met with premature death.† By the latter limitation we exclude all specialists in

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† As a matter of fact, no man is mentioned who did not die more than five years ago; and, if all of those mentioned were still living, the youngest would be about seventy years old.

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plant morphology and physiology, fields of study which have seen their entire development, as far as this country is concerned, within the memory of the living. Even thus limited, the number of botanists worthy of mention on an occasion such as this is so large that we must necessarily omit altogether some who might reasonably be looked for; and we may as well admit that in doubtful instances our choice has been influenced by the facility with which we are able to illustrate* our remarks.

The earliest knowledge of North American plants was derived from the accounts of observant travelers and explorers, and from specimens and seeds carried to Europe by them and by traders. Living plants and seeds were grown in European gardens, and it was from material raised in this way that most of the early technical descriptions of American plants were drawn. The collectors possessed little or no botanical knowledge, and the scientists who studied the collections can not be classed as "American" in any sense.

The first settler of whose scientific attainments as a botanist we have positive evidence, was John Banister, a missionary in Virginia, who lost his life by falling from some rocks while on one of his collecting expeditions. In 1680, Banister sent a list of Virginian plants to John Ray, of England, who published it as an appendix to his Historia Plantarum in 1688. Fifty years had elapsed, however, before the appearance of a work dealing exclusively with North American plants, and nearly a century before the first botanical work was published in North America.

John Clayton, who came from England to Virginia in 1705, and was for 51 years clerk of Gloucester County, prepared a scholarly work on Virginian plants. Of course he lacked facilities for publication, and for the comparison of his plants with those previously described; his specimens and manuscripts were sent to Holland, where the flora was published under the editorship of Gronovius, whose blunders are to be found on nearly every page. Clayton's botanical exploration covered all of eastern Virginia, and extended through many years; even the year before his death, when he was about 87 years of age, he made a botanical tour through Orange County. All of the care-

* The paper was illustrated with lantern slides.

fully prepared manuscripts and collections left by him were destroyed by fire a few years later, during the Revolutionary War.

While Clayton was pursuing his explorations in Virginia, Cadwalader Colden was studying the flora of his great three-thousand-acre estate, "Coldenham", in the colony of New York. Dr. Colden was a very busy man, nearly always holding some public

FLORA VIRGINICA

Exhibens

PLANTAS

Quas

V. C.

JOHANNES CLAYTON

In

VIRGINIA

Obſervavit atque collegit.

Eaſdem

Methodo Sexuali diſpoſuit, ad Genera propria retulit, Nominibus ſpecificis inſignivit, & minus cognitas deſcripſit

JOH. FRED. GRONOVIUS.

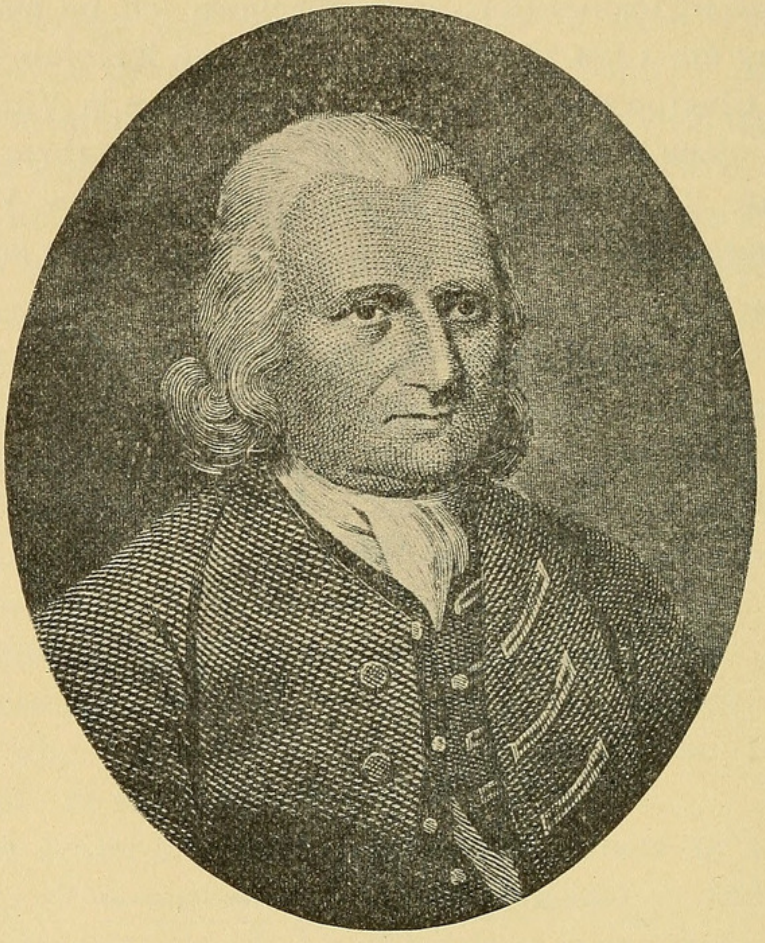
Pars Secunda.

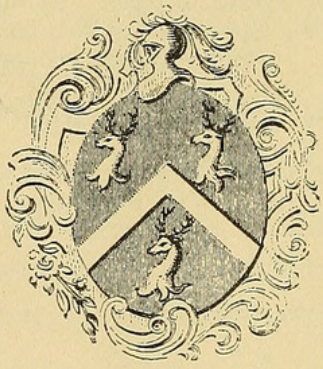
LUGDUNI BATAVORUM,
Apud CORNELIUM HAAK, 1743.

FIRST PAGE OF BANISTER'S CATALOGUE.*

office of importance, and at one time lieutenant-governor of the colony of New York; yet, with the aid, no doubt, of his gifted daughter, he found time to prepare a careful account of the native plants of Coldenham, and sent this to Linnaeus, who published it in the proceedings of the royal society of Upsala. This was the earliest local flora of any part of the present state of New

*This illustration was provided with the aid of the Catherine McManes fund.





Cadwallader Colden

CADWALLADER COLDEN, 1688–1776

York. The daughter, Jane Colden, commenced the preparation of a remarkably accurate flora of New York, of which the completed portion is preserved, in manuscript, in the Department of Botany of the British Museum.

Banister, Clayton, and Colden, as well as other early workers on the flora of North America, such as Catesby, Garden, Kalm, Vernon, and Kreig, were all Europeans by birth. The first native American botanist was John Bartram, a Quaker, who was born near Philadelphia in 1699. He published but little, and that little furnishes very slight evidence of his botanical attainments; but he was a correspondent of Collinson, Gronovius, and other famous European botanists of his day, and by the number and accuracy of the observations contained in his letters seems to have deserved their admiration. He traveled throughout eastern North America, from New York to Florida, collecting particularly seeds for his Old-World correspondents; but he is best remembered from the fact that he established, near Philadelphia, about 1730, the first botanic garden in America, and into this garden he gathered representatives of the largest possible number of native American plants. It was a small affair (the entire property comprised only five acres), and a part of the limited space was occupied by the house, built by his own hands; but the garden was a remarkable project indeed for those days, and is known to have contained many choice specimens.

William Bartram, son of John, is perhaps better known as a botanist, because of the fact that his account of his extended travels in the southern Atlantic states was published, and contains many important observations upon the plants of the regions explored by him. He maintained the garden established by his father, and after his death the property remained in the hands of owners who were deeply concerned in its preservation, for many years. During a short period of neglect, serious damage was done to the old garden, but within the past twenty years it has become the property of the city of Philadelphia, and is now a city park. Its collection of trees and shrubs has always been a notable one, and the old house is still in an excellent state of preservation.

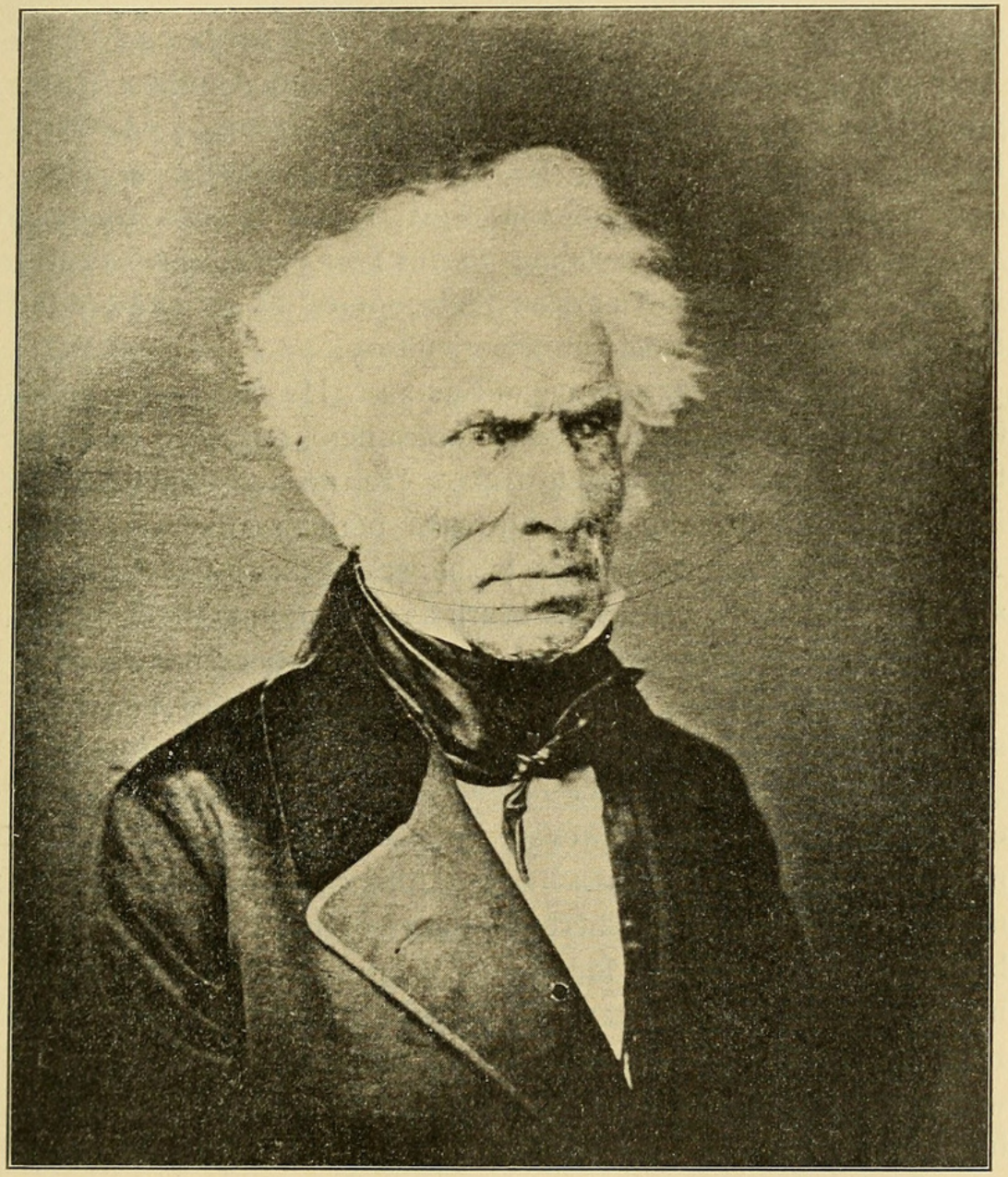
The second American botanic garden in North America was also near Philadelphia, and was established in 1773 by Humphry Marshall, a first cousin of John Bartram and, like him, a Quaker. The old garden has long since passed into a state of decay, but the house, built by Marshall with his own hands in 1773, is still in an excellent state of preservation. Humphry Marshall has the distinction of having written the first botanical work ever published in the United States, an account of our native trees and shrubs, printed at Philadelphia in the latter part of the year 1785.

One of the most remarkable of the early American botanists was Thomas Walter, a native of Hampshire, England, who went to South Carolina when a young man, married there, and settled on the banks of the Santee River. How he became interested in botany, how he was able to carry on his botanical work in such complete isolation from the rest of the scientific world, is quite unaccountable. However accomplished, it is an indisputable fact that he prepared a clear, succinct, and remarkably complete flora of the region about his home, which was published in London by John Fraser in 1788. Fraser was a collector who visited the southern states repeatedly, the first time as early as 1785; he was a personal friend of Walter's, and took the manuscript back with him upon his return from one of his earlier trips. Walter died in the same year in which his flora was published, less than fifty years of age, and was buried in the garden adjoining his home, where he is said to have cultivated many of the plants described in his Flora Caroliniana. His herbarium is preserved in the Department of Botany of the British Museum.

Our attention is now claimed by a small group of men who played an important part in the development of American botany. They were born, and died, in foreign lands, but they spent years in the active botanical exploration of the United States as then limited, and their labors resulted, in each instance, in the publication of a monumental work upon the North American flora.

André Michaux, a Frenchman, already well known for his botanical travels in Europe and the Orient, landed at New York late in 1785, and spent more than ten years in America, traveling throughout the known parts of the country from Hudson Bay to

Florida, and as far west as Kentucky and the Cumberland settlements. On his travels he was sometimes accompanied by his son, François André, who was only fifteen years old upon their first arrival. During all these years, although for a part of the



FRANÇOIS ANDRÉ MICHAUX, 1770–1855
(Daguerreotype, 1851)

time he was engaged upon a political mission for the French government, Michaux seems to have had in mind the accumulation of material for a general flora of North America, and when he

returned to France in 1796 he carried with him an herbarium of North American plants such as had never before been brought together. His flora was edited by the famous French botanist, L. C. Richard, and published at Paris in 1803; meanwhile the man whose labors had made this great undertaking possible of accomplishment had lost life on the island of Madagascar.

The son, François André Michaux, revisited America in the years 1801–03, traveling through the then extreme west, Ohio, Kentucky, and Tennessee. He afterwards published an elaborately illustrated history of the forest trees of North America, and several other works relating to our flora; and, at his death, in 1855, he left to the American Philosophical Society a fund for the development of American arboriculture.

Frederick Pursh was a native of Saxony. He came to America in 1799, and spent nearly twelve years here, engaged much of the time in botanical collecting trips. He traveled principally on foot, and without companionship save perhaps that of a dog. According to his own statements, he was as far to the northeast as New Hampshire and as far south as the mountains of North Carolina, but as far as collateral evidence is concerned there is no proof that he was farther northeast than Vermont or farther south than southern Virginia; and, unfortunately, the reputation of Frederick Pursh for strict veracity is not of the best. In the course of his travels, however, he made the acquaintance of nearly all the botanists then living in this country, and was permitted to examine all the herbaria then existing here; and, upon his return to Europe, he found in England, where he made his home, several fine herbaria of North American plants. In England, in 1814, he published his flora of North America, which was the second (and last successful) attempt to comprehend in a single work descriptions of all known North American flowering plants. A few years later Pursh began the exploration of Canada, with a view to the preparation of a descriptive Canadian flora, but before this was accomplished he died, at Montreal.

Thomas Nuttall was an Englishman who, when he came to America in 1808, at the age of twenty-two, had no knowledge of botany, and received his first lessons in that science from Pro-

fessor B. S. Barton, to whom he had applied for information concerning an unfamiliar plant. Yet he became a great enthusiast in the pursuit of botanical knowledge, and only ten years later he published his famous work on the genera of North American plants, which gave him a place in the first rank of the botanists of his day. Meanwhile he had made excursions to various parts of the country east of the Mississippi, and one far up the Missouri, utilizing the inclement winter seasons for working up his collections at Philadelphia. Nuttall continued botanical work in this country until 1841, when he returned to England, where he spent his remaining years, with the exception of a brief visit to Philadelphia in the winter of 1847–48.

By the time Nuttall's work on the genera of North American plants appeared, in 1818, there had sprung up two vigorous centers of botanical activity in this country, one at Philadelphia, the other at New York. In discussing these, we shall find it convenient to take up the Philadelphia group of botanists first. This was doubtless directly influenced by the earlier work of the Bartrams and of Marshall in that vicinity.

Henry Muhlenberg was a Lutheran clergyman, born in Pennsylvania, but educated in Germany. He did not take up the study of botany until he was nearly thirty years old, about 1782 or later. His home was at Lancaster from this time until his death in 1815, but he is mentioned here because his botanical associations were chiefly with the younger workers of Philadelphia. By his thorough work, his publications, his collections, and his correspondence with European botanists, he did much to advance the knowledge of our flora.

Dr. Benjamin Smith Barton, a native of Pennsylvania, who had received his medical education at Edinburgh and Göttingen, became a professor in the University of Pennsylvania in 1790, at the early age of twenty-four, and continued to occupy this chair until his death twenty-five years later. His position gave him much prestige, and his contributions to the advance of American botany are to be measured less by his published work than by the influence of his botanical lectures, and the sympathy and financial support given by him to other students, such as Pursh

and Nuttall. His nephew, Dr. William P. C. Barton, also became a well-known botanist.

One of Dr. Barton's students, whose interest in botany seems to have been first aroused, however, by Humphry Marshall, was Dr. William Baldwin. Dr. Baldwin had already visited China before he received his professional degree in 1807, and within the next ten years he traveled extensively in the southern states, and as a surgeon in the United States Navy visited various South American ports. In 1819 he joined a government expedition for the exploration of the upper Missouri, and died before they were well under way. His published papers were few, but his notes and memoranda were very useful to contemporary workers, and his memory is kept green by the publication of a volume of his letters by his friend, Dr. Darlington.

Dr. William Darlington was another physician who enjoyed the inspiration of Barton's lectures, and in spite of his arduous labors as a member of Congress and in various other public and semi-public positions, devoted much time throughout a long life to botanical study. His flora of his home county of Chester, which went through three editions, was a model local flora which in some respects has never been surpassed. He was deeply interested in such subjects as those we are discussing this evening, and it was through his efforts and under his editorship that the literary relics of Bartram, of Marshall, and of Baldwin, were rescued from oblivion.

Lewis D. de Schweinitz was a Moravian preacher, a native of Bethlehem, Pennsylvania, where he spent most of his life. He was educated in part, however, in Austria and Germany; although his study of botany was begun before he left America, his first published work was in collaboration with Professor J. B. Albertini, of Niesky, in upper Lusatia. His chief interest was in cryptogamous plants, particularly fungi, and he was the first American specialist in this group of plants. Although his published works were few, they were fairly voluminous, and are of great importance.

The leader of the New York group of botanists was Dr. Samuel L. Mitchill. He was a naturalist of broad interests, and never published any botanical work of consequence, yet he ex-

erted such a remarkable influence upon the young men he gathered about him that no student of the history of botany in this city could fail to recognize in him a great pioneer. When a handful of young enthusiasts gathered in 1817 to organize the Lyceum of Natural History, now the New York Academy of Sciences, the only candidate considered for president was their beloved professor, Dr. Mitchill, and he retained his interest in the institution until his death. At various times Congressman, Senator, and College Professor, his is a striking figure in the history of natural science in this vicinity.

A contemporary of Dr. Mitchill was Dr. David Hosack, a New York boy, a graduate of Princeton, who pursued his medical studies in Scotland and England, and while there acquired a taste for botany, and received some training in that science from William Curtis and Sir James E. Smith, the famous English botanists. Soon after his return to New York he established the first botanical garden in this city, a short distance north of where the Grand Central Station now stands. A hundred years ago this Elgin Botanic Garden was one of the show places of the city; in 1811 it was sold by Hosack to the State of New York, and three years later was granted to Columbia College. The grant did not require Columbia to maintain the Garden as such, and it was soon diverted from its former uses; with the later marvellous rise in value of real estate in that vicinity, it became the foundation of Columbia's prosperity.

Among the founders of the Lyceum were several young men particularly interested in botany, among them LeConte, Eddy, Knevels, and Torrey. Of this number Dr. John Torrey became most renowned in after years. His first important botanical work was performed as a member of a committee appointed by the Lyceum to prepare a flora of the region around New York City. This report, prepared chiefly by Torrey, was afterward published, and was the first of a long series of important works, which won for Torrey universal recognition as the foremost American botanist of his day. He was for many years a professor in the College of Physicians and Surgeons, and died at the age of 76, universally beloved.

As Torrey had been one of the young men drawn together by the magnetic personality of Dr. Mitchill, for the establishment of the Lyceum, so he was in turn the center of attraction for the group who, nearly sixty years later, founded the Torrey Botanical Club. The leading spirit in this later movement was William H. Leggett, who acted as editor of the Bulletin of the Club from its commencement in 1870 until his death in 1882.

One of the early botanists of the Lyceum was Professor C. S. Rafinesque, and we may as well refer to him at this point, although by nature and by fate he was a cosmopolitan. His father was a French merchant, his mother was of German extraction, he was born in a suburb of Constantinople and spent most of his early years in Italy. He was a precocious child, becoming familiar with various languages and more or less acquainted with various sciences at an early age. As a young man he spent several years in America; then several years in Sicily; in 1815 he returned to the United States, where he spent the remainder of his life. He was in many ways the most striking figure to be found in American botany; brilliant, but erratic; undervalued, misunderstood, and misrepresented by his contemporaries, yet deserving by his rashness and the superficiality of his work many of the harsh criticisms with which he was assailed. As professor in Transylvania University, he was the first resident botanist west of the Alleghenies. His later years were spent in Philadelphia, where he died in poverty and almost friendless. Most of his numerous publications might better never have been written, yet with the dross are occasionally to be found grains of pure gold, and the present generation is inclined to put a more just estimate upon the work of Rafinesque than has hitherto prevailed.

Amos Eaton was the first great popularizer of botany in this country, and in tracing back the history of any American botanist of the past century we are as likely as not to find that Eaton was, botanically speaking, his father or grandfather. Eaton was a teacher, and was always full of enthusiasm of such a contagious character that his pupils found it irresistible. Wherever he went he inspired others with the same interest in natural science that he felt himself. None of his predecessors

could be compared with him in this respect except perhaps B. S. Barton, and Barton's personality was cold and formal when compared with that of Eaton. His manual, prepared specifically to meet the needs of the amateur, was popular for many years, and went through eight editions. The last eighteen years of his life were chiefly occupied with labors incident to the establishment and administration of the Rensselaer Polytechnic Institute, at Troy. Among the many inspired by him was Mrs. Almira H. Lincoln, afterwards Mrs. Phelps, whose text-book did so much to popularize the study of botany.

At this time there was no group of botanists in New England comparable to those in Philadelphia and New York ; yet at least two New England botanists of this period should be mentioned. One was Dr. Jacob Bigelow, author of a Boston flora which appeared in three editions. He was one of the most famous of Boston physicians, and lived to be nearly 92 years of age. The other was Professor Chester Dewey, well known for his work on the difficult genus Carex.

Another man who was doing remarkable work at about the same time was Stephen Elliott, of Charleston, South Carolina. Isolated from most other botanists, with meager facilities for the prosecution of scientific work, occupied much of the time with his duties as a member of the legislature of his state, he nevertheless published, at intervals, beginning in 1816, a descriptive flora of South Carolina and Georgia which challenges our admiration.

We now come to a new era in the development of American botany. Hitherto most American botanists had been interested in other natural sciences as well, and in so far as they had devoted their attention to botany they had covered essentially the same ground. Morphology and physiology were still in the background, but although taxonomy held the field, specialization was the order of the day.

The acknowledged leader of American botany during this period was Dr. Asa Gray. At first in New York, and later for many years at Harvard, he made a name for himself, as a man of sound scholarship, of broad culture, and of commanding person-

ality. He seems, however, to have been jealous of his own pre-eminence, and to have discouraged successfully every possible rival in his chosen field. Few indeed, during a period of many years, were the Americans who ventured to differ with him upon any botanical matter on which he had expressed an opinion. His assistant at Harvard in his later years, and his successor, was Dr. Sereno Watson, a man of similarly scholarly attainments.

In one line, however, Gray had a worthy rival. Alphonso Wood possessed neither the talents nor the advantages of Asa Gray, but his class-book of botany always disputed with Gray's manual the right to popular approval as a working reference book upon the flora of the northeastern United States. Nor was Wood's work patterned after that of Gray; its first edition appeared several months earlier, and its later editions covered a considerably larger field, while the author always persisted in giving clear expression to his own views. Dr. Alvan W. Chapman, on the other hand, who wrote the well-known flora of the southern United States, was an author in little more than name, the absolute authority of Dr. Gray being recognized throughout the work.

During the years when Dr. Gray monopolized nearly all of the work on the taxonomy of flowering plants in this country, there arose a number of specialists in plant-groups in which he took little interest — for he realized that it was impossible for one man to cover all the ground — who, as a rule, coöperated with him in their work. Among the specialists in groups of flowering plants were M. S. Bebb, who did notable work with the willows, having at his home in Illinois a remarkable salicetum where he was able to compare the various species in a living state; George Thurber, best known to botanists as a grass student, although most of his time was devoted to editorial work in agriculture; and George Vasey, also a specialist in the taxonomy of grasses, and for years the botanist of the United States Department of Agriculture.

In ferns, the one prominent name was that of Daniel C. Eaton, for thirty years professor of botany at Yale; he was a grandson of Amos Eaton, whose wonderful influence upon American botany

has been mentioned. Among moss students, we may refer to William S. Sullivant, who was the pioneer in the work upon this group of plants in this country, and Thomas P. James, who assisted Leo Lesquereux (of whom more later) in the preparation of the manual which is even now the only book of its kind for the identification of all then known American mosses. In the study of the Hepaticae, Coe F. Austin was the pioneer; his home, at Closter, New Jersey, was in a region peculiarly rich in its hepatic flora.

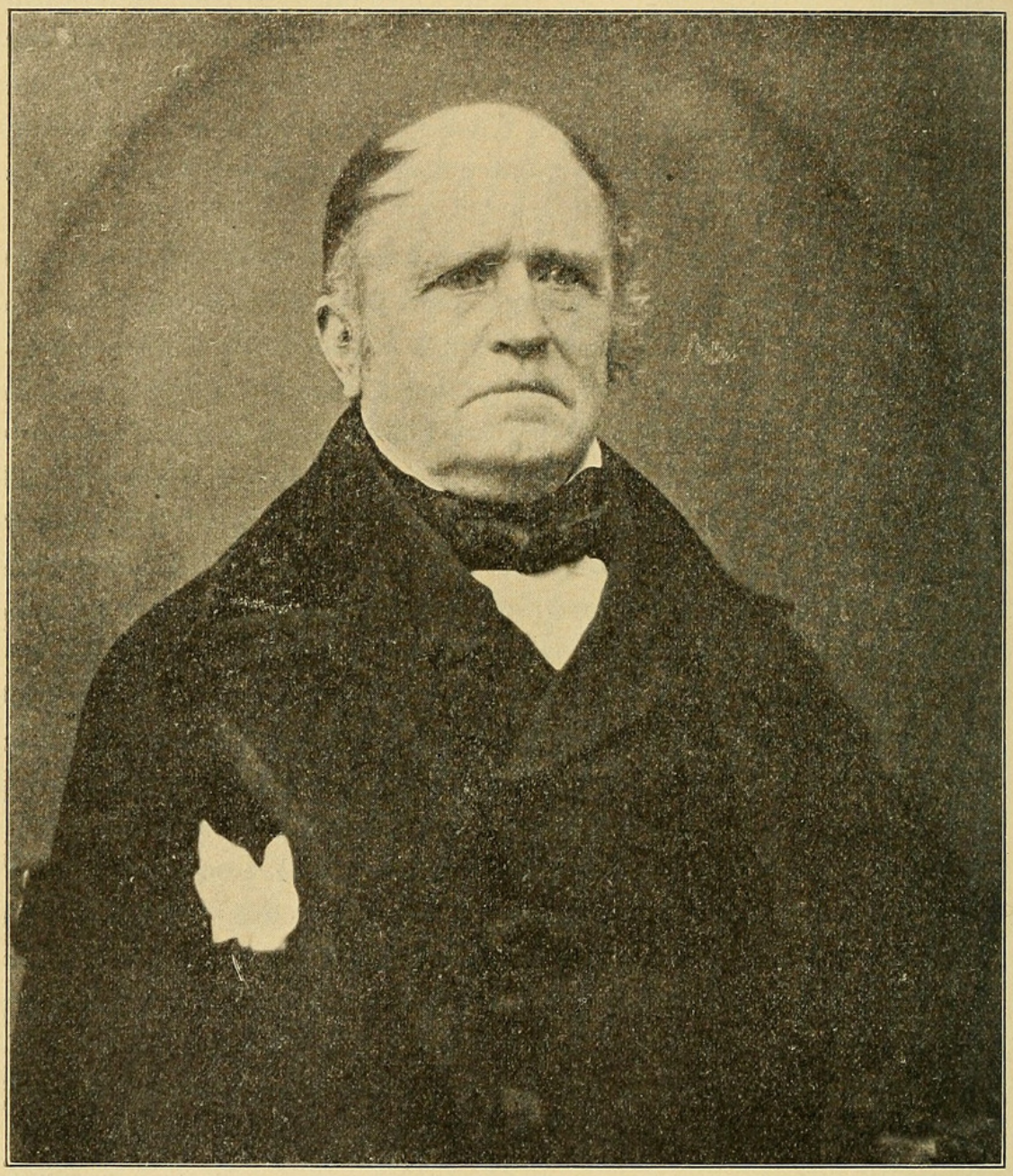
Among the specialists in Algae we may mention Dr. Francis Wolle, a Moravian clergyman, who published several books dealing chiefly with freshwater forms. Almost the only American student of lichens, for many years, was Professor Edward Tuckerman, of Amherst College. The most prominent mycologists of this period were Rev. M. A. Curtis, an Episcopalian clergyman, and Henry W. Ravenel, a planter, and since their work, as well as much of that of Schweinitz, was done in the southeastern states, the fungi of that region were better known forty years ago than those of any other part of the country.

As an example of the few palaeobotanical students of this period we may mention J. S. Newberry, geologist of several government exploring expeditions, state geologist of Ohio, and for twenty-four years professor in Columbia University. A unique position, as one who was at the same time a botanical horticulturist and a horticultural botanist, was occupied by Thomas Meehan, of Germantown, Philadelphia; his botanical work always betrayed his lack of scientific training, but contained much of permanent value.

The remarkable immigration to this country from central Europe during the thirties and forties, influenced largely by political conditions, had a pronounced effect upon American botany. Dr. George Engelmann, from Germany, became the pioneer of botanical work in the Mississippi valley, and established a botanical center at St. Louis which has been increasing in influence ever since. Dr. Leo Lesquereux, a Swiss, was for many years the foremost American student of fossil plants, and of mosses. Two men of German birth, Dr. Charles Mohr, of

Mobile, and Dr. Augustin Gattinger, of Nashville, became noted for their work upon the flora of their respective states.

In a discussion of American botanists, we must not overlook



CHARLES WILKINS SHORT, 1794–1863
(Daguerreotype, 1853)

those who are best known for field work, but of this class we can only mention a few. Perhaps the first person in this country to become noted for the excellence of the herbarium material distributed by him was Dr. Charles W. Short, of Kentucky. Dr·

Charles C. Parry is best remembered for his field work throughout the west, upon various government and private expeditions. H. N. Bolander and Thomas Bridges were among those who did notable work in the botanical exploration of California. But the prince of American plant collectors of former days was a modest Connecticut Yankee, Charles Wright, who devoted twenty years to work in the southwest, in Mexico, in China, and in Japan, and another ten years to the botanical exploration of Cuba.

Nor can we omit mention of those who, although busily engaged with other occupations, have found time to do valuable work upon the flora of the regions in which they have made their homes. Such a one, for instance, was Charles C. Frost, the shoemaker of Brattleboro, who had "more friends among the educated people of Europe than in his native village." Another such was John Williamson, of Kentucky, who with his own hands produced those beautiful etchings now so highly prized by American fern students.

The day of usefulness of amateur work in botany, such as that of Frost and of Williamson, has not passed. The limits of our topic forbid the mention of the names of the living, but even now there are farmers, and merchants, and professional men, who by devoting their leisure moments to serious study are notably advancing botanical science.

LOCAL FLORA NOTES — II

By Norman Taylor

Scheuchzeriaceae

1. *Triglochin palustris* L. There are no specimens of this from the area.* North American Flora, the manuals and other general works all credit this species with a range that includes at least the upper part of our area. Most of the local lists contain no mention

*The local flora range as prescribed by the Club's preliminary catalog of 1888 is as follows: All the state of Connecticut; Long Island; in New York, the counties bordering the Hudson Valley, up to and including Columbia and Greene, also Sullivan and Delaware counties; all the state of New Jersey; and Pike, Wayne, Monroe, Lackawanna, Luzerne, Northampton, Lehigh, Carbon, Bucks, Berks, Schuylkill, Montgomery, Philadelphia, Delaware, and Chester counties in Pennsylvania.