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History of Botanical Exploration

In The Beginning

By Edmund Berkeley

One who had not fully investigated the subject might readily assume that Virginia would have been among the first states to publish a state flora. The first book concerned with American flora was Harriot's *A Briefe and True Report of the New Found Land of Virginia*, published in London in 1588. The first drawings of North American plants were those of John White from Roanoke Island. The first permanent settlement in the American colonies was in Virginia. There were early studies of flora in the colony and the first colonial flora published was of Virginia. This early promise of a complete flora of the region has never materialized. Precisely why it has not is difficult to evaluate. There have been a number of movements toward one, and today we once again have hope. It would seem desirable to summarize here the history of previous floristic studies in Virginia.

Only thirty species of North American plants are known to have been successfully introduced into Europe prior to 1600. Many of these were brought back by Harriet's expedition of 1586, including *Nicotiana rustica*, *Diospyros virginiana*, and *Juniperus virginiana*. Many in England and elsewhere in Europe were eager to learn more about the wealth of new plants which evidently existed in North America but the introduction of these plants into Europe was surprisingly slow, and did not really reach a large scale until the eighteenth century. One of the more notable of the early plant collectors was the younger John Tradescant, who made several collecting expeditions to Virginia between 1632 and 1654. He collected largely along the York River. The elder John Tradescant, a native of Holland, had travelled widely in Europe, Greece and Egypt before he settled in London in the 1620's and became gardener to Charles I. Here he established one of the first botanic gardens in England in that part of London known as South Lambeth. The younger Tradescant brought back perhaps a hundred species of Virginia plants to his father's garden including

Acer rubrum, *Celtis occidentalis*, *Juglans nigra* and *Platanus occidentalis*. Another later collector of Virginia plants, Dr. John Mitchell, was fascinated to find a few Virginia plants still growing in the remnants of Tradescant's garden in 1749. He noted particularly a large Bald Cypress, *Taxodium distichum*.

Contributions to early knowledge of the natural history of Virginia were made by two Church of England clergymen. The Reverend John Clayton, rector at Jamestown from 1684 to 1686, had been well trained as a scientist at Oxford University. He made extensive reports of his observations in Virginia to Nehemiah Grew, Robert Boyle and the Royal Society of London. He collected more than three hundred plants which he believed to be unknown in Europe which, unfortunately, were lost. His contemporary and friend, John Banister, made a greater contribution to botanic knowledge. He, too, had been educated at Oxford, where he spent eleven years, and where he served as chaplain of Magdalen College until 1678. He had made extensive studies of botany at Oxford and he was thoroughly familiar with the Virginia plants growing in the botanic garden there, a number of which were Tradescant's. He went to Virginia in 1678 with the expressed intention of writing a "Natural History," and he took with him herbarium specimens of the Virginia plants growing at Oxford. In Virginia, he settled at the Falls of the James, under the patronage of William Byrd I. For fourteen years he collected in various parts of Virginia and sent back reports, seeds, drawings and plants to his botanic friends at Oxford. Many of his drawings of Virginia plants appeared in Plukenet's *Phytographia*, and several hundred descriptions of new species were included in John Ray's *Historia Plantarum*. In 1692, he went with Byrd on an expedition to the Roanoke River and was accidentally shot and killed by a member of Byrd's scouting party. He had never published his manuscripts of a Natural History.

In 1712, Mark Catesby came to Virginia from England to visit his sister Elizabeth, wife of Dr. William Coker, and remained for about seven years, during which time he made extensive observations on the flora and fauna. He left little written record of them except that many were included in his later *Natural History of Carolina*, based primarily on years which he spent in that colony.

In 1720, another John Clayton with a keen interest in botany became Clerk of Court for Gloucester County, Virginia. He was a distant kinsman of the Reverend John Clayton, and was the son of John Clayton, Attorney General of Virginia. The exact year of his coming to Virginia is not known but is believed to have been about 1715. He was grandson of Sir John Clayton, one of the original Fellows of the Royal Society of London, and he had been well educated in England, although details of his education are not known. In the early 1730's he began sending plant specimens to Mark Catesby in London. His father had known Catesby in Virginia and it is probable that the son had also. Catesby apparently introduced him to a correspondence with Dr. John Frederick Gronovius, of Leiden, Holland. As early as 1735, and perhaps earlier, Clayton was sending plant specimens to Gronovius for his assistance in identification. At Leiden these were eagerly studied, not only by Gronovius, an ardent botanist, but also by his young friend recently arrived from Sweden, Carolus Linnaeus. The latter so impressed Gronovius, that he and another friend, Isaac Lawson, volunteered to finance the publication of Linnaeus's *Systema Naturae*, which first presented the "sexual system" of classification of Linnaeus to the botanic world. In gratitude for all of the help which Gronovius and Linnaeus had given him, Clayton prepared and sent to Gronovius, for his library, "A Catalogue of Plants, Fruits and Trees Native to Virginia." Gronovius was so pleased with the Catalogue that he proceeded to edit and publish it as the *Flora Virginica*, in 1739, without asking Clayton's permission to do so. He did give Clayton full credit for his work in the introduction, which later writers have frequently failed to do. He also proposed to Clayton that this should merely be Part I of the *Flora* and that they should jointly prepare a second part. This they did and Part II appeared in 1743. They then set about producing a third part but it progressed very slowly,

and communication between them seemed to break down. Clayton was still eager but Gronovius lost some of his enthusiasm. Eventually, Clayton gave up hope of action by Gronovius and prepared an entirely new flora of his own. He sent the manuscript to friends in England for publication in 1758. Botanists there were enthusiastic and acclaimed it as "greatly enlarged and improved," referring to it as Clayton's "Flora Virginiana." Plant descriptions would be given in both Latin and English and it would be illustrated by George Ehret, the leading botanical illustrator of the day. Perhaps their plans became too grandiose. In any event, several years passed without it being published. In 1762 a new second edition of the original *Flora Virginica* was published at Leiden by Laurens Theodore Gronovius, son of John Frederick. It did not contain many of the additions known to have been included by Clayton in his manuscript. Clayton's was never published and the manuscript has been lost, and we are the poorer for it. Only an outline of the flora remains in the Ellis papers in the library of the Linnean Society of London.

In late 1731 or early 1732, a young Virginia - born doctor, John Mitchell, returned from some years of study at the University of Edinburgh, to his home in Lancaster County. He had been born there in 1711, numerous accounts to the contrary notwithstanding. At Edinburgh he had studied botany under Dr. Charles Alston and he was eager to investigate the flora of Tidewater Virginia. He was soon sending plants to Alston, to Dr. John Jacob Dillenius, Botany Professor at Oxford, and others. He established his medical practice at Urbanna, and began building a hortus siccus and physic garden. He made the acquaintance of John Clayton and exchanged specimens with him. The more he attempted to use existing systems of classification, the more fault he found with them and eventually he proposed one of his own. It was eventually published at Nuremberg, Germany, in 1748, and seems to have attracted little attention, although recently some have acclaimed it to have been far ahead of its time. He also wrote a treatise on medicinal plants of Virginia, which was never published. He might well have undertaken a flora of Virginia eventually had not bad health persuaded him to leave Virginia for England in 1746.

There is remarkably little record of botanic work in Virginia for some years following the death

of Clayton in 1773. The great Philadelphia botanist, John Bartram, was a contemporary of Clayton and visited him on collecting trips to Virginia where he explored the Valley of Virginia as well as the Tidewater area. In 1792, James Greenway of Dinwiddie County, compiled a flora of Virginia but it was never published. In 1812, Dr. Benjamin Smith Barton, a professor at the University of Pennsylvania, undertook to revise and expand Clayton's *Flora Virginica*. He planned to include

everything in the 1762 edition and add a great deal of new material. Like a number of things which Barton started, this was never completed. Only seventy-four pages were published.

A number of botanists collected plants in Virginia during the nineteenth century, notably John Lyon during the early years and Asa Gray in the later period. None of them appears to have contemplated a flora of the state.

The Middle Decades

By Alton Harvill

Carrying Dr. Berkeley's story further, the nineteenth century in Virginia was largely an era of sporadic collecting by out-of-state botanists, whose specimens, in most cases, ended in northern herbaria. Frederick Pursh, a native of Saxony, collected extensively here in 1806. His headquarters for some time were in Southampton County with Dr. Edwin Gray, whose plantation covered much of Southampton County in the late eighteenth and early nineteenth centuries. Pursh discovered many rare and local species, and some of them have never been seen again in the region. His Virginia plants are included in *Flora Americae Septentrionalis*, a classic two-volume work which he published in 1814.

In 1858 William M. Canby explored mountain areas of southwestern Virginia, especially along New River and Salt Pond Mountain. At Eggleston Springs in Giles County, he discovered *Paxistima canbyi*, named in his honor by Asa Gray. Canby was in Pursh's sand country near Franklin in 1867, and back in Virginia again in 1868.

Howard Shriver, M. A., was born near Baltimore in 1824, moving to Wytheville about 1858 where he operated a private school and tutored pupils until at least 1885. Although interested in all phases of natural history, he was particularly devoted to botany and built up a private herbarium which was large for its day. Shriver became the authority on the flora of Wythe County and vicinity. Many of his specimens are preserved in northern herbaria, about 200 in the Smithsonian Institution, a like number in the Gray Herbarium, but the bulk of his collections are in the Philadelphia Academy of Natural Sciences. His is still our only specimen of

Adiantum capillus-veneris collected in Virginia.

Originally from New York, Allen Hiram Curtiss' father bought a farm 24 miles west of Lynchburg, in Bedford County, shortly after the Civil War. Here the son collected plants from 1868 to 1872, and hundreds of these specimens are now in the Gray Herbarium and the Smithsonian Institution. These are still the largest collections from Bedford County, and formed the basis for our knowledge of one of our larger counties until Ruskin S. Freer started working on the central Blue Ridge counties in the 1930s.

Early years of the twentieth century were still marked by only sporadic botanical work in Virginia, but soon resident botanists would awaken, and the contributions of visitors would become much more effective and valuable.

After more than a decade of work in the shale areas of western Virginia, Edward S. Steele first used the term *shale barrens* for this unique type of vegetation in 1911. Specimens of the many important discoveries made by him and Mrs. Steele in western Virginia are now preserved in the Smithsonian Institution.

In 1920 and 1921, Earl J. Grimes, a professor at the College of William and Mary, with Mrs. Grimes, botanized the entire Peninsula of Virginia, the first notable collections from the area since John Clayton's time. This work was published as the *Flora of the Peninsula of Virginia* by Eileen W. Erlanson, the former Mrs. Grimes, in 1924, but their specimens went to northern herbaria. While doing this work, Grimes came to recognize the ecological significance of marl areas for the persistence of

many rare and local species in the region. Also in the 20s, Edgar T. Wherry started working in Virginia on a number of speciality groups, especially ferns, orchids, and the Polemoniaceae. Through the years since then, he has extended his scope to include shale-barren and flat-rock plants, and many other novelties. Carrying these studies on over a long span of years, his work has greatly augmented our knowledge of many phases of the flora and vegetation of the state.

And about this time Paul Merriman was working in the Richmond area, an effort which would culminate in the *Flora of Richmond and Vicinity* in 1930, a handbook without trees, grasses, or sedges, but nicely illustrated by Mary S. Lynn.

With his appointment to the staff of the Virginia Polytechnic Institute in 1913, A. B. Massey started a long period of service to the state and its botanical endowments. There were no collections of plants of consequence in the state, and Massey through the years built up the largest collection of Virginia specimens outside northern herbaria. By this work and by his many papers on various groups of Virginia species, he held the faith through a long period of virtual botanical desuetude. His *Virginia Flora*, published in 1961, stimulated much botanical activity because of its county distribution of species over the entire state.

In 1890, a year after the founding of the New York Botanical Garden where he was its first director, Nathaniel L. Britton, with Mrs. Britton, Addison Brown, Anna Vail and others collected in southwestern Virginia. Most of their specimens, of course, are at the Garden. A year later, John K. Small, with Anna Vail and the Brittons, made large collections in southwestern Virginia, especially Smyth County, and their results were published in 1892.

Amos Arthur Heller, a native of Pennsylvania, travelled and collected in Virginia in 1893, accumulating a large number of specimens. He followed Pursh and Canby in the pine-barren sands south of Franklin. These stretches of deep sand along the Blackwater River, where so many rare species grow, would be again rediscovered more than forty years later by M. L. Fernald.

Thomas H. Kearney started field work in southeastern Virginia in 1898, which would be the basis for his *Report on a Botanical Survey of the Dismal Swamp Region*, a pioneer and now classic vegetational study of a large area which was published in 1901 and is still useful today.

About the turn of the century, Gerrit S. Miller, Jr. collected extensively in Virginia, mostly in Warren County, and hundreds of his specimens are in the Smithsonian Institution, where he was later, and for many years, curator of the Division of Mammals.

By assembling an excellent reference herbarium, of his own and other's collections, John M. Fogg left an important legacy to the state while teaching at the Mt. Lake Biological Station in the late 30s.

As an intrepid plant physiologist, but with a yen for field work, H. A. Allard made collections in Virginia in the 1930s and 1940s which would add immensely to our knowledge. His concentrated assault on the vegetation and floristics of Bull Run Mountain and many other areas of northern Virginia has not only added greatly to our understanding of our natural heritage, but has been an inspiration to all other workers.

Also beginning in the 1930s, Lena Artz directed her work toward the flora of the Massanutten, plants of the shale barrens, bogs, and other distinctive habitats. Her many papers are a botanical record of another fascinating region in the Old Dominion.

As a high-school boy in the 1930s, Lloyd G. C. Carr began making excursions on foot to peculiar ponds and swales in his native Augusta County, to collect the great numbers of odd plants in and around these wet lands. Information about many of the ponds came from his school mates. These are the famous sinkhole ponds in the Great Valley, which are partially filled with acid rocks from the Blue Ridge, where peat accumulations are suitable for pollen analysis, and whose acid waters have provided an environment for the persistence of many Coastal Plain species. Carr's collections from this area, and from southwestern Virginia, are mostly in the Gray Herbarium and some state herbaria.

Over a period of many years, Robert R. Tatnall collected in Delaware and on down the Eastern Shore and brought together herbarium records of this region. Although he did not spend much of his time on the Virginia end, his *Flora of Delaware and the Eastern Shore*, published in 1946, is still the basic botanical reference for Virginia's Eastern Shore.

During the fall of 1940, and spring and summer of 1941, Frank E. Egler investigated the flora and vegetation of Seashore State Park on Cape Henry, making extensive collections. A

mimeographed publication of 1942, on the ecology of the ferns and flowering plants of this attractive area, was republished, under the direction of E. Spencer Wise, by the Princess Ann High School in 1962.

By concentrating intensive field and herbarium studies on one particular county, Carroll Wood's work on Roanoke County, published in 1944, became the first of its type for Virginia.

In order to make *Gray's Manual* more authentic in its extreme southeastern range, M. L. Fernald and Ludlow Griscom of Harvard explored the Virginia Beach region for three days back in 1933. Fernald was then about 60 years old, but this was the beginning of 14 field seasons which he and his colleagues, most often Bayard Long, were to work in Virginia. Their publications are of inestimable importance for taxonomic, ecological, and environmental studies in Virginia to this day.

Fernald reached the state at just the right time, when it was being opened to efficient travel by a good road system, yet, before the vast destruction which would come in the wake of the developing heavy earth-destroying equipment. Using every

scrap of information from any source available, he and his co-workers pushed on week after week, to discover most of the unusual and frequently very local habitats which harbor so many of Virginia's rare and local species, this in a broad area from the coast to Brunswick County inland, but mostly south of the James River.

All of this vast accumulation, not only of botanical and other scientific data, but valuable observations on the folk ways of the people and the state of the country, was published year after year to number twelve Virginia papers totaling more than 1200 pages with some 267 plates. The last of these, on additions to and subtractions from the flora, was published in 1947.

Some of Fernald's most famous plant locales have already been destroyed, and were it not for those fourteen years of persisting and masterful field work, we would have never known of many of Virginia's most ecologically and phytogeographically significant habitats, with their many rare and fastidious species.

Up to Date

By Donna M.E. Ware

Between the years of publication of the first edition of the *Atlas of the Virginia Flora*, two parts in 1977 and 1981, and the second edition in 1986, more than 50 species new for the state were added and mapped. In addition, 220 waifs and taxa of doubtful persistence, along with eight hybrids, were also recorded in a list following the maps. The third edition includes maps for 36 species not recorded in the previous editions and also many additional waifs.

During the years since the publication of the first edition of the *Atlas*, the number of active botanists and level of field activity in the state have steadily increased. Thanks to the bounty of information generated by this activity, the maps in edition three represent another significant increase in our knowledge of plant distribution in Virginia.

Several workers have been particularly closely involved with the *Atlas* work for many years. Ted R. Bradley continues to delve into the flora of most counties in northern Virginia and also that of the Northern Neck and Eastern Shore. Field work being done by Gary Fleming has added over 1,000 new county records since the publication of

edition two. Many of these were from the northern Virginia Blue Ridge. Charles E. Stevens continues collecting widely throughout the state. He has also added a staggering number of highly significant records while working through massive collections from previous years. Douglas Ogle's field work is still turning up numerous exceedingly rare and unusual species in the far southwestern part of the state. Thomas F. Wieboldt continues highly productive exploration in the mountains of southwestern Virginia and other regions of the state. And Robert Simpson continues to contribute collections from many areas of Virginia. Another fertile source of records is the floristic inventory of the James River Gorge, by Gwynn Ramsey and associates, which has resulted in hundreds of county records.

Philip Sheridan and Mark Strong are continuing to document distributions of wetland species. Donna M. E. Ware's recent field work has been centered in James City, York and Louisa counties. Robert Wright is focusing on various piedmont and coastal plain counties. Additional contributions of specimens have come from the

following:

Western Virginia - Stanley Bentley, southwestern Virginia; Doug Coleman, Central Blue Ridge; Richard Davis, Scott Co.; Greg Frank, various regions; Donna Hansen, Greene Co.; Jacob Kegey, mountain counties; Randell Kendrick, Blue Ridge; Conley McMullen, Rockingham Co.; Charles Leys, James River Gorge; Kenneth Markley, Breaks Interstate Park; Dorothy Music, Tazewell Co.; Charles Owens, Washington Co.; Terry Sharik, Craig and Buck-ingham counties; Mary Linda Smyth, Montgomery Co. and elsewhere; Terry Theodose, Highland Co.; and Frank Watson, Nelson Co.

Eastern Virginia - For more than fifteen years Spencer Wise worked with us through each season from the northern border of Accomack County on the Eastern Shore to the southern border of Virginia south of False Cape, including the barrier islands. Spencer provided the logistics, including boats and trucks, for these operations, and without his dedication our coverage of that vast area would have been nowhere near the picture we have in this edition. Also Patrick Baldwin, Hampton and Newport News; Virginia Crouch, Williamsburg; James Greaves, Gloucester Co.; Gustav Hall, Isle of Wight, King and Queen and Middlesex counties; John Hayden, Melanie Haskins and James Gardner, Richmond battle fields; Richard Keyser, Prince William Co.; Bruce King, Hanover Co.; Gretchen North, Middlesex

Co.; Gregory Plunkett, Isle of Wight Co.; Mark Simmons, King George Co.; Elizabeth Train, Middlesex Co., Katherine Tucker, Prince William Co.; and Anna Vascott, King and Queen Co.

Southeastern Virginia - Rebecca Bray, Bryon Carmean, Gisela Grimm, David Knepper, Lytton Mussleman, Rebecca White; and Joan Wright (Seashore State Park).

Eastern Shore - Steven Hill, E. E. Lamont and Richard Statler, Assateague Is.; and Larry Klotz, Wallops Is. and Wallops mainland.

Heritage Group - The period between editions two and three of the *Atlas* also coincided with the establishment of the Virginia Division of Natural Heritage. Important distributional information has been contributed to this new edition by Garrie Rouse, Christopher Ludwig, Christopher Clampitt, Tom Rawinski, Allen Belden, and Nancy van Alstine.

Other contributors of distributional information include Dorothy Allard, Dorothy Bliss, Steve Croy, Louis Cullipher, Allison Cusick, Bruce Davenport, Damon Doumlele, Barry Ensley, Susan Grimshaw, Brian T. Hazlett, John Hummer, Cliff Hupp, Robert B. McCartney, Kent Minichiello, Marcia Minichiello, Aubrey Neas, Roland Monette, Dan Pittillo, Walter Priest, Steve Rottenborn, Bill Scholl, Harry Smith (Hanover and Henry counties); Steve Stevenson, and Alan Weakley (Henry and Patrick counties).