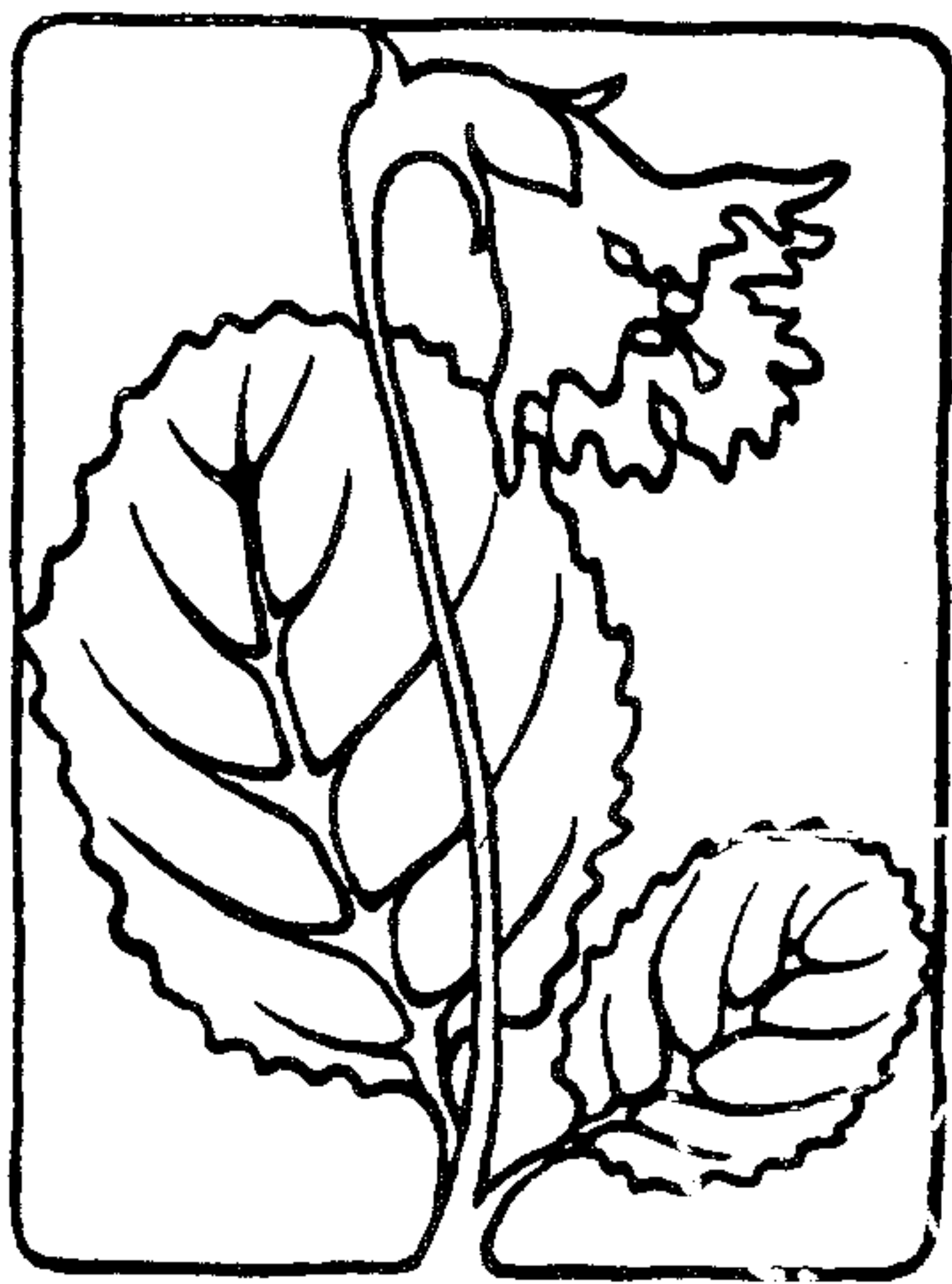


SHORTIA

NEWSLETTER OF THE
WESTERN CAROLINA BOTANICAL CLUB

SUMMER 1992



BUD PEARSON, Editor

When you receive this issue of Shortia, most of the spring flowers will have set seeds, which contain the embryo for next year's plants. Thus the seed is both the beginning and the end. Summer flowers will bloom, ready for pollination. The seed is fertilized. The cycle is complete once again.

This is one of many, many cycles of nature. To me another cycle of fascination is called in botanical terms, phyllotaxy, meaning the placement of leaves on a stem or axis. Many times the question has been asked, are the leaves opposite or alternate. True, an important tool in identifying a plant, but, more important is the reason for such an arrangement. The position of the leaves is generally governed chiefly by their relation to light. Scientist have worked this out by a mathematical formula. Be aware of other cycles as our field trips take us to different ecological environments. How is our environment shaped and changed by the natural elements of bacteria, toxins, and viruses. There are always new cycles. New species replace old ones by competitive exclusion. Our woods and forests are forever changing. The process of changes are seen everywhere. Look for them.

In closing, I know you would want me to express our sympathy and understanding to Erica in the loss of her mother who lived a full 97 years.

And congratulations to Frank Bell, a valuable and an enthusiastic member - one who is always looking ahead - on the celebration of his 95th Birthday.

Have a great summer. We look forward to seeing many new faces. Name tags are helpful to members - old and new.....Bessie Sinish

NEW MEMBERS AND ADDRESS CHANGES:

New members: Perry, Pat H. & Lois W.
32 Dvdardi Court
Brevard, NC 28712

French, Price & Alice
216 Haywood Knoll Drive
Hendersonville, NC 28739

Address change: Camenzind, Enno & Peggy
116 Lambs Creek Road
Brevard, NC 28712

INVITATION TO MEMBERS

Frank and Calla Bell asked that an invitation be extended to Western Carolina Botanical Club members to visit their Camp Green Cove and enjoy the beauty of the woods and trails. The woods and hiking trail of this beautiful location offer an abundance of botanical specimen natural to the Southern Appalachians. In past years the club has scheduled many field trips to the Bell's property. Current scheduling has not included these trips because the committee has made an effort to find new and varied environments and to avoid repetition. However, individuals and small groups who would take advantage of the Bell's invitation will have an enjoyable and rewarding experience. It would be best to phone Frank Bell at 692 3241 in advance.

SUGGESTIONS AND CRITICISM INVITED

The editor invites any suggestions members might wish to make as to the material or format of SHORTIA. You are also invited to present any criticism or correction of any material printed. Suggestions are accepted in any form, criticism and corrections should be in writing.

RECORDER'S REPORT

ERICA S. PARMİ

The last issue of SHORTIA contained Elton Hansens' last report as Recorder. In it he thanked the members of his committee for their help, but I want to thank Elton for the superb job of organizing many years of back files and pioneering the new system of listing flowering plants. It will make my job easier.

Thanks are in order for two other members of the Club - Millie Blaha and Anne Ulinski - who were most instrumental in securing the wetlands of Jackson Park and Mud Creek for future generations. The Club as a whole and as individuals already have enjoyed the flora and fauna of the Park. Please add my "Bouquet" to that of the Times News and the Transylvania Times to Anne and Millie.

After a winter of fascinating indoor programs we plunged into the spring season of field trips. It was inaugurated by a "Hardy Souls" hike in the Pink Beds on February 21st. Although the calendar said it was winter, the trip turned into a "spring romp" on a delightfully warm, sunny day. The weatherman, however, had some surprises in store for us.

After an unusually warm winter, spring arrived with a month of cold weather. This effectively halted the advance of the spring flower season. As a result, flowers were scarce on many of our field trips. Jones Gap, Bat Cave and Pearson Falls, however, did not disappoint us. The biggest disappointment came when the three day Smokies trip was cancelled due to rainy weather. The recorder did not miss the trip, because I was fortunate enough to be taking Millie Blaha's Wild Flower Class which included three days at Snowbird Mt. Lodge. After driving over in the rain we had several beautiful days of searching for wildflowers. The loop trail at the Joyce Kilmer Wilderness area was as fantastic as ever - perhaps slightly beyond the peak bloom on April 21st. The Stewart Ridge Road was a highlight, as well as a section of the AT Trail at Stecoah Gap. Here the white and yellow trillium, *Trillium grandiflorum* and *T. cuneatum* var. *lutem*, were prolific and at their peak. Underneath the trillium the forest floor was white with Rue anemone, *Thalictrum thalictroides*, interspersed with lush violet plants, *Viola palmata*, var. *palmata*. Sad to say that we witnessed a senseless act here. A family from Georgia pulled up specimens of plants and carried them back to their van. Somehow I doubt that the plants will live, even if they survive the trip back to Georgia. We all should remember that the flowers belong to all of us and that they should be left to bring pleasure to all who walk among them.

On April 26th I lost my Mother who knew that special joy and contentment that comes from walking amidst the beauty of the natural world. Some of you may remember her from the Smokies trip of April 1991 where, at the age of 96, she inspired us all. I shall miss telling her about, and often showing her, the beauty that we experience on our field trips.....Erica

THE BELGIUM DENDROLOGISTS

BESSIE SINISH

The past months have been very busy and rewarding to a few of your botanical club members. A group of Belgium dendrologists - nineteen in number - visited our area. Those of us who had contact with them found them to be quite overwhelmed with the area in its beauty and resources. Bill Verduin, Elizabeth Feil and Lowell Orbison gave of their time and knowledge. Thank you. We also are grateful for leadership from the North Carolina Arboretum, the Biltmore Estates, Dr. E. Buckner of the University of Tennessee, and Dr. John Creech.

Was there trouble in communication with these Belgians? Not in the FIELD. They knew the BOTANICAL NAMES.....Bessie

PAYMENT OF DUES: 1992 Annual dues are now long past due. Any member who has overlooked payment of their \$8.00 annual dues and wishes to remain a member, is urged to send their payment to the treasurer, Ken Sinish, at once. The rolls and address list will be purged of all names of former members who have not paid dues for this year, 1992. If you have any doubts about whether you have paid or not, you may contact Ken at (704) 693 1573. His address is; 230 Echo Drive, Laurel Park, NC 28739.

Reflecting on all the wonderful diversity of the plant life on earth, I have become a firm believer that every plant, no matter how insignificant it may seem to us, has a purpose and a use. Take the stinging nettle, *Urtica dioica*, for instance. It stimulates the growth of all other plants in its neighborhood and helps to hasten the decomposing of the compost heap by excreting nitrogen, silica, iron, protein, phosphates, formic acid and other mineral salts. Also, it makes a tasty and healthful dish when lightly boiled.

The poke berry, *Phytolacca americana*, has roots, leaves and berries that are toxic to humans, but, if picked early when the shoots are just coming out of the ground, it makes a delicious dish. The "old folks" always prepared them with eggs to counteract the toxins. They also say, "If you eat a big "mess" of 'poke salat' in the spring you will not be sick for a year." The birds grow fat on the berries all the fall and winter. The Indians used the berries for a lovely shade of red dye.

The leaves of pipsissewa, *Chimaphila umbellata*, or Prince's Pine, with its delicate waxy petals contrasting beautifully with its variegated pistil and stamens and its glossy leaves, make it one of the prettiest of woodland flowers. "Leaves of this plant, moistened with brandy, assuage the rheumatism." -- (Vegetable Materia Medica, published 1825)

Then there is the poison ivy, *Rhus radicans*, surely not here just to plague us? Even though we may not know of what use it is - it, too, has its place in the interdependence of plant and animal life on this mysterious and wonderful planet on which we are privileged to live. Millie Pearson

ASPLENIUM PLATYNEURON

by BILL VERDUIN

For many, many years I have been taking special note of the locations in which we find Ebony Spleenwort, *asplenium platyneuron*. A very large proportion of these ferns were growing in transitional forest... "old fields" abandoned and reverting to forest. A much smaller number of sightings have been on road cuts, slopes of exposed subsoil and rock. Occasionally, but only very seldom, have I found ebony spleenwort in undisturbed woods. Why such limited distribution? Why those specific areas? This puzzle has haunted me for years and no one I have asked has been able to give me any explanation.

At last, a solution! Santa Claus brought me a new fern book, "Ferns of the Coastal Plain", by Lin Dunbar. She writes, "*Asplenium platyneuron* can be grown in a fern garden or on a window sill, though a soil rich in nutrients will kill the plant." So that's it! Like birdfoot violet, it just can't stand prosperity! Old abandoned fields have generally lost their topsoil to erosion... they are abandoned just because the soil has lost its nutrients, And road cuts where the surface is only subsoil would certainly be low on nutrients. Dunbar's statement is clearly substantiated by my observations. But..., but why are these two species (and perhaps others) actually killed by good rich loam in which most plant would thrive? So another puzzle replaces the first. Does anyone have comments or suggestions?

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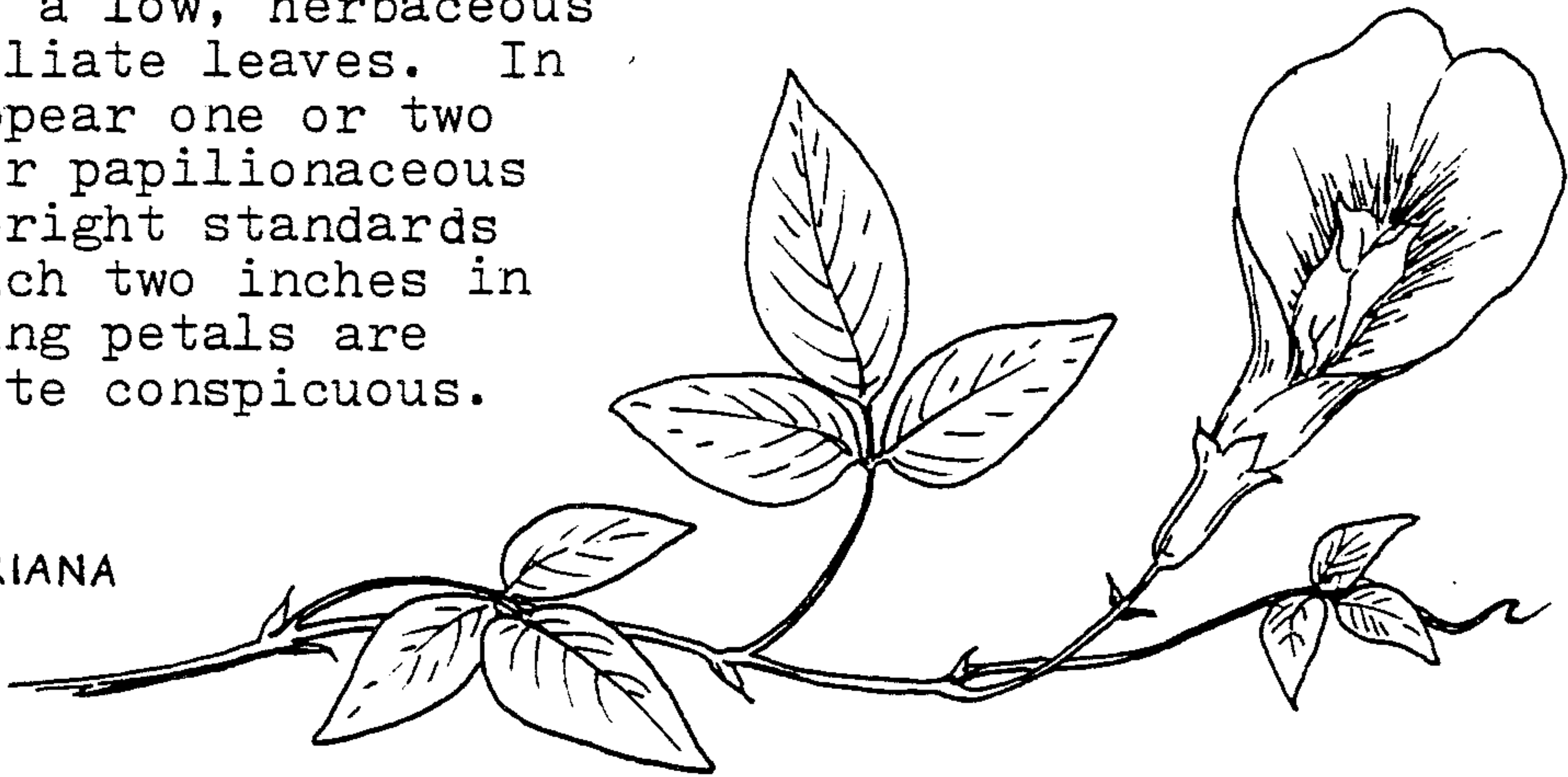
NOTE: Both Millie and Bill have posed questions. Your answers or comments are invited. If you read on, there is question and curiosity about leaf color which begs your comments. Please send your comments to SHORTIA in care of the editor.

LOOK AGAIN !

We tend to think of plants in the Bean Family (Fabaceae) as having smallish flowers aggregated into heads, spikes or racemes. A notable exception in our area is the Butterfly Pea (Clitoria mariana), which bears solitary (or very few) flowers of relatively large size.

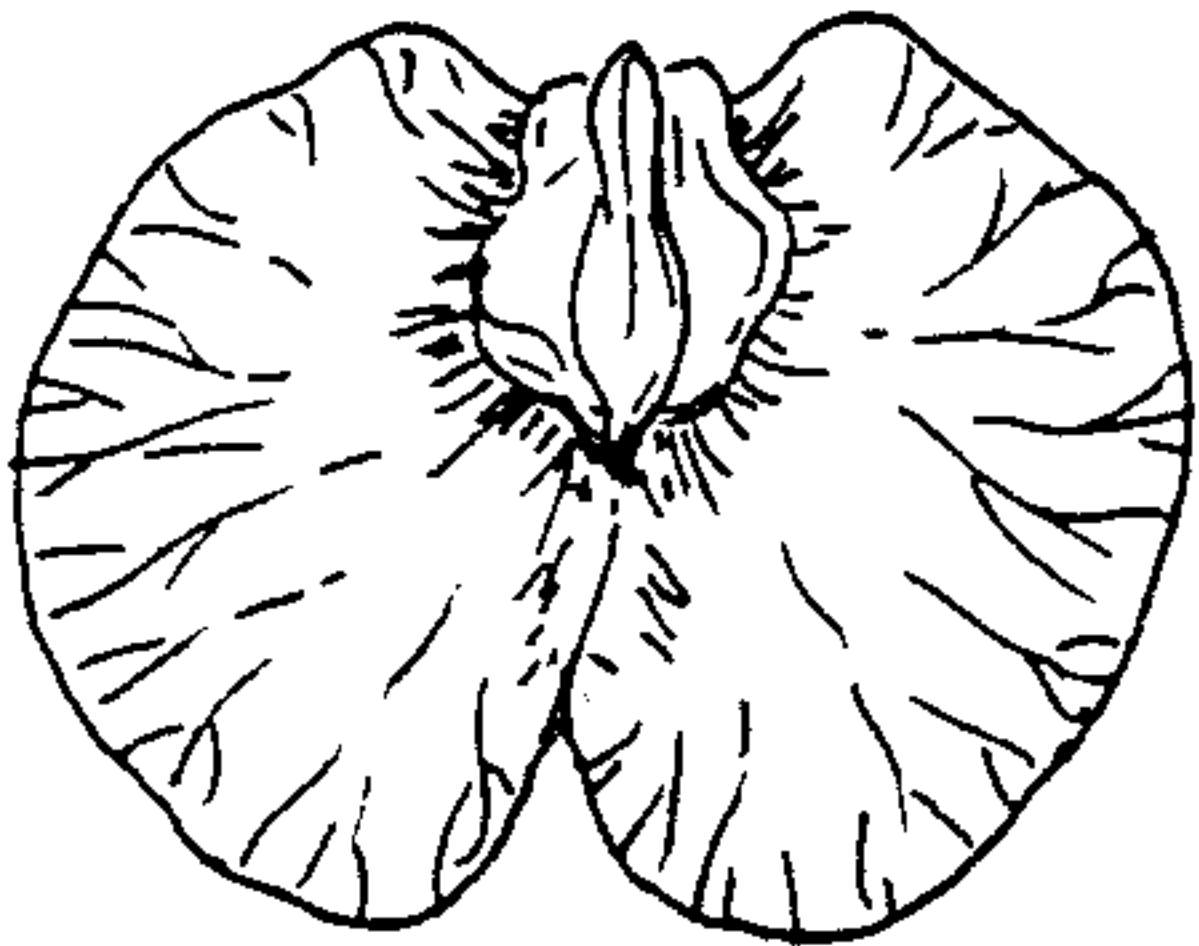
It is a low, herbaceous vine with trifoliate leaves. In summer there appear one or two pinkish lavender papilionaceous flowers with upright standards that may approach two inches in height. The wing petals are smaller but quite conspicuous.

CLITORIA MARIANA



Sometimes confused with this is the closely related Centrosema virginianum, which is known as Spurred Butterfly Pea. This is also a vine, sometimes climbing as well as trailing.

The flowers are flatter, more circular, and only about an inch long. It owes its common name to the presence of a small spur at the base of the standard, but certainly more evident is the fact that the flowers appear upside-down, with the keel and wings uppermost. Also, the calyx (which is partially hidden by bractlets) has a short tube and longer lobes, whereas the reverse is true in Clitoria.



CENTROSEMA VIRGINIANUM

Butterfly Pea is fairly common in some of our mountains; Spurred Butterfly Pea is more likely to be found as we explore farther into the adjacent piedmont.

Dick Smith

The function and importance of photosynthesis is well known, at least by people with the slightest interest in botany. There is a great deal known about the process, but, apparently a great deal more to be discovered. While trying to learn something about leaf color, a library book contained a preface to more detailed information that was apparently written to impart a perspective that developed the importance of the subject. The following was "extracted" from those paragraphs.

The most important colour in plants, and indeed in the whole world, is the green of chlorophyll. It is this pigment that harnesses sunlight and channels its energy into producing the chemicals and oxygen that provide for all life on earth.

In the sun, 148 million kilometers away, a continuous nuclear explosion is going on. The enormous energy this produces is radiated as electromagnetic waves in all directions across space. A tiny fraction (equivalent nonetheless to the energy produced by one million atom bombs) reaches the outer part of the earth's atmosphere every day. Over a third of this is reflected back into space by clouds, snow, and ice. Most of the remainder warms up the oceans and the land and drives the great heat engine of the earth which we recognize as weather. A small amount of the energy, light mainly in the red and blue region of the visible spectrum, is absorbed by the chlorophyll of green plants. (Green light is the least absorbed by green plants; we see their transmitted or reflected light.) By the process called photosynthesis some of this light is converted into the chemical energy of the plants substance. The earth's plants trap in this way on average about 0.2% of the energy of the sun's radiation that reaches the earth's surface.

Harvesting of sunlight only takes place in chlorophyll containing plant cells (there are minor exceptions.). In photosynthesis, the chlorophyll captures the energy of sunlight and uses it to split water into its constituents, hydrogen and oxygen, and to form energy rich compounds. The hydrogen is combined with other chemicals in the plant, but the oxygen is liberated into the air because the plant does not use all of it. The plant uses the chemicals it has formed to help convert carbon dioxide into carbohydrates and other organic matter. These spread throughout the plant to be used for growth, seed and fruit production. Given sunlight, green plants are thus able to form all the chemical compounds they need from the carbon dioxide in the atmosphere, water and small quantities of mineral salts from the soil. The main by-product of photosynthesis, oxygen, is of overwhelming importance to all other living things and has made life on land possible. Plants, virtually alone, have produced the oxygen which now forms a large proportion of our atmosphere. Green plants in the sea were making oxygen over 3 billion years ago. Very slowly the oxygen content of the atmosphere increased and after millions of years, perhaps 450 million years ago, life moved from the sea and began on the land. The reason for the long period of life in the sea before life on land evolved is closely connected with oxygen. When it reaches the upper layer of the atmosphere, some of the oxygen is converted to ozone, which blocks the ultra-violet radiation sent out by the sun and prevents it from reaching the earth's surface. Until sufficient oxygen and its product ozone had been produced by the green plants in the sea, the lethal radiation reaching the earth would have killed any living organisms on land. Ultra-violet radiation does not penetrate water, so plants and animals were able to evolve safely in the depths of the ocean, gradually emerging to colonize the land when there was enough oxygen and ozone to reduce ultra-violet radiation to an acceptable level.

Plant chemical energy in the form of green plants is therefore the very thread of life on earth. The rest of the living world, including animals and fungi, cannot use light to manufacture their own substances. Instead they obtain plant chemical energy, which we call food, in a great variety of ways. Herbivores feed on green plants directly. Carnivores feed on herbivores and other carnivores. Omnivores, including man, feed on both green plants and other animals.

Even after they have died, plants continue to be useful. They are the storehouse of

the sun's energy. Together with decaying animal matter they provide food for a whole battery of decomposer organisms, including small animals, fungi and bacteria. Since plant substances that are eaten can only be used efficiently if they are combined with oxygen in the body, we are double dependent on plants: they provide both the raw materials and the oxygen for releasing their energy to maintain the living world.

Oil, coal and peat are products of ancient photosynthesis and by burning them we release energy captured by green chlorophyll from sunlight millions of years ago. This is the principle of fossil fuel burning on which we depend for much of our industrial and domestic energy requirements.

The study of botany, the ~~continuing~~ evolutionary process, and environmental responsibility are inseparable subjects.

LEAF COLOR

BUD PEARSON

Why aren't all leaves uniformly green? For the most part we expect leaves to green, and most are. There are some that are not all uniformly green, though, such as the Trout Lily, with spotted leaves that suggest the markings of the fish.

A year or two ago one of our members reported on several years of observation of a patch of Galax, with the result that no conclusion could be reached as to why some leaves were a shiny green and others were a deep, liver shade of red. Since then I have somewhat casually observed that the Galax in our woods is sometimes green and sometimes the deep dark color. A few months ago, two patches were the dark color. Yesterday there were new green leaves and old leaves that were green with traces of the dark color, but none with uniform dark color. Admittedly my observations have been too casual.

A little library search has turned up several reasons for variations in plant leaf color. The most interesting is the mechanical and chemical adjustments to available light according to the needs of the plant. A plant in the diffuse light of the forest floor may be solid green with chlorophyll to adapt to the limited light for the process of photosynthesis. Conversely, an unsheltered plant exposed to intense sun, may reduce its use of the sunlight by withdrawing a portion of chlorophyll in its leaves, usually leaving white or pale green edges or lines along the leaf veins.

Another reason for different colors may be that the leaf is able to use different wave lengths of the color spectrum. Green chlorophyll uses the red light rays of the sun, reflecting the green color which humans can see.

Among the various chemicals that leaves contain besides Chlorophyll, which reflects green color, are Carotene, that reflects yellow, and Anthocyanin that reflects red and blue. Different chemical reactions from soil and environment are thought to influence variegation by chemical action. (In the fall, when trees are preparing for their dormant stage, the tree withdraws the chlorophyll from the leaves, thus leaving the carotene and anthocyanin to produce the colorful spectacle of the forest in autumn.)

Some plants are thought to have colorful leaves to attract pollinators. The Indian Paint Brush, with the tips of its leaves that could have been dipped in red paint and its non-showy flower that is almost obscure, is an example.

Another reason suggested for varied color is to warn predatory insect away by having colors that suggest poison or bad taste.

Still another author stated that viruses altered color traits that were sustained through reproduction, generation after generation.

Most of the above information was taken from a couple of library books. Both happen to be mostly picture books with limited text in big print. One is entitled "Leaves" with photos by Kjell B. Sandved and text by Ghilleen Tolmie Prance (Non-fiction, 582.01). The other is "Color in Plants and Flowers" by John and Susan Proctor (Non-fiction 582.13)

S H O R T I A

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FIRST CLASS
