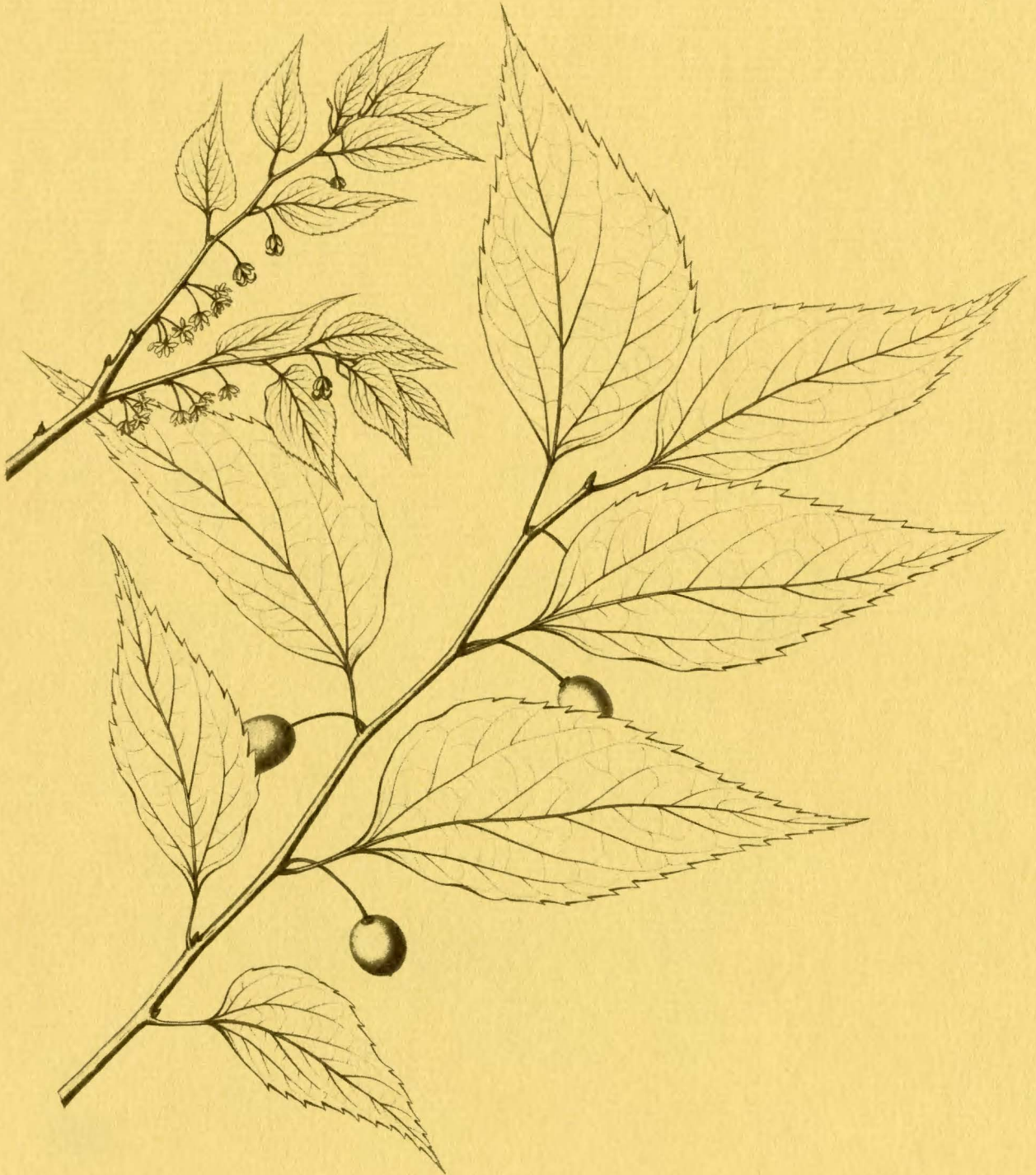


# THE MORTON ARBORETUM

VOLUME 8, NUMBER 2    Summer 1972

*Quarterly*



COVER: Hackberry, *Celtis occidentalis*  
From Charles S. Sargent, *The Silva of North America*  
(Boston: Houghton Mifflin Company, 1891-1902), IX, Plate CCCXVII.  
Original drawing by Charles Edward Faxon.

Hackberry, a member of the Elm Family, is a tree of the eastern United States which reaches its greatest development on the flood-plains of streams. It also occurs on dry sites, but its growth there is often reduced.

Older trees are easily identified by their warty, roughened bark. The fruits — small drupes about the size of choke cherries — are edible, especially after frost, with a flavor rather like that of dates. They are too small and dry to have any commercial value.

Hackberry leaves frequently have green gall growths, the most common being hackberry nipple gall, caused by the egg-laying of an insect called the jumping plant louse. The galls can be seen at close range, but do not spoil the appearance of the tree. Hackberry is also frequently affected by witches brooms, a conspicuous condition in which the twigs become shortened and form bunches due to the presence of both a powdery mildew and a gall mite. These give the tree a curious, sometimes unsightly, appearance. Hackberry is grown as a street tree, especially farther south.

*The Morton Arboretum Quarterly*  
VOLUME EIGHT, NUMBER TWO

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*Published quarterly by The Morton Arboretum, Lisle, Illinois 60532. Annual subscription, two dollars. Single copies, fifty cents. Foreign countries including Canada add fifty cents for postage.*  
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*"... these are childish things which I  
have no desire to put away."*

*W. H. Hudson, Far Away and Long Ago*

## *Ropes on the Fox*

*By Alfred Etter*

An old family photograph, a legal battle to prevent the drainage of a marsh, and a canoe trip I recently made down the Fox River in northern Illinois have left me wondering whether to be hopeful or doubtful about the future of man—especially about the future of man in Illinois, and specifically about the future of children on the Fox.

The photo is from a weathered album and shows a skinny kid, myself, swinging on a rope, ready to plunge into a deep pool of the Illinois River at Starved Rock State Park. While the photo is blurry, the memory is sharp. At that time my family and I lived in St. Louis. My father had invited my brother and me to accompany him on a business trip to northern Illinois, but we were slow to accept since we visualized just another journey through endless flat land and hot miles of corn. My father promised us, however, that we would stop on the way at a place called Starved Rock State Park and that we would be pleasantly surprised by the scenery there.

He was right. It was a great adventure for all of us to climb the sandstone promontories, to explore the canyons, and to take a boat ride on the river. The trip holds an importance out of all proportion to my other boyhood adventures. There was something secret and hidden and unexpected about Starved Rock, appearing suddenly, as it did, out of a sea of crops. In one stolen day during which we kids scrambled among the history-filled cliffs and tested the ropes from which the local Toms and Hucks plunged into the river, our impression of Illinois was completely changed. We learned that "flat" can be beautiful—with the help of rivers, ropes, and pools.

\* \* \* \* \*

Long after I thought I had severed my ties with the Midwest and was living in the fastness of the Colorado mountains, events began to transpire which would involve me once again with an Illinois river. In the late winter of 1965 a young woman, Ann Reuter, who lived with her mother Adelaide and a young nephew in a small home on a bay of Lake Beulah in southeastern Wisconsin, looked out her kitchen window to enjoy the familiar beauty of a marsh in winter—its wealth of cattails, sedges, and swamp loosestrife protruding from gracefully sculptured snowdrifts. This particular morning Ann noted with some dismay that men were placing stakes near the edge of the marsh, and it was not long before a fleet of trucks began dumping fill on the frozen soil around the marsh and in the marsh itself. Some hasty telephoning revealed that their neighbor had been granted a permit by the Wisconsin Public Service Commission to dredge the marsh, and he was preparing



a roadbed for the dragline that would scoop out the built-up peat and vegetation.

The Reuters decided to fight the destruction of this soggy little two-acre piece of Wisconsin. They were not deterred by the fact that their neighbor owned most of the land around the marsh. They were aware that the marsh was not only beautiful, and a wildlife haven, but that it served as a catchbasin for sediment from the watershed, that it soaked up nutrients washing down from pastured hills and from adjacent roadways. They recognized that the little marsh was, in fact, part of the water purification system of Lake Beulah, and in turn, of Mukwonago Creek that ultimately drained into the Fox River and thence into the Illinois, just above the cliffs of Starved Rock.

The Reuters had little money, but they tossed economic considerations aside. It was worth every cent to save the view and prove the point. Initial efforts to gain support were not productive. Residents around the lake seemed not to understand the importance of the issue. In desperation Miss Reuter phoned me one evening, long distance, hoping that in my position as ecologist for a conservation organization, I might be of some help.

Although the Reuters were total strangers to me, their appeal was so intelligent and determined that I soon found myself traveling from Colorado to look at Lake Beulah and the marsh. It seemed a long way to go to save two acres, but the very smallness of the marsh made the principle for which we would be fighting crystal clear—the issue was not to save a mallard nest, a frog pond, or some lily pads, nor to prevent the destruction of a virgin wilderness or a popular recreation area, but to save part of the functioning machinery of nature. It was to establish the principle that the United States was being taken apart bit by infinitesimal bit, one piece after another, by seemingly unrelated actions, either innocently or indifferently. Just as air pollution is created by millions of exhaust pipes, so our river systems are being destroyed by tiny invasions and defilements at thousands of places by millions of people.

The Reuters' first appeal had to be to the Wisconsin Public Service Commission, which had granted the permit. We wondered whether it was possible for so little a patch of vegetation and such novice litigants to convey such a powerful message to a public agency — but long before the establishment of such sophisticated groups as the Environmental Defense Fund, we determined to try to turn the tide. To stop further damage to the marsh, an immediate injunction was obtained from the local Walworth County Circuit Court, and this required a \$10,000 bond to protect the applicant from any financial losses which might accrue from delay and inconvenience should the right of private gain prevail over the rights of the public to environmental stability — in other words, if the Reuters should lose.

By the time a hearing was called to reconsider the granting of the permit to dredge the marsh, the Wisconsin Public Service Commission and the Wisconsin Conservation Department had been joined in a super-agency, the Wisconsin Department of Natural Resources. In spite of this broadened approach to resource management, our efforts to gain an appreciation of the larger environmental issues involved did not appear to be effective.

At the hearing I took parts of the floating loosestrife mat which made up most of the marsh and introduced them as exhibits. I explained how the vegetation, with its web of filtering roots and interwoven stems, provided at no cost all the functions of an expensive sewage disposal plant — silt entrapment, aerobic and anaerobic decomposition, nutrient removal, and even cooling. I pointed out that wildlife habitat and beauty were extras which few disposal plants provide. It was obvious, however, that questions that dealt with who owned the lake bottom, whether the bay was navigable, cubic yardage of fill to be removed, and other engineering data seemed to be of more concern than



ecological arguments. We were struggling against the momentum of a body of law and interpretation built up in times past. There was a great reluctance to admit that pollution of the lake was involved and our arguments were made to seem irrelevant. The permit to dredge was regranted.

Undaunted, the Reuters asked for a rehearing as provided for by existing statutes, but the permit was again unheld. They then appealed to the Dane County Circuit Court and met similar discouragement, even though Dane County was the home of Aldo Leopold whose tributes to the values of a marsh were legend.

With assurance from the Reuters' attorney, Willis Zick, that he was more interested in establishing a precedent than in garnering fees, the Reuters decided to take the case to the Wisconsin State Supreme Court. By this time the Audubon Wild Land Foundation of Wisconsin had become interested and volunteered to participate in the hearing as a "friend of the court". The brief which their lawyer submitted undoubtedly played an important role. The Supreme Court reversed the decisions of the lower courts. The matter was remanded to the Department of Natural Resources for a specific finding of fact as to the effect of granting the permit upon water quality and water pollution, and the Department was ordered to take additional testimony on water quality and pollution effects.

After a long delay, a rehearing of the Reuter case was finally scheduled for February 2, 1971, nearly six years after the marsh was first threatened. Unfortunately, Ann's mother, Adelaide Reuter, died on November 19, 1970, just before her seventy-first birthday, and so she did not get to see the massive turnout of people from all over the state who came to the hearing representing conservation, citizen, education, and youth groups hoping to speak in behalf of preserving the little marsh. Mrs. Reuter would have been surprised and rewarded to have witnessed the results of the efforts she and her daughter had made on behalf of the environment and future generations.

Tragically, after a period of preliminary consultation, the hearing was adjourned on a technicality, and those who came prepared to give testimony were denied the opportunity. Nevertheless, it was obvious to everyone from the list of those assembled to oppose the permit, that if the citizens of Wisconsin have anything to say about their resources, the marsh will not be dredged.

Recently, the applicant for the permit asked Miss Reuter to agree to dismiss the injunction which is still in effect as a result of her request to the Circuit Court. This would release her bond and her liability for any damages. It seemed, however, that this move might open the door for a new permit to dredge an even larger area in the lake. Miss Reuter chose to keep the injunction in effect, and so the marsh remains protected until the Department of Natural Resources calls another hearing. How many other people would pay the interest on \$10,000 in order to preserve the integrity of two acres of nature's machinery? In the meantime, the marsh has continued to serve its purpose and has gained six years of life. New information on aquatic habitats has substantiated the Reuters' claims. New and stronger water laws have been devised since their fight began. Through the efforts of Ann and her mother, many people have become aware of the importance of natural habitats in the preservation and health of the environment.

One of the most remarkable results has been the apparent influence of this case and the Supreme Court ruling of June, 1969, on actions taken and decisions made by the Department of Natural Resources and the Office of the Attorney General of Wisconsin. Late in 1968 the Department of Natural Resources was called upon to rule whether DDT should be considered a pollutant according to the new Wisconsin Water Law. The summary of evidence and ruling, issued May 21, 1970, was a masterful analysis of a very complex case, and it left no question but that DDT was an environmental pollutant, that it contaminated and rendered "unclean and impure the air, land, and waters of the



state", and made the "same injurious to public health and deleterious to fish, bird, and animal life."

Another recent decision involved an application for a permit to construct a dam on Hulbert Creek near Wisconsin Dells. The Department of Natural Resources, citing the Reuter Decision as the chief precedent for concern over environmental impacts, found that the projected structure would "adversely affect the water quality" of the creek, and that it was "in the public interest to protect, foster, and preserve the archeological, geological, botanical, aquatic, and other ecological values now existing in a five-hundred-acre area" that would be submerged by the proposed impoundment.

The same examiner, M. H. Van Susteren, heard the Reuter, DDT, and Hulbert Creek cases and made the decisions. Both the examiner and the Attorney General are quick to admit their gratitude for the Reuter case, and find use for the Supreme Court ruling almost constantly. It is indeed ironic that the fate of the marsh which has already helped save other sites still hangs in the balance because of a backlog of legal technicalities. While many people have helped keep the marsh alive, it appears that many more will be needed to bring the case to a successful conclusion.

\* \* \* \* \*

By the time the last Reuter hearing had been adjourned, I found myself no longer blissfully removed from the pollution problems of the Fox River by a thousand miles and a continental divide. Instead, I was serving as Naturalist at the Morton Arboretum only seventy-five miles below Lake Beulah. On weekends I began looking toward the Fox for a place to escape suburban Chicago. I wanted to find a place where I might see sandstone bluffs with clinging arborvitae, white pine, and junipers—river bottoms spontaneously producing walnut and sycamore—a place where I might recapture some of the excitement of my childhood known many years before at Starved Rock. Maybe I even yearned to swing out on a rope and plunge into a shining pool.

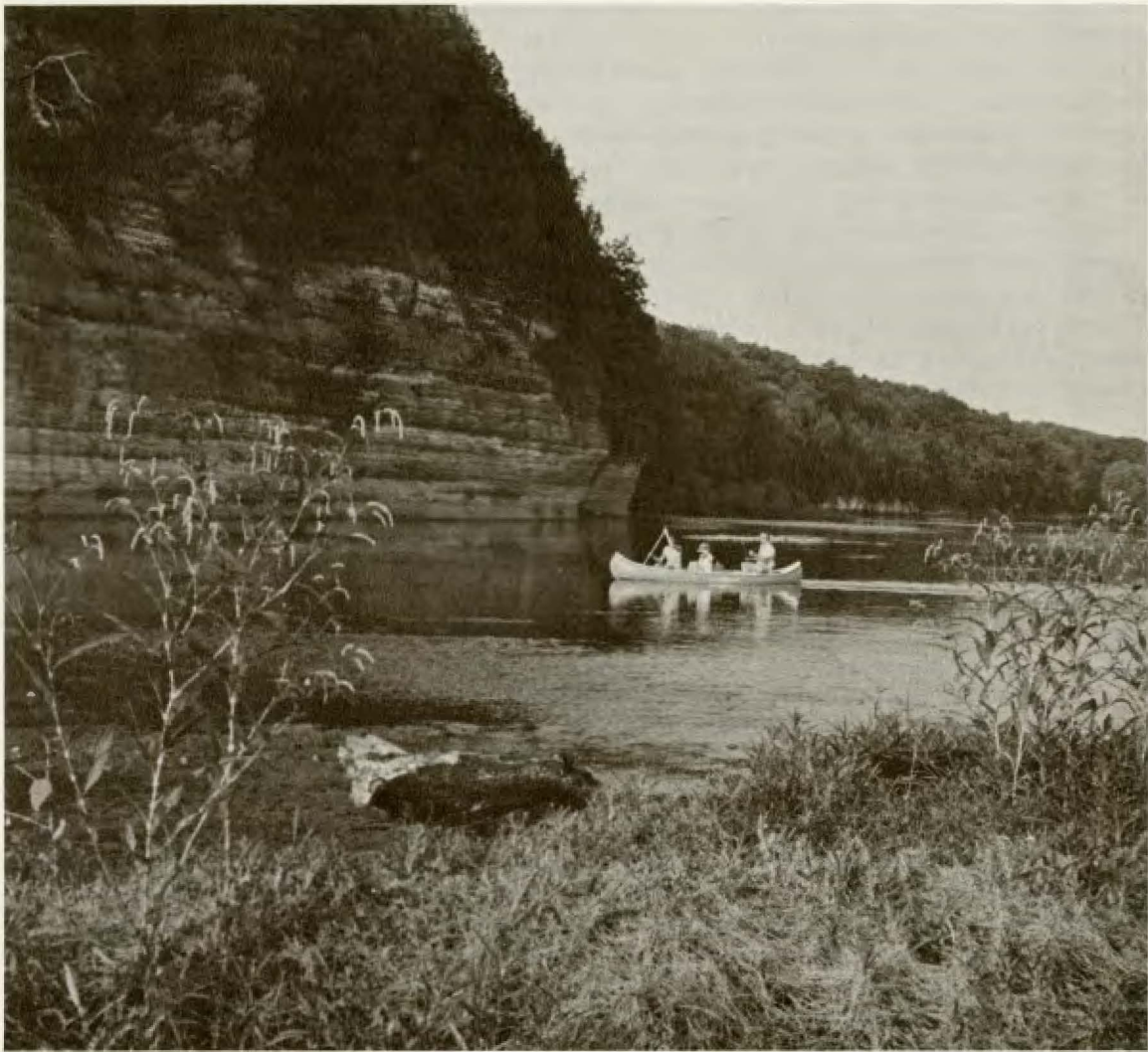
In August, 1971, it was announced that hearings on the Illinois Scenic Rivers Bill would be held at Serena, near the Fox. With this incentive, I traveled to Wedron just downstream to see how the river fared—to see whether the example set by my good friend on Lake Beulah, plus a proliferation of laws, rulings, and environmental agencies, was having any effect on the lower Fox River.

I planned to motor upstream in my canoe, then paddle down. It was easy enough to slip the boat into the water at Wedron just across from a noisy silica mill, though I had some difficulty ignoring a six-foot pile of trash in the middle of the launching site. Having lived among humans for some time now, I was not surprised to discover the entry to the scenic Fox had been corrupted, or that the image I had treasured for so long of the beauty of northern Illinois rivers was only a romantic notion out of the past. I have grown adaptable—albeit less bright-eyed—and so I proceeded upstream, slowly leaving behind the grinding and screeching of the mill.

Soon I began to see the staunch sandstone rocks, the pillars, caves, and canyons that I had hoped to find—though it was like looking at an image in a tarnished mirror, for the roily water bubbled with carp lapping at frothy green algae, and the backwaters fermented with methane. Shells of dead mussels gathered silt at the heads of islands. From adjacent hillsides came the sound of power equipment scraping and scratching at the hills, and in places whole cliffs were being prepared for mining. Landslides of rubble capped the sand palisades, appearing like the backsides of giant beasts urinating into the river through long rusty pipes. At several shallow rapids I had to pull my canoe over the scummy rocks, but only this necessity could force me to put my feet in the water.

Finally, I seemed to have left man behind, for I discovered a wild tributary valley through which a tiny clear stream came winding down. I put ashore and walked among tall trees and rank bell-flower. From a towering elm a long forgotten friend from the South, the blue grosbeak, warbled his





couplets. From somewhere back in a tangle of touch-me-nots came the calls of another southerner, the Carolina wren, and on a rotting tree I watched the red-headed woodpecker, the “telephone line-man” of over-mature forests, drilling holes and listening in on the party lines of busy beetles—wire-tapping at its most legitimate level.

It was hot, and I was thirsty, but I dared not drink from the spring. I ate a sandwich and shoved off in my canoe again, passing beneath the overhanging trees of an island where I found still-warm campfires of recent picnickers. As I sat at the head of the island I was hailed by fellow boatmen, families headed downstream, girls learning to canoe, bearded loners drifting on their fragile islands in a brief escape. Farther upstream I saw some young boys catching frogs and exploring cavities in the cliffs to see who could find the biggest wolf spiders. In a few places children were swinging on

ropes hung from trees that leaned over the Fox, but nowhere did I see any of them daring or foolish enough to plunge into the river.

On an overhanging cliff I saw three youths but they were not leaping into the pool beneath as many a boy had done in the Fox's finer days—nor were there any boys grasping for the frazzled ropes that dangled from old junipers down the sandstone to the water's edge—nor were there any barefooted swimmers pulling themselves from the water to climb back up polished paths to the top of the rock pedestal so they could plunge in again.

Who wants to swim in the Fox? Who wants to swim in the wastes of Waukesha, of Elgin, of Aurora? Who wants to swim in the effluent of feed lots and septic tanks and the chemical wash of fields and gutters and industrial drains? Who wants to swim in the Fox? I do, and a lot of kids I know, but not in what passes for water in the lower Fox in August. And so the tree ropes are merely swings, and the rock ropes hang limp against the sun-warmed sandstone, bleached and covered with spider webs.


\* \* \* \* \*

Is it any wonder that we have trouble with people when we so blatantly deprive them of the enjoyment of living on the earth? We concern ourselves with the status of the stock market, the gross national product, wider highways, new housing starts, and novelties and luxuries of every sort while we destroy the very foundations of the earth upon which all our activities take place, our houses are built, our cravings satisfied. We worry about the inflation of our economy. Isn't it time to worry about the deflation of our spirits? We worry about our declining balances abroad. What about the imbalances in nature at our very feet?

The basis of economics, as of ecology, is the concept of a home. Yet the end result of all our economics is that instead of building and managing a home, we deprive people of a place to put down roots, to grow, to feel nourished, to live in a familiar place, to plunge into a natural pool and be refreshed.

If we can appropriate millions to dig a hole in Illinois and plant a ring of magnets in the earth, as we are now doing in order to find out more about infinitely small particles, why can't we appropriate more money to preserve places where we can see—each of us with his own eyes and no technology—how the earth is put together, how it works, what other kinds of living things live with us, and how we must treat them and our fellow men? Why can't we do more to save what is real so that there will be something left to study, something to demonstrate, something to experience, something to watch and understand—like the spring-fed bird-enlivened valley I discovered along the Fox—like the snow-encrusted marsh on Lake Beulah?

Isn't it an upset world when we can afford to walk in space, to junk a million dollar car on the moon, but can't afford to clean up our rivers and set them aside so that a boy or a girl can hang on a rope and plunge into a clean shining pool? That's a greater and more valuable thrill than any astronaut can ever get looking down into the dead landscape of Hadley's Rille on the moon. Isn't it a stingy society that, for the love of corn and convenience deprives its children of the thrill of exploring the rills on earth—rills that can echo with the songs of birds, the whistle of woodchucks, or the swat of a beaver's tail?

I say it is time to start putting boys and girls back on the ropes over the Fox, to let them plummet through the space on earth and into a clear river, to give them adventures that no man on the moon will ever be able to experience—much less describe. The moon will keep—but youth and the Fox will not. 





## *In Memoriam: Mary K. Moulton*

1913-1972

*The Arboretum family mourns the loss of a talented and beloved member of our staff, Mary K. Moulton, who died on April 7, 1972, following surgery for a brain tumor.*

*"Marlie," as she was known to many, came to us in 1963 as Librarian, some months before the opening of the Sterling Morton Library. She brought to her work an unusual combination of qualifications: a great love of books; fifteen years of direct experience in horticulture as a landscape designer and owner-operator of a nursery; and a thorough familiarity with the Arboretum and its plant collections, gained over years of coming here to the classes of May Theilgaard Watts and Roy Nordine.*

*Mrs. Watts' classes ranged from natural history, gardening, and ecology to plant sketching, poetry, writing, and nature literature, and often she would bring out some of the rare botanical books that were then secured behind secret panels in Joy Morton's library (now the Founder's Room) at Thornhill. Marlie became keenly interested in these old volumes—in their subject content, and also in their physical makeup: typography, paper, printing, techniques of illustration and binding.*

*When she came to the Arboretum as Librarian a few years later, Marlie threw herself wholeheartedly into augmenting the rare book holdings—assiduously studying other botanical libraries, bibliographies, sales records and catalogs of dealers and auction rooms, and visiting booksellers from coast to coast and in Europe, especially England. She also attended numerous professional workshops on the care and conservation of rare books. She made many friends as she went.*

*She started classes and lectures in the library, making use of our herbals and other botanical works of the last five centuries, as part of the Arboretum's educational program. Subjects included early garden literature, plant explorers, plants of Shakespeare, herbals, nineteenth century horticultural periodicals, the literature of weeds, early agricultural philosophers, the language of flowers, and the history of botanical illustration. In 1967, Marlie and Nancy Hart began to teach a class in botanical illustration together, complementing art instruction with botanical and historical information. Observation of living plant material, usually outdoors, and the use of our herbals and other old books as examples of fine illustration were vital to these classes, taught continuously to the present time.*

*Along with her deep love of books, Marlie was a voracious reader, and it remains a mystery as to when, with her very active schedule, she managed to digest so much print. As she read, she kept in mind the particular interests of her colleagues, library patrons, and friends—calling newly found references to their attention with a missionary zeal.*

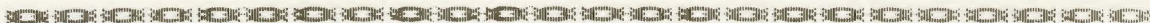
*In the same spirit, she found it lamentable for anyone to visit the Arboretum without at least an*

introduction to the reading room—which she kept so charmingly with well arranged exhibit cases, seasonal plant arrangements, and crackling wood fires in winter—and a look at the adjacent Reading Garden which she had created in honor of Mrs. Watts. She was not only hospitable, but endlessly generous with her time, answering a vast assortment of questions from the public. To many she could reply from her own encyclopedic knowledge of horticulture and allied subjects, but when she had to look something up she knew where to turn—and nothing was too much trouble.

In addition to her library preoccupations, Marlie played a key role in numerous Arboretum activities. In 1966, she originated the OIKOS conference, now held annually, as a way of bringing together ecologists and biologists with members of the planning professions to consider problems of land-use. She wrote for the Morton Arboretum Quarterly and served on its editorial committee. She took her turn at staffing the Plant Clinic, working on Arboretum exhibits for the Chicago World Flower and Garden Show (for which she created the “Living Library” exhibit in 1964), and helping organize a number of festive occasions. She could always be counted on for creativity, imagination, originality, good taste, and enthusiastic cooperation.

*We have lost a very special person.*

Suzette Morton Davidson

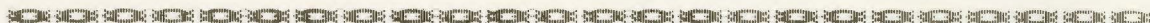


## HORTUS BOTANICUS *The Botanic Garden & The Book*

*In April and May of this year, the Newberry Library in Chicago held an exhibition of fifty rare books from the Sterling Morton Library, to mark the fiftieth anniversary of the Morton Arboretum. The title of the 120-page illustrated catalog prepared for the occasion reflects the theme of the exhibition: Hortus Botanicus; The Botanic Garden & The Book.*

*Each of the books exhibited and described in the catalog is associated with one of the great botanic gardens of the world, from the Orto Botanico of Padua, the earliest European botanic garden, to the Arnold Arboretum in Jamaica Plain, Massachusetts — which is, coincidentally, celebrating its one-hundredth anniversary this year. These books illustrate the fact that botanic gardens have, from their beginnings, produced not only flowers and trees, but also books — some of them pictorially splendid, and all of them in one way or another interesting or significant to the botanist today.*

*Descriptions of the books follow a lengthy introductory essay on the history of botanic gardens and their publications, written by Dr. Joseph Ewan, Professor of Biology at Tulane University and author of numerous historical studies in botany and natural history. The exhibition catalog was compiled by Ian MacPhail and its handsome format designed by Suzette Morton Davidson. It contains forty-one exquisitely printed plates, four of them in color. Copies of the catalog may be obtained from the Sterling Morton Library at four dollars and fifty cents each.*





## *ADVENTURES AFIELD; A Brief History*

The Arboretum's educational program, begun in 1942 by May Theilgaard Watts, has always given a strong emphasis to "reading the landscape", as Mrs. Watts expressed it, especially in our own region. An understanding and appreciation of forests, prairies, bogs, and other habitats as living communities came about as students learned to see the Arboretum through the seasons and took all-day field trips to nearby destinations, including the Indiana dunes, the beech-maple forest at Warren Woods in Michigan, the Volo Bog in northern Illinois, and other places.

As time went on, many of the advanced students began to "read the landscape" on their own—and their travels often took them to other parts of the country. In 1960, the first Arboretum-sponsored field trip outside our own area was announced: a spring visit to the Great Smoky Mountains. But as the time neared, it became apparent that Mrs. Watts would be unable to lead the trip, due to illness. Still, enthusiasm was high and a small group determined to go ahead with their plans, altering their schedules so they could go in May when Floyd Swink, then Senior Naturalist with the Cook County Forest Preserve District, could serve as their guide. About a dozen people made the trip, among them Elizabeth Zimmerman, a student of Mrs. Watts, who was later to join the Arboretum's Educational Department as an instructor.

In the autumn of that same year, Mrs. Watts introduced a new class, "Ecology of Our Vacations", in which advanced students shared their observations about the geology, flora, and fauna of places they had visited. This was a great success and was followed by "Ecology for Travelers" the next spring. This course would "read the landscapes" of American deserts and mesas, western mountains, eastern mountains, and then the landscapes of France, Switzerland, Denmark, Scotland, and England. Mrs. Watts promised no field trip, but added wryly, "We will no doubt pay our respects to a visiting English oak, a Norway spruce, a piñon pine, etc."

In the summer of 1962, a second trip to the Great Smoky Mountains was planned. This time a group of about thirty met in Gatlinburg, Tennessee, for a three-day field trip, again under the leadership of Floyd Swink, who by this time had joined the Arboretum staff. Enthusiasm over this adventure spread, and talk of similar trips was heard from time to time.

This same year, Elizabeth Zimmerman began teaching classes at the Arboretum. She started with wildflower gardening, and quickly found an audience eager to learn more about plant families and the ecology of various habitats. She began a series called "Elements of Environment", and in the fall of 1965 members of this class and other advanced students took a three-day field trip to Beall Woods in southern Illinois. Another of her classes, "Forest Ecology", included four days in the Huron Mountains of Michigan where they studied the northern forests in contrast to those nearer the Arboretum.

Being a native Coloradoan, Mrs. Zimmerman discovered many common interests with Richard Wason, a former ranger-naturalist at Rocky Mountain National Park, when he joined the Arboretum staff as Head of Education in 1964. The two combined their talents in the winter of 1970, and again in 1971 to teach a class on "The American Landscape." Described as "an interpretive look at the major natural ecosystems of the United States and Canada including their physiographic settings; a course intended to add to our enjoyment as travelers", these classes proved to be both popular and challenging.

In 1970, another "Coloradophile" joined the Arboretum Staff. Patricia Armstrong, an experienced mountaineer with a master's degree in arctic and alpine tundra ecology, was appointed Assistant in



Education. In addition to her talents for working with school and youth groups, Mrs. Armstrong's expertise in alpine ecology complemented the interests of Mr. Wason and Mrs. Zimmerman. Thus it was not surprising to find the following advanced course listed in the spring of 1971: "The Colorado Rockies: A preliminary study of the Colorado Rockies from plains to mountain tops. Emphasis will be on knowing the components of the various biotic communities and their physiographic and climatic settings."

Needless to say, adventures afield soon followed. Mrs. Armstrong describes the group's summer week in the Rockies in the article that follows. C. D.

*Arboretum class members look on as geologist Carl Kellogg points out a dinosaur bone, barely visible in the rock just below his knee. This was in the Morrison formation, part of the hogback west of Denver.*





# *Field Course in the Rocky Mountains*

*By Patricia K. Armstrong*

Last summer nineteen Arboretum students and two instructors spent seven wonderful days in the heart of the Rocky Mountains, living and learning together. For the Arboretum instructors, this was the culmination of an idea that had been brewing for a long time; for the students it was the climax of many weeks of preliminary study and anticipation. Here are some of the comments that were heard during the last evening session:

"It was the best class I ever took at the Arboretum!"

"I liked the two kinds of hikes every day, giving us a choice of interests and pace."

"I wish we could all come back in August and do it again!"

Before enrolling for the summer field course, all of the students had taken a prerequisite course at the Arboretum during the spring. Along with nineteen others who were unable to make the trip, they attended seven weekly sessions — listening to lectures, looking at color slides of alpine plants and landscapes, examining pressed plant specimens, and immersing themselves in reading lists and plant checklists which included 490 montane species, 541 subalpine species, and 269 tundra species.

The spring course was a blend of three instructors' interests and abilities: Elizabeth Zimmerman combined her artistic talent and her knowledge of Colorado plants in a set of beautifully drawn worksheets picturing the alpine flora and alpine habitats; Dick Wason shared his intimate acquaintance with the geology and fauna; and I enthusiastically explained the tundra environment and the cryptogams that grow there. After this intensive preparation, all of us looked forward to going to Colorado.

We chose July 5 to 11—the time of the usual peak of wild flower bloom—for our trip, and we met in Boulder at 9:00 A.M. the first day. What an interested and excited group we were, too. Carl Kellogg, a young geologist from the University of Colorado and our leader for the day, scratched his head. "You mean all these people came here from Chicago just to study plants?" he asked. Twenty-one people nodded eagerly. In addition to Mrs. Zimmerman and myself, there were ten women, one man, three married couples, and two children. We all regretted that Dick Wason had been unable to come with us.

From Boulder, our nine-car caravan wound over the plains and mesas and through the foothills, making various stops where we learned about geology and ecology. Our geologist told us about the pediments, the sediments, the orogenies, and the orgies (over the discovery of gold, of course); and we told him about *Thermopsis* and *Ipomopsis* and *Antennaria* and *Stellaria*. It was a marvelous day! We ate our lunch in the Central City cemetery, surrounded by old graves and mines; had ice cream cones in Georgetown near the Hotel de Parie; and said our goodbye to Carl Kellogg on Loveland Pass where we saw cirques and tarns and tundra flowers—the first time for many in the group.

We spent the rest of the day settling into Dillon, which would be our headquarters for the next few days. There the Zimmermans have a spacious apartment which served as our nightly



meeting place. Each night we went over the high points of the day, laid our plans for the next day, and listened to reports about the areas we would be seeing. Part of the class assignment had been a lengthy reading list, and each person was to have found out about some aspect of Colorado history that could be shared with the group. The stories were truly fascinating! For example, one was about the elephants that pushed the Phineas T. Barnum circus train over Boreas Pass during the winter of 1882; another was about Mt. Silverheels, named after a dance hall girl who saved the lives of many miners during a smallpox epidemic in the early days; and there was the tale about the Gore hunting party in the 1840's that lasted three years, covered 6000 miles, employed 50 men, required 112 horses and 369 hounds, and cost a half-million dollars. We also heard about Edwin James, Rocky Mountain Jim, Enos Mills, the Earl of Dunraven, Isabella Byrd, the Ute Indians, and the Colorado Ranger horse. These reports did much to enrich our experiences, as each person became an authority on some phase of Colorado lore. We appreciated each area more because we knew something of its history and outstanding characters.

The next three days in Dillon followed a pattern. We met at 8:00 or 9:00 in the morning, complete with lunches, collecting and identifying equipment, cameras, and extra clothing in case of rain or cold. We loaded ourselves into four or five cars and drove off to the mountains. Several stops were planned each day, with one or two longer hikes, for which we usually divided into two groups. The one led by Mrs. Zimmerman wandered slowly around the lower reaches, while I led the other group upward to see what grew on the ridge tops. Each evening we compared notes to find out what each group had seen.

On Tuesday, July 6, we stopped in Breckenridge and observed the effects of gold dredging on the landscape; examined a subalpine forest and meadow; saw the tundra above Boreas Pass and the relics of the Boreas railroad; explored the vegetation in South Park, including a bristlecone pine stand north of Fairplay; and observed layering and frost phenomena such as solifluction (soil movement) on Hoosier Pass. Exciting finds of the day included a tiny, white star gentian, *Gentiana fremontii*; a rare pink lousewort, *Pedicularis sudetica* var. *scopulorum*; a demure bird's-eye primrose, *Primula incana*; the flaming orange paintbrush, *Castilleja integra*; the little red elephants, *Pedicularis groenlandica*; and a natural rock garden full of *Phlox pulvinata*, the alpine phlox.

The following day we rented four-wheel-drive vehicles and took a ride up Peru Gulch to the abandoned National Treasury Mine. En route we stopped to examine sagebrush meadows near Dillon, a dry place with a stand of lodgepole pine, a rich subalpine forest carpeted with orchids, the high subalpine meadows, and the alpine streams, tarns, and frost boils below Gray's Peak. A little rain at lunchtime didn't even dampen our potato chips. Highlights of the day included finding the exquisite fairy slipper orchid, *Calypso bulbosa*; large stands of the Colorado columbine, *Aquilegia caerulea*; bitterbrush, *Purshia tridentata*, in bloom; the gaudy, big magenta primrose, *Primula parryi*; and snow buttercups, *Ranunculus adoneus*, blooming in the snow.

On Thursday we went back over Loveland Pass to Georgetown and up to Guanella Pass. There we observed a Douglas fir—limber pine stand and spent a lot of time hiking in the





*A system of interspersing clear-cut areas with uncut stands, resulting in better water retention, was seen at the Fraser Experimental Forest.*

willow shrubs and tundra atop Guanella Pass. We found the infrequent bog laurel, *Kalmia polifolia*, in bloom, and the large queen's crown, *Sedum rhodanthum*. The wax flower, *Jamesia americana*, was delightful, too. In the high tundra we lunched among *Androsace chamaejasme* var. *carinata*, the lovely rock jasmine, and discovered the rare columbine, *Aquilegia saximontana*, and the three-inch-high alpine meadow rue, *Thalictrum alpinum*.

Friday we packed up our things and began our caravan to Rocky Mountain National Park. We drove down the valley of the Blue River and over to Fraser where we were met by Mr. Heffner and Mr. Noble of the Fraser Experimental Forest. They explained some of the forestry experiments in progress there and took us to see the watershed management areas and regeneration plots on Fool Creek. It was interesting to see the type of clear-cutting they used, which left all small trees to reseed. The patches of clear-cut were checker-boarded between uncut stands to increase the amount of snow accumulation and spring runoff. Their main interest was in managing the forest to produce an abundant water supply. We were all surprised to see five-year-old *Picea engelmannii* seedlings that were only one-third inch tall due to the severe mountain environment.

After leaving Fraser we hiked in the subalpine forest and through the Krummholz, a zone of dwarf trees at timberline, on Sherman Adams Knob. We discovered terraces of mountain dryad, *Dryas octopetala*, an important alpine plant, and thrilled to see the delicately spotted petals of *Saxifraga bronchialis* on the wind-swept slopes. We also discovered *Pulsatilla patens*, the pasque flower, which is not supposed to occur west of the Continental Divide.

Saturday, when we drove across Trail Ridge Road, the winds were close to fifty miles per hour, and it was cold—a typical alpine day. We visited the National Park Museum and Visitor

*(Continued on page 32)*







# Sugar Maple, *Acer saccharum*

Maple Family (*Aceraceae*)

## *General Description:*

Sugar maple is one of the most prized shade trees of North America, enjoyed especially for its vivid autumn color and its sugar-making sap. It grows at a moderately good rate into an erect, ovoid, round-topped tree, often reaching a height of over one hundred feet. Its top widens with age. Its leaves which are arranged oppositely, are smooth and a lighter green than those of the commonly planted and slower-growing Norway maple (*A. platanoides*). Its buds are distinctly pointed and brown. The bark of young trees is gray. Branches are at right angles to the trunk. When the trunk reaches a foot or more in diameter, the bark begins to break with longitudinal furrows. The flowering of the sugar maple is not conspicuous, but the pendent clusters of pistillate and staminate flowers are greenish-yellow, appearing as the leaves begin to open, and giving a soft, delicate, hazy effect to the tree. They are beautiful at close range. Sugar maple is hardy in Zone 4.\*

## *Soil and Site:*

Sugar maple grows naturally on upland wooded sites which have good, well-drained soils, often in mixed forests which include linden and oak. Similar terrain and soil conditions provide the best sites for planted sugar maples. Ample space is needed, and where this maple has been planted along old roads, it suffers as these are widened and automobile problems affect its growth. Its moderately shallow horizontal root system will not fare well where paving or traffic impede the aeration of the soil.

## *Planting and Care:*

If a specific autumn coloration is desired, a tree should be selected in a nursery during the autumn. A nursery-grown, root-pruned sugar maple may be transplanted with bare roots if it measures less than 2" in diameter a foot above the ground. For trees larger than 4", winter moving with a frozen ball of earth is recommended. Very early spring is the best time for transplanting, but it is possible to move a sugar maple immediately after hard frost in autumn if a very heavy mulch is applied well beyond the root area. Trees collected from the wild are sometimes offered in spring, already dug; these do not become established so quickly and may be disappointing. Trunks of newly-planted maples need protection from sun-scald; this may be accomplished by using tree-wrap or a tube of green plastic screening, or by erecting a wide vertical board to shade the southwest side of the trunk. Pruning should be done when the tree is in full leaf and not in early spring. Pruning a dormant tree leads to loss of sap, tending to attract bacteria, yeasts, fungi, and insects.

## *Geographic Variation:*

There is great variation in both appearance and ecological attributes of sugar maple in different parts of eastern North America. Those in the Chicago region are generally similar to those of other parts of the upper Midwest but differ in several interesting ways from the sugar maples of New England and other eastern areas. For example, midwestern sugar maples have fewer coarse teeth on the lobes; their foliage often has a drooping appearance; leaf undersides have greater numbers of minute hairs; and the most prevalent autumn color is yellow, in contrast to the celebrated carmine-orange of New England maples. These features of midwestern sugar maples are strongly expressed in Iowa trees which are sometimes considered to represent a separate entity, black maple, *Acer nigrum* Michx. f.

*Location in the Arboretum:* Near main entrances; throughout the woods on the east side.

\*Hardiness Zone based on Plant Hardiness Zone Map prepared jointly by the U.S. National Arboretum in cooperation with the American Horticultural Society. U.S.D.A. Misc. Pub. #814, May, 1960.




(Continued from page 29)

Center at Fall River Pass and divided into groups to hike on the tundra. One group went upward in the teeth of the wind to see patterned ground, while another group headed down to see ptarmigan. Most of us saw *Dryas* terraces, rock polygons, fell fields, *Kobresia* meadows (the climax community of this area), solifluction ponds, and alpine gardens. We watched rosy finches about their nests, pikas in the rocks, and found rare alpine kittentails, *Besseyia alpina*. Most charming of all were the cushions of Rocky Mountain nailwort, *Paronychia sessiliflora* var. *pulvinata*; the pink fairy primrose, *Primula angustifolia*; the many-flowered moss campion, *Silene acaulis*; and everybody's favorite, alpine forget-me-not, *Eritrichium aretioides*.

That night we stayed at the YMCA of the Rockies and were entertained and educated by reports from our own group and by a lecture on other areas of Colorado and on birds and mammals of the state, given by Dr. Richard Beidleman of Colorado College and Rocky Mountain National Park. His presentation, punctuated by his delightfully spontaneous sense of humor, was a highlight of the trip.

Sunday, our last day, was spent hiking in Rocky Mountain National Park. One group meandered around Bear Lake and saw seven different kinds of orchids. The other group walked to Nymph, Dream, and Emerald Lakes. In the afternoon we all followed the Cub Lake trail as far as we wanted. Some stopped at the rocky xerosere containing *Opuntia*, some turned back where the *Lilium philadelphicum* grows; others went as far as the ninety-foot beaver dam, and five of us got all the way to Cub Lake and back.

The final evening was spent discussing our week together and what we all thought of it. Afterwards some of us wandered down to the nearby ponds to watch beavers trace silver V's on the inky water and disappear in a flap and splash of spray in the moonlight. For a long time we all just sat and looked at each other and the brightening stars — remembering — not wanting the class to end. Gradually we said our goodbyes and moved off — each to his separate way home.

But this was a new beginning as well as an end. Each person had become more aware of and more personally involved in the mountain environment. Therefore each had become somewhat possessive of its frail beauty. We would not forget these experiences for a long time. This was the way to learn! 

Climatological Summary			
Data	February	March	April
Average mean temperature	22.8° F	36.0° F	46.0° F
Highest temperature	63° F	72° F	79° F
Lowest temperature	—12° F	5° F	7° F
Days maximum below 32° F	8	0	0
Days minimum below 0° F	6	0	0
Precipitation	0.64"	4.22"	3.71



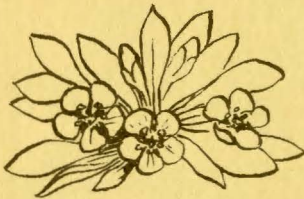
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### *ILLUSTRATION SOURCES*

*Page 21: Photograph by Alfred Etter*

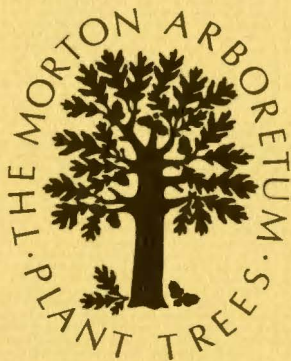
*Pages 26 and 29: Photographs by Patricia K. Armstrong*

*Page 30: Pen and ink drawing by Anthony Tyznik*

*Inside back cover: Big-rooted spring beauty, Claytonia megarhiza;*

*Pen and ink drawing by Elizabeth Zimmerman*





## THE MORTON ARBORETUM

*LISLE, ILLINOIS*

*Founded by Joy Morton, 1922*

A PRIVATELY ENDOWED EDUCATIONAL FOUNDATION FOR PRACTICAL, SCIENTIFIC RESEARCH WORK IN HORTICULTURE AND AGRICULTURE, PARTICULARLY IN THE GROWTH AND CULTURE OF TREES, SHRUBS, AND VINES BY MEANS OF A GREAT OUTDOOR MUSEUM ARRANGED FOR CONVENIENT STUDY OF EVERY SPECIES, VARIETY, AND HYBRID OF THE WOODY PLANTS OF THE WORLD ABLE TO SUPPORT THE CLIMATE OF ILLINOIS . . . TO INCREASE THE GENERAL KNOWLEDGE AND LOVE OF TREES AND SHRUBS, AND TO BRING ABOUT AN INCREASE AND IMPROVEMENT IN THEIR GROWTH AND CULTURE.