NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY

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Chagrin Falls, Ohio 44022
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On the Fringe

Volume 5 **November/December 1986** **Number 6**

ANNUAL DINNER - DECEMBER 5TH

PLEASE NOTE: Interest in the Annual Dinner is extremely high due to the reputation of the speaker. It is possible that we will exceed the seating capacity of the room where the dinner is served, in which case requests for reservations will be turned away. **DO NOT WAIT UNTIL THE LAST MINUTE TO SEND IN YOUR RESERVATIONS!!**

This is a happy change from other years when I have had to call some of you. In addition to the accomplishments of Dr. Raven as outlined in the article in this issue, he has just been awarded the International Prize for Biology. The Crown Prince of Japan will give him this honor on November 20th in Tokyo at the National Academy. The award carries with it a grant of $65,000.00. He was recognized for his work in systematic biology and taxonomy. Moreover, he has just returned from Geneva, Switzerland where he served on a committee of 6 American scientists and 6 Soviet scientists, approved by President Reagan and Premier Gorbachev, to submit scientific proposals for consideration at the next summit. This is a first for this idea.

We have an extremely distinguished scientist coming, one of international repute. In addition, he is a dynamic speaker. Those who have heard him say it is an experience not to be missed. The auditorium at the Museum holds 600 people. Let's hope that it's filled to overflowing.

A reservation form is inside this newsletter.

RE-SCHEDULE OF IAN ADAMS' PROGRAM

November 21 (Friday) **7:30 p.m. - Cleveland Chapter - Ian Adams will present his mushroom program at the Brecksville Reservation - Co-Sponsored with the Cleveland MetroParks.**

PROGRAM AND EVENTS:

November 8 (Saturday) **2:00 p.m. - Wilderness Center** - A program on moss identification at the interpretative building to be presented by Frank Buser, the botanist from East Stroudsburg who joined us at Hocking Hills last summer.

November 14 (Friday) **8:00 p.m. - Avon Woods Outdoor Education Center - Cincinnati Chapter** - Cincinnati's Hillsides by Robin Corathers, Hillside Trust

November 17 (Monday) **7:30 p.m. - Spring Hollow Conference Center in Sharon Woods MetroPark - Columbus Chapter** - "Tundra Wildflowers" - Member Jim Stahl will discuss wildflowers found on both arctic and alpine tundras and show slides of his trip to Churchill, Manitoba this past summer.

November 17 (Monday) **6:30 p.m. - Cox Arboretum - Dayton Chapter** - First annual pot-luck dinner. Richard E. Moseley, Chief, ODNR Division of Natural Areas and Preserves, will be speaking about native orchids.

November 22 (Saturday) **2:00 p.m.** - A **Wilderness Center** pioneer path walk to observe the winter aspect of plants.

December 7 (Sunday) **3:30 p.m. - Cincinnati Zoo** - Hardy Soul's Hike - Leader: Dave Ehrlinger - Northern Hills Fellowship, Fleming Road - **6:00 p.m.** - Covered Dish Supper - **7:00 p.m.** - "Flora, Giant Pandas & People of Sichuan, China" - Dr. Julian Campbell, University of Kentucky

December 7 (Sunday) **1:30 p.m. - Dayton Chapter** - Winter identification of native trees with Paul Knoop. Meet at parking overlook at northeast end of **Englewood Dam.** Open to public - bring camera.

December 13 (Saturday) **2:00 p.m. - Wilderness Center** - A trip to **Quail Hollow State Park** to observe interesting plant habitats there.

December 15 (Monday) **7:30 p.m. - Spring Hollow Conference Center in Sharon Woods MetroPark - Columbus Chapter** - "Bogs and Fens of Ohio" - Member Guy Denny will share his excellent multi-media production of these rare Ohio wetlands and their unique plant life. Plus annual Christmas party and pot-luck.

The Athens Chapter does not have plans ready for November and December as yet. They had an excellent field trip on October 12th to a retired paleobotanists property to survey his plants. On October 30th they will have a slide program of southeastern wildflowers through the seasons.

PRESERVING BIODIVERSITY: IS IT TOO LATE? by Jeff Knoop

Planet earth is in the midst of the greatest mass extinction in history. Today our planet exhibits the richest biodiversity ever evolved. Yet, we must face the frightening thought that, if current trends continue, our planet, through the activities of mankind, will lose 50% of all living species by early next century. The loss of ecosystems and continuing population growth create a synergistic response that threatens every species on earth.

PAST EXTINCTIONS

Fossil records reveal that the earth has endured at least 3 mass extinctions. The most recent extinction brought about an end to the dinosaur era some 65 million years ago and at this time, up to 90% of all faunal species may have disappeared. In contrast to prehuman mass extinctions which are attributable to slow processes of climatic change, the current extinction process is very rapid. A wink of the eye in earth history.

Moreover, the processes of evolution that create new species have been greatly altered. We must face the fact that species evolve within complex ecosystems. The anthropocentric landscape of today, dominated by agriculture and urbanization, tends to promote biological simplicity at the expense of biological diversity. Destroying ecosystems not only destroys individual species but more importantly destroys the very fabric necessary to create new species. Since the tropical rainforests may harbor some 10 million species the ultimate demise of these systems will represent the greatest loss of earth's biological capital.

HOW MANY SPECIES EXIST?

According to Wilson (1985) about 1.7 million species of living things have been named and described. Almost half of these are insects; 440,000 of them are plants. Erwin (1983) believes that there are 30 million species of insects alone, the majority confined to the rainforest canopy.

Since we don't even have a close estimate of how many species exist we really don't know how many are faced with extinction. The number is probably staggering. Many have become extinct, without ever having been catalogued or described. Since 50% of the tropical rainforest is gone, conservatively, we may have already lost 20% of all species. This is frightening.

WHY SAVE DIVERSITY?

To Aldo Leopold the answer was simple, "To save all the pieces is the first precaution in intelligent tinkering".

Some of the species we lose may possess unknown utilitarian values. For example, who would have guessed that an insignificant fungus would produce the antibiotic, Penicillin, the wonder drug of this century. Or that the nearly extinct desert pupfish may prove beneficial to human kidney disease because it can tolerate extremes in temperature and salinity. Almost all drugs and food crops are derived from wild ancestral species that occur in the natural world around us.

Plants and animals not only serve humankind but also offer clues for human survival. Each species that has survived through the ages to share the earth with us is a success story. Each of our cohabitants has evolved an ingenious and revealing set of life strategies.

If we look hard enough, each survivor can tell us something we need to know. For example, cave dwelling organisms can help to indicate groundwater pollution. Lichens wither and die if exposed to high amounts of air pollutants. Honey can be used to monitor heavy metal pollution. In more cases than not, a diverse landscape is a healthy landscape.

And, of course, there is the moral aspect of protecting diversity. All species, no matter how great or small, should be given a chance to survive. As rational beings, humans are responsible for safeguarding forms of life that we cannot create but suddenly have the power to destroy.

TROPICAL FOREST DEMISE

The greatest species diversity lies in the tropics and since this is a region experiencing rapid population growth and development, the consequences of rainforest destruction are severe and far reaching.

Every minute another 50 acres of rainforest succumbs to the chain saw. Every year 26 million acres, an area the size of Pennsylvania, is destroyed. At this rate the remaining rainforests will be gone within 35 years.

This is an inevitable fact if current trends continue and it has the potential of affecting all other species on the globe. Scientists link deforestation to changes in rainfall patterns and the spread of deserts. Burning of the rainforest releases great quantities of carbon dioxide into the atmosphere. This increase, augmented by the burning of fossil fuels, is contributing to a warming of the earth's climate, a so-called "greenhouse" effect. If such a change occurs it has a potential to reduce the remaining species diversity in temperate regions. And ultimately the ice caps may melt, raising the ocean levels and inundating a majority of coastal cities. Seventy-five percent of urban areas occur within coastal zones.

Erosion and crop failures triggered by deforestation will swell the number of economic refugees. Immigration officials estimate that over 30 million refugees, primarily from Mexico and Central America, may try to enter the United States by the end of this century.

RESPONDING TO SPECIES LOSS

There are a number of organizations working to preserve biological diversity. Most of the work involves acquiring land in this country or convincing a foreign country to do the same and most augment this approach with education.

The Nature Conservancy, a national conservation organization, devotes 100% of their efforts to preserving biological diversity. The approach is to acquire both terrestrial and aquatic habitats that harbor endangered species. Thus far the Conservancy has acquired some 2.5 million acres across the United States. The ultimate goal is to protect at least one occurrence of all endangered species, including rare plant and animal communities, in the United States.

Realizing that the U.S. harbors less than 10 percent of all described species, The Nature Conservancy has expanded internationally to work in the species rich rainforests of the neotropics. The approach here, however, is not to buy land. The idea is to export TNC's land preservation technology to build Conservancy-like programs and to get these methods institutionalized within foreign governments and conservation agencies. Thus far, the program has been successful and continuing progress is being made.

The World Wildlife Fund is another private conservation organization working to preserve biodiversity around the globe. Their efforts, for the most part, center around rare mammal species like the Pandas of China, the Mountain Gorillas of Africa and the golden Lion Tamarins of Brazil.

Working with the governments of these foreign countries World Wildlife Fund supports research and educational programs while providing expertise, manpower, and supplies to protect critical habitat. Using this approach the species earmarked for preservation becomes an umbrella species which ultimately protects a plethora of species. For example, the Mountain Gorilla of western Africa is restricted to a single remote mountaintop, blanketed by a lush tropical forest. World Wildlife Fund has worked with several African countries to protect the gorilla habitat and the many other rare and endemic species present. There has been some success, yet poachers and squatters continue to stress the gorilla population. If the gorilla goes, this entire montane community will follow.

Other organizations working directly or indirectly to preserve biodiversity include the National Audubon Society, the Sierra Club, National Wildlife Federa-

tion, Friends of the Earth and Greenpeace. Many others abound. Support of any of these non-profit organizations will assist in the preservation of biodiversity.

WHERE FROM HERE?

Nothing short of reducing the human population and achieving a major shift in how humankind views the natural world will assure the preservation of biological diversity.

In my opinion, reducing human populations and saving biodiversity go hand in hand. Traditionally, we have treated the symptoms with little regard for attacking the underlying problem: overpopulation by Homo sapien. (The current U.S. administration recently cut family planning assistance programs to foreign countries.) Treating symptoms will buy time. Even if replacement birth rate could be instantly reduced to 50% or one child per couple the population would continue to grow into the next century before declining. Currently, world population is growing by 85 million per year. At this rate the human population will double by 2030.

To commit ourselves to the preservation of biodiversity implies moral respect for elephants and ants, redwoods and snail darters. The greastest diversity of life on earth is in the insect kingdom. Most insects don't possess utilitarian value. In fact the United States spends a conservative $2.5 billion annually eradicating insects. Worldwide, the figure must be 10 times that amount. How can we justify preserving an estimated 10 million insect species unless we possess a reverence for life and protect species for their own sakes as our moral obligation? All species are unique and, if for no other reason, should be preserved for their beauty and presence.

This article may be depressing; all attempts at preserving biodiversity in this day and age are inherently depressing. Yet our planet has endured great extinctions and emerged victorious. Our planet has evolved at least 50 million species throughout its 4.5 billion year history. It can rebound.

Preserving land today for tomorrow will result not only in immediate protection of species but also result in leaving options open for the future evolution of new species. The islands of diversity thus far protected will expand and provide the necessary material for organic evolution.

Humankind, although the current captain of spaceship earth, is not immortal; we are a part of the fabric of life on earth. We would be wise to listen to Robinson Jeffers who wrote, "the greatest beauty is organic wholeness, the wholeness of life and things, the divine beauty of the universe. Love that, not man apart from that."

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PRESIDENT'S COLUMN:

Enclosed in your newsletter is a paper with the 1986 election ballot. This year we have issued a double ballot for use by family members. If your membership is a single one, whatever the membership category, please send in one ballot only. However, if your membership includes 2 members (family, sustaining, patron) you are entitled to return both ballots. Do not sign this ballot.

The lower half of the sheet is the dinner reservation form. Make your check payable to Native Plant Society. Return both forms to: 6 Louise Drive, Chagrin Falls, Ohio 44022.

PLEASE NOTE: The program re-schedule of Ian Adams mushroom lecture on November 21st. He is one of the most knowledgeable men in the state on the subject and a superb photographer. Several of his pictures are included in this year's Audubon Calendar.

We had a magic carpet trip abroad this Fall. Perfect weather, no illness, no troubles. Some random thoughts from across the sea. Walking the ruins of Middleham Castle on an early, sunny, dew-covered morning, carrying on a conversation with Richard the III. Climbing Hadrian's Wall at sunset with the vast silence of the moors around us and our only company the quietly grazing sheep. Touching the tomb of the Venerable Bede, history's greatest historian. Walking the paths of Bosworth Field with all the tales of the War of Roses echoing in your mind. The ruins of Byron's Abbey, and the glorious remains of Fountains Abbey, again at sunset. Chartres Cathedral standing on its hill, a beacon of faith and strength throughout the ages. The hundreds of troops with submachine guns at the ready all over Paris waiting for the next bomb to go off, and impressing us with the immense insanity of it all. Our first view of the Alps was while crossing the St. Bernard Pass as the fog drifted in and out. Climbing the glacier at the Eiger with blowing snow haloing the peaks, and finding several varieties of gentians blooming, and even an orchid. Standing in the cemetary in Vienna and facing the graves of Brahms, Beethoven, Schubert, Strauss and others, with the statue to Mozart in the middle of the circle known as Musik Corner, where the word immortality came alive. The walled Roman town of Rothenburg, untouched and unchanged in over a thousand years. The surprise of traveling up the Rhine and seeing real castle after castle perched on the hillsides, like pictures from a storybook. When I say it was a magic carpet trip, that is exactly what I mean — we were transported to a fairy tale world of castles and cathedrals, palaces and ruins, history come alive in battlefields and the homes of the giants of literature and music. Europe, from Britain throughout the Continent, is one vast flower garden, carefully tended and lovingly designed.

And yet, for all of the experiences of that six weeks and twelve countries, when our plane crossed the coast of North America I was practically hanging off the wing. Europe is an armed military camp, the line drawn between Russia and our way of life. There was not a day that we did not see constant evidence on land or in the air that each country was armed to the teeth. Every place is ready for terrorism, a fact of life in Europe. Our primary goal was to get to know the countryside and the people, and we did do just that. We came away with the firm impression that the common people want to live in peace with one another; that national politics and friction between countries is not an issue with them. However, it seemed that laissez-faire vanished rapidly as the socio-economic stratas increased, and the traditional criticism, or dislike of Americans, also increased at the upper levels. Meeting human being to human being, with nationality completely out of it, everyone got along fine; in spite of the language barrier, for which there are many ways around if one wants to try. The most precious possession, though, that we had on our trip was not our travelers checks, but our blue passport with the golden eagle on the front. Home is the best place to be, after all.

REWARD FOR ACCOMPLISHMENT by Judith Newmark

It was just a happy conincidence that the call came when it did, on his 49th birthday. Hello, Dr. Raven, the man said (more or less). You don't know me but here's $240,000. You deserve it.

And so Peter H. Raven, botanist, environmentalist, professor, director of Shaw's Garden, learned that he had been chosen one of the 1985 MacArthur Fellows.

"It was like 'The Millionaire,'" said Raven, who will receive the money, tax free, over the next five years. "The man said, 'I've been calling all these people who are supposed to be so smart, and all any of them can say is, "Gosh." It just came right out of the blue."

The John D. and Catherine T. MacArthur Foundation bestows its no-strings awards on people who are creative and who, presumably, could accomplish even more if they had more money. Raven and the other 24 recipients -- a group including a woodworker, a medievalist and a dancer -- did not apply for the followships; they were secretly nominated by an anonymous committee. The committee cited Raven for his 30-year study of the evening primrose plant; for his pioneering work in exploring the co-evolution, or related development, of plants and animals; and for his efforts toward the conservation of natural resources in the topics.

This award, extremely prestigious as well as generous, is only the latest in a long string of honors for Raven. He serves on the U.S. National Academy of Sciences Council and on the governing board of the National Research Council, "the board of trustees of American science," according to his wife, Tamra, herself a botanist. "Peter rises to the top of whatever he does."

What does this latest honor mean?" "Well, it's a recognition isn't it?" Raven said, almost shyly. "Somebody decided you are good and hard-working and wanted to help you. It will help me psychologically. If you have a big, diverse job -- which this is and which I love -- you tend to feel that you can't accomplish everything you want to. This will encourage me." He talks vaguely of hiring an assistant or studying abroad, definitely of planning a short leave to give himself "a block of one or two months of heavy, sustained work. You get a lot more done that way. Since grad school I have rarely had the luxury of doing one sustained thing."

Or, perhaps, the desire for it. Living and working behind the stone Garden walls, Raven seems to lead a dozen lives. He moves, frequently and easily, from the administrator's desk to the scientist's greenhouse, from the solitude of the scholar to the bustle of the fund raiser, from the efficiency of the computer bank to the charm of formal gardens.

There is more old-fashioned charm in the Ravens' home at the southeast corner of the Garden. They spend a lot of time on the breezy back porch overlooking

their fabulous yard, with a garden that testifies to their shared passion for natural beauty. (The Ravens met at a botanical field study in Costa Rica. They have four children: Alice, 25, Elizabeth, 23, Francis, 8, and Katie, 2) "Peter tries to be home at 6 -- it's a hard rule," Tamra Raven said. "We try to have a civilized, sane existence with our little kids.

But it's not unusual for him to be working at his computer up on the third floor at 5:30 in the morning, before he goes to the office. There isn't a lot of time. I have actually made appointments with him.

"But the Garden is beautiful, and deals with global issues. We were pretty impressed with the potential when we moved here. We have always felt that this place is a great challenge, and fun -- both."

Under Raven's direction, Shaw's Garden has become the pre-eminent botanical garden in the United States, as well as the oldest extant one. When he arrived in 1971, there were three Ph.D's on the staff; today, there are more than 30 on the Garden's payroll. Ten of them live in the tropics; one is stationed at the British Museum in London; another, at Chicago's Field Museum. The Garden's Herbarium, which was considered large at 2.4 million specimens when Raven came here, has 3.5 million now, making it the largest in the world.

In addition, Shaw's Garden, Harvard University and the University of California at Berkeley are considered the foremost institutions in the world in tropical ecology. And, though the Garden is by far the smallest of the three, its commitment would be hard to equal.

The problem, Raven explains, is that tropical forests are disappearing so rapidly -- because of logging, cattle-raising and poor agricultural methods — that every day, more and more species of plants are becoming extinct. Most are plants that have never even been named, let alone studied.

Yet it is known that many of them are related to other plants, such as grasses and legumes, that are good sources of food for man. "The plants that produce most of our food -- rice, corn and wheat -- were cultivated by primitive people because they were so obvious," Raven said. "Most plants have never even been looked at to see if they might be of interest to us now." If some of the threatened plants are potentially nutritious, that would be very helpful in a region where starvation is rampant. The plants might have other practical uses, too, as fodder, firewood or in drugs.

But at the present rate, many will be destroyed before any of that is known, Raven says. He describes the destruction as a crazy game of ecological gin rummy, where most players don't even look at the hand before they give up their cards. "It's mindless," he said. "It's an emergency."

* * *

"This is one of my favorite views of the Garden. If you consider that we are

right in the middle of the city ...!" Raven, behind the wheel of the little motorized surrey he uses to tool around the Garden's 79 acres, gazed north across a lake and toward the Japanese Garden. In the winter, he says, you do have to look at Barnes Hospital. But the summer view is completely enclosed, a cool basin of green.

The people strolling down the paths or resting on benches seem to enjoy that illusion of remoteness, to appreciate the tranquility. Raven said he would like to appreciate it, too. Then he shook his gray head. "It's hard for me to relax in the Garden," said the tall, powerful-looking scientist. He is too busy looking for soft spots, checking to see what might need to be done next.

The Garden has grown tremendously under Raven's direction. There is one building, a greenhouse near the Climatron, that has had "essentially the same display for the last 103 years," he said, a curiosity that delights him. But almost everything else today would stun Henry Shaw, the 19th-century hardware magnate who created and endowed the Garden.

Shaw's own garden, Raven said, was made up of "super-fancy, flat beds of flowers. There was a gazebo you could climb (to observe the floral designs from above). He had a much bigger staff than we have now, all poorly paid laborers. You need that in that kind of garden.

"In 1912 or '14, the graceful, swooping beds you think of as English gardening were included. People think it is Shaw who designed that, but he wouldn't have known that at all. A woman in England, Gertrude Jekyll, designed the concept in the late 1800s."

If those beds would have startled Shaw, what would he make of the Japanese Garden, now the most popular exhibit of all? (The Climatron is No. 2.) Raven freely admits that even he can't quite believe it. "It's only 8 years old, and the carp in the lake have almost become a St. Louis landmark of their own," he said. "This is like a garden you would have built in Japan about 100 years ago, if you were rich and lived in the country — a big garden that could incorporate all the elements of landscape architecture."

Plans are under way for other new, appealing garden areas: a meadow of plants that attract butterflies; "Missouri glades," rooted in limestone or sandstone; and an 8½-acre Home Gardening Center. "I know that will attract people, no question," Raven said.

That has always been her husband's goal, Tamra Raven said. "Peter's idea is that the Garden should be as open to as many kinds of people, with as many different interests, as possible. Very broad -- not narrow."

"When we first came here, we would look over at the Garden at night and it was dark. Nothing was going on. Then the Lehmann Building was finished and gradually, things started happening. We would always attend whatever was going on."

"Then we would look over and see people. - Oh, it's such-and-such a group meeting, or a performance. But we were not there any more. And now we look over, and see things, and we don't have a clue!" Progress. Tamra Raven grinned with pleasure.

* * *

At an age when other kids are thinking about dates and hit records, Peter Raven was already an experienced field botanist. "I was interested in natural history from the time I was 8 or 9 years old," he said. "Bugs and things. There are nice parks in San Francisco, where I grew up."

(Raven was born in Shanghai, where his father was a banker, but the family soon moved to San Francisco. "I had my first birthday on the boat to California. In fact, I had two first birthdays, because it fell on the day we crossed the International Date Line," Raven said.

There were extra science classes after school, annual summer outings with the Sierra Club to study the plants of the Sierra Nevada, eventually a botany major at the University of California at Berkeley. Then, the summer before his senior year, "I found a very rare plant, by chance, in the presidio in San Francisco -- it only occurs on one small outcropping -- a **clarkia**, named for Clark of Lewis and Clark." He began to study the plant -- a member of the evening primrose family.

There are about 200 species of the plant, known scientifically as the **onagraceae** family. They are found in many parts of the world. "Few plants cover such a wide range," said Raven, who has written more than 100 scholarly papers and a book on this one subject. "You can cross most of them and study the hybrids to see how the genetic factors come together." That versatility in the laboratory makes the evening primrose something of a botanical fruit fly.

About 15 years ago, the Ravens went to New Zealand to study the nearly 40 different species of evening primrose that flourish there. "You really want to understand why there are so many in New Zealand, and only a dozen in the Rocky Mountains," Raven said. "Why are so many crammed into such a small space? What is going on?

"In New Zealand, most of them are above the timberline in habitats that didn't exist 3 or 4 million years ago. So the few groups that can grow well there diversified, took up lots of niches. The Alpine regions of New Zealand represent a kind of new opportunity for plants.

"Everything is in a frenzy of evolution. When you study groups like the **onagraceae**, it becomes a gigantic, utterly fascinating puzzle. What biologists try to understand, working in the level of systems and ecology, is: What are the general rules that govern life? What are the unifying principles?

"Evolution is the greatest unifying generality in biology," he continued. "And

it's not just biology, it's pervasive in human thought. Yet it came directly from the study of biology. Darwin spent 20 years studying the formation of barnacles.

"Genetics is a great, unifying field. The fact that all organisms replicate themselves by means of a single kind of chemical molecule (DNA) -- that's a tremendous generality that goes back only to 1953. If you don't know that, you can't cure cancer, you can't even think about what causes cancer."

"That's how it builds. In that sense, the evening primrose family is just a vehicle for studying that. But it's a very good vehicle."

Raven and noted biologist Paul Ehrlich crystallized one such general, basic principle in their landmark 1965 paper, "Butterflies and Plants: A Study in Co-Evolution." The paper set forth a new concept (and, incidentally, coined a new word, now standard among scientists): Animals and plants affect each other in the ways they develop. The evolution of the one may depend in part on contributions of the other.

For example, some flowers that are pollinated by birds, not insects, are red; birds can see red, but insects cannot. Some white flowers, which do attract insects, turn red after the nectar is gone — it's "like turning off a neon sign," Raven explained. The characteristics of birds and insects are affected by the plants in much the same way. For example, he said, birds that visit flowers a great deal, like hummingbirds, may develop long beaks.

Those accommodations go on constantly, he said, even if we are not aware of them. "The average person doesn't think that a woodland is a dynamic set of interacting needs. But each population is gradually changing from generation to generation. And the representation of each species, the number, is determined by the way it lives, the way it eats, the way it relates to the other species."

But that dynamic balance, Raven warns, is threatened in a more urgent fashion than ever before. "What is happening worldwide is that a human population that was 2.5 billion in 1950 is now 5 billion — and in 30 years, 8 billion. You go from 2.5 billion to 8 billion in 70 years — the length of one human life — and you are putting pressures without precedent on the whole productive capabilities of the earth.

"As you reduce and change the systems of the earth, you really do not know what will happen to the human race. You cannot expect it to keep going uninjured. You are striking at the fabric of life."

The 10 Garden botantists stationed in the tropics are trying to find, collect, describe and understand the local plants. (Incidentally, the Garden spent about $400,000 on their work in 1984; the money came from the Garden's $1.1 million in research grants.)

"The tropics are being destroyed so rapidly that opportunities to study organisms there are being lost," Raven said. "And so many species that are so poorly known. At most, one out of six has even been named. Learning about them could provide a key to use."

The diversity of tropical plant life makes the botanists' task sound almost hopeless. "In one hectare (2.47 acres) of tropical forest in Peru, you can have 700 species of trees. That's as many species of trees as there are in the United States and Canada put together," he said.

"We act as if it didn't matter. But whether you are talking philosopically, or in terms of human comfort -- in the tropics, about 11 million babies under the age of 4 starve to death every year. And older people are starving too.

"People say things like, are we going to avoid a catastrophe? I say, about 75,000 to 100,000 people are starving to death **every day.**"

Today, of course, the tropical regions in the world are more likely to draw attention for their political troubles than their ecological ones. But according to Raven, there is really little difference. "The political problems are generated by the same sources -- depletion of resources, absolute poverty, consumption rather than management of forests -- as the environmental problems. To look at it as an economic or political problem is to dismiss any possibility of solving it. Those are just the symptoms at the end. The symptoms can be manipulated forever, no government replacing another. These are just games we are playing."

Yet, he does not consider these problems hopeless. A strong combined effort addressing population control, the cultivation of labor-intensive industry to combat poverty, and intelligent farming methods could create a better life for people in the tropics, he believes. That, in turn, would give them an alternative to slash-and-burn farming that, right now, is their only chance for any sustenance at all.

Slash-and-burn farming is the major destroyer of the tropical forests, Raven said. The farmers exhaust the land in just a few years with this method of clearing land, so they move on to repeat the process elsewhere. "We think of it as mean and mindless, but what choice do they have?" he said. "About 40 percent of the people in the tropics live in absolute poverty, as defined by the World Bank. No hope at all. They are ignored by their own governments, who concentrate on the upper and middle classes. You have got to find a way to incorporate them into the economy.

"That means you need to understand the way the forest works -- the management of natural resources, your assets. In the tropics, by and large, a combination of lack of education and no credit and a foolish desire to think that our American agricultural systems will work means that we are really consuming, not managing, resources.

"When we try to make a tropical forest into a soybean field, you are asking for trouble. Nature didn't make these tropical regions diverse for laughs. An area in the tropics has many things in it because that works well, and stably, to control the flow of energy and nutrients there. On a prairie, many fewer species do the same job. So what needs to be done is to figure out how to use the forest, the agriculture, the soil in a suitable way."

As things stand, Raven estimates that 10 to 15 percent of the species in the tropics will be extinct in the next 30 years. "You are talking about 25,000 to 40,000 species of plants," he said. "More extinction will happen in our lifetime than has happened since the dinosaurs. It simply means the world will be poorer. You **know** that some of them are valuable. We just want to keep some of them, selectively."

Given the urgency he himself describes to this issue, shouldn't Raven concentrate on tropical conservation and let someone else tend the Garden? Raven things not, not at all. "The thing you have to remember about the Garden is, the reason it is here at all is St. Louis supports it and has for years," he said. "You appeal to the people in the community and by doing that, you involve their sense of ecology and the environment. You educate people.

"If you were going to devote everything to research, it would all disappear. All the parts fit together and reinforce each other. If we have a successful Home Gardening Center, it will be that much easier to raise funds for tropical study. If the institution is strong, we can go forward in many directions."

And what directions would Peter Raven like to go forward in himself? Where does he hope to be at 59? The MacArthur fellowship has made him give those questions a little extra thought lately.

"You know, I'd like to wrap up my work on the evening primrose, bring it to a logical plateau. I'd like to look back and see that," he said. "And I'd like to be able to look at the tropics in 10 years and see that things are better, and that I have made a difference toward that.

"People say, what is really going to happen? Well, things are bad, they are going to be bad. But people can help. If we can save 300 legumes, that's great. Or save 50. One. Extinction is permanent.

"There **is** a lot of interest. But there can never be enough. Every day there are fewer species than there were the day before. Every day you have less chance to affect it. Every day, what you can do is what you do."

This article is a reprint from the St. Louis Post-Dispatch.

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NATIVE PLANT SOCIETY OF NORTHEASTERN OHIO

Founding Chapter Of

THE OHIO NATIVE PLANT SOCIETY

6 Louise Drive Chagrin Falls, Ohio 44022

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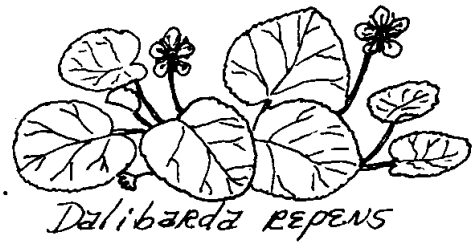

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