GREENVILLE: A BASE OF BOTANICAL ACTIVITY

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The natural beauty of Greenville County, South Carolina, and its surroundings is a fitting place to stimulate an interest in botany. Its rolling topography spares us the monotony of extensive stretches of the sameness. Fields, ravines, slopes of different exposures, high ground, low ground, swamps, lakes, bedrock, mountains, and piedmont are all close at hand. Each, with its own ecological characteristics, supports a distinctive flora, individualistic in its living composition as well as its attraction to botanists.

Weather also favors this region with a long growing season and an abundance of rain. The nearby Blue Ridge Mountains have the highest rainfall in the eastern part of the United States. Many nature lovers have long appreciated the lush display of flowering shrubs and showy herbs that thrive in such an environment. From all over the country people come to participate in annual excursions in the Blue Ridge and other parts of the Southern Appalachians.

The deciduous forests of the Southern Appalachians contain more species than deciduous forests bordering them. This is taken as evidence that plants survived here during the recent ice age after which they dispersed into contiguous areas. Such a center is not only interesting because of its rich floristic content but also because it is a reservoir of phytogeographic and evolutionary clues.

Within a half-day drive of Greenville are such diverse and interesting places as the beach and dune areas, coastal plain, sand hills, piedmont, and mountains. Within these areas are many islands of beauty, both natural and formal, set aside for public pleasure.

Some of the formal gardens of the Low Country have been popular since colonial days. The beauty of their flowering shrubs is accented by the Spanish moss that drapes the stately oaks and somber cypresses.

The maritime forest, a thicket of live oaks and associated plants forming a fringe along the coast, has a wind-swept appearance due to the oceanic winds and salt spray. The future of this picturesque forest is threatened as the strand is commercialized. A small but characteristic sample of it is preserved in the Myrtle Beach State Park.

The mountains in particular have many protected areas more or less in their natural state. The Great Smoky Mountain National Park, established in 1940, attracts more visitors than any other national park. At the present time naturalists are resisting efforts to build roads into some of its wilderness areas. Mt. Mitchell, the highest mountain east of the Rockies, is congested with visitors at certain times of the year, particularly in the fall when the leaves are turning. Natural forests, especially the Pisgah Forest, have both beauty and accessibility to large centers of population. The Blue Ridge Parkway traverses other areas of unusual splendor.

Nearby, the large Keowee-Little rivers project, covering more than 100,000 acres, will be developed by the Duke Power Company into a power, lumbering, and recreational complex. This acreage has been and continues to be extensively exploited. Recently I observed lumbering operations in a virgin forest on the Thompson River. The noisy buzz of a chain saw followed by the crashing sound of falling giants of oaks and poplars is in sharp contrast to the beauty and serenity of the day before. What was once closed in greenery is open and scarred. Bulldozers have defaced the surface, falling trees have crushed and broken the undergrowth, and discarded laps and tops have cluttered the ground. On the positive side, the power company is cooperating with wildlife managers in a conservation program. Perhaps this great natural asset, which was previously enjoyed only by the most rugged adventurers, will be accessible to the general public.

The day will surely come when other natural areas will be preserved. Now is the time to set aside acreage of park-like pines on the Coastal Plain, scrubby oaks on the glistening sand of the Fall Line, and gums and bays in the Carolina Bays.

The Carolina Bays in the Low Country are intriguing natural gardens having an enigmatic origin. Viewed from the highways

they look swampy and uninviting; from the air they have large egg-shaped outlines oriented in a north west–south east direction, the broadest end nearest the sea. Although some have said that the bays originated from a meteoritic shower, others are attempting to find a more satisfactory explanation.

THE CHANGING LANDSCAPE

Rapid industrialization and population growth are forever changing the face of Greenville County. Some of the clear sparkling streams enjoyed by the previous generation are now too polluted to support fish. Some of the better-known wild niches have been smothered by introduced weeds or obliterated by new roads and developments.

Although numerous plants have been introduced locally, four in particular have widespread distributions and often-times very damaging consequences. The Japanese boneysuckle is widely distributed at elevations below 2000 feet. Ravines and bottomland once filled with wild flowers are often thickets of boneysuckle. Kudzu was extensively planted when the county was filled with cotton farms. Being in hilly country, some farms were so badly eroded that kudzu was planted in gullies and on abandoned fields to stabilize the soil. Now the plant is a real nuisance, even covering the tops of trees. Johnson grass, a coarse grass by nature, is difficult to eradicate from farm land. The most conspicuous recent introduction is camphor weed (*Heterotheca subaxillaris* [Lam.] Britt. & Rusby), introduced around Spartanburg in the early 1940's and around Colbert, Georgia, in 1945, Since its introduction, camphor weed bas spread throughout South Carolina. This is the yellow-flowered weed so conspicuous in fields during the late summer and fall.

LOCAL PLACES OF INTEREST

Despite the loss of many beauty spots to the changes of time, Greenvillians are still blessed with accessible, interesting locations. Especially along the Blue Ridge escarpment; outcrops of bedrock, deep ravines, sparkling streams, and hardwood forests provide opportunities to enjoy plants in relatively undisturbed situations. Among the more interesting locations are the Table Rock-Pinnacle Mountain area, Caesars Head, the Dismal and Raven Cliff Falls, Oil Camp Creek Road, Jones Gap Road, Gap Creek Road, Glassy Mountain, and around the old Poinsett Bridge.

Plants Having Local Identity

Certain plants are of special interest because of places or people that identify them with upper South Carolina. Some of these are well known to local historians and gardeners.

Shortia galacifolia T. & G. is endemic to the Southern Appalachians and concentrated in South Carolina along the tributaries of the Keowee River. It has a very restricted distribution in Georgia and North Carolina. André Michaux discovered the plant on December 8, 1788, apparently near the junction of the Horsepasture and Toxaway Rivers. Today Shortia is especially abundant in Horsepasture Gorge. Maps of the section of Pickens and Oconee Counties under development by Duke Power Company indicate that Shortia will not be seriously disturbed.

Clethra acuminata Michx., white alder, was probably discovered by André Michaux on June 15, 1787, near the Tugelo (now Tugaloo) River. This is a shrub of the Family *Clethraceae* found along stream banks in the mountains from Georgia to West Virginia. It may be seen in the mountains of Greenville County.

Lonicera flava Sims was first discovered by Governor John Drayton about 1798 on the south side of Paris Mountain. He called it *Lonicera lutea caroliniensia*, Yellow Carolinian Woodbine or Honeysuckle. He said, "I have so called this flowering plant; it not being noticed in any botanical book, respecting this state. It is the climbing species, but rather shrubby. Bearing bright yellow blossoms, extremely elegant and fragrant: in form and appearance much like the English honeysuckle. It grows in a warm southern exposure, on a Rocky precipice of Paris's Mountain in the Greenville district." This plant is still found on the south side of the mountain as well as in a number of other locations in upper Greenville County. It is by no means confined to this locality, being found as far west as Oklahoma, Arkansas, and Missouri. From a Paris Mountain site John Fraser later collected a specimen which was used by Sims when he described it and gave it the name *Lonicera flava*, the name presently in use. Both Albert Sanders and C. Leland Rodgers refer to this plant in articles published in *Botanical Gardening in Greenville*, 1982.

Poinsettia is a common name given to some species of euphorbias in honor of Joel Robert Poinsett, the same man who

built the stone bridge now known as the old Poinsett Bridge. In addition, his name is given to other local structures or organizations. He is identified with the poinsettias because he introduced them from Mexico. Wild poinsettias of any type are rare or nonexistant in this county. The only ones I have seen are persisting around an old homesite in the Mountain View Community.

A prostrate cedar (*Juniperus communis* L. var. *depressa* Pursh) is reported on Paris Mountain in Coker and Totten's *Trees of the Southeastern States*. This plant reaches its southern limit in South Carolina, where Paris Mountain is perhaps its only location. Coker and Totten do refer to a site in Aiken County, but this place is not mentioned in the more recent *Guide to the Vascular Flora of the Carolinas*. The South Carolina location (or locations) is a considerable distance from the nearest ones known in North Carolina. Thus far, I have not succeeded in relocating the clump reported on Paris Mountain.

EARLY BOTANICAL EXPLORERS

Among the early botanical explorers who visited the Up Country of the Carolinas were William Bartram, Andre Michaux, and Asa Gray. At the time of their explorations, the country was wild and difficult to penetrate.

William Bartram, the well-known Quaker naturalist, ventured into the Cherokee Country of the northwest corner of South Carolina in 1775. On May 10 he crossed the Savannah River and entered South Carolina headed for the Cherokee towns of Senica (Seneca), about a mile below the present site of Clemson University, and Keowe (Keowee), about sixteen miles to the north. Both villages were on the Keowe River — Senica on the east bank and Keowe on the west bank. The village of Keowe was just across the river from Fort Prince George. Bartram called the Seneca River and its tributaries, the Keowe River.

Bartram's impressions of places in Pickens and Oconee Counties show his appreciation of country so similar to our Greenville County. Of the town of Keowe, he said:

> Keowe is a most charming situation, and the adjacent heights are naturally so formed and disposed, as with little expence of military architecture to be rendered almost impregnable; in a fertile vale, at this season enam-

> elled with incarnate fragrant strawberries and blooming plants, through which the beautiful river meanders, sometimes gently flowing, but more frequently agitated, gliding swiftly between the fruitful strawberry banks, environed at various distances by high hills and mountains, some rising boldly almost upright upon the verge of the expansive lawn, so as to overlook and shadow it, whilst others more lofty, superb, misty and blue, majestically mount far above.

Time and again he refers to the strawberry and its fruits, which must have impressed him greatly.

Magnolia fraseri Walt., the Umbrella Tree, was discovered in 1775 by William Bartram. He described the tree from the location of Falling Creek, now Martin Creek, which is near Clayton, Georgia. In recounting the experience he said:

> This exalted peak I named mount Magnolia, from a new and beautiful species of that celebrated family of flowering trees, which here, at the cascades of Falling Creek, grows in a high degree of perfection, for although I had noticed this curious tree several times before, particularly on the high ridges betwixt Sinica and Keowe, and on ascending the first mountain after leaving Keowe, when I observed it in flower, but here it flourishes and commands our attention.

Bartram gave it the descriptive name of *Magnolia auriculata* but delayed so long in publishing his description that Walter's name won priority. Michaux also noticed the same magnolia twelve years later in the same general locality (Kiwi) and called it *Magnolia hastata*. This magnificent magnolia of the Southern Appalachians has large deciduous, auriculate leaves.

His description of Occonne (Oconee) environs could just as well be Greenville County. He writes:

> Now at once the mount divides, and discloses to view the ample Occonne vale, encircled by a wreath of uniform hills; their swelling bases clad in cheerful verdure, over which issuing from between the mountains, plays along a glittering river, meandering through the meadows, which crossing at the upper end of the vale, I began to ascend the Occonne mountain [now Station Mountain, elevation 2,,300 ft., one mile west of Tomassee Knob]. On the foot of the hills are the ruins of the antient [ancient] Occonne town: the first step after leaving the verdant beds of the hills was a very high rock chain of pointed

> hills, extremely well timbered with the following trees: *Quercus tinctoria, Querc. alba, Querc. rubra, Fraxinus excelsior, Juglans hickory,* various species, *Ulmus, Tilia, Acer saccharium, Morus, Juglans nigra, Juglans alba, Annona glabra, Robinia pseudoacacia, Magnolia acuminata, Aesculus sylvatica* with many more, particularly a species of Robinia new to me, though perhaps the same as figured and slightly described by Catesby in his Nat. Hist. Carol. This beautiful flowering tree grows twenty and thirty feet high, with a crooked leaning trunk, the branches spread greatly, and wreath about, some almost touching the ground; however there appears a singular pleasing wildness and freedom in its manner of growth, the slender subdivisions of the branches terminate with heavy compound panicles of rose or pink coloured flowers, amidst a wreath of beautiful pinnated leaves.
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> My next flight was up a very high peak, to the top of the Occonne mountain, where I rested; and turning about found that I was now in a very elevated situation, from whence I enjoyed a view inexpressibly magnificent and comprehensive. The mountainous wilderness through which I had lately traversed down to the region of Augusta, appearing regularly undulated as the great ocean after a tempest; the undulations gradually depressing, yet perfectly regular, as the squamae nf fish or imbrications of tile on a roof: the nearest ground to me of a perfect full green, next more glaucous, and lastly almost as blue as the ether with which the most distant curve of the horizon seems to he blended.

André Michaux was a botanical collector sent by the French Government to the New World to seek economically useful plants. He came to Charleston in 1787 and made it his base of operations for more than ten years. From Charleston he made excursions inland and to the Bahamas and other islands. It was on one of the inland trips to the Oconee-Pickens territory that he discovered *Shortia galacifolia* T. & G. (1788) and *Clethra acuminata* Michx. (1787).

At Charleston, Michaux maintained a botanical nursery, the site of which is near the Ten Mile Station on the Southern Railway, for the propagation of plants. Here he kept promising American plants for shipment to France and introduced other plants into this country. Among the plants he brought to this garden were ginkgo (*Ginkgo biloba* L.), Japanese varnish-tree (*Firmiana plantanifolia* (L.f.) Marsili, and mimosa (*Albizia julibrissin* Dur-

raz). All three plants are still around, but mimosa is especially abundant. Michaux is also credited with informing the Alleghany settlers about the use of ginseng by the Chinese people and showing them how to prepare the American species for the Chinese market.

Michaux's son Francois André, a noted botanist himself, was a companion to his father on some of his trips and assisted him in his nursery. He returned to America in 1801 to dispose of the nursery and its plants.

The noted botanist Asa Gray, father of *Gray's Manual of Botany* and the one who together with Torrey named and described *Shortia galacifolia* T & G., made an exploration into the Southern Appalachians in 1841. At that time the country he visited was a virtual wilderness penetrated only by paths and trails. Travel was primarily by foot or horseback. Gray got as far south as Grandfather Mountain in Ashe County, North Carolina, and Roan Mountain on the Tennessee-North Carolina border.

GREENVILLE BOTANISTS

Besides the pioneers who made collecting trips into the hig country of the Carolinas, several Greenvillians have made noteworthy contributions to botanical science. Included is a short biography of those who are closely tied to Greenville County either because they were born here or because they make their homes here now. They are Wade T. Batson, Hiden T. Cox, Charles P. Daniel, Paul L. Fisher, William C. Grimm, Rex E. Kerstetter, Harriet A. Lipscomb, Nora E. Mullens, E. Gibbs Patton, Donald D. Ritchie, C. Leland Rodgers, and James B. Shuler, Jr.

From 1926 until his death in 1944, Greenville could claim Dr. Sumner A. Ives, a Furman professor, as one of its outstanding botanists. He is still remembered affectionately by many of the older people and by his students. He energetically promoted garden-club projects and established the now-abandoned arboretum located in the old Furman campus. He started a collection of plants that is the nucleus of the present herbarium at Furman University. Two of his publications, "The Vascular Plants of Greenville County, South Carolina" (1944) and "Vascular Plants of Horry County, South Carolina" (1932) are of local interest. Dr. Ives influenced a number of his students to enter the botanical profession. Dr. Ritchie writes that he was "brought to botany by

S. A. Ives at Furman." Wade Batson and C. Leland Rodgers also give credit to this great teacher for stimulating their interest in plants.

BOTANISTS NOW IN RESIDENCE

Resident botanists in Greenville County are Paul Fisher, William Grimm, Rex Kerstetter, Nora Mullens, Leland Rodgers, and James Shuler. From this group have come scholarly publications of local and national interest.

Paul Fisher is a plant physiologist and economic botanist. He has had wide experience in government service and has to his credit a number of publications. His interest in plant diseases, food processing, seed germination, and conservation attracted the attention of a local radio station where he was appointed director of its farm program. In this capacity he presented "Farm Service Center." His major publications are on fusarium wilt of tomatoes, seed germination, and nutritional studies. Dr. Fisher succeeded Dr. Ives at Furman University. Within the last year Dr. Fisher has taken the lead in having a natural area preserved on the new Furman campus. This preserve will be invaluable as a teaching laboratory. He has also obtained the gift of a large greenhouse for the Biology Department at Furman.

William Grimm is well-known for his publications on trees and shrubs. His most recent book, *Recognizing Native Shrubs* (Stackpole, 1966), received very favorable reviews. Since there are only a few books on shrubs, this particular work fills a real need and, because of its quality, should be well received. Since William Grimm is a skilled illustrator, his books are especially attractive. Mr. Grimm has been painting wild flowers for a number of years. This fine collection of paintings should eventually be published in book form. Other books by Grimm are *The Book of Trees* (Stackpole, 1965), *The Book of Shrubs* (Stackpole, 1957), *The Study of Flowers Made Simple* (Doubleday, 1962), and *Familiar Trees of America* (Harper & Row, in press). Mr. Grimm has been a teacher, researcher, and park naturalist.

Rex Kerstetter is a newcomer to the local botanical community. He is a plant physiologist at Furman University. His interests are plant tissue culture and auxin physiology.

Miss Nora E. Mullens, a Furman professor, has interests in several areas of biology. In recent years she has made important

contributions to the *Flora of the Carolinas.* Miss Mullens and Leland Rodgers have reported 121 new county records this year and found several plants that are rare in the state. Together they are exchanging plants with the University of North Carolina. Upon completion of the project the Furman Herbarium will have a specimen of essentially all of the seed plants that grow in the Carolinas. As curator of the Furman Herbarium, Miss Mullens is actively accumulating and filing specimens.

Leland Rodgers has published several papers of a floristic or ecological nature from studies made locally. In 1962 his revision of the Ives' "Flora of Greenville County" (originally, "The Vascular Plants of Greenville County, South Carolina") was published in *Botanical Gardening in Greenville* (1962), the second volume of two historical booklets of happenings in Greenville County. An earlier work, "Vascular Plants of Table Rock Mountain, South Carolina," was published in *Castanea,* journal of the Southern Appalachian Botanical Club (1955). Two publications of recent interest were "Survey of Vascular Plants in Bearcamp Creek Watershed" (with Roy E. Shake) and "The Vegetation of Horse-pasture Gorge" (1965). The locations upon which the latter papers were based are on the Blue Ridge escarpment and are presently under development by Duke Power Company. On these locations, *Shortia* is most abundant. As a college professor, Leland Rodgers has also published teaching materials. His textbook in biology was published this year and another book of an educational nature is in press.

James Shuler is especially interested in nature study and devotes full time to writing and lecturing. He has a wide interest in both animal and plant life. He has made a study of local orchids and has discovered locations of several plants rare in this county. Jay, as he is affectionately known, is skilled in nature photography. He produces film strips and other illustrative materials for educational use. Some of his photographs are included in *Wild Flowers in Color* (Harper & Row, 1965), *Wild Flowers of the United States, the Northeastern States* (McGraw-Hill, 1965), *Wild Flowers of the United States, Southeastern States* (McGraw-Hill, 1967), and *The World Around Hampton* (Bobbs Merril, 1960). His *South Carolina Birds of the Foothills* (1966) is written for local enthusiasts. During the last few summers, Jay has been a naturalist in Grand Teton National Park. Before that, he was a summer naturalist on the Blue Ridge Parkway.

GREENVILLE BOTANISTS LIVING ELSEWHERE

Greenville-born botanists in residence elsewhere are Wade Batson, Hiden Cox, Charles Daniel, Harriet Lipscomb, and Gibbs Patton. All have relatives here and return frequently for visits.

Wade Batson, Professor of Biology at the University of South Carolina, has a long record of interest in plants. He is an expert on the Juncaceae (rush family). At the latest meeting of the South Carolina Academy of Science he described a new species of *Juncus* discovered by him in South Carolina. Dr. Batson's book, *Wild Flowers of South Carolina* (Univ. of S. C. Press, 1964), contains beautiful color photographs of many native plants. Dr. Batson began studying plants around his home in upper Greenville County and expanded his field of interest in southern plants, especially those in South Carolina.

Hiden Cox is now Coordinator of Research and Professor of Biology at California State College in Long Beach. He is a former Executive Director of The American Institute of Biological Science. Dr. Cox has been honored by being selected as a fellow in AAAS and received a distinguished citation by NASA. His contributions to journals have been many, especially in the fields of science education and public science policy. In the field of botany his interests are primarily in anatomy and morphology.

Charles Daniel, now teaching at the Georgia State College in Milledgeville, was recently at Furman University. He and his family were close to Furman for a number of years. At one time he made a collection of woody plants for High Point College. His current interests concern radiation effects on secondary succession. Charles Daniel has published a number of papers on this subject including "Study of Succession in Fields Irradiated with Fast Neutron and Gamma Radiation" (*Radioecology*, 1963) and "Direct and Indirect Effects of Short Term Ionizing Radiation in Old Field Succession" (*Ecological Monographs*, 1968).

Harriet Lipscomb is receiving her doctorate in botany from the University of North Carolina. She has worked on a species of *Fusarium* associated with tulip poplar cankers anatomical studies of *Phryma leptostachys* L.

Gibbs Patton, Professor of Biology at Wofford, is closely identified with this area. Dr. Patton's publications have been both

ecological and educational in nature. At the present time he is actively studying shrubs in their native habitats. Besides studying them in nature, he has accumulated a collection now transplanted on the Wofford campus. Dr. Patton has been especially active in trying to conserve natural areas.

Several other botanists have strong ties to Greenville but were born elsewhere. Those coming to mind immediately are George Christenberry, Louis Williams, and Donald Ritchie. Drs. Christenberry and Ritchie specialize in fungi and Dr. Williams in algae.

Donald Ritchie, who calls himself a Greenvillian, is Professor of Biology at Barnard College of Columbia University, New York. His work is nationally recognized. In addition to his publications on fungi, he has coauthored *College Botany*. Dr. Ritchie has had the honor of being a Fulbright Lecturer.

Because Dr. Ritchie's love for botany is revealed so clearly in a note he sent to me, I want to quote it in full:

> Until I went on one of the Furman summer expeditions, I never considered working with plants in any serious way, but after I got into botanical pursuits as a fulltime occupation, I looked back and saw I had had an interest in plants for as long a time as I can remember. Some plants impressed me as objects of curiosity before I started school, so that I have a sharp recollection of such minutiae as the triangular kernels in the little red flowers of smartweeds, the soft pith in goldenrod stems, the slithery seeds in catalpa beans, the scratchy stems on the sensitive Shrankias, the velvety bud scales of hickories, the fuzz on kudzu vines, the flexibility of peach branches. I knew many plants by sight without having any names for them, for most of the books I could get my hands on were for the New England area, and ignored the southern species. At Furman, Dr. Ives opened up a new view to me, not only by the summer expeditions he took to seashore and mountain, but locally in the Greenville region, and I spent many a Saturday, either alone or with him, prowling along the banks of the Saluda or up Jones Gap or even by what Professor Gilpatrick called the mellifluous Reedy. He knew the flowering plants, mosses, algae, and the various odd small groups such as quillworts and liverworts, and encouraged his students to hunt things for themselves. Only after I left his tutelage did I become interested in fungi, a group of plants that has held my attention ever since. Now,

after seeing the floras of many other regions, I still think the plants of the southeastern United States are more various and alluring than those of any other temperate land.

TODAY AND THE FUTURE

In this generation the Southern Appalachians attract investigators from far and wide. A steady stream of biologists come into Highlands, North Carolina, where they make the Highlands Biological Station their base of operations. Many of the investigators have concentrated their study on the Blue Ridge escarpment that faces the south between Hendersonville and Highlands.

With all the talk of population growth and industrialization expected within a short time, botanists and others are feeling an urgency to set aside large tracts of land for public use. The section of the escarpment between Highlands and Hendersonville just mentioned is not only botanically interesting but serves as the headwaters for two reservoirs in Greenville County and for the large power and recreational complex under development by Duke Power in Oconee and Pickens Counties. Each of us in our own way must be alert to further opportunities to protect valuable water, recreational, and biological resources.

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