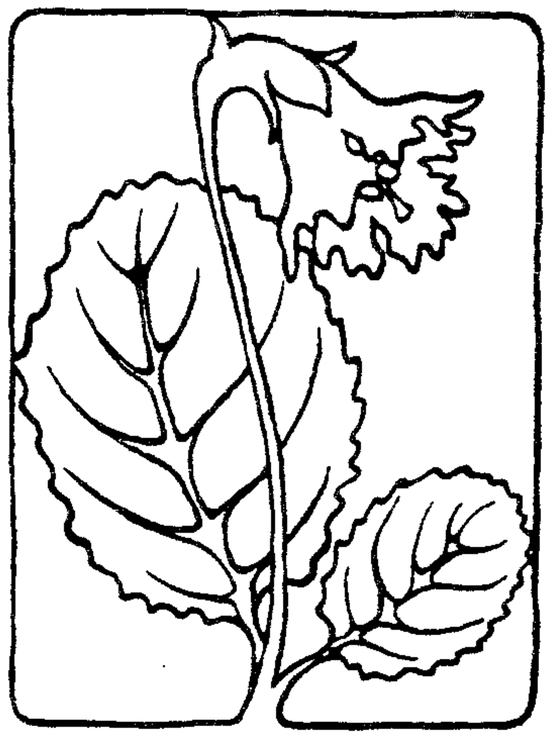
SHORTIA

NEWSLETTER OF THE
WESTERN CAROLINA BOTANICAL CLUB

SUMMER 1991



BUD PEARSON, EDITOR

FROM THE PRESIDENT — BESSIE L. SINISH

As spring flows into summer, of what have you been most aware?

To me, form, color, and texture play a dominant part in the marvels of the unfolding and the development of all nature. In my garden, I became aware that it is possible to recognize the different species of ferns by the way the fronds unfold.

Have you observed this? For several years I have been watching the development of Jack-in-the-pulpits. Many times we only see a plant in its maturity and miss the beauty of its development. In the fall, we recognize trees by the color of their leaves. Can you do the same in the spring? Try it as our field trips take us to the higher mountains where late spring still is arriving. Look at the immature oak leaves in their beautiful colors, and note the shades of green in the unfolding of the prayer-like buds of the tulip tree.

To me, form, color, and texture play an important part in the marvels of nature. As we approach summer, concentrate on the changes in form, color and texture in all of nature which give pleasure and satisfaction to our being.

****

This issue of Shortia introduces our new Editor, Bud Pearson. Bud has been a member of the Botanical Club for six years. His curiosity, interest, enthusiasm and awareness of the world of nature about him is apparent to those of us who have walked with him on our field trips. These very qualities can serve each one of us and inspire us to learn more and, furthermore, to share that information through the pages of Shortia.

With awareness, curiosity and learning in association with others comes knowledge, "Let knowledge grow from more to more".

Bessie L. Sinish, President

NOTICE OF PROGRAM CHANGE:

The June 28, 1991 field trip planned for Mt. Mitchell has been changed. The new destination will be a field trip to Roan Mountain. The date and meeting place is unchanged.

ROSTER CHANGES AND CORRECTIONS:
To be added to 1991 roster:

Appelgate, Esther
511 Timberlane Drive
Etowah, NC 28729
Phone 891 3052

Isley, Susan Lee
36 Montrose Ave.
Asheville, NC 28804
Phone (704) 645 5758

Murray, Linwood & Mary
6 Cherry Lane
Asheville, NC 28804
Phone (704) 253 5900

Address change:

Prentice, Don & Alta Mae
303 Wesley Drive
Givens Estate
Asheville, NC 28803

RECORDERS REPORT.....Elton J. Hansens

In the first four months of 1991 we enjoyed 9 field trips; average attendance was 19 in this rainy spring. Of the scheduled trips, 4 suffered from heavy rain, 2 were cancelled and 2 were held on scheduled "rain dates". The entire program was instructive and enjoyable. The Smokies overnight was again special. April 17 to 19 started out rainy but turned beautiful and flowers were at or near their peak at Cosby Nature Trail, Little River Trail, Little River Road, Chestnut Top Trail, the Quiet Walk, Cades Cove and the Chimneys Nature Trail. That is a FULL schedule.

In the Schedule of Field Trips for Spring 1991 the Program Committee innovated "rain dates" for two Friday trips they judged would be special. Both Friday trips were rained out and the Mondays, April 1 and 29 were super days in the field.

On April 1 Dick Smith selected the Oconee Station Creek trail and waterfalls for study of SC wildflowers. Thirty-eight spring flowers were in bloom ranging from the remnants of many bloodroot and wind flowers to pawpaw trees (Asimina triloba) which were about to bloom. The waterfalls were an important part of the trip. Everyone hoped this location would become a frequent study area, perhaps alternating with the Clemson Forest at Lake Issaqueena.

The second "rain date" trip was to Bull Gap on April 29. Ivan Kuster and Bill Verduin led us to 38 species of flowers including a spectacular display of dwarf larkspur (Delphinium tricorne) and large white trillium (Trillium grandiflorum). This area so captivated the hikers that four of their number took friends to view the area later in the week. Also on this hike we saw an abundance of tiny yellow flowere on Corydalis flavula. This plant is recorded by Radford, Ahles and Bell as occurring locally in the mountains and piedmont. The plant was present in masses here and I have a feeling that now that we know it, we will be seeing it elsewhere.

Violets are among the most prized of flowers and I dare say that all of us look forward to seeing them each spring. The first ones we see are usually yellow but soon white and blue ones appear. Most violets bloom profusely and propogate easily. This year we saw the first violets in mid-March and by the end of April we had identified 18 species. However, violets are difficult to identify to species. We could easily by-pass some species or give them incorrect names. Most of us have too little knowledge to recognize their subtle differences nor do we recognize the hybrids between species. Even the experts have great trouble with violets

In the recent Guide to the Vascular Plants of the Blue Ridge, B. Eugene Wofford includes Viola palmata var. sororia, V. papilionacea, and V. papilionacea priceana (confederate violet) under the name Viola sororia and adds "This is perhaps the most common and variable violet; probably hybridizing with all other stemless blues." Since the experts have great trouble identifying many of the violets and they hybridize so easily, perhaps we would be wise not to struggle too hard for a name but enjoy all the violets for their variety and beauty.

PHYLLOTAXIS AND THE HELIX

(Phyllotaxis: The system or order of leaf arrangement on the stem.) In a paper presented to SHORTIA by member Ralph Raymond, he quotes "The Elements of Botany", by Asa Gray that in turn observes the consistency of the spiral arrangement of leaves in the same specie. Gray states that the arrangement of leaves is said to be a spiral because, if we draw a line from the insertion of one leaf to that of the next, and so on, this line will wind spirally around the stem, and in the same species will always bear the same number of leaves for each turn around the stem. Any two successive leaves will be separated from each other by an equal portion of the circumference of the stem. The distance in height between the leaves may vary greatly, but the distance measured around the circumference will be uniformly the same for any given specie.

Gray explained that opposite leaved plants are in reality plants with their leaves in whorls of two and all whorled leaved plants are an exception to the system.

The article proceeds to demonstrate the numerical relationship of leaf placement. The two-ranked leaf arrangement, where the second leaf stands exactly on the opposite side of the stem and the third leaf is opposite the second and directly above the first. This is the simplest of all arrangements and occurs in all grasses and Indian Corn, also Basswood, according to Gray. The phyllotaxis for the two-ranked arrangement is represented by the fraction 1/2; the numerator representing the number of times the spiral makes around the stem before it meets a leaf standing directly above the first, or starting leaf. The denominator represents the number of leaves in the path of the spiral, with the starting leaf being counted as the first.

The three-ranked arrangement places the second leaf a third of the way around the stem from the first leaf and the third leaf would be a third of the way around the stem from the second. The fourth leaf, travelling up the stem, would be above the first leaf, and so on. The three-ranked would then be represented by the fraction 1/3. These include all the sedges and white hellebore.

The next series is five ranked leaves represented by the fraction 2/5. In this series, a spiral line starting with any leaf and passing upward from leaf to leaf will pass twice around the stem before reaching a leaf directly above the starting leaf.

The above two, three and five ranked arrangements have been expressed by a series of fractions; 1/2, 1/3 and 2/5. Next would be the eighth-ranked, 3/8, which is found in common plantain and holly. Next would be the thirteenth-ranked, 5/13, such as pussy willow. Next higher progression would be 8/21, then 13/34 and so on. These higher phyllotaxis designations are found, for example, in cones of the pine family and in the pineapple.

The phyllotaxis designations are 1/2, 1/3, 2/5, 3/8, 5/13, 8/21 and 13/34. Note that both the numerator and the denominator of each fraction is the sum of the two preceding numbers.

In his paper, Mr. Raymond wonders whether Asa Gray was the first to consider phyllotaxis and the orderly series of fractions that it employs. The quotations are from Gray's book published in 1887. The denominators in Gray's fractions coincide with a series of numbers known as the "Fibonacci Series", named for mathematician Leonardo Fibonacci, who died in 1240. Each number in the series is the sum of the two preceding numbers; 1, 1, 2, 3, 5, 8, 13, 21, 34, etc. The ratios of these numbers occur in other fields of science, architecture and art.

Mr. Raymond also draws attention to the similarity of the spiral arrangement of phyllotaxis and the helix formed by DNA.

We thank Mr. Raymond for his scholarly contribution. In its entirety it was a bit too long for this publication. Those who would like to study the complete paper are invited to borrow it from the editor.

FROM THE PRIMEVAL FOREST

The Horsetail and Scouring Rush were identified as unique because they are remnants of the primeval forests. They are also unique because of their jointed stems. Whorls of small scale like leaves form a ring around the stems and seemed to be clasping the next segment of the stem. The segments can be pulled apart much like the sections of a jointed fishing rod.

These plants are of genus Equisetum in the phylum Pteridophytes, which includes the True Ferns and related Club Mosses. The Pteridophytes were the dominant plant life, forming the swamp forests that covered most of what is now the Eastern United States, during the late Paleozoic Era, about 200 million years ago. The tree-like species died out almost entirely with the onset of the Spermatophytes, which were much better suited for land living. In their place we have the remnants of those huge plants as the herbaceous Club Mosses, Creeping Pines, Horsetails and Scouring Rushes. They rarely exceed a few feet in height, a contrast to the forest trees that were their ancestors in the Paleozoic Swamp which grew to heights of 60 and 100 feet. These were the plant life from which coal was made. Coal deposits have preserved the fossil shapes of these early species.

The Horsetails and Scouring Rushes; family equisetacea, genus equisetum, are practically leafless, with the green stems providing for food production. They grow in moist and wooded environment as their Fern allies, but have also adapted to open, dry areas. They are often found rooted in the cinder and ashes along railroad embankments. In some places they are called Railroad Fern.

The Scouring Rush (Equisetum laevigatum) gets its name from the siliceous material in its stalk that give them the gritty characteristic found valuable for scouring. They reproduce by spore production contained in cones at the tip of their stems. This plant forms a single stalk two to three feet high.

The Common Horsetail (Equisetum arvense) has branches of green, which are sterile, and of tan, which are reproductive. These are tipped with a single yellow cone which releases spores. Horsetails are one of the first signs of spring, pushing their way up through the grasses well in advance of the flowering plants. These attractive little plants are from six to twelve inches in height.

The text used for reference did not actually identify the family name, equistacea, and another source identified the Scouring Rush species as hyemale. A basic research principal; when conflicting information causes doubt, choose the reference printed on the best paper. The following was "stumbled upon" while looking for the above information.

EARLY PLANT LIFE: Life on earth is thought to have began about two billion years or more ago, in some simple form. The planet was probably more than two billion years old by then. There is no fossil evidence. The estimation of the date that life began on the planet is an educated guess based on the observable progress of the development of life. The first fossil evidence of plants that can be recognized are about five hundred million years old. These are of ancient seaweed that was in the ocean during the Cambrian period, the earliest part of the paleozoic era.

The first land plants lived during the Silurian period (360 million years ago) of the paleozoic era; fossils from Silurian rocks indicate that a land flora was well established in some parts of the world. The Silurian period plants possessed water-conducting cells in their stems, unnecessary in seaweed, and were propagated by producing spores.

Evolution carried the development along. By the end of the next period, the Devonian period (330 million years ago), ferns had appeared and the first gymnosperms, or cone-bearing seed plants appeared. There were, as yet, no flowering plants; these did not appear until the end of the Jurassic period of the Mesozoic era (170 million years ago). When they did appear they quickly dominated all other plant forms. This was followed by the founding of botanical clubs.

MEMBERS HONORED FOR JACKSON PARK WETLAND EFFORTS

An article in the March 24, 1991 local paper, The Times News, reported recognition of Millie Blaha and Anne Ulinski for their efforts in having the Jackson Park Wetlands listed on the North Carolina Registry of Natural Heritage Areas. The state praised the work done by Anne and Millie. Charles Roe, then head of the North Carolina Natural Heritage Program, said, "We have rarely received such detail and great amount of information in support for a nomination, and we compliment your work."

Anne and Millie are well known to members of the Western Carolina Botanical Club for their contributions to the club. Millie has served as president of the club and is recognized as a "Knowledgeable One" who members gather about on the trail during field trips. Anne, also knowledgeable, while serving as recorder for the club, has established the foundation for field trip recording which provides information for the essential function of program planning. No doubt, Anne and Millie worked at Jackson Park with the same expertise and diligence that other members have observed on field trips.

Anne says that recent publicized personnel changes should not effect the status of the park wetlands registration and that there has been some assurance that grants will be allowed as expected.

"ROOT ROT" INFECTS PINES ALONG U.S.276. For those of you who may have wondered about the reason for cutting the trees in the Davidson River Campground and along U.S.276, the U.S. Forest service says the white pines are infected with root rot. They are being cut to prevent the hazard of their falling, possibly on campsites. The disease spreads through the root system.

Art Rowe, of the U.S. Forest Service, said they plan to replace the pines with more vegetation such as rhododendron, hemlocks and autumn olive.

CHECKING THE PHYLLOTAXIS

A flowering plant, called Dame's Rocket, was pointed out by a "Knowledgeable One". I thought it was phlox. However, it is a member of the Mustard family (Cruciferea). Page 84, in Peterson's gave it three lines, "DAME'S ROCKET, Alien - (Hesperis matronalis). Pink, purple or white. Leaves large, toothed, alternate. See text and color plate, p.226". On page 226, they added that the species was an escape from the garden that resembles phlox, but has 4 petals, not 5. (Matronalis suggests the plant was named for a female with status, not a botanist named "Dame".)

Were the leaves alternate? It didn't say opposite and alternate, just alternate. With new knowledge of Gray's theory of phyllotaxis in mind, I counted the leaves on the stem. Starting at the lowest leaf I counted, eight leaves before I reached the ninth which was directly above the first leaf and I had circled the stem three times. Then the Dame's Rocket must have a phyllotaxis of 3/8! Thinking the one I counted could be a specimen of the well known genre, "the anomaly", I turned to another plant in the rather large cluster and counted the same number of leaves and turns around the stem. The phyllotaxis of the Dame's Rocket must be 3/8. Check it out.

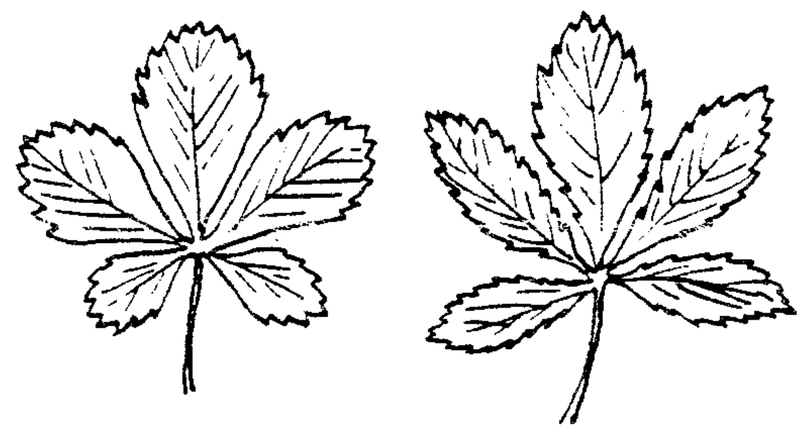
HELP MAKE SHORTIA A BETTER PUBLICATION. All members are invited to contribute to Shortia. If you have an article that you think would be of interest to other members, send it to the editor. If there is a subject that particularly interests you, do a little research, write it up, and send it to the editor. The subject that interests you will likely be of interest to many other members. The sharing of knowledge is one of the most important elements of the botanical club. We all appreciate the generosity of those knowledgeable ones who share so freely and patiently with those of us who have short memories. But you don't need to be an expert to write about a specimen or a natural phenomena. Researching a subject can be very entertaining.

LOOK AGAIN !

The Rose family is a difficult one for taxonomists, and includes several genera in which the "splitters" have established hundreds of (in their judgment, at least) species; the hawthorns and the brambles are notorious examples.

The genus Potentilla - the Cinquefoils - is another, but it is nevertheless a good choice for practicing wildflower identification in the Southern Appalachians, where there are only a handful of species, most of them clearly different from one another.

The only exceptions happen to be the two that are the most numerous and are encountered repeatedly in old fields, on dry banks, and along the edges of sunny woodland trails. These are often confused, and sometimes even mislabeled in field guides. They are Potentilla canadensis, or dwarf cinquefoil, and P. simplex, usually referred to as common cinquefoil. Both have long trailing stems and five-parted palmate leaves, with small yellow flowers arising from the axils. They can most easily be separated on the basis of their leaflets, which in P. canadensis are more broadly rounded than in P. simplex, where they taper gradually toward the apex. Most significant, however, is the fact that the teeth of P. canadensis are confined to the upper half of each leaflet and seldom number more than five on each side, while P. simplex has more and they extend along virtually the whole margin.



The name "cinquefoil" denotes five leaflets, but there is only one other distinct species in our area that follows this rule. It is Potentilla argentea, or "silvery" cinquefoil, so-called because the undersides of its narrow, revolute leaflets are covered with silky white hairs.

P. tridentata

Potentilla recta, or rough-fruited cinquefoil, an erect plant with large, handsome sulfur-yellow flowers, has leaves which usually are seven- or nine-parted. Going in the other direction we find P. norvegica and P. tridentata with only three leaflets. The latter is the white-flowered "wine-leaved" cinquefoil, a boreal species restricted in the southern United States to high balds and ridges.

Dick Smith

S H O R T I A

Vol. XIII, No. 2 Summer 1991

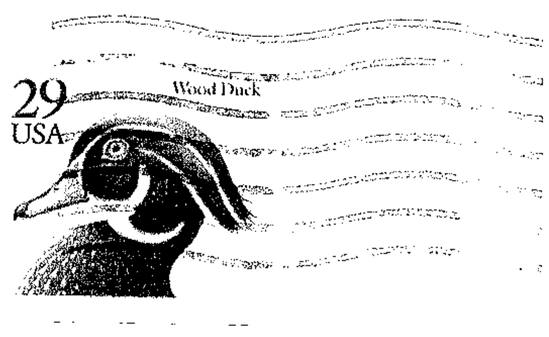
A quarterly publication of the Western Carolina Botanical Club

Editor: Bud Pearson Distribution: Frances Gadd

Please submit contributions for the next issue by August 15, 1991 to:

Bud Pearson
2514 Kanuga Road
Hendersonville, NC 28739

SHORTIA
c/o Frances Gadd
218 Pheasant Run
Hendersonville, NC 28739



FIRST CLASS