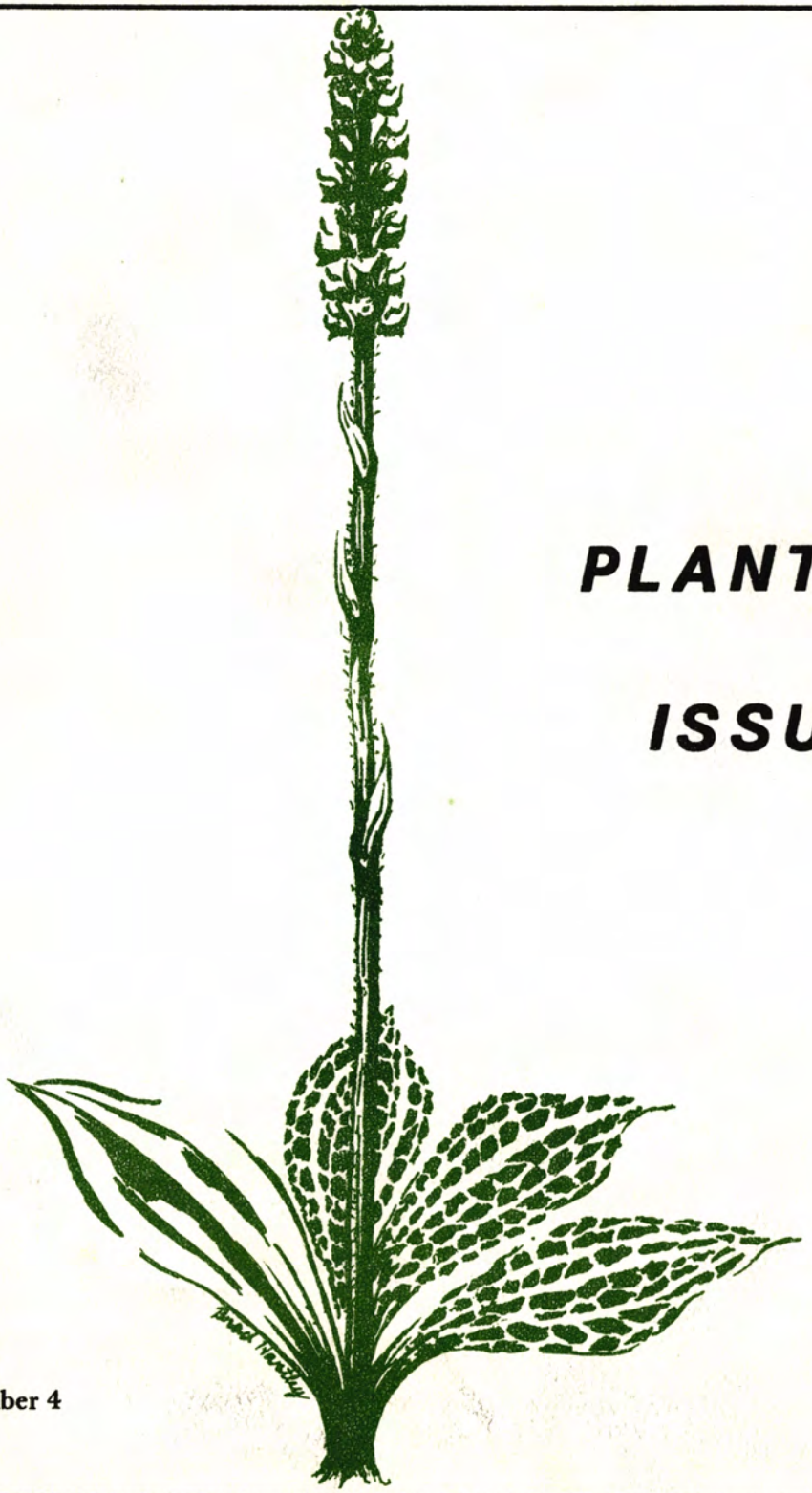
# Nature Study



## PLANTS ISSUE

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Congressman Robert T. Matsui of California is exploring the sponsorship of a bill to declare the sunflower our national flower.

Worldwide, sunflowers now rank second only to soybeans as a source of vegetable oil. Some thirty-five countries now grow sunflowers as a crop. This is the only plant domesticated by North American Indians that is now world-important.

In its ornamental flower forms, our native sunflower is equally famous. Masterpieces by Monet, van Gogh and Gauguin celebrate its beauty. Double and red sunflowers are popular throughout Europe.

Any plant worthy of being named national flower will naturally already be some state's official flower. Kansas claims the wild sunflower.

Professor Charles Heiser of Indiana University has researched sunflower ancestry for over 35 years. He says American Indians domesticated the sunflower in what is now the central U.S., exactly where they have so recently returned as an important "new" cash crop.

## Resolution Declaring the Annual Sunflower the National Flower of the United States.

**Whereas,** the annual sunflower (Helianthus annuus) is the only world-important food plant species native to any part of the present United States; and

**Whereas,** the annual sunflower has, in recent years, again become an important crop in its natal land, and the United States is now the leading exporter of sunflower products; and

**Whereas,** the annual sunflower is the only native plant species triply valued as a crop, an ornamental garden flower, and as a ubiquitous wildflower; and

**Whereas,** the annual sunflower is the native plant species most often associated with the sun in present and past American cultures, and will well serve the future United States as the symbol of its leadership in scientific conversion of solar energy to meet growing human needs; and

**Whereas,** the annual sunflower is grown in each of the States; and

**Whereas,** the annual sunflower is recognized around the world, has armorial qualities, is ideally suited for artistic reproduction -- children can draw it, artists can paint or chisel in stone, sew with a needle, or fashion in clay -- truly a flower for all people; **therefore**

**Be it enacted** by the Congress of the United States of America: That Helianthus annuus or annual sunflower in its wild, agricultural and ornamental forms, is hereby designated the official flower and floral emblem of the United States of America.

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# Nature Study

## Features



## Departments



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# The Remarkable Cactus

## by S. Marie Kuhnen

**ONE OF THE MOST** fascinating biomes to explore is that of the desert. Life is severe and in order to survive an organism must adapt or get out.

Temperature changes may range from the upper limit of survival to near freezing in just one twenty-four hour period. Water supply is limited, either because of lack of rainfall or because of a high rate of evaporation. When a rain does come it is often a "gully washer," dropping many inches of rain within a few hours. I experienced one such storm in Mexico. The prickly pear and cholla were just barely protruding above the flooded desert. The run-off was extremely rapid. By the next day bare ground was exposed and there were few signs, except for the damage, of the abundance of water on the previous day. The rainfall may be limited to a brief period, not necessarily that of the active growing season. For many of the Arizona desert plants a wet winter means a blooming desert in the spring. Spring rains help little in terms of flower setting.

Some areas almost never get rain but can support plants because of the heavy coastal fogs such as those that are found along the coast of Chile, Peru, and South Africa or those that keep the spectacular silverswords of Haleakala Crater of Hawaii alive. These plants are so dependent upon the fogs that the rings of stones placed around the young plants by well-meaning hikers might present just enough of a barrier to keep the plants from getting sufficient moisture to survive.

Intense sun with little shade is another factor. Desert plants need sun in order to bloom, but many of the cacti and other succulents will be found growing in the shade of a pebble, grasses or some barrier during the hottest periods of the day. Contributing to the low water supply and tied in with light duration and intensity is the very low relative humidity. My nasal passages have never been the same since their exposure to the three percent relative humidity of the Egyptian deserts. Water loss can be extreme under these conditions.

The soil, too, offers problems. There is little organic matter because there is not even enough water to support bacterial action. It is very rocky with the surface pebbles often settling in tightly against one another to form "desert pavement," a surface difficult to penetrate. Although lacking in organic matter the soil is rich in nutrients, something which many cactus growers tend to overlook. As Rowley indicates in *The Illustrated Encyclopedia of Succulents,* many of the desert succulents could not meet the competition from other plants in a richer habitat and thus are found where few other things will grow. Our *Opuntias* in the East either grow on sandy soil or on the thin soil covering a rocky base. The topsoil layers of some deserts may be forty or more feet in thickness. These layers have slowly accumulated over the millennia because there have been few users. Look at how the irrigated valleys of California flourish.

**HIGH WINDS** are common in desert areas. They not only have drying effects but they carry soil particles which sandblast surfaces. If they are important in the formation of a Bryce Canyon imagine what they do to plants. The openness of the desert lacks barriers such as are found in our Eastern forests so that the force of the winds is maintained constantly.

These and many more factors produce the conditions which add up to creating a desert. Plants and animals living under these conditions must have the proper structure and physiology or they will not make it. There are many species of desert plants and many adaptations. However, I will limit this discussion primarily to cacti with an occasional reference to other succulents.

Succulents, of course, are plants whose parts are modified for water storage, making them rather fleshy. The fleshiness may be seen in the roots, stems, leaves and even some flower parts. Cacti are succulents because their stems, in particular, have adapted for water storage.

How do they do it; that is, how are they modified for holding water? Secondly, how are they modified to prevent water loss? The combination of these two sets of adaptations leads to survival in a world of almost constant drought.

The plant body, or stem tissue, is thick and fleshy. It can be almost spherical, cylindrical or a flat pad. Internally there is an effective vascular system which transports water rapidly to the abundant water storage cells. These are large, thin-walled cells with many intercellular air spaces to permit expansion of the cells during periods of high water availability. A saguaro can take in over a ton of water during a heavy storm. The stems are often fluted so that they can expand or shrink accordion-like when necessary. Shrinking results in larger shadows which help to moderate the surface temperature of the plant. The cells have hydrophilic compounds, chemicals which enable them to hold on to water tenaciously. Barrel cacti take in so much water they, at times, topple over. Instead of dying, they often send out roots where they contact the ground.

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**ROOTS CAN BE** of two basic types. They can be much-branching, close to the surface and very extensive. Saguaros can send out roots to almost 100 feet from the plant body. Even the very small cacti have extensive systems. Often they penetrate deeply into rock crevices making it impossible to remove them. In fact, cacti can produce roots very readily under the right conditions. Within a couple of days of a good rain new roots can appear on some. Others will lose much of their root systems during a drought but can produce fine branch roots quickly when conditions are right. When you pot your cacti be sure not to overpot them. Often they are placed into pots much too large for them. The pot should not be more than a half inch larger than the plant. Otherwise the plant will fill the pot with roots before it will start to grow. Sometimes the plant will even get smaller!

Of course, roots grow close to the surface of the ground in order to offer as much area as possible to absorb rainfall. However, the second type of root system lacks this feature because it is a tap root system. Some of these deep-penetrating, thickened roots can weigh hundreds of pounds. They grow deep to penetrate to sub-surface water supplies. These types are difficult to grow on your windowsill because they are too easily over-watered. Watering of those with the diffuse system can also be tricky. A general rule is not to water until at least an inch of soil is dry. Avoid over-watering. Remember the moving air of the outdoors has great drying effects. Even with a heavy rain most runs off rather than in. You have to know your plants. If in doubt, give them a highly porous soil and feed lightly more often.

As you can see the plants have effective systems for obtaining and holding water. What are some of their adaptations for enabling them to hold the water after they have gotten it? There are many.

**MANY CACTI** are spherical or nearly so. This gives maximum volume for minimum surface, resulting in less water loss. Those that are flattened tend to have their pads at right angles to the sun during the hottest parts of the day. Their surface is covered with a thick waxy cuticle, a layer impermeable to water. The epidermal cells are thick-walled, presenting a tough, resistant exterior. Guard cells are not very abundant, are deeply imbedded in the epidermis and very small. In many plants they open mainly at night rather than during the day which is the usual case. This requires an alteration of the photosynthetic cycle in which carbon dioxide is fixed at night in acid and then released to the photosynthetic reaction during the day. The usual reaction in other plants occurs during the day when the guard cells are open and the carbon dioxide is used directly without need for storage. Some cactus plants follow a different pathway in photosynthesis involving molecules with four carbon atoms rather than the usual three.

Cells of the cortex have taken over the job of photosynthesis because only a few cacti have leaves. Most lost them during the evolutionary process. The *Opuntias,* prickly pears, have small cylindrical leaves which they produce after a period of heavy rain. These last for only a few weeks. Only the *Pereskias* have true, persistent leaves. These are forest plants. Since plants lose a very high percent of their moisture through leaves, why have them when water is at a premium?

**A SAGUARO CAN TAKE IN OVER A TON OF WATER DURING A HEAVY STORM**

The surface of the plant body is covered to varying degrees by spines and glochids originating from areoles. All cacti bear areoles. These are pads which give rise to leaves, spines, glochids, wool, hairs, branches and flowers. They actually are stem nodes with some unusual modifications. Glochids are tiny hooked spines which occur in numbers in the areoles, especially in the *Opuntias.* A friend carefully avoided the long (6-8") straight spines of the tree *Opuntias* on Barrington Island, Galapagos. She was not aware of the glochids until she got hundreds of them in her leg after a brief accidental encounter with what looked like an unarmed stem. They are "vicious little rascals."

The spines are highly variable. They may be straight or curved, cross-ribbed or smooth, large or small, dagger-like or strongly hooked, coarse or fine, hard or soft (as in the paper-spined cactus), feathery, long or short-haired, single or grouped; white, red, yellow or something in between. It is the size, shape, color and orientation of these spines which are of such fascination to a cactophile. Their variety is endless and the symmetry of their arrangement exceedingly beautiful. Many of the cacti have large, showy flowers. Unquestionably they are responsible for part of the appeal of the plants, but I find the marvelous symmetry of the spines even more impressive. Moreover, they are present throughout the life of the plant. The flowers of many are ephemeral (a water-saving device).

The spines contribute importantly to the survival of the plant. Many types reflect light, thus keeping the plant cooler and the immediately adjacent area a little more humid. Likewise, they shade the surface. Generally, the very hairy forms are found in the bright, direct sun during the critical, hot periods of the day. Those with little spination cannot stand so much light and heat. Some develop red pigment, bronze off, and stop absorbing water which leads to death. These types are generally found embedded in thick grasses or in deep shade during midday.

Spines also prevent animals from eating the tissue. Apparently, some cattle and goats can accept the very bitter taste of the plant sap, this bitterness being a protective device against being eaten by most animals, including humans. Just do not plan on being saved by that barrel cactus. The sap is not that abundant and it is most distasteful.

The spines of some cacti, especially those of the jumping cholla, are important in dispersing the plant. The plant breaks off readily at the nodes, so readily that the parts seem to jump at you. You will never forget the experience if these loosely attached joints happen to latch on to you. The spines are strong and hooked so that it is impossible to free oneself unless the proper tools are used. These may be a couple of sticks or even a comb, but never the hands. On the ground these sections root readily.

The flowers of cacti are very showy whether they be the tiny ones of many of the Mammillarias or the large, brightly colored ones of the *Epiphyllums* or the *Echinocereus* group. They have many petals and petaloid sepals, all of thin, delicate tissue. This legislates against water-retention and so many last for just a day.

*(continued on page 21)*

# THE VANISHING PRAIRIES

## by Karen Wendt

It is Indian summer and the patterns, colors and textures of the endless grasslands are their most glorious. Tall grasses sway gracefully with the wind as wildflowers dance among them. Turkey foot grasses reflect rich reds; coneflowers display spectacular purple. Herds of bison crush prairie dock.

The first European explorers were awed by the beauty and infinity of the prairie wilderness. Those French adventurers had never seen such endless vistas in their own country, and for want of an appropriately descriptive name, they called it, simply, "prairie," or meadow.

The early settlers had settled in the forests, which they knew contained the basic materials to support life. They assumed that the prairies had nothing to offer. While the forest yielded timber for building materials and fuel, and protection from the harsh winter winds, the prairie lacked all these accustomed woodland stands. Only a few lone bur oaks existed on the prairie.

The bur oak became the pioneers' oasis. Its shade provided a temporary escape from the scorching summer sun. Its meager height was useful as a lookout tower, particularly in Illinois where many grasses, six to eight feet tall, made vision difficult.

The bur oak was scarce. The pioneers wondered, If trees could not flourish in the prairies, what could? They believed the soil infertile, and left the grasslands untouched and unsettled.

By 1835, the eastern woodlands were fully claimed, and the settlers began to inhabit the forest perimeters of the prairie. The "infertile soil" could no longer be avoided, and the first farmers were faced with the difficult task of "breaking the prairie." This first plowing entailed turning up a sod which was a thick, deep and tough mat of vegetation that had been undisturbed for thousands of years.

Prairie plants had learned to conserve moisture and to survive the frequent fires, by developing a root system extending ten to fifteen feet deep. These root systems, which made two-thirds of the plant exist underground, might have served the plants themselves well, but made early farming difficult, and often nearly impossible.

With hard work, determination, and the use of the new steel plow, the prairie sod was broken and the first crops planted. The myth of the infertile soil was quickly dismissed as the harvest yields far surpassed the yields from the forest plots. The rich black soil was rich in humus and nitrate. Pioneers were no longer doubtful of the prairie's fertility and rapidly inhabited it.

Eventually, the farmers overcame the lack of an efficient transportation system, by urging the use of railroad systems. The railroads brought still more settlers, and as 1860 passed, the prairie lands vanished.

Pasqueflower, shooting star, compass plant, prairie dock, fringed gentian, butterly weed, switch grass, Indian grass– these sunshine loving plants were destroyed as the land was transformed into grainfields and grazinglands. Checkerboards of corn and soybean replaced the natural pattern and a pattern of life over 10,000 years old was destroyed within 40.

Today, only a few prairie areas remain untouched by man, and are preserved by state and federal parks, nature conservancy areas, arboretums, and botanic gardens. Some are located along railroad rights-of-way and fencerows and old cemeteries. Only some are protected.

A prairie community is aesthetically and scientifically desirable. Its summer wildflowers display a succession of colors, textures and forms of amazing wealth. Its plant and insect population is impressive, and its tenacity and hardiness allow it to exist where our tender bluegrass cannot. A prairie community has twice the diversification of a Eurasian weed patch, and offers a low maintenance landscape that does not need pest control, watering, weeding, mowing, or fertilization. As a wildlife habitat, the prairie provides food, covering and nesting areas. It stabilizes the soil, prevents erosion and rebuilds worn-out soils. It is also a link with our past, and an outdoor laboratory. Ecology, taxonomy, plant economics, ornithology, painting and photography are only a few of the educational potentials. Most important, it provides a peaceful space for pleasurable walks where one can become more aware and appreciative of our environment.

Whether the prairie remnants flourish, and whether our children will in the future find a pasqueflower is up to us right now. This landscape of exhilaration and tranquility is vanishing. □

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# What's in a Name?

## by Anne Cloutier

What does the beautiful marsh marigold have to do with cow slop? Which popular Christmas plant is called the thief tree? What is a hoary puccoon or a bastard toadflax?

The answers to such questions are hidden in the curious jargon of plant systematics. This exacting science need not be left solely to the categorical, classifying minds of botanical scholars. There are engrossing legends, unsuspected kinships and logical correlations to be discovered by studying both the common and the scientific names of any of the thousands of plant species you may one day encounter.

The Latin system of classification, wherein each plant is given a unique binomial, was developed in the eighteenth century by Carl Linnaeus. With the publication of his *Genera Plantarum* and *Species Plantarum,* the vast accumulation of botanical knowledge was finally ordered, and a system of naming plants according to genus and species was established.

Common names were not forsaken, however. Despite the lack of practical utility to the serious botanist, plant vernacular can tell us much about a species' appearance, characteristics or history.

Consider lousewort, a wyrt (in Anglo-Saxon, a root or herb) whose presence, according to folklore, encouraged the infestation of lice in sheep and cattle; its generic name, *Pedicularis,* translates to lousy. Also of Anglo-Saxon origin is the witch hazel, a tree whose pliant stems (wicen means to bend) were used as divining rods, and were therefore associated with uncanny phenomena.

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Mistletoe is similarly immersed in Anglo-Saxon legend: it was commonly thought that this traditional Christmas plant was propagated by bird droppings, mistle meaning dung and toe translating to twig. It was only later discovered that the seeds of mistletoe sprouted from the droppings of birds that had eaten its berries. The Greek name, *Phoradendron,* means the thief tree and refers to the plant's parasitic nature.

Perhaps the most intriguing Anglo-Saxon plant name originated in the barnyard. Marsh marigold, or cowslip (from cuslyppe or cowslop) is a striking member of the buttercup family which grows in rich, wet soils such as those found in trampled barnyards. Its habitat preference is also indicated by its specific name, *palustris*—of the swamp.

Animals have played an important role in the naming of many plants. Viper, rattlesnake, adder or snake are terms found in the common names of at least ten species of wildflowers or ferns. Relationships to such ill-reputed reptiles range from similarity in appearance (adder's-tongue, rattlesnake plantain, snake mouth) to purported remedies for snakebite (viper's bugloss, rattlesnake root, adder's-tongue fern).

There are many wildflowers, or parts thereof, which bear resemblance to animals. The stamens of moth mullein look like the antennae and tongue of a moth; dandelion leaves and lions' teeth (dent de lion in French) are similarly serrated; the trout lily has spotted leaves similar to the spots on a trout; the spurs of the columbine (from the Latin for dove) resemble 5 birds perched on the rim of a dish, while its petals take the form of an eagle—hence its Latin name, *Aquilegia.*

Another grouping of plants with bird-like characteristics is the Geranium family. The long slender beak of the Geranium's seed pod is similar to a crane's bill, or *geranos* in Greek. Amphibian rank belongs to the less highly evolved Buttercup family. Its seeds resemble small frogs—the Latin name for both is *Ranunculus.*

Not all plants look like a viper's tongue, a lion's tooth or a dove on a dish. Names have been imparted over the years for a variety of reasons: a plant may be named for a famous person; a flower's unique characteristic or appearance may be worthy of recognition; or, a species may be associated with some special use such as healing. In any case, a plant's name—be it Hebrew, Latin, Greek, Indian, Arabic or Slavic in origin—tells us something about that plant and perhaps something about the people who named it.

The dainty twinflower is a case in point. Its Latin name is *Linnaea borealis,* the only species Linnaeus named for himself. He described the twinflower as ". . . lowly, insignificant, flowering but for a brief space—from Linnaeus, who resembles it."

Saints, kings, gods and goddesses, scientists and herbal doctors are among those who share names with the plants. There is St. Johnswort, which flowers in late June near the feast of St. John; there is *Barbarea vulgaris* (wintercress), named for St. Barbara, whose feast day was celebrated in the Middle Ages by collecting wintercress from under the December snow; and there is Joe-Pye Weed, honoring the Indian herb doctor of the Massachusetts Bay Colony, Joe-Pye, who cured typhus fever and other ailments of the early settlers.

Iris, the goddess of the rainbow and messenger of the gods, has a genus of multi-colored flowers named for her. So too does Circe the enchantress, who made use of such poisonous plants as enchanter's nightshade *(Circaea quadrisulcata.)* A less sinister herb, the violet, is said to have been created by Zeus as a special food for Io, daughter of the river god, Inarchus. The Latin generic term, *Viola,* is derived from this Greek name.

Some of the more intriguing plant names—pipsissewa, hoary puccoon, askutasquash—originated with the native Americans. Translated from Cree, pipsissewa means "juice which breaks stone in bladder into small pieces," referring to the Indian's belief in pipsissewa's curative effects. Puccoon is an Algonquin Indian name for a plant which yields a red pigment used for staining, and askutasquash is the full-length version of our present day squash.

A pointed leaf, a hairy stamen, a pungent taste, a preference for meadows—these are some of the simple, yet distinctive characteristics which have often earned plants their names. *Sagittaria latifolia,* for example, refers to the arrow-shaped, broad leaves of arrowhead. Beard-tongue *(Penstemon)* was named for one of its 5 stamens—a bearded, tongue-shaped sterile oddity. "Twisted nose" is the English translation for *Nasturtium* or watercress, an aquatic herb with succulent, pungent-tasting leaves. The delicate pendant flowers of jewelweed give way in the fall to ripe seed pods which explode when touched; this characteristic is responsible for the generic designation *Impatiens* as well as another common name, touch-me-not.

A preferred habitat is often indicated in a plant's name. Bindweed is an example, with 2 species growing in 2 distinct areas: field bindweed, *Convolvulus arvensis,* translates to "twining around cultivated fields," while hedge bindweed, *C. sepium,* refers to a vine "of the hedges." Clover, *Trifolium pratense,* is a 3-leaved flower of the meadows; beechdrops is a parasite on the roots of beech trees, and its Latin name is *Epifagus,* or "upon the beech." Hens and chickens *(Sempervivum tectorum),* on the other hand, has been found growing on the roofs of houses, as its species name implies.

There are many plants whose names indicate the geographical area in which they were first discovered or described: mullein, *Verbascum thapsus,* from Thapsos, Greece; Culver's Root, *Veronicastrum virginicum,* from Virginia; golden seal, *Hydrastis canadensis,* from Canada; jewelweed, *Impatiens capensis,* of the Cape of Good Hope, and many others.

The plant species thus far mentioned have been named for their peculiar shape, for the habitat in which they grow, for their kinship with the gods, or for their similarity to an animal. But what of those herbs to which man has designated some special function or purpose? Indians, pioneers, herbalists and artisans have, for centuries, relied on the natural properties of hundreds of plant species—be they curative, culinary or constructive.

The medicinal values ascribed to such plants as cinquefoil, marsh mallow and ginseng are acknowledged in their scientific names. *Potentilla,* the generic name for cinquefoil, was thought to be a potent or powerful enough medicine to ward off evil spirits. Likewise, ginseng's Latin name, *Panax,* translated to a panacea for all man's ills. The marsh mallow, *Althaea officinalis,* has played an important role in the history of the healing arts; its scientific name, which translates to "that which heals" and "of the apothecary shop," indicates its medicinal significance. Healing properties were also attributed to certain species of goldenrod, thereby explaining its Latin name, *Solidago,* to make whole. Another common herb believed to possess wide-ranging medicinal properties was heal-all or self-heal. Its scientific name *Prunella* stems from the German *breaune* which refers to diseases of the mouth and throat.

More specific remedies were attributed to other herbs such as bellwort, hawkweed and boneset. Diseases of the uvula (the fleshy part of the palate) were controlled by *Uvularia* (bellwort). Sharp sight, such as that of hawks, could be developed through the use of an eye salve made from the juice of *Hieracium* (hawkweed). The Greek generic name is derived from hieros or hawk. The root extract of figwort was purported to be a cure for figs or piles, while the rapid setting of fractures was attributed to the healing properties of boneset.

The Doctrine of Signatures, the superstitious medieval belief that a plant's shape was related to its function, has played a part in the naming of certain herbs and ferns. The theory, as stated in 1886 by Reverend Hilderic Friend, was that "nature had, in giving particular

*"I call it* Bellis riddance *in memory of my first wife."*

*(continued on page 24)*

# BEANS: A Sampling of the Variations in Plants

## by Helen Ross Russell

Probably no family has more Dr. Jekylls and Mr. Hydes than the legumes. Twenty-one out of thirty beans listed in popular guides to edible plants are also listed as poisonous in John Kingsbury's *Poisonous Plants of the United States and Canada.*

Of course, if we stopped eating everything listed in Kingsbury's book we would give up, among other things, tomatoes, potatoes, peaches, apricots, plums, cherries, apples, and rhubarb because one or more parts of these plants are deadly. We would also turn away from kale, turnips, brocolli, cabbage, and other mustards, because they cause goiter and other physiological problems when consumed in quantities.

At the ultimate panic level we would quiver in our insulated-from-the-natural-world homes while we hoped that no botulism or salmonella had invaded our canned or frozen dinners. As soon as we begin to be involved in food production and/or foraging we must take responsibility. The rules are definite:

1. Know your plant.
2. Know which parts are edible.
3. Know in which season the plant can be harvested.
4. Know how it must be prepared.
5. Never transfer knowledge of one plant to another similar plant.
6. The first time you try any new plant food take a small serving to make sure that you do not have an allergy.
7. At all times remember that "The best physician is always one's own moderation."

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Legumes certainly play the leading role in the simplest of all household food-growing activities, sprouting. Many persons purchase mung beans, alfalfa and clover seeds at natural food stores for this activity. In addition, all but one of the beans on the grocery shelf are excellent for sprouting. Soup beans, pea beans, calico beans, kidney beans, lentils, all produce crisp, nutritious sprouts, high in vitamins, low in cost; but lima beans produce hydrocyanic acid when they sprout and they can be deadly.

The flowers of a number of legumes can be eaten. They make good additions to salads. Dipped in batter they may be fried as fritters or tempura. Unopened flower buds may be pickled like capers. Common flowers that can be used in this way are redbud, *Cercis canadensis,* black locust, *Robinia Pseudo-Acacia,* broom, *Cytisus scoparius,* and *Wisteria* spp.

The leaves, twigs, seeds and pods of broom and Wisteria are poisonous. Both the green and dried beans of the black locust were cooked and eaten by the Amerindians but cooking is essential. Raw they are highly poisonous as are the inner bark and roots.

The poisonous principle in broom seeds is destroyed by heat and they were roasted as a coffee substitute in Europe for centuries. In the United States the seeds of the Kentucky coffee tree, *Gymnocladus dioica* were roasted by the Pawnee and Meskwapi Indians and eaten like chestnuts. Europe settlers roasted them harder and used them for coffee. Again, the foliage, young sprouts, and unroasted pods are poisonous.

Honey locust pods, *Gleditsia triancanthos,* were used by Amerindians for sugar and a beer-type beverage; while the pulp between the seeds provided chewing material for children in pre-chicle days. Another bean tree whose pulp was, and is, chewed is St. Johnsbread, *Ceratonia siliqua.* Today this tree from the Mediterranean has been introduced into Florida and California. Its young pods are pickled and mature ones are roasted and ground into carob powder.

One of the first of the North American root crops which the Amerindians shared with the Europeans was the groundnut, *Apios tuberosa.* The passengers of the Mayflower arriving at Cape Cod in December found a store of groundnuts which helped them survive until spring. In Delaware, the Swedish settlers were introduced to this plant by the Lenni-Lenapes and survived because of their abundance. These beans were planted in European gardens as a potential crop but were eventually displaced by the easier-to-cultivate South American potatoes. Groundnuts are still a good woodland forage providing small

edible beans and potato-like tubers. To ensure future crops it is essential to leave some of the tubers in the ground.

Changing habitats have greatly reduced the areas where groundnuts are found and practically wiped out the prairie legumes used by Amerindians, explorers and early settlers: pomme blanc, licorice root, and wild licorice. On the other hand, kudzu, *Pueraria lobata,* which was introduced from Japan in the 1940's to heal gullies, has been climbing out of gullies and up road cuts, competing with crops and smothering forests for the last three decades.

The whole plant is edible. The large perennial root can be peeled and cooked, or pounded to produce a flour. The beans can be cooked like any fresh beans and the shoots and young leaves can be cooked as greens. Anyone living near a kudzu vine could help bring this Jack-in-the-beanstalk monstrosity under control while enjoying a fresh vegetable and balancing the budget.

Hog peanuts, *Amphicarpa bracteata,* grow in woodlands. They produce two types of seed pods, slender, several-seeded ones from showy flowers which grow on the tops of the vines and fat ones with a single plump seed produced by cleistogamous flowers whose short stems grow into the earth after the flower is self-fertilized. Early settlers learned to gather these from Amerindians who sometimes harvested them by digging around the base of the plant and sometimes collected them from the winter storage caches of small rodents. Frequently the forager left corn in place of the pilfered seeds.

Attempts to grow these as a crop plant were abandoned when that most versatile of legumes, known as a peanut, arrived from Peru by way of Africa. Like the hog peanut, peanuts are a modified bean pod produced by a flower that grows close to the ground. Even more than peanuts, the members of the genus *Phaseolus,* like lima beans, kidney beans, string beans, soup beans, pea beans, dramatically changed the diets of Europeans. Prior to the discovery of America, members of the genus *Lathyrus* were the main legumes in the diet. Beach peas, *Lathyrus maritimus,* were foraged and chickling vetch or grass pea, *L. sativus,* were widely planted for their edible seeds. Even then it was known that quantities of *L. sativus* caused paralysis, and in the seventeenth century a law was passed in Wurtenburg forbidding the use of this plant. Peasants suffering from food shortages ignored the law and combined one part *Lathyrus* meal with three parts of wheat flour. Modern research has shown that as long as the diet is less than one third *Lathyrus* there are no ill effects.

Lupines were the main legume in Roman kitchens. Today lupines are grown for their flowers but not for their seeds. In addition to cultivated lupines there are more than 100 species of wild lupines in the United States. Some were eaten by the Amerindians. Others are extremely toxic. The same species may be edible one place and toxic at another. Cattle, sheep, horses, deer, and humans have been killed by eating the wrong lupines. They are best admired for their beauty but avoided as food.

They share their difficult botany and large numbers with the loco weeds. Loco weeds belong to two genera, *Astragalus* and *Oxytropis,* and represent more than three-hundred species. Some were eaten by the Amerindians. Some are highly toxic to people and cattle with the symptoms which were described as "loco" by the Spanish being followed by death. It also appears that some of the toxic species are habit-forming. Cattle and horses rescued from near-death and returned to outdoor feeding after their recovery will frequently seek out and feed on the loco weeds if they are available in preference to good pasture plants.

Mesquite, *Prosopis glandulosa,* and screw bean, *P. pubescens,* are Southwestern legumes whose dried pods provided a highly nutritious food when ground into meal. The green pods were also cooked, used for making a beverage, or chewed like honey locust and St. Johnsbread by the native people of Southwestern and Mexican cultures.

Cattle, on the other hand, are killed by mesquite. It appears that the high sugar content of the bean pods kills the microorganisms in the rumen with a resulting breakdown in digestion. Once this happens proteins and other foods go directly through the animals digestive tract without being utilized. Death is slow but inevitable since there seems to be no way to get the mesquite out of the stomach walls.

Although we think of clovers as animal forage plants they have almost all been eaten by humans at one time or another. Flour made by drying and grinding the plants was a famine food in Scotland. Dried red clover blossoms were a widely used colonial tea and still make an excellent caffein-free drink which is naturally sweet from the abundant nectar at the base of each slender flower. Clover flower heads and young leaves may be added to salads in moderate amounts. In large amounts they produce flatulence.

Flowers and seeds of sweet clovers *Melilotus alba* and *M. officinale,* can be used as seasonings in salads and stews or dried for tea. These plants are grown in Switzerland as a flavoring for Gruyre cheese.

Moldy *Melilotus* produces the chemical dicoumarin, an anti-coagulant used in human medicine and as the base for *Warfarin,* a rat poison which causes death by internal bleeding.

Alfalfa sprouts are nutritious and delicious. In a mixed diet cattle thrive with the addition of alfalfa; but a pure alfalfa diet causes white animals to suffer from photosensitization, a disease characterized by the breakdown of normal liver function with a resulting deposit of materials under the skin which would normally be excreted in the urine. This process is followed by destructive chemical reactions fired by solar energy. Animals protected by melanin in their skin or fur do not suffer from this disease. Even the most fair-skinned humans do not need to worry about this as long as they confine their alfalfa munching to sprouts and eat a balanced diet.

Fava beans, *Vicia faba,* cannot be eaten by some people of Italian or Jewish ancestry who have an inherited biochemical deficiency in red blood cells. The disease, called favism, is sex-linked and much more common in males than females. Children are more seriously affected than adults. In extreme cases inhaling the pollen brings on the symptoms of headaches, dizziness, nausea, vomiting, and fever. Raw or partially cooked beans are much more upsetting than well-cooked ones.

Every once in a while I encounter would-be foragers who talk about the joy of getting close to nature, and being refueled from Earth's bounty, who propose that planting and cultivating is corrupt and who suggest that you really don't have to know the identity of all the plants that you harvest if you just take a little sample you ought to be able to tell.

A little sample of *Abrus precatorius* might reasonably be only one of the bright red seeds called rosary pea, crab's eye, or precatory bean but that is all that is necessary to kill an adult human. It takes a few more seeds of *Laburnum anagyroides,* goldenchain tree, the beautiful ornamental planted for its long hanging racemes of golden flowers, but death is just as painful and final. *(continued on page 24)*

# OWNERSHIP

## by Malvina Trussell

What better place for meditation than on an open deck, seated in a comfortable butterfly chair, surrounded by unspoiled nature. Looking straight ahead is Sagee mountain, rising 1000 feet above the Cove. It was named by the Indians who were free to roam these mountains for possibly thousands of years before the arrival of white man. They owned this land—an ownership which was earned through an understanding of, and an appreciation for, this glorious environment.

What does ownership mean? I do not *legally* own the pond, only a couple of hundred feet from where I sit. But *legal* ownership is not essential to my enjoyment of the spring peepers *(Hyla crucifer)* which are now gathering by the thousands among the shrubs, and along the pond's edge, for their early spring nuptial ceremony. The combined calls of the males is almost deafening, but a single male in a tree close by takes a solo part as the chorus continues. How did I come to own these "Voices of the Night?" That is a long and interesting story, filled with beautiful memories which I have owned and treasured for thirty years; the lone spring peeper, no larger than the first joint of my little finger, awakens these memories—bogging along the muddy edge of a pond in Southeast Georgia to record the Jug-O-Rum call of the Southern Bullfrog *(Rana catesbiana);* wading in hip boots through crystal clear water to capture the voice of the barking frog *(Hyla gratiosa);* climbing the tall cypress tree to get near the bird-voiced frog *(Hyla avivoca).* The two Cornell professors, who were my companions on these memorable nights, have now gone to the Great Beyond but before they left they deeded me "Title of Ownership" to a brilliant facet of this beautiful world. As I meditate, I recall the clever limericks they composed and mailed to me each day as they headed north. I smile inwardly as I recall three of these limericks, which are now a part of the Arthur A. Allen Archives in the Cornell Library.

"Could anything ever be finer
Than barbecued pig in the diner?
Why yes, you poor fool,
If you must make me drool,
It's brunch in the home of Malviner."

"We are fond of sweet Georgia peaches
In baskets, in hoop skirts or breeches
But there is only just one
That can give you much fun
In the swamps of the river Ogeeches."

"Why don't you plant a cypress
And sit upon its knee
Be an avivocaculturist
And think of Paul
and me."

From Paul Kellogg and Doc Allen I was given full "Title of Permanent Ownership" to all the frog ponds throughout the world.

Is understanding a good measure of ownership? Was the Indian's "Title of Ownership" more meaningful than the *legal* ownership of the distant Miamians who built the $500,000 house on top of Sagee? The *legal* owners, at most, spend a month each year on the mountain top. They do not spend this time roaming the mountains and valleys or even on their deck looking at range after range of the Blue Ridge Mountains. They spend most of their time indoors entertaining friends at cocktail parties. Do they have real ownership to this surrounding beauty?

A Barred Owl calls from deep in my white pine woods; he is answered by another owl from a tree in my neighbor's yard. Do I enjoy the mating call of the second owl any less because I do not *legally* own the tree from which it is calling?

Now that my eyes are adjusted to seeing in the darkness, I can enjoy the white and purple Siberian Iris which cover an area of 2500 square feet between where I sit and the pond. I do not *legally* own the land on which these Iris are blooming. I planted the Iris seventeen years ago. I do not recall even asking my neighbors, who live across from the pond, if I could plant them on their land. But, I know my neighbors and I know their philosophy of environmental ownership. During the building of the pond, the land had been disturbed, nature needed some help in stabilizing the easily eroded clay soil; iris and daylilies proved to be the solution. During these seventeen years both have multiplied profusely. They have been shared with dozens of friends who, too, had spots where nature needed help. From the few original plants brought by friends from Tallahassee and Kissimmee, Florida, beauty and ownership have been shared by hundreds during seventeen spring and summer seasons. Nature has cooperated in this sharing of ownership. Not only have the root systems multiplied and spread, but wind and water have distributed the seed down to the water's edge, in the crevices of rocks and along the roadsides. No doubt the birds have played an important role in scattering the seed well beyond our little cove.

What does it mean to *own* a piece of this beautiful world? Do we too often think of ownership as merely a means for making a quick buck; does ownership give one a license to take everything possible from the land without returning anything to it? To feel true ownership one must have understanding and appreciation. If we are to own one tiny spot of this wonderful world we must nurture it, enjoy it, share its beauty with others, and finally pass it along to another generation more beautiful than when we found it. □

*MALVINA TRUSSELL is Professor Emeritus, Florida State University. She served as Editor, ANSS Newsletter (1950-1955) and President, ANSS (1955-1956). Her time is now divided between Miami, Florida and Highlands, North Carolina, where she works with the Highlands Biological Station.*

# PUBLICATIONS: 1908-1980

Publications have always been important to ANSS. One might almost say that the society was spawned by *The Nature Study Review* although, in reality, both the magazine and the society represented an idea and a movement.

At the turn of the century the concept of science for children was new. Almost all the children's science material that was published was moralistic, sentimental, or anthropomorphic. In a pendulum-swing against this, some educators were borrowing high school equipment and content and watering it down for grade school use.

Maurice Bigelow, of Teachers College, Columbia University, initiated the *Nature Study Review* to counteract both of these approaches and to provide teachers with usable materials and with techniques appropriate for children. His focus on nature study was broad as was indicated by his editorial board: Liberty Hyde Bailey, dean of the College of Agriculture at Cornell University, and author of *The Nature Study Idea,* C. F. Hodges, biology professor at Clark University, Massachusetts, author of *Nature Study and Life,* J. F. Woodhull, professor of physical sciences at Teachers College and H. W. Fairbanks, a geology professor from Berkeley. From the beginning articles in the *Review* covered all aspects of the natural world and included topics that today we would call tips, "How to Use School Gardening to Teach Science," "How to Conduct a Museum Trip."

After two years of publication Maurice Bigelow asked for readers' reaction to the idea of a society to bring together persons interested in this approach. The result was the founding of ANSS in January 1908 at the close of the meeting of the American Association for the Advancement of Science at the University of Chicago. Liberty Hyde Bailey was elected the first president.

The *Nature Study Review* became the official organ of the Society. Dr. Bigelow turned the editorship of the *Review* over to Elliot R. Downing of the University of Chicago during the years when Professor Downing was secretary of the Society. Anna Botsford Comstock took over the editorship in 1915.

In 1923 the Pack foundation founded the American Nature Association of Washington, D.C. which was formed to publish a general interest nature periodical. At its annual meeting that year ANSS members voted to discontinue publishing the *Review* and use *Nature Magazine* as their official publication. *Nature Magazine,* in turn, provided space for ANSS news whenever the secretary provided the copy.

In 1940 *Nature Magazine* merged with *Natural History* and the society voted to use *Canadian Nature* as its official organ. From a nature standpoint this was an excellent choice for members who lived in the northern United States. Except for its environmental philosophy and suggestions for teachers it was less useful for members in other parts of the United States. Soon Cornell Rural School Leaflets were made available to the membership as an option. Neither publication provided any ANSS news.

Three years later, Richard Weaver, secretary-treasurer of ANSS corrected this by mimeographing a newsletter. Dr. Weaver, Dick, as he was known to everyone in the society and in the environmental education world, as well, was a proponent of wise resource use—broadening the natural world conservation concept of the 1930's and 1940's to include human and social resources. He was a dynamo of a man who not only worked tirelessly for the things he believed in but pushed his fellow members as well.

In 1947 the Society voted to adopt an expanded newsletter as its official publication. Entitled *The American Nature Study Society Newsletter,* it was printed by Park Press and edited by Dick Weaver. It contained short articles in addition to news and was issued quarterly.

At the time of Dick Weaver's premature death, Dorothy Treat briefly took over editing the newsletter. She was succeeded by Dr. Malvina Trussell of Florida State University at Tallahassee. Under Malvina the newsletter varied from four to eight pages and covered a variety of topics. The most notable of these was the memorial issue in which Malvina did an eight page story on Liberty Hyde Bailey including excerpts from his book published in 1903, *The Nature Study Idea* and reminiscing about her experiences studying Nature Study as a Cornellian and being a guest in Liberty Hyde Bailey's home when that very active and productive renaissance man was in his eighties. At the end of 1954 Stanley Mulaik, University of Utah, became editor and the title was changed to *American Nature Study Society News.* In June 1964 the format was enlarged to that of a Journal named *Nature Study Society News* with the subtitle "Journal of the American Nature Study Society." Under Stan Mulaik the publishing story had come full circle. Like the *Review,* the Journal now featured articles that appealed to audiences outside of ANSS membership and library subscriptions became common.

Dr. Mulaik continued as editor for another ten years. John A. Gustafson, State University of New York at Cortland, was appointed associate editor, and in time he and Stan edited alternate issues. Robert M. McClung, Amherst, Mass., served as literature editor, and Adrian Fox, Washington D.C., performed as services editor. The following year the name of the journal was changed to *Nature Study* with the same staff of editors. Dorothy Mulaik shared editorial duties with her husband, the two always working together as a team over many years time. The first issue of the new series became issue no. 1 of volume 19, since volume numbers were retroactive to the beginning of the printed Newsletter. Until recently the Park Press of Indiana, Pennsylvania, printed our publications including reprints of the special journal feature entitled TIPS which were widely distributed among school teachers.

In the summer of 1968 the editor and associate editor continued as above, but a new position of audio-visual editor was established and filled by Paul V. Webster, Bryan (Ohio) City Schools. This special editorial position continued for three years. In the fall of 1974 John A. Gustafson was appointed the new editor of *Nature Study.* Marshall T. Case, Fairfield, Connecticut, was the associate editor, for two years and again edited alternative issues.

In the spring of 1978 a Special Index Issue (1964-76) was published, prepared by John A. Gustafson's father. This was

*(continued on page 14)*

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*Research by Ralph Dexter, ANSS historian.*

# WEEDS AGAINST THE WALL

## by John Brainerd

**A TEACHER** was once defined as somebody who stands between students and their subject. Perhaps the teacher was an old-timer when books were scarce and subjects were largely on the blackboard; but the implication is that much pedagogy restrains young minds by interposing an authority figure who lessens initiative and creative learning. Today our students are apt to be held back by other obstacles, the school walls. I, for one, never became inured to being immured; hence this little essay on walls and weeds.

School walls stand for protection of learning. Within them great things happen. Schools are recognized as essential and central to each community, often taxed heavily for bricks and mortar. But even while beneficially protective, buildings wall out essentials. They largely exclude the natural world, the ultimate subject, along with the personal, proximal one about which Socrates admonished us. Of course we do bring in petroleum, coal, and wood, and these days of energy need may in cooler climates invite more sun into our buildings. We do bring in books and audiovisual aids, trying to compensate for what we have shut out. We do encourage resource persons to stand in front of the chalkboard with us. But still we are experientially confined, walled in.

To help compensate more for the unnaturalness of school buildings and the educational methods circumscribed by them, nature centers have arisen. Sometimes they start with a relatively natural piece of land, or with a basement room in a museum or library, or (in my case) with a child's bookcase boasting pieces of shiny rock and old birdsnests. Subsequently money is raised for a special building to protect the objects, tools, and people who use them for education.

WEEDS—Indeed walls are wonderful. Make sure, though, that they have enough doors to invite leaders and followers to the marvels of the natural world outside, for instance weeds. Our planet is blessed with weeds of many kinds and prodigious quantities. Of course you may not always be happy with weeds if you are a farmer, gardener, or devotee of lawns which must be as green as Mr. Scott's next door. But if you are a teacher, interpretive naturalist, youth group leader, parent, or other people-developer, you can enthuse about weeds, especially those just outside against the wall.

**FOR YEARS** a weed has been variously defined and described, for instance as a plant in the wrong place, a competitor of desired growth, a volunteer plant, an ugly plant, and, more generously, a plant whose use has not yet been discovered. The Anglo-Saxons inventing the word "weed" probably had some such aversions, as do the Germans with their *Kraut* and *Unkraut* and the French with their *mauvaises herbes.* Shakespeare's Hamlet exclaimed, "Fie on't! Ah fie! 'tis an unweeded garden that grows to seed; things rank and gross in nature possess it merely." Herein, then, lies a real challenge to educators: create a broader understanding and appreciation of weeds. At this moment, this subject is not just on the chalkboard; it is growing (or dormant) right outside your door against the wall, ready to be studied and appreciated.

If you are a teacher, or an environmental center naturalist, or a parent at home presumably lacking a school lesson plan, seasonal theme, energy lesson requirement, or other institutional constraint, just step out the door with your sense of sight. (Save other senses for savoring weeds later.) Also take along some enthusiasm, or, if you are dubious about the value of weeds, latent enthusiasm. Enthusiasm is essential. The *thu* of "enthusiasm" is cognate with the root *the* of "theology," meaning "god." Perhaps not at first but in time after study and meditation, any weed can bring you to the mysteries and magnificence of creation, those imponderables worth pondering which have led all peoples to develop concepts, no matter how vague, of deity. (See Tennyson's *Flower In The Crannied Wall.*) What you may *not* know about a weed may be as important as what you do know—but don't settle for ignorance.

WALLS—If you teach school, you have a *lesson plan,* more or less supervised, more or less flexible; and at least in the upper grades and college you have a *subject.* Can you encourage "Weeds" to become an integral part of your subjects and lesson plans? And what about "Walls"? Have you taught "Walls" lately? You have four of them in your classroom (unless you teach in a tipi, yurt, or some such); you use them for protection, privacy, posting, chalkboards, and maybe coathooks and hooks for hanging plants. I hope you have studied those walls in English, math, social studies when your pupils became curious about what materials the walls were made of, whence came the materials, who brought them, who in the community erected them, who paid for

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them, and who painted them. I hope student poems about walls are pinned on the tackboard, and pictures of walls too, for architecture is a noble subject to enrich other subjects. I shall never forget our sand table when I was in second grade and my joy when Miss Whittemore let us add mud and make adobe bricks. Now *there* was a great teacher, one whose lesson plan could bend to accommodate her children's curiosity, which she of course stimulated.

THE GROUND—When you exit from your school, environmental center, home, or any other building and turn to look at the outside of the wall, you note of course that it meets the ground (unless perhaps the building stands on columns). The ground may be earth (soil), or turf (grass-covered soil), or it may be concrete (gravel aggregate with more or less sand and some cement to bind it); perhaps it is blacktop (asphalt, tarmac, or some such material), or snow. Whatever materials the wall and ground are made of, there is usually a crack where they meet. If you do not spot one immediately, go on a Crack Hunt. If you feel insecure about such a venture, you may wish to slip out the door and go alone; then later take others to show them what you have found. But if you feel more sure of your abilities in thing-finding, take others along on your first Crack Hunt, to let them share the exhilaration of your premier wall-ground exploration. Some of the best trips are those which the leader has *not* already taken. If you do not find any crack, perhaps your building is very new or is entirely surrounded by sand, in which case hunt for depressions among the sand grains, perhaps little hollows made by rain-drip from eaves or leaky gutters, or wind-deflated valleys, or conical hollows where ant-lions *(Neuroptera)* lurk. The ground is never blah, never completely uniform.

THE CRACK—What is at the bottom of the crack or depression you have found? Suppose you are kneeling in the school parking lot, perhaps with a notebook under your knees to keep the hard, dirty pavement from damaging them. Your mini-canyon is probably too small to poke into with an exploratory finger or even with the eraser end of a pencil. Maybe the pointed end of a pencil? No, it is too dry to retrieve anything from the crack. But, ah, moistened with a bit of saliva the graphite brings up something. You may have captured some of what a soil scientist (pedologist) calls "fines," tiny mineral particles of silt and, the finest of all, clay. You may find a piece of the exoskeleton of a dead ant or beetle, maybe a dog's hair or fiber of a facial tissue. In other words, you discover the particles of mineral and organic matter which are the beginnings of soil formation. Yes, it is dirty. No, it is not dirt, in the sense that "dirt is matter out of place." The makings of soil, important, are at the bottom of the crack.

**YOU CAN NOW PONDER** how these constituents of soil got there. You can use both deduction and experimentation to make hypotheses, establish theories, and set down on paper (or on a chalkboard) your derived *Laws Of Nature Governing Deposition Of Parking Lot Sediments.* For wider sharing, these may find space in the school newspaper.

THE CRADLE—On our planet at least, our Father Nature always tries to grow plants wherever there is soil with adequate moisture to support life. Praise be that we live on what Jacques Cousteau calls The Water Planet. Clouds of moisture from the oceans drift over our building and parking lot and some of that water at some time finds its way down into our little canyon. Chances are that the crack is not only a canyon but also a cradle. The forces of nature which washed and blew mineral particles into the crack may well have wafted a seed into it, a weed seed of course because nobody invited it or had found a use for it there yet. Sheltered now from the wind, waiting there for moistening rain or snowmelt, the new weed inside the seed lies on the incipient soil.

THE PLANTS—Often, however, the weed seed has already received enough moisture to soak through its seed-coat and activate the enzymes needed for sprouting. If, in the northern hemisphere, the wall faces south, it and the pavement may have absorbed enough solar energy to promote late-winter growth. Of course in warm climates, weeds may be in bloom at any time of year. In earliest spring you may find Chickweeds (*Cerastium* or *Stellaria)* and Shepherdspurse *(Capsella bursapastoris L.)* in bloom in such location at the same time that Snowdrops in the garden begin the flowering procession of spring bulbs. The tiny flowers of these weeds often are busy attracting insects long before most people know that any flowers and insects are up and about; they do not look closely at this special niche where wall meets ground, where sun meets wall, and where moisture sinks into a cradling crack.

SCIENCE—Weeds are cosmopolitan, living almost everywhere. They have won-

drous abilities for getting around, dispersing by many techniques well described in books but best appreciated by watching the weeds themselves, for instance those just outside your doorway. Most weeds are annuals; each starts from a seed at the beginning of a growing season, when warmth and moisture are adequate. By the end of that growing season the plant body, stems and leaves constituting the *vegetative part,* dies; by then the *reproductive part* has been prepared to take over perpetuation of the species with its myriad of seeds. Each seed, whose marvels are far beyond the scope of this essay, contains the sleeping embryo of a plant similar to its parents, beautifully packaged in protective coats including stored nutrients to last through unfavorably dry or cold weather until the next suitable growing season. A seed at first glance looks simple. It is not. Do not let appearances fool you or fool those who explore nature with you.

The next suitable growing season may not be the next spring. Cold weather, necessary for the dormancy of many seeds in cool climates, will surely be followed by warmer weather. But if the spring does not bring enough moisture to penetrate the seed-coats, the embryo will not be awakened, especially if the seed's niche does not have enough soil or incipient soil to hold moisture long enough for it to soak through the seed-coats. Thus a seed may lie dormant for years. Some species, especially in deserts with very irregular rains, produce seeds with differing needs for sprout-water; some may sprout after a brief thundershower and take their chances with not having enough water to fulfill their growth; others with more water-resistant coats may wait for years for extended rains giving opportunity for more assured survival. Evolution over immense time has created diversity of seeds to accommodate the species to a variety of environmental conditions, including those outside your door, perhaps in a desert-like parking lot, where the wall meets the ground.

**SOME FAMILIES** of flowering plants are notable for having evolved crack-inhabiting weeds, for example the Grass Family *(Gramineae),* Mustard Family *(Cruciferae),* and Buckwheat Family *(Polygonaceae).* These families are primary ones for people to learn about. They are economically and ecologically important, not just because of their competing weeds but because they produce grains and vegetables making human populations possible. While farm children experience these plants as part of their daily lives, some eighty percent of our United States population is too urban or suburban. But even in dense cities, representatives of these families can usually be found in the cracks where walls meet the ground. If when you step out your door to look for crack plants, winter snow or summer drought afford no glimpse of green, look for dried remains of vegetative stems and leaves; then wait until some sleeping seed drinks deeply and springs to reproductive life. In the meantime you can harvest some dead weedstalks, take them indoors for scientific study, and make dried arrangements of them to add beauty to indoor living.

ARTS—Indeed Art and Science should always be hand-in-hand companions in the study of weeds (and all else). While watching the life and death of weeds against the wall, one can sense unending challenges to the biologist, physicist, and chemist for pondering and exploring nature's ways. Weed-watching also can stimulate many kinds of artists to penetrate the mysteries which these nearby plants pose and to express their findings sensitively according to the interpretations and modes of each person's artistic spirit. The skilled veteran teacher stimulates each individual student to approach even a dead weed or dormant seed creatively; and the novice leader can do the same, less skillfully at first and without the accumulated "bag of tricks" but with curiosity and contagious enthusiasm for exploring the unknown.

What subjects weeds afford for compositions, haiku and other poems, plays, and even business letters! "Dear Sir: Your order for Pepperwort seeds for your school's seed collection is being mailed today. Please note, however, that the price has risen since you read our advertisement in your school newspaper, so your three 15¢ stamps are not quite adequate. We shall appreciate your completing payment by mailing us one additional 15¢ stamp at your early convenience. Sincerely yours, Billy O'Weed, Secretary, Botanical School-Swaps, UnInc., Washington Street School, East Wherever."

Compositions are not just for teachers of English, of course. The world has a multitude of languages including Spanish, French, and Parsi, and each culture has its words for weeds, its work eradicating them, and its people who appreciate their beauty. A notebook about a weed outside the classroom door may be a launching pad for missives to children of another culture, a stimulus to learning about other people and their other ways. (I've heard that the Esquimos have more than twenty different words to describe various kinds of snow. I wonder what words they have for weeds. I've read too that the gauchos of the Argentine pampas have only four words for plants: they are either hay, pasture, bedding, or weeds, a limited classification but adequate for their daily cowboy life in which some thirty different words are used to describe the color patterns of horses!)

Performing arts should not be neglected. We say that children grow like weeds. In both graceful and gawky ways, young people can invent trouser-lengthening dramas of how Pigweed *(Amaranthus blitoides S. Wats.)* pokes up through a crack and how Queen-Annes-Lace *(Daucus carota L.)* flowers delicately against the wall its second year (being a biennial rather than an annual). Do you remember how in Shakespeare's *A Midsummer Night's Dream* one actor played the part of "Wall"?

Graphic arts provide many media for portraying a weed against a wall. For less experienced artists, weeds in this site make for relatively easy composition of a picture. Whereas most landscapes have a foreground, middle distance, and background, here the middle distances are omitted, the plant being close to its background lying in one plane. In the uniform light of an overcast day, the lines expressing shape and direction of growth stand out particularly well. On a sunny day, textures and colors will be more apparent; the play of lights and darks, however, (called chiaroscuro by artists) is readily seen but may be complicated by patterns of shadows cast by the weed against the wall. Sometimes the shadow patterns alone make beautiful designs.

OTHER SENSES—For those whose sense of sight is limited or lacking, weeds can prove stimulating in other ways. After it has been carefully identified by reference to a botany book or by apprenticeship to a person with authoritative knowledge of plants, one can safely and sensibly taste the seed-pods of Virginia Pepperweed *(Lepidium virginicum L.),* which grows in every one of the United States. Common Purslane *(Portulaca oleracea L.),* as widely distributed, can provide the base for a well-dressed salad. (Avoid, however, eating these or other greens where exhausts from parked cars or passing traffic

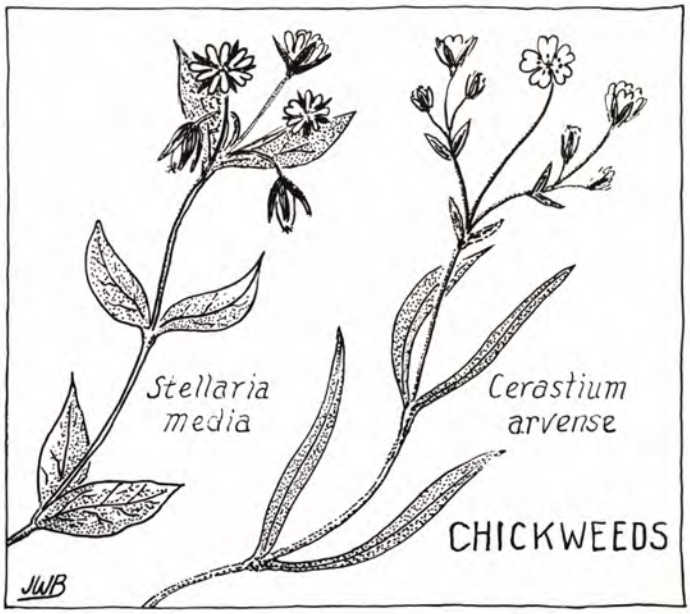
may have deposited contaminants such as lead.)

Some weeds have notable fragrances. Pineappleweed *(Matricaria suaveolens* Buchenau), native in the western United States and now spread over much of the East, has a delightful odor. Like so many weeds, it is widely distributed in bare soils where only the most hardy plants can thrive, for instance at the edges of unpaved parking lots.

The sense of touch too can find many stimuli: the ground has its texture and cracks, its coolness and warmth; the wall similarly, perhaps with a crust of lichens or velvet of moss following lines of mortar between bricks or growing in crevices of stone or in crannies between wooden clapboards; and then the plants themselves have their own tactile characteristics. For example, Common Mullein *(Verbascum Thapsus L.)* is reportedly native of Sicily but is now found in every state. Although preferring more space in which to spread its rosette of gray-green leaves, it sometimes huddles with lop-sided symmetry against a wall before sending up its biennial stalk of yellow flowers. Its furry leaves, so soft, have long been used by country girls for temporary rouge at some sentimental moment; rubbed gently on a smooth cheek the leaves elicit a flirty blush, especially when accompanied by a certain kind of smile.

MATHEMATICS—There can be the romance of numbers too. The four-parted precision of the woody fruit-pod of Evening-primrose *(Oenothera biennis L.),* another biennial weed, opens to reveal the apparent confusion of a multitude of seeds within. The pods, though, open with difficulty, progressively, thereby insuring a continuous source of seeds for sparrows during a long, snowy winter when these tall fruiting stalks may be the only ones not buried by snow. How many seeds to a pod? How many pods to a plant? How many plants? How many sparrows? How deep the snow? How many degree-days of heat? Often the depth of appreciation of nature's ways is best reached via the paths of arithmetic and the complicated leadings of higher mathematics and their revealing statistics. A subtle measurement can be made of the amount of light or lack of it which stimulates the opening of the Evening-primrose flowers in the evening or on a darkly cloudy day.

THE BROADER VIEW—As teaching naturalists, we view the built environment of school, environmental center, and home as prime environments for developing greater understanding of what the world around us offers us. When we step outside our constructed walls and meet living plants, even weeds, opportunities increase for developing feelings of being kindred with the rest of the organic world. With stronger feelings of attachment to it and for it, we can better sense what we in turn can offer the world. Let us then profess our earth-caring from both sides of our walls, with the help of weeds.

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**PUBLICATIONS: 1908-1980 (continued)**

the first issue printed by Wilkins/Printers, Cortland, New York, our newly appointed printer. The new board is currently searching for another talented, interested, patient, painstaking person with available time to index the Journals of the past five years.

In addition to the periodical literature published by the American Nature Study Society, three special volumes have been published by the Society. "First Yearbook of the American Nature Study Society" was published in 1924, "Nature Education in Elementary Schools" in 1925, and "City Critters" by Helen Ross Russell in 1976. □

# FLORA'S ARK:

# The Plant Gene Banks

## by Marie F. Long

Endangered whales, wolves and eagles easily capture public imagination and concern. Animals have a way of doing that. It is natural for the human animal to empathize with other animals which also move about, eat, give birth, and function in similar ways. Sensibilities are understandably offended at the sight of bloodied baby seals or the certain demise of a unique butterfly or sparrow as a result of habitat destruction.

However, the loss of plant species and the depletion of the genetic base of plants is taking place with little notice from the public. The situation is serious. The Threatened Plants Committee at Kew categorizes 20,000 to 25,000 vascular plant species as extinct, endangered, vulnerable or rare, which is ten percent of the total existing higher plants. The Smithsonian Institution has listed 2,500 threatened U. S. species. Ten percent of the native species of the Hawaiian Islands are extinct and forty percent endangered.

Although preserving endangered plant species in natural habitat is more reliable than attempting to do so under controlled conditions, most natural ecosystems are under threat. Madagascar's forested area has declined from ninety percent to eight percent. In ten years Thailand's forests have shrunk from seventy-five to eleven percent. Scientific organizations are just beginning to debate the issues involved with saving plant species by creating simulated environments within arboreta, natural areas, and gardens.

Population growth, spread of communities, pollution, irrigation of deserts, drainage of wetlands, clearing wild areas for agriculture, "clear-cut" forestry, heavy applications of fertilizer, and damming rivers are all threats to various ecosystems and causes of plant extinction. Modern agriculture and applied technology have brought great changes in the world's ecosystems with the concomitant extinction of unique species. As the disruption continues almost unabated everywhere but especially in the tropics, scientists have begun to address the questions raised. A sort of scientific and genetic *triage* emerges as a possible solution.

But which plants are important? There are thousands of genera of plants which may be of incalculable use in the future. It is important that gene plasm be preserved for future uses that we can only imagine today. For the good of our children and for the survival of the human race, we must protect this irreplaceable material even if present knowledge yields no clues to practical use. We do know that the usefulness of most plant species has not been fully tested. For example, some synthetic chemicals first recognized from plant specimens include aspirin from willow, quinine from the cinchona tree, birth control aids from a South American yam, and anticarcinogins from several species.

Prospects are hopeful for the use of jojoba seeds which yield a clear, odorless oil with properties like sperm-whale oil. This oil is now used in cosmetics and wax products, and is able to withstand high temperatures and pressures as a lubricant. It may be of value pharmaceutically and as a substitute for fossil fuel products. *Amaranthus sp.* and the African yehab nut are both rich in protein and are potentially important food sources. There is a great economic potential for oil-rich genera of palms in the Amazon flora. Many other plants in this flora might be cultivated, as the Para' rubber tree recently was. Phytochemical studies may also uncover new chemicals which may prove important in medicine and industry and in the future.

Past experiences with the extensive devastation caused by disease, point up the importance of having a gene pool to develop disease resistant characters of various plants. Wheat stem rust in 1954, the corn leaf blight in 1970, Dutch elm disease, the American chestnut blight and the potato blight which caused the Irish famine in the nineteenth century are all examples of this need.

There are sixty nationally controlled gene banks, but very little collection work is being done by or in Third World countries where plants are especially threatened. These gene banks include the National Seed Storage Laboratory in Fort Collins, Colorado, and the National Vegetable Research Station at Wellesbourne, U.K., which collect and store seeds of old and wild varieties of plants for use by plant breeders. Seeds are dried, stored at low temperatures, ca. -20° C., and have a shelf-life of 30-50 years. On a rotating basis, seeds are monitored for germination viability every five years. Samples are field grown to increase viable stock. However, most of the seeds are from the most dominant food, and fodder plants, not from rare or endangered species.

Dr. Harold Koopowitz, director of the Arboretum at the University of California, Irvine, indicates that if people want to save all species of plants, some will have to be in botanical gardens, just as some endangered animals have survived in zoos. Dr. Koopowitz is creating a gene bank for gladiolus which contains both seeds and pollen. Some collections may contain germ plasm which is vegetatively propagated. There are tropical plants which

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cannot be preserved in a frozen state and will require different preservation techniques such as tissue culture.

Private corporate interests in the developed countries are building up private seed banks accessible only to the company's breeders. The Third World may be denied access even though the Third World was the original supplier of the germ plasm. The countries where this genetic material is collected may want to have their own collections of this gene plasm so that they will not be dependent on the developed countries for their own plant breeding work. The capture and control of the genetic wealth of the world's vegetation is at stake.

At the same time, there has been a loss of diverse native agricultures. The Third World nations are areas of genetic diversity and up until now, germ plasm has been collected there. Now, these areas are using improved varieties of seeds from various seed companies and plant breeding stations around the world. This has resulted in the loss of the native plants (cultivars and strains) providing the genetic base for the further improvement of our crops.

The United States has always been dependent on worldwide plant resources. Our native plants produce only a small amount of our food stuffs, and our major crops are introductions from other parts of the world. Plant populations of wild races, land races (which evolved from wild populations) and weed races have been the genetic base for the improvement of our crops whether grown here or overseas by American firms. There have also been losses in the genetic base of major food crops due to lack of attention to the maintenance of superceded varieties used in agribusiness ventures.

To address these issues, the 1978 report of the National Academy of Sciences outlined the policy for germ plasm preservation and maintenance as follows:

1. exploration and collection, including wild species related to major crop plants;
2. improved preservation facilities;
3. improved data-processing evaluation systems;
4. developmental breeding, in which desired gene characters are isolated;
5. conventional plant breeding, done commercially.

What can we do? In addition to support for the government's germ banks and habitat preservation programs, we can:

1. Plant obsolete varieties along with the latest varieties in our gardens;
2. Save our own seeds of old varieties each year;
3. Purchase seeds from catalogues that specialize in preservation of various types of plants;
4. Encourage the exchange and sharing of seeds with other countries—for enrichment of all collections and to provide more insurance against accidental loss of seeds;
5. Support the efforts of botanical gardens and arboreta to propagate, distribute, and maintain simulated habitats for endangered plant species;
6. Redouble our efforts to preserve and defend the natural habitats of all plant species here and overseas. □

# TIPS *for Environmental Education . . .* by ROBERT S. RUSSELL

## LEAF PRINTS

**SOME OF THE EARLIEST** artistic renderings were rubbings and prints. We see evidence of print making thirty thousand years ago in Paleolithic times. Whether our early cave ancestors used their own hands for prints (positive print) or outlined a hand (negative print) a realistic representation was the end result. Today printmaking is still a lively, imaginative art form. Even simple print-making techniques may be used to produce sophisticated patterns. Sometimes positive and negative prints are combined to produce artistic effects.

When leaves and other plant parts are used print making may be either an art activity or a science activity. At its best it combines both. Art and science share a number of aspects: both depend on and foster good observation, both often center on the question, "What would happen if?" and both thrive on creative thinking.

Negative rubbings are made when a leaf is placed upper surface down and either held or fastened in place with pins and outlined by making short strokes away from the edge with a crayon, felt-tipped pen or pastel. Spatter prints are another form of negative print. Here tiny drops of colored ink, dilute paint, or acryllic are spattered to make the leaf outline by rubbing an old toothbrush that has a light coating of paint on it across a square of window screening or an old comb with every other tooth removed. Spray guns may also be used for spattering as long as precautions are taken to use harmless materials and avoid inhalation.

**POSITIVE PRINTS** are made when the under surface of the leaf is inked and then used to make a print on paper or cloth.

The simplest of these prints is made by placing a leaf, underside down, on a stamp pad, covering the leaf with a piece of scrap paper and gently rubbing over the whole leaf area. The inked leaf is then lifted and transferred to clean paper, ink side down, covered with another piece of scrap paper, (newspaper cut into small rectangles is fine for this purpose) and again rubbed to transfer the ink and make the print.

**SMOKE PRINTS** are a sophisticated modification of stamp pad printing. The ink is produced by evenly greasing a piece of lightweight cardboard with Vaseline and covering it with carbon produced by holding the cardboard horizontally over a candle flame, close enough to cause a deposit of smoky carbon. Move the cardboard back and forth so that it does not become overheated and an even deposit of carbon is achieved. The production of this smoky surface can be an activity for junior high age students under supervision. As long as the cardboard is kept moving and the edge is never allowed to get in the flame it will not burn. Once the inked surface is produced it can be used for a number of prints. These prints will be more detailed and delicate than other types.

Inks and acryllics can be applied directly to the back of a leaf with a brayer. Care must be taken to keep the coating thin or all of the details will be lost.

Prints can be used as illustrations in reports on plants studied. They can be used to decorate stationery, or postcards to mail home to anxious parents from camp. With acryllics and permanent inks they can decorate scarves and T shirts. □

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*ROBERT S. RUSSELL is a professor of art at Jersey City State College with a longtime interest in plants and gardening.*

# TIPS *for Environmental Education . . .*

by JOHN L. GREEN

## BOTANICAL ARCHEOLOGY

Plants out of place give you the clues! Plan an archeological theme for your next botanical field trip, combining history, botany, archeology and ecology; or use botany as a tool for your next archeological exploration. Beyond the obvious clues of rusted barbed-wire, stone walls and old foundations, plants out of place give us indications of human history and activities. The dooryard may have disappeared, but an old fashioned lilac sprouting and cloning its way beyond the borders of that long-ago garden always tells of former habitation.

If grassy glades have not yet yielded to plant succession, a clump of double daffodils should arouse your suspicion of an earlier settlement. Sometimes a clump of horseradish, evidently a much used herb in olden days, still flourishes where a kitchen garden once stood; or tansy may flow in yellow streams along the road and across fields out-competing grasses. Sometimes a patch of special daylilies flourishes on the roadside, the flower buds good for a wild food class, but also offering a clue to an abandoned garden. Add the chance patches of an old variety of raspberry and abundant clumps of asparagus to the food and clue list. A few stag-headed old apple trees may mingle with lilacs or blend with early pioneer trees, soon to lose their vigor when forced to endure the shade. But they may offer a Snow, Baldwin, or Russet as well as indicate the presence of a former homestead. Here is a chance to gather twigs in early spring and conduct some grafting experiments using a selection of original apple varieties.

Often Sweet William tarries in bright clumps among the grasses. The blue flowers of persistent periwinkle or myrtle, frequently in the shade of trees, should send you searching for other clues of a bygone dwelling.

Perhaps that planted clump of black locust, growing far beyond its natural range, was ordered from a turn-of-the-century catalog that recommended these trees for fence posts that would last for decades. The silhouettes of these twisted trees stand in sharp contrast to the familiar maples and beeches. Slower to leaf in spring and slower to drop their leaves in fall, they are conspicuous in all seasons. The solitary towering Norway spruce may have arrived as a seed from that same catalog.

Even in winter a twisting brown vine, capturing the first pioneer fire cherry for a prop, bears brown, papery fruits and reminds us that most of the brewing done at home was with a taste of hops. These are living relics, some with strength of weeds, strong as the original settlers and just as reluctant to leave the old homestead.

A rusting hay rake is ample evidence but more subtle clues are there. Look for pioneer trees such as red cedar or gray birch which only thrive as seedlings in full sunlight. Was this an open field? Can you tell how many years ago? Sometimes it helps to bring along a forester's increment borer. After a few turns you will have a core of wood which reveals the age of the tree. A spreading old oak or maple with large limbs at the base could only have developed in open space standing alone in the sunlight.

Sometimes the archeological tale tells of local industries. Long after the sod has covered horse shoes and peaveys, a persistent opening deep in the woods may produce the columnar head of timothy or the grey-green clumps of orchard grass. Horses need hay, and a complexity of plant species can sometimes be found where native hay carted into a logging camp was once stored. □

*JOHN L. GREEN, a past-president of ANSS, is professor of biology at St. Lawrence University.*

*Sweet William*

*Photo by John L. Green*

# MEET TWO MEMBERS

### A PROUD NATURALIST

I decided on a career in nature interpretation under the influence and guidance of ANSS member, Jean MacGregor. This was back when both Jean and Ruth Yarrow worked at the Schuylkill Valley Nature Center in Philadelphia.

Four years ago I received a B.S.C. degree in Nature Interpretation from the University of Massachusetts and have since free-lanced part-time as a naturalist.

My main concerns are that there be an improvement in the general public's attitude toward our environment and that environmental education become an integral part of school system curriculums throughout the country.

I use a variety of skills to achieve these goals which include teaching natural history photography and beginning bird-watching, leading hikes and week-long field trips, and talking with individuals on a one-to-one basis about natural history subjects and environmental issues. I also offer natural history slide presentations to interested groups. Topics include "The Everglades," "Glacier National Park," "The Gannets of Bonaventure," and "Nature's Beauty."

I thoroughly enjoy my work, although at times things are quite frustrating, for example, building on flood plains can be "unhealthy;" trying to convince the public that wolves are not a threat to mankind, and integrated pest management can be a sane alternative to the indiscriminate spraying of dangerous chemicals. However, if I had it all to do over, I again would choose nature interpretation as my life's work.

It is encouraging to be reminded in each issue of the *Nature Study Journal* that other dedicated individuals are expending time and energy to change the negative attitude toward environmentalism in our society. Although there is much yet to be done, and often we seem to lose more ground than we gain, I think those of us who care will accept the challenge to make our world a more desirable place for all living things.

For a Sound Environment,
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Hi, *Nature Study* readers! Last year I retired from thirty-one years of teaching biology and conservation at Springfield College. Most of those years, I was an ANSS member. I hope you are one. I have not been an active member recently, because of other duties, life adjustments, and a vague feeling that perhaps other conservation and education organizations had made ANSS redundant. But now I want to be active again, as with writing for *Nature Study,* believing that ANSS must continue its historic role of truly creative leadership.

When I was president of ANSS for a stint in the 1960s, I stressed that both art and science are required in studying nature. Today I'll add religion as a *sine qua non.* I'm neither a born-again Christian nor advocate of conservative moralism. My beliefs continue to recognize that in nature, art, and science there are profound mysteries which challenge each of us to the most critical thinking and deepest feelings of which we are individually capable, including the kinship of all creatures and all creation. To buy another's philosophy and to follow it blindly will never rate higher than "C-minus" with me. It is essential that we continue study of nature and of our meaningful place in it, and that we use all of our ANSS talents to urge others to do likewise.

One of my special interests is nature study on the grounds of schools and colleges, and to only a slightly lesser extent on grounds of other institutions such as environmental centers, camps, and church-

*(continued on page 24)*

# NEWS and NOTES *for Environmental Education . . .*

### ANSS MEETS

The ANSS General Membership meeting was convened in conjunction with the Conservation Education Association's 28th annual conference on August 2-6, 1981, at Warren Wilson College in the Blue Ridge Mountains of North Carolina.

The theme, "LAND * PEOPLE * CULTURE," focused on the many ways people view and interact with their surroundings. Featured speakers included Eliot Wigginton and students from his Foxfire Program. Conference sessions were largely field oriented or workshops, ranging from storytelling to computer simulation, stream studies to solar design. Daylong trips explored Blue Ridge Mountain ecology, Appalachian Folk Art, *Mother Earth News* and other southern mountain alternative lifestyles, and a city (Asheville) and its river by raft.

A preconference seminar, "Styles for Environmental Learning in the 1980's," was held at the conference site July 31-August 2. Teacher and youth group leaders who attended received two graduate education credits.

"Land, People and Policy: The Western Connection" was the theme of the 36th annual meeting of the Soil Conservation Society of America, August 2-5, 1981, at the Sheraton Spokane Hotel, Spokane, Washington. The program focused on natural resource management issues in the western United States and Canada from the perspective of national and world needs.

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### CALLING ALL AUTHORS

In 1974 the ANSS set up an exhibit of books written by its members. Seventy to one hundred books were exhibited in arboreteums, nature centers, schools and museums as well as at workshops and conferences. They were available for the cost of shipping and stayed at one site from three days to several months depending on the event and location.

An exhibit of this type eventually wears out and needs to be replaced. Talbert Spence is in the process of assembling an entirely new collection. To be effective all ANSS members should be represented. We can use only *two* books from each author. Please mail, or have your publisher mail, your two most recent or your two best books to:

American Nature Study Society
Book Exhibit
Attn: Talbert Spence
Wave Hill Center for
Environmental Studies
675 W. 252nd Street
Bronx, New York City, NY 10471

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Earthwatch, a national volunteer organization offering members of the public a chance to join research expeditions, is running expeditions next spring under titles such as Humpback Whales in Hawaii, Search for the Mangrove Terrapin (Florida), On the Track of Maya Jade (Guatemala) and Search for Man's Ancestors (Libya). Expeditions run two or three weeks and range in cost from $390 to $1250.

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### ANSS SAYS SOS

Are you interested in a volunteer job that would give you a satisfying feeling of completing something useful for the present and future? Think about these:

1. Compiling a new ANSS membership list.

2. Compiling an index of *Nature Study* articles since the last index in 1976.

3. Reaching out with ANSS membership brochures to teachers, group leaders, schools and environmental centers.

If any of these appeal to you even a little, please contact Helen Russell, 44 College Drive, Jersey City, NJ 07305 by mail, by phone, or in person if you live close enough. We will work closely with you on any of these projects.

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### EMPLOYMENT OPPORTUNITIES

1. *Orion Nature Book Review,* a monthly on nature books for the general reader, is looking for reviewers. The editorial emphasis is on an accurate summary of the book's content, tone and style, with attention to the relation of man to the natural world and an objective approach to environmental questions. The editor reserves the right to edit manuscripts extensively and will pay a $25 minimum for a 300-1800 word review. Those interested should contact David A. Barten, *Orion Nature Book Review,* P.O. Box 581, Great Barrington, MA 01230.

2. The Atlantic Center for the Environment accepts applications for positions listed below, with food, lodging and a modest weekly stipend provided. Application deadline is six weeks before the project starts.

Internships:

May-Aug.—Team Resource Inventory and Education Project. Working with Maine Land-Use Regulation Commission, compiling data on natural areas.

June-Aug.—Field Research Project (tentative)—Field study of designated Atlantic Region species.

June-Aug.—Administrative Intern—Assisting ACE staff in plans for new headquarters, interpretive displays and curriculum material.

Summer Programs:

June-Aug.—Living Rivers Program—Local participants examine resource issues of New England and Atlantic Canada through instruction and field trips—5 staff positions.

June-Aug.—Oceans Horizons—Instruction on ecology and resource management through first-hand experience on rustic Fogo Island, Newfoundland—5 staff positions.

June-Aug.—St. Mary's Workshop on Seabirds—Examining the ecology and behavior of seabirds in Quebec, to further conservation efforts—3 staff positions.

For further information please contact Rosemary Furfey, Atlantic Center for the Environment, 951 Highland Street, Ipswich, MA 01938.

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### RESOLUTION ADOPTED

The following resolution was adopted by members of ANSS at the membership meeting in Swannanoa, NC:

Whereas, there is a perceived need for environmental organizations in the United States to explore areas of mutual interest and cooperation in order that the goals of environmental education can be achieved more effectively and efficiently,

Therefore, be it resolved, that the American Nature Study Society in membership meeting assembled 2 August 1981 in Swannanoa, North Carolina, hereby urges that the Alliance for Environmental Education lead its affiliate organizations interested in a cooperative relationship to convene a joint conference.

## WINTER WORKSHOP

"Winter and Beyond" was the theme of a unique workshop convened at the Pocono Environmental Education Center (PEEC), Dingmans Ferry, PA, Dec. 4-6, 1981. Presented by the American Nature Study Society (ANSS) and PEEC, the workshop provided an opportunity to learn more about the out-of-doors in winter. According to John Padalino, ANSS President and PEEC Director, the Winter and Beyond Workshop demonstrated techniques for teaching others about the environment of late fall, winter, and early spring.

The workshop was one of many offered by the ANSS, which is dedicated to educating others about the natural world. Led by outstanding naturalists and educators, the society's activities since its establishment in 1908 have brought both beginners and more experienced persons to an increased environmental awareness. ANSS leaders conducted many of the workshop sessions offered at the Winter and Beyond Workshop.

Sessions included, among others:

Art and the Environment—Susan Burleigh
Environmental Education and the Arms Race—Ruth Yarrow
Nature Photography—Frank Knight
Mammals — Field Teaching Techniques — John Enders.

Twenty-four indoor and outdoor workshop sessions offered a comprehensive view of cold-weather environmental education at schools, nature centers, camps, residential centers, museums, and related institutions.

Keynote speaker for the workshop was Dr. John J. Kirk, Director, New Jersey School of Conservation, who spoke on: Environmental Education: An Historical Perspective. The coveted Eva L. Gordon Award for Nature Literature was presented to Herbert S. Zim, teacher and author, co-author, and editor of over 200 million books. As a wrap-up to the workshop, John Padalino officially transferred the ANSS presidency, a post he has held for two years. The new ANSS president is Talbert Spence.

Site of the workshop was the PEEC campus in the scenic Delaware Water Gap National Recreation Area. PEEC annually provides environmental programs to over 20,000 educators, students, scouts, and nature club, religious, and community organization members. The center is run cooperatively by Keystone Junior College, LaPlume, PA, and the U.S. Dept. of the Interior, National Park Service.

## CONSERVATION NEWS

The Nature Conservancy's Land Preservation Fund has recently received the largest grant ever made to conservation, a $15 million contribution from the Mellon Foundation. The grant will be used by the nonprofit conservation organization to begin a cooperative ten year effort by private conservation, state and federal government and industry to protect miles of six meandering southern rivers and the unique hardwood forests that line their banks.

The Nature Conservancy has also gained a $10 million pledge from the Goodhill Foundation of New York to launch a $30 million drive to acquire representative areas of more than 50 of the nation's most threatened types of natural systems. The effort is the most comprehensive land conservation program ever undertaken by the private sector. If you wish to know more or to contribute, the Nature Conservancy National Office address is 100 N. Kent St., Arlington, VA 22209.


## SEAWEED STUDY COMES OF AGE

The article entitled "Seaweed Market Rises" on page 18 in *Nature Study,* volume 34, numbers 1 and 2, was written by Esther L. McCandless of McMaster University. Dr. McCandless is a specialist in biochemical research on the brown algae. As a result of her discoveries she has been invited to participate in the last five international seaweed conferences. These conferences have been held at three-year intervals for the last thirty years. Here representatives of commercial interests and academic institutions come together to read papers and share scientific discoveries and commercial applications. The 1982 conference will be held in China. The six previous ones were held in Nova Scotia, Spain, Japan, Wales, California, and Sweden. Increasingly people of the world are recognizing these plants not only as a source of human food and products but as an essential part of Earth's ecosystem.

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## GLENN BLOUGH RECEIVES EVA L. GORDON AWARD

In 1948 Eva L. Gordon included a section on textbooks in her "Nature Movement and Its Makers" course at Cornell University. As part of that topic she discussed the Row-Peterson Uni-Texts which were profusely illustrated, single-topic children's science booklets prepared for classroom use at the University of Chicago. Many of these were written by Bertha Parker but some were written and most were edited by Glenn O. Blough. Eva cited Glenn Blough's competence as a teacher as being an important part of his success as a writer.

Later, in 1951, when she was working on the Cornell Rural School Leaflet on elementary science literature she was delighted by Glenn Blough's *Activities in Elementary School Science* and described it as a much needed book for teachers by an author who had that special combination of sound science, understanding of children and the ability to write well.

Eva's evaluation of Glenn O. Blough's teaching ability was not based on hearsay, for she, and all the ANSS members who attended an annual meeting of that period, had watched Glenn do a demonstration lesson with a full classroom of elementary children brought in from a local school at a jointly sponsored ANSS and National Science Teachers Association program. The excitement and effectiveness of that lesson was an excellent demonstration of the value and benefits of good science in the curriculum.

Since none of the committee members was a part of these experiences their choice seems particularly meaningful.

## A BRIEF BIOGRAPHY

Glenn O. Blough was born in Michigan in 1907. Like many persons of his period he had the advantage of a "layered career" with college study interspersed with teaching experiences.

Dr. Blough is a graduate of Central Michigan University and the University of Michigan. He did additional study at the University of Chicago and Columbia University. He was a teacher in the elementary and secondary schools in Michigan. He also taught at Eastern Michigan University, Colorado State College, and the University of Chicago.

He served as the specialist for elementary science in the U.S. Office of Education, Washington, D.C., and later he was professor of education at the University of Maryland. He has been president of the National Science Teachers Association as well as the National Council of Elementary Science International. Currently he is chairman of the Science Materials Review Committee for the National Science Teachers Association.

Glenn O. Blough has not only written many books on natural science for children, but also books on science education for teachers. He was co-author of a science textbook for the elementary grades.

The following are titles of books he has written for children on natural science topics:

*After the Sun Goes Down: The Story of Animals at Night*
*Animals Round the Year*
*Bird Watchers and Bird Feeders*
*Christmas Trees and How They Grow*
*Discovering Cycles*
*Discovering Dinosaurs*
*Discovering Plants*
*Discovering Insects*
*Lookout for the Forests: A Conservation Story*
*Not Only for Ducks: The Story of Rain*
*Plants Round the Year*
*Soon After September*
*Tree on the Road to Turntown*
*Wait for the Sunshine*
*Who Lives in This House: A Story of Animal Families*
*Who Lives at the Seashore?*
*Who Lives in the Meadow?*
*When You Go to the Zoo*
*Young People's Book of Science*

— *Louise Ritsema*

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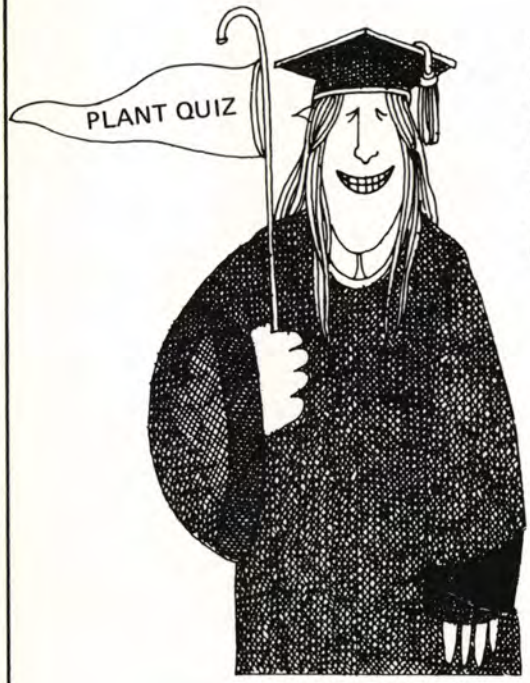
*LOUISE RITSEMA, chairperson of the Eva L. Gordon Award Committee, recently retired from teaching to edit and review books.*




PLANT QUIZ

What popular names can you derive from these?

1 Helianthus giganteus
2 Dionaea muscipula
3 Podophyllum peltatum
4 Mimosa pudica
5 Sanguinaria canadensis
6 Hemerocallis fulva

---

ANSWERS

1 Helios=sun; anthos=flower; giganteus=gigantic (Sunflower)
2 Dionaea=Venus; muscipula=flytrap catching (Venus's flytrap)
3 Podophyllum=foot leaf; peltatum=shield-shaped (May apple)
4 Mimus=to act; pudica=bashful (Sensitive plant)
5 Sanguis=blood; canadensis=Canada (Bloodroot)
6 Hemerocallis=beautiful for a day; fulva=orange (Day Lily)

## THE REMARKABLE CACTUS (continued)


Some, such as the night-blooming cereus and the saguaro, open only for a night when the humidity is higher. However, there is a succession of bloom which can be enjoyed for a time. Those with smaller flowers tend to bloom for a much longer period and many flowers tend to be deeply imbedded in the plant body.

Abundant seeds are produced, but many will not germinate until conditions are exactly right. For instance, with some, water must penetrate to a certain depth into the soil before germination will occur. This assures sufficient water to the seedling, enabling it to grow to a stage where some of its adaptations for survival have developed. The young seedlings are very succulent, very fleshy, very sensitive. They are eaten avidly by numbers of fauna so the great quantity of seed is essential; maybe a few will be overlooked and permitted to develop to maturity.

The tremendous appeal of these plants has led to a tragic situation. The attraction of the dollar has led to the overcollection of wild plants. Hundreds of thousands have been collected, dumped by the roadside, and forgotten. Whole populations have been wiped out. Most will not root even if given some care. It takes much skill and knowledge to get a wild plant to take. *Do not buy collected plants.* You can tell them by their tough, scarred appearance. Those that have been grown from seeds or offsets have a much better chance for survival and are more attractive in appearance. If the market for collected plants declines, the plants in nature will have a much better chance for survival because at no time in evolution did anything evolve to overcome the rapaciousness of modern man.

### SUGGESTED READING

Rowley, Gordon. *The Illustrated Encyclopedia of Succulents.* 1978. Crown Publishers, New York.

This is an excellent overview of succulents. It is a must for anyone interested in these plants. □

# GOOD READING

*Gather Ye Wild Things: A Forager's Year* by Susan Tyler Hitchcock. Illustrated by G. B. McIntosh. Harper and Row, New York, 1980. 182 pp. $10.95.

Susan Hitchcock has tackled a subject for which Euell Gibbons' *Stalking the Wild Asparagus* (David McKay, 1962) is no longer the primary guide. Other fine books describe how to stalk your own wild fruits and vegetables including Gibbons' *Stalking the Healthful Herbs* (David McKay, 1966), also written in his enthusiastic, almost evangelical style, Bradford Angier's *Field Guide to Edible Wild Plants* (Stackpole Books, 1974), with full page color plates, Helen Ross Russell's *Foraging for Dinner,* my favorite, a combined introduction, field guide and wonderful cookbook enriched by Helen's deep knowledge of the natural world and ideas from the people with whom she has shared wild foods over the years.

But in spite of increasing numbers of forays by authors into the fields of foraging publication, Hitchcock has managed to write a valuable contribution. Her book opens the door to beginning enthusiasts in a most enticing way.

First, her PhD in English literature shows—she writes vividly. A reader might almost find her descriptions too lush, except that her genuine love of her subject carries the reader with her. For example:

> A faint green mist hangs in the treetops. The redbud darts into bloom, mauve blossoms on stark black boughs. The petals are pastel but seem shocking amidst gray shadows of winter lingering in the woods.

Not only her rich adjectives but her fresh verbs pull you into the pleasurable activity of living with wild things:

> Once you begin to recognize sprouting lamb's quarters, chickweed, purslane, sorrel, amaranth, and others, you may feel yourself slipping free of the ever-pressing need to weed, weed, weed.

Each short section's concluding paragraph sums up the plant it depicts succinctly but with a special zip or turn of the phrase. It is a pleasure to read.

Second, her format has elegance. Well spaced sections have large headings. G. B. McIntosh's handsome stippled drawings, one for each of the fifty-two sections, add immeasurably to the clarity and artistry of the text.

The fifty-two sections hint at the reason she gives for writing the book—that she needed "a (foraging) book that organized itself around a yearly calendar." But in spite of the magical 52, each section does not represent a rigid week; the author is too atune to the effects of weather, geography and altitude to get caught by a calendar. And as she states, the book was never intended to be a field guide. What the book does do is express the special feeling of each season, so that the plant descriptions resonate with your own feelings for that time of year—much as season is used in haiku. I am sure, as Hitchcock hopes, that her book "will convince someone to step out more."

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*Newcomb's Wildflower Guide* by Lawrence Newcomb. Illustrated by Gordon Morrison. Little, Brown and Co., Boston, 1977. 490 pp. $6.95.

*Weeds in Winter* by Lauren Brown. W. W. Norton, New York, 1976. Paperback; Houghton Mifflin, Boston. 252 pp. $5.95 paperback.

*Grasses: An Identification Guide* by Lauren Brown. Peterson Nature Library, Houghton Mifflin, Boston, 1979. 240 pp. $9.95 hardback.

Out in the field, fingering the leaves of a plant I know I identified last year but can't quite remember now, I am all too frequently tempted to slip a piece in my pocket for later confirmation. But I would much prefer, for the sake of the diminishing vegetation on our planet, and for accuracy of identification, to use a field guide on the spot. These three field guides are of that high quality that lures you into carrying them along. For those of us in the Northeast, they are comprehensive, concise and clear.

A fellow naturalist introduced me to *Newcomb's Wildflower Guide* when it first came out. I bristled when I read the foreword, which skipped over the decade in which I had been happily using Roger Tory Peterson and Margaret McKenny's *A Field Guide to Wildflowers* (Houghton Mifflin 1968), as part of an era with no adequate wildflower guide. But once I began using Newcomb's key, I had to admit that he has worked out a most ingenious system. It trains you first to ask the key (no pun intended) questions: How many regular parts does the flower have—or are they irregular or indistinguishable? Is it a shrub or vine? If a wildflower, is the leaf arrangement basal, alternate, opposite or whorled? Are the leaves—if any, entire, toothed, lobed or divided? By answering these few questions, you assign your unknown flower a three-digit group number, turn to a much shortened part of the total key, and thence directly to the page illustrating your unknown plant. The genius in this system is the group number which is not only easily memorized but helps you to observe important features for identification and to retain them.

What I miss in this guide is something more than an English family name; I am never sure that "Figwort Family" really means Scrophulariaceae. Perhaps this is a bias from a job at the Chicago Natural History Museum where I enjoyed looking up the family names for incoming herbarium specimens because strange plants began to hint at their relationships when observed from this level. Peterson and McKenny provide attractive family symbols, both English and Latin family names and clear capsule descriptions of the families. But in other important ways, such as the realistic illustrations, the guides are comparable. So when asked to recommend a wildflower guide, I recommend Newcomb's because his system works so beautifully.

Although I have only recently discovered Lauren Brown's fine guides, they already fill two important gaps in my field guides. Her perky ink diagrams of groups of grasses liven up a clear key without the use of ponderous terminology. Similarly, the workable key in *Weeds in Winter* jolts you into admitting that you might not really be sure about the definition of one of the sparingly used botanical terms because these terms are printed in capitals. Both books feature Brown's own handsome ink drawings, which often use a sil-

houette to dramatize the plant's overall form. This is important for the variable grasses and the often battered remains of winter weeds. For grasses, she uses the Peterson system of pointing out distinguishing characteristics. Although the author addresses the reader with a familiar "you," she is not chatty but clear, concise and informative. Brown's books should be very welcome companions in the field.

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Some books are for sit down reading, while some books prompt you to go outside, book in hand, to try a new skill or to apply new knowledge. Often "botany books" have a dry, dusty, static stereotype of the former. The following plant books however, are not only action oriented but reflect the author's true affection for their subject.

*Hello Dandelions!* by Barbara Williams with photographs by the author. Holt, Rinehart and Winston, New York. 1979. 29 pp. $6.95.

The toddler's open minded joy at a fistful of yellow lawnflowers is expressed in the first line of this amusing book, "Hello dandelions, I'm glad you've come." What follows is a playful child's training guide in the art of dandelion watching, smelling and gamesmanship. For example, inquisitive young people are urged to add their personal description of dandelion perfume to a list that includes the "like nice old sleeping bags or Fourth of July picnics." The final lesson in the guidebook is called "Sharing Dandelions with a Friend Who Doesn't Understand Them." Captivating photos add to the mood of celebration of the commonplace. *Hello Dandelions* is appealing to all who welcome a fresh look at the ubiquitous and much demeaned dandelion.

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*Tremendous Tree Book.* May Garelick and Barbara Brenner, illustrated by Fred Brenner. Four Winds Press, New York. 1979. 36 pp. $8.95.

Delightful graphics make this book a treat for young children. The large, bright illustrations portray the many aspects of trees, from identification to evolution to utilization. Appropriately enough, the pictures are all cut paper on paper designs.

A simple, but often poetic text introduces children to the excitement of trees. Interesting "tree-via" ("one tree has the cooling power of 100 air conditioners") is sure to impress a young audience. My favorite page was entitled "Food Tree" in which an old nursery cadence is borrowed: "And this is the owl that eats the shrew that eats the caterpillar that eats the leaves on the wild cherry tree."

*The Tremendous Tree Book* is an appealing addition to the nature corner or storyhour collection.

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*Wildflowers and the Stories Behind Their Names.* Phyllis S. Busch, paintings by Anne Ophelia Dowden, Charles Scribner's Sons. New York. 1977, 88 pp. $9.95

"Who was Witch Hazel, anyhow?" If you ever wondered, here is a book for you. In this storyteller's botany, the author concisely comments on the poetry, humor, history and even mystery behind the names of fifty common plants. It is a fascinating tribute to the imagination and observing ability of the folk botanists of ages past. Beautiful full page illustrations, many in color, are an integral part of the stories.

Nuggets of plant lore are numerous. The name "Whitemen's Foot" certainly invites more inquiry than "common plantain" (and is even mentioned in Longfellow's *Song of Hiawatha*). Just knowing that "day's eye" was the original name of the common yellow and white field flower makes you want to take another look. Names sometimes indicate little known uses for wildflowers, such as the use of dried teasel heads to "tease" up the nap of woolen cloth. Directions are included for finding "Johnny" (of the Johnny Jump Up) in a tub bathing his tired stamen "feet."

The field guide description of St. Johnswort holds no particular interest for me. But after reading of the origin of its name, it will be difficult to forget! The flowers open near the Saint's feast day, June 24, near the longest day of the year. So the plant was considered a chaser of darkness, and Satan, Legend has it that the characteristic dots on the plant's leaves are places where the devil pricked them with a needle. It is said that the plant resisted, and from then on the devil has feared St. Johnswort. What an enjoyable way to learn the identity of a wildflower.

For the upper elementary grade beginner as well as the professional naturalist who wants to spice up a botany walk, this is an exceptional reference.

Oh yes, the Witch Hazel. You may

## MEET A MEMBER (continued)

es. I invite *Nature Study* readers to correspond with me about any of the above (being patient for replies!). Also, I'd like to see some experiments in "City-Country Hosting" wherein an urban organization and a rural one arrange small-group interchange of youths so that each can knowledgeably and pridefully introduce the other group to its environment, be it slums or boondocks. One of the great needs of our distraught times is for country people and urbanites to be more understanding of their interdependence and of the contributions which each population makes to a full life for the other.

In 1971 the American Nature Study Society sponsored (gave its approval to) my first book, *Nature Study for Conservation—A Handbook for Environmental Education* (Macmillan, NY, 1971). Our illustrious past-president Roger Tory Peterson honored it with a Foreword. The book is now out of print with no immediate plans for a new edition. I hope members can find a copy in a library or used-book store. My second book, *Working With Nature—A Practical Guide* (Oxford University Press, NY, 1973) is almost out of print; so look for it soon if you want to *do* things outdoors while you study them. Prentice-Hall, NJ, distributes 8 filmstrips with cassettes which my wife Barbara and I made on *Shores, the Edges of Things,* for use in schools and colleges.

Now that I am retired, I hope to do more writing, but I find myself busy volunteering at local schools and working one-to-one with 4H youngsters on environmental surveys of their home territories, along with fixing up an old house, gardening, and grandchildrening. If you can visit us, let us know first to make sure we are here, and expect to work/play along with us in our busy, back-to-the-land life.

John Brainerd

## WHAT'S IN A NAME? (continued)

shapes to leaves and flowers, thereby plainly taught for what diseases they were especially useful, thus a heart shaped leaf was for heart disease, a bright eyed flower for the eyes, a foot shaped flower or leaf would certainly cure the gout . . ." Such markings were "signatures" from God. The roots of *Scrophularia* (the aforementioned figwort) resemble scrophulous tumors, and therefore have been ascribed such curative properties. The hairlike stalk of maiden hair fern was thought to be a certain remedy for baldness, just as spleenwort, *Asplenium,* was supposedly a cure for diseases of the spleen.

In addition to their purported medicinal virtues, plants were found to possess a variety of useful properties. Bedstraw, for instance, was employed not only as a straw filling for mattresses, but also as an agent in milk curdling. Its generic name *Galium* stems from the Greek word for milk, "gala." Helleborine, or *Epipactus,* an old Greek plant name which means to coagulate was similarly used to make cheese. The branches of heather were used in broom making; its Greek name *Calluna* means "to sweep." The stiff, dried flower heads of teasel were used by Europeans to card or tease the nap on woolen cloth. A secondary use, as reflected in its Latin name *Dipsacus,* or thirst, was as a thirst quencher, since water would accumulate in the hollows of its large leaf bases. Even more important as a thirst quencher was the evening primrose, whose scientific name *Oenothera* means "wine-imbibing." An infusion of the roots was supposed to enhance one's ability to drink wine.

An intriguing history can be found in the nomenclature of any flower, shrub, or tree. A more complete study can yield knowledge of scientific, historic, geographic or psychological interest. □

## BEANS (continued)

There is only one way to know about wild and cultivated plants regardless of which plant group they belong to and that is to learn each individual species. Don't guess—don't generalize.

Part of the wonder of planet Earth is its diversity. Part of the joy of being an Earthling is our ability to learn about and appreciate a small part of Earth's bounty.

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## GOOD READING (continued)

choose your favorite way to connect the shrub to the supernatural: its use in "water witching" or its scary way of shooting out seeds.

*Plants in Danger.* Edward R. Ricciuti. Harper, Row, Publishers, New York. Illustrations by Ann Zwinger.

Have you ever heard of "plant rustling" or "cactus cops?" Unfortunately such terms are being added to our vocabulary. Most people are aware of the plight of endangered animal species. *Plants in Danger* makes the point that the danger to plant life is even more serious. Compared to the 1,000 or so animals threatened with extinction, there are more than 20,000 species of plants (about a tenth of all those known) that could disappear forever if nothing is done to save them.

From the stolen 200 year old towering (but very delicate) saguaro cactus languishing in a shopping center to the productive rainforest ravaged to make way for "progress," the author takes us on a worldwide tour of endangered plant species. Humankind's 10,000 year old war on plants is seen as a movement resulting from greed and ignorance.

A tragic description is given of huge growling machines smashing the most quickly disappearing ecosystem in the world, the rain forest. In Colombia the destruction amounts to an incredible four acres a minute, every day, all year. Even the revered sequoias of California seem to be in danger from the very volume of the people who come to admire them. It is suggested that the packing of the soil around the shallow rooted giant trees might reduce their stability.

"Will it make any real difference (if a plant becomes extinct)?" A vivid description of life in a saguaro forest shows how the stately armed cactus touches the lives of numerous creatures, including humans. The ability of people to ask the question shows that they do not yet understand their connection to such a delicate web.

But there have been some successful attempts to save plants and their habitats. From a rocky plant laden ridge near Nairobi, Kenya, to Organ Pipe National Monument in Arizona, land has been set aside to preserve plants in danger.

Ricciuti has provided good reading about an alarming topic for junior high age and up.

*Books reviewed by RUTH YARROW.*

# GOOD READING (continued)

*Minnie Muenscher's Herb Cookbook and Garden Spice and Wild Pot Herbs.*

When Minnie Muenscher decided to leave Ithaca after her husband Walter died and return to the land of her youth on the West Coast, she took cuttings from all her herbs, packed her cookbooks and her recipe file and moved into a small house in Panorama City at Olympia, Washington, that provided a guest room for company, a garden for herbs and flowers, and a kitchen for cooking. Since she already was active in the Herb Societv of America she quickly had a schedule filled with speaking engagements and other herb-related projects. In fact, her schedule was so busy that almost ten years elapsed between her migration and the publication of *Minnie Muenscher's Herb Cookbook.* But those years, along with the decades of growing herbs, cooking with herbs and serving herbed food to family, friends and Dr. Muenscher's economic botany students at Cornell all helped shape the book.

The cookbook contains 250 recipes, using forty different herbs. The recipes are arranged alphabetically by herb. Two indexes, one of herbs and another of food make any topic easy to find. Each herb is introduced by a page of history, folklore and culinary information. The book is illustrated by thirty-two of Elfriede Abbe's beautiful woodcuts.

Minnie Muenscher is an imaginative cook who combines herbs with everyday ingredients. Her recipes are explicit, but she constantly urges her readers to personalize them by adjusting the quantities and varieties of herbs to suit their families' tastes. She also offers variations on

many recipes that multiply the number of recipes several times and should guide readers into the fun of creative cooking.

There are special sections on growing herbs indoors and out, techniques for drying and freezing herbs, and using herbs in a salt-free diet, along with information on twenty-two other herbs, safety warnings and a bibliography.

There is a wealth of information in this volume, there is also a distillation of Minnie Worthen Muenscher's enthusiasm about herbs, gardening and cooking along with her love of people permeating the text.

Cornell University Press published the book as a hard cover in 1978. In 1980 Keats Publishing, Inc. of Canaan, Conn. issued it as a paperback. That same year Cornell University Press reissued the late Walter Conrad Muenscher and Myron C. Rice's *Garden-Spice and Wild Potherbs* as a paperback. This is a book to delight the eyes as well as the mind. Elfriede Abbe's full page woodcuts are dramatically beautiful in their accurate rendition of each plant, a perfect complement to a text that deals with herbs whose uses have come to us from ancient days.

The text includes the scientific name, a listing of common names and their derivation, an easily readable and understandable plant description as well as historical information on culinary, medicinal, and religious uses. Not only is this a superb reference, it is a fun book for browsing and a good conversation source of the coffee table.

There is a little overlap in these two volumes. Walter's contains an occasional recipe, Minnie's contains bits of history, but the emphasis of each is different. One picks up where the other lets off. Together they form a superb reference library on herbs.

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*Gypsy Moth, Its History in America.* Robert McClung, William Morrow Junior Books, 1974. $6.00.

With gypsy moths chomping on a great variety of woody plants, defoliating forests, and causing alarm over much of the Northeast, Bob McClung's comprehensive story of these insects will be in great demand in any library. While the book can be read by young people, its 96 pages contain answers to the scores of questions asked by persons of all ages. It is a book with a double function. Many persons will enjoy reading it from cover to cover to obtain a complete story of the insects and their complicated relationship to human activities. Others will find it an excellent reference with its extensive index and many illustrations.

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*Books reviewed by HELEN ROSS RUSSELL.*

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