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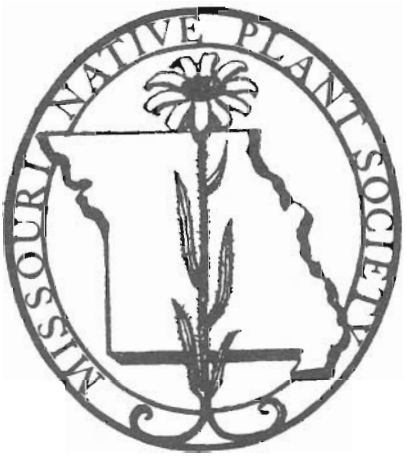
Missouriensis



JOURNAL OF THE

MISSOURI NATIVE PLANT SOCIETY

CONTENTS

Missouriensis is the official publication of the Missouri Native Plant Society. Founded in 1979 as a non-profit corporation, the Society is devoted to the conservation and study of the plants growing wild in Missouri, to the education of the public about the significance of the native flora and its habitat, and to the publication of related information.

Minutes of the Winter Meeting

Winter Meeting of Missouri Native Plant Society--held at the Missouri Botanical Garden, St. Louis, MO, on Saturday, January 12, 1985.

Morning Program

Speakers were Carol Sutherland, David Castaner, Jim Henry Wilson, and Paul Nelson.

The Board Meeting was held in the afternoon with the following members present:

Melvin Conrad, President; David Castaner, Vice President; Jean Webdell, Secretary; Jay Raveill, Bob Mohlenbrock, Ginny Wallace, John Molyneaux, Joanna Turner, Rod Miller, Erna Eisendrath, Mervin Wallace, Sue Taylor, Bill Summers, John Doggett, Karen Haller, Paul Nelson, Jean Freiling, Catherine Filla, Pat Grace, Owen J. Sexton, Art Christ, Susan Russell, Katherine Chambers, Barbara Krauz, John Logan, Mary L. Lehmann, and Sandra Posen.

The meeting was called to order by President Melvin Conrad. Members introduced themselves.

Minutes were approved as printed in MISSOURIENSIS.

Treasurer's-Membership Report

Paul Nelson made the treasurer's report for John Karel, who was absent. On September 22, 1984, there was $3,838.73 in the treasury; membership dues increased the treasury by $811.50 for a total of $4,650.23. Disbursements were $100.00 to St. Louis Chapter of MONPS; $166.50 to S.E. MO State University for breakfast (members paid MONPS): $19.10 for doughnuts; $60.00 for postage for 1985 membership renewal notice, totalling $34.60. Balance on hand on December 31, 1984, was $4,304.63

A breakdown for the year was also provided. The year 1984 showed an income of $3,226.00 in dues with $163.12 paid by members for breakfast; this in turn was paid out in expenses. Expenses for the year for postage, $173.20; printing MISSOURIENSIS, $1,614.00; contribution to MO Parks Association, $50.00; St. Louis Chapter of MONPS, $100.00; and miscellaneous MONPS meeting costs, $210.90; Totalling, $2,148.10. The balance from 1983 was $3,063.61, the addition of $1,241.02 (income less expenses) left a balance of $4,304.63 at the end of 1984.

Membership renewal notices were mailed by Treasurer John Karel and as of January 9, 1985, only 140 of 313 members had renewed. John Karel expressed concern that more renewals had not come in.

In response, Karen Haller, Treasurer of the St. Louis Chapter, reported that she had $420.00 from approximately 44 St. Louis Chapter members

(some gave more than the regular membership dues). Memberships had been delayed because the President, Dotty Epstein, is receiving the mail in Florida and must send it back to St. Louis. In the future members who join the St. Louis chapter should send their dues to Karen Haller at 618 Spring Meadows Drive, St. Louis, MO 63011.

No membership report was made from the committee; however, discussion continued on problems and concerns with membership.

Problem--forwarding of members' names to be put on or deleted from mailing list for MISSOURIENSIS. Jerry Harris, Department of Natural Resources, apparently has a manual membership file.

It was suggested that members of the St. Louis branch and other branches as they form should be indicated with a chapter code that could be put after members' names, following a comma.

One goal of the membership committee has been to increase local chapters. Mary Lehmann reported that a Jefferson City chapter is being formed.

With March being the next target date for MISSOURIENSIS, it is hoped that an up-to-date membership list will be available at that time.

To expand membership, Nancy Morin suggested that a one-page flyer on MONPS be developed and sent to Garden Clubs and colleges around the state.

Paul Nelson felt that the Society needed to strengthen itself before it sought expansion.

Bob Mohlenbrock, SIU, reported that as a member of many native plant societies that they have traditionally gone up and down in membership. He suggested that the best way to expand membership was for each individual member to recruit other members.

It was also suggested that inventory sheets for reporting plant findings could be sent to members and others to encourage expansion of the inventory and gain recognition for the Society.

It was also suggested we co-sponsor some events with other organizations.

Ginny Wallace mentioned that the membership brochure could be updated and possibly have a post office box to write to for information as the officers change. An alternative would be to have a rubber stamp or labels that could be put on the flyers with the current address on them.

Another idea was to have an article developed for the CONSERVATIONIST or that some type of short notice of some native plant society activity could be placed in the Almanac Section of the CONSERVATIONIST with a paragraph about the Native Plant Society.

New Business

Ginny Wallace and Jim Henry Wilson reported on a plant salvage to take place at the Ruth and Paul Henning State Forest, where a parking lot will be constructed. Native plants in that area will be made available to society members and/or possibly to the public. Still in the formulation stage, plans are being considered to ask MONPS members to help the public in locating, digging and counseling them about the plants. More news will be forthcoming on this venture.

Field Trips

Ginny Wallace reviewed the questionnaires that had been returned and found that most people were interested in going to new places, places that they were not familiar with or places not generally available to the public. From the questionnaires, Ginny Wallace has names of people interested in helping with field trips. Areas that were most requested were prairies and glades; the flower people most wanted to see was the orchid. She is hoping to have local field trips around the state that are open to the public. Some of these will be in conjunction with our Spring Meeting in Springfield.

In addition, she hopes to have an article in every issue of MISSOURIENSIS of locations of where to go to see plants. Regional field trips will be publicized through flyers and local contacts, who can possibly put the information in the local papers.

Awards

As part of his morning talk, Paul Nelson had suggested that the Society might want to recognize the contributions of individuals to the preservation of plants. The Prairie Foundation does give out awards such as the Conservationist of the Year and Land-owners of the Year. It was mentioned that at one time the Board had developed a Julian Steyermark award, but had never followed through on giving it out. A motion was made and passed that the President appoint an Ad Hoc Committee to develop an awards system to include award categories, requirements, develop names for the awards if so desired and determine what the awards will be. A report from the Committee should be made at the April Meeting. The first awards will be given out in June 1986 at the Annual Meeting.

Election

John Doggett and Steve Chaplin were elected to serve two-year terms on the board of MONPS.

Other

It was requested that names and addresses of other native plant societies be made available to members to be used for contact about vacations, etc. Ginny Wallace reported that she had such a list.

Future Meetings

Spring Meeting to be held in Springfield, MO, on April 26, 27, 28. The Board meeting will be 1:00 or 1:30 p.m. on Saturday, April 27. Field trips possibly on Friday and Saturday night.

Dates for future meetings were set as follows.

MONPS Annual Meeting to be held June 7, 8, and 9 at a location to be announced.

Other 1985 meetings will be held on September 7 and December 7. 1986 meetings will be held on March 1 and June 7.

Minutes of the Spring Meeting

Minutes of Missouri Native Plant Society Board Meeting--held in Springfield, Missouri, on April 27, 1985.

Members Present: Board Members--Ginny Wallace; Wallace Weber; Joanna Turner; David Castaner (Vice President and presiding); Jean Webdell, Secretary; John Molyneaux; and Jay Raveill.

Other members present: Paul Redfearn, Paul Nelson, Pat Grace, Gary A. Reese, Sue Hollis, Bill Summers, Mervin Wallace, Karen S. Haller, Robert C. Hansen, Sue Taylor, Dick and Susan Russell, Sherry Morgan, Jim H. Wilson, Dotty Epstein, and Jean Freiling.

The meeting was called to order at 3 p.m. by Vice President Dave Castaner in the absence of President Melvin Conrad.

To begin the meeting, members introduced themselves.

Treasurer's Report

In the absence of Treasurer John Karel, Paul Nelson made the treasurer's report. Nelson noted that 273 people had renewed their membership, a decrease of 40 from 313. Balance in the treasury on 1/1/85 was $4,304.63. There was an income of $1,113.00 from membership dues. Disbursements were $23.64 for coffee and donuts for 1/12/85 meeting; meeting notices, $9.50; $15.00 payment for chapter dues paid to state society. Total disbursements were $48.14. Balance on hand on 4/26/85 was $5,369.79. New membership lists were distributed. Membership runs from January to January, with a grace period through March. Sue Taylor is to take the list with address labels to St. Louis.

Paul Nelson reported that a letter had been received from Dr. B. R. Cook of New Zealand, who had two copies of MISSOURIENSIS and wanted additional copies, as well as some type of condensed version of the flora of MO. Back issues of MISSOURIENSIS will be forwarded to him.

Nominating: Two members of the nominating committee, Jim Henry Wilson and Sherry Morgan, were present. It was notd that Steve Chaplain is moving out of state and will have to be replaced. Nominations were not complete at the meeting and will be mailed out.

Inventory: MO Flora List--Paul Nelson displayed a three-inch stack of computer print-outs on Missouri Flora, which is part of the attempt to computerize Steyermark's flora list with added species. Members mentioned that they already had additions for the list.

Inventory Committee Head Jay Raveill reported that the project is going on many fronts and far beyond the initial idea of County Records. Problems include the acquisition of new records, with approximately 2000

more needed. Another problem is the selection of plant names. On the positive side, D. Weber has nearly completed a digitization of Steyermark's records.

The merits of publishing a want list were then discussed. The question was raised whether people would look for other plants not on the list. David Castaner wanted a preliminary check list. This was also debated. The discussion concluded with Paul Redfearn's comments on computers and plants. Dr. Redfearn felt that the most important thing was to know habitats of plants so they could be found. He reflected on the danger of loving data and forgetting to love plants. This love of data can result in a neurosis known as dot jockey.

Awards Committee: Since there was no record of an Awards Committee being appointed previously, Vice President David Castaner appointed Paul Nelson, Ginny Wallace, and Gary Reese.

Missouriensis: Delay in publication has been due to computer changeover at the Missouri Botanical Garden. It was suggested that the number of issues be reduced from four to three per year, with the remaining issues being larger.

Native Plant Awards: It was suggested that the Native Plant Society develop a system and criteria to recognize the six most important plant finds. The Audubon Society has a similiar program for the 12 best bird finds. The Missouri Natural Heritage Program was suggested as the organization that could make recommendations for the awards, which could then be published.

Post Office Box: A discussion of the need for a post office box located in Jefferson City where the box would be accessible to members from DNR or the Conservation Commission then took place. It was resolved and passed that Ginny Wallace would investigate the cost and other needed information on the renting of a post office box in Jefferson City. In addition, she is to establish guidelines to make sure that mail is picked up, etc. This information is to be submitted to board members before the next board meeting.

David Castaner brought up whether a stamped post card should be enclosed with the meeting notice. Only approximately 40 of the membership returned their cards, thus wasting the rest of the postage. It was suggested that Ginny Wallace also check on what is needed to have return postage guaranteed on cards so that payment is made only on those that are returned.

Death of Erna Eisendrath: A resolution was passed that $50 be donated to Tyson Research Center c/o Washington University from the Native Plant Society in the memory of Erna Eisendrath. In addition, a special article is being written and the next year's issues of MISSOURIENSIS will be dedicated to Mrs. Eisendrath, who was so instrumental in starting the newsletter.

Steyermark Slides: Gary Reese suggested that black and white slides be made of the negatives of pictures that Dr. Steyermark took years ago. The Board voted to appropriate $100 to be used at the discretion of the committee, which is composed of Sue Taylor, Pat Grace, Joanna Turner, and Gary Reese, to reproduce the negatives in the form of black and white slides. (Joanna Turner believes that there are prints of thse negatives somewhere else in the Garden.)

Special Display: The Garden Club of America is having a special show in September at the Riverfront area in St. Louis. They have asked the Native Plant Society to have a display of some type as part of the show. A discussion of what could be displayed and who would do it took place. Paul Redfearn has a video tape which could be used on a VCR. It was decided that the task of the display would be assigned to the St. Louis Chapter, which will report on any cost at the next meeting.

Membership Brochure: It was suggested that, with a new post office box, a membership brochure could be developed. Ginny Wallace is to coordinate the brochure and ideas are to be submitted to her. It was requested that the St. Louis Chapter, which has 90 members, be included in the brochure.

MONPS Pins: Wally Weber has a fancy newfangled machine that makes buttons. He was wondering if people would be interested in having some; they cost $.50 to make and if sold for $1.00, he would donate profits to the society.

Annual Meeting: The Annual Meeting which will be held on June 7, 8, and 9, at Alley Springs, was discussed. The importance of getting out a notice right away was stressed.

Other Business: Field trips were held in the morning of Saturday and Sunday. In addition, a nice party was hosted by Wally Weber. Paul Redfearn showed his slides from China. Thanks to the Webers for the nice party and the coordination of field trips.

Show-Me Places

Virginia K. Wallace[1]

A little over a year ago a questionnaire about MONPS and Missouriensis was sent with the dues notices. The response was good and results were summarized in Volume 5 No. 4 of Missouriensis. One of the things we learned was that one-third of the respondents would like to see information on interesting places to botanize included in Missouriensis. We also learned that most respondents were interested in field trips to natural areas. Surprisingly, few people were interested in trips to public lands.

Beginning with this issue, I will be contributing a regular column in Missouriensis in which I'll introduce one or two areas in different parts of the state. The article will include what plants may be found, the best times to visit, and directions on how to get there. I intend to write about Department of Conservation areas: State Forests, Wildlife Areas, Accesses, Natural History Areas, and Natural Areas. My reasons for this are several. First, these areas are public land and open to anyone at any time without having to gain a land owner's permission. Secondly, I was dismayed that so few people wanted field trips to public lands until I realized it is probably because most of us don't really know what types of areas are in public ownership. There is much more than second-growth forest and cropped wildlife areas. Many of the state's rare and endangered plants occur on Conservation Department lands which are not classified as Natural Area. So, I hope to show you some of the interesting places to see that are in public ownership. (NOTE: Plant collecting is NOT allowed on any of these areas).

Finally, I am writing about public lands because I am a Conservation Department employee, and I know of enough Department areas to fill articles for years to come. I realize there is an abundance of "good," diverse areas to botanize outside of DOC lands (in fact my favorite is owned by the U.S.F.S.). I hope others of you will share some of your favorite places.

Now for the first of our "arm chair" field trips.

PAINT BRUSH PRAIRIE
Pettis County

Prairies were selected as the type of area that questionnaire respondents were most interested in visiting. Paint Brush Prairie is one of the finest examples of native virgin prairie that I know of in the state. It's also one of the easiest to get to; it is located on the east side of Highway 65, nine miles south of Sedalia (see map). Seventy-four acres of the prairie are a designated Missouri Natural Area. In 1983, the Department purchased an additional 80 acres south of the gravel road and 80 acres to the east of the Natural Area.

[1]Botanist, Missouri Department of Conservation

I have visited Paint Brush Prairie often at many different times of year. Each time I find something new, and I have never been disappointed. Mid-May is an excellent time to visit Paint Brush. In fact, that's when the Department holds Prairie Day, which has been held at Paint Brush frequently (this year Prairie Day will be held there on May 18). The Indian Paint Brush is in full bloom then, and carpets portions of the prairie. The area nearest Highway 65 is hayed annually to encourage this magnificent display. You can also expect to see Yellow Star Grass, Hoary Puccoon, Golden Alexander, Golden Ragwort, Blue-eyed Grass and the Creamy Long-bracted Wild Indigo, as well as a host of other spring blooms. If it's been an early spring, even the Pale Purple Coneflowers may be beginning to bloom.

By early June, around the 10th, the coneflowers are in full bloom. Both purple (Echinacea pallida Nutt.) and yellow (E. paradoxa (Norton) Britton) grow here. Early June is also when the rare Mead's Milkweed blooms. It is estimated tht over 1,000 stems of this species grow on Paint Brush Prairie, which is more than the rest of the world's known populations combined! (Research is being conducted on this population so the plants MUST NOT be disturbed.) Last June, while looking for Mead's Milkweed on the new portion south of the gravel road, Donna Pasley and I found several clumps of Grass Pink Orchid, Calopogon tuberosus (L.) Britton, Sterns & Pogg. It was a new record for Pettis County, and just shows that no matter how often you visit a place you'll never see it all; there is always something waiting to be found.

In addition to plants, there are many interesting animals to be seen here, including Upland Sandpipers, Henslow's Sparrows, and Prairie Chickens. I have also seen bright pink Katydids (which may be a new species).

Toward the end of July the Blazing Star, Liatris pycnostachya Michaux, begins to bloom. It is very common on Paint Brush and the display of color is nothing short of spectacular. It's followed by Ashe Sunflower, Rattlesnake Master, Compass Plant, and goldenrods. The short little Liatris squarrosa (L.) Michaux and the tall L. aspera Michaux bloom later still.

There are still sights to see in October and even November, when the Downy Gentian and Ladies-tresses Orchids bloom. A beautiful scene I discovered this past fall is the silvery, feathery fruits of Liatris squarrosa shimmering in the late afternoon sun.

An informational brochure is available for this area and may be obtained by writing to me at the Department of Conservation, P. O. Box 180, Jefferson City, MO 65102. There are two additional prairies nearby, both owned by the Missouri Prairie Foundation. Friendly Prairie is one mile directly west of Paint Brush on the gravel road, and Drover's Prairie is one mile south and one mile west of Paint Brush on Highway 52.

Make plans to visit all three of these areas in 1985. They are open every day of the year. In order to protect the prairie, vehicles,

camping, fires, and plant and animal collecting are not allowed. Hiking is encouraged. No matter when you choose to visit I guarantee you will not be disappointed.

(If you make a plant list, and/or find anything new or unusual, I would love to hear about it. Also, if you find any pink katydids, please contact Dennis Figg at the Conservation Department, P. O. Box 180, Jefferson City, MO 65102.)

Oenothera triloba Nutt.

Edgar Denison[1]

Oenothera triloba Nutt. is one of many species which should be on the "rare and endangered" list of Missouri, but isn't. The St. Louis chapter of the Missouri Native Plant Society knows of only one locality where it can be found. Steyermark (1963) calls it "rare and scattered," showing six counties from which it has been recorded over the past 120 or so years. [Ed. note: Past issues of Missouriensis have reported collections from three additional counties: Johnson, Vernon, and Washington.]

Steyermark further suggests that the species "makes a fine addition to a rock garden or perennial border." This is certainly a valid statement but we should be aware that O. triloba is a biennial. The flowers resemble O. macrocarpa Nutt. to the last detail, though they are somewhat smaller. The leaves are totally different in the two species, O. triloba having deeply cut, irregularly toothed, narrow leaves, all in a basal rosette. The shape resembles somewhat the leaves of dandelion though the teeth of dandelion leaves are recurved, pointing toward the center of the plant, while those of O. triloba are more perpendicular to the central axis.

Oenothera triloba needs a well-drained soil, or an imitation of the stony texture of a limestone glade. It self-seeds generously and, given the space, will spread readily. Despite the fact that the plant has a taproot, it transplants well if taken up with sufficient soil.

Having grown O. triloba, an evening primrose which has no specific common name, for many years in a number of spots in the garden, I was puzzled by the way the flowers open and, even more so, by the great difference in the timing that triggers the opening and closing of the flowers. The opening process is fascinating because it is accomplished in a period of a few seconds to no more than two to three minutes. In bud the petals are tightly rolled--like an umbrella--showing a small, yellow tip from the middle of the afternoon on the day, or rather evening, on which they will open. Slowly the pistil emerges through this tip, its four lobes tightly joined. The opening of the flower begins when the connate sepals break apart and the petals start unwinding their spiral fold. Simultaneously the lobes of the stigma descend to their horizontal position. In contrast to this nearly instantaneous process, the unfolding of the O. macrocarpa flower takes hours.

Flowers open almost any time after 6:00 p.m., but usually they open just at dusk. O. triloba is very floriferous over a period of several weeks. I have observed as many as 30 flowers open in one evening. Even more mysterious than the flower opening time is the closing in the morning.

[1]544 East Adams, Kirkwood, MO 63122.

On most mornings all flowers will have closed before 6:00 a.m.; on others they may still be open at 9:00 a.m. What determines the timing of the opening and closing mechanism?

It dawned on me that temperature is the deciding factor in this problem. With night temperatures around 60°F flowers stay open until 9:00 or 10:00 a.m. Also, on cooler days the flowers open earlier in the evening. Thus, the cooler the day the longer the flowering hours.

May 30, 1984, revealed more information. The morning temperature sank to an unseasonal 41°F and daytime temperatures did not exceed 60°F. What happened to O. triloba? The flowers which opened during the evening of May 29 stayed open not only during May 30 but did not close until 9:00 a.m. on May 31. There was no sign of wilting though the color of the petals faded to a clean white with deep yellow veining.

Insects cannot fly when it is cold and, thus, I theorized that Nature cleverly developed the time-temperature variation in the length of flowering to increase the chance of insect visits on cooler days. The weak point of this idea was that I have never observed an insect visiting my plants, though I expected visits by night-flying moths. F. Schuyler Mathews (1902) does mention this form of pollination for the larger flowered Oenotheras. On the other hand, self-fertilization seemed impossible due to the position of the stigmatic surface considerably above the stamens. Yet, the specimens in my garden produced a lot of viable seeds.

This is where Warren L. Wagner, a botanist formerly with the Missouri Botanical Garden, and, today, Associate Research Botanist at the Bishop Museum of Honolulu, Hawaii, came to my rescue. Dr. Peter Raven, who calls Warren Wagner THE expert on the genus Oenothera, submitted my findings and questions to him. The unexpected reply was that O. triloba "is typically self-pollinated". As the flower withers and shrivels, the pollen does come in contact with the stigma, according to Dr. Wagner. This is very surprising for two reasons: First, one could expect the pollen to have lost its viability at the time of wilting, and, second, the stigma is usually unreceptive at such a late stage of the flowering. Dr. Wagner also pointed to the fact that O. triloba has no scent, an absence typical of flowers which do not depend on insects for pollination.

My theory having been scrubbed, I still wonder, why such a spectacular floral display with its timing intricacies of flower opening and closing persists, and speculate that in its evolution O. triloba must have had a very different ecological and climatic association from today.

For those not familiar with the structure of the flowers of O. triloba and O. macrocarpa, it should be of interest that what looks like the stem of a flower--almost seven inches long--is not a stem but part of the flower, the floral tube, with the ovary located at the lower end. The immense journey which a pollen grain has to accomplish to travel from the stigmatic surface to the ovary is, considering the microscopic size of the pollen grain, comparable to Man's journey to the moon.

One final puzzle. Why is the Oenothea named triloba? What is three-lobed? Does anybody know?

If you, dear reader, are aware of a locality that supports O. triloba, please share this secret with me or Mrs. Ginny Wallace, Botanist of the Missouri Department of Conservation. Such a locality should be protected.

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The Effects of Simulated Grazing Disturbance on Clematis fremontii S. Watson var. riehlii R. O. Erickson

Carol S. Sutherland[1]

Clematis fremontii S. Watson var. riehlii R. O. Erickson (Ranunculaceae), Fremont's Leather Flower, is endemic to the dolomite glades of Franklin, Jefferson, Ste. Genevieve, St. Francois, St. Louis, and Washington Counties in eastern Missouri, and has been reported locally from Ozark and Shannon Counties (Steyermark, 1963). Although this plant is abundant to moderately abundant where it occurs, its populations are confined mainly to an area (metropolitan St. Louis) where its habitat may be destroyed by urbanization. Therefore, it is considered a species to be watched (Missouri Department of Conservation, 1984).

Casual observation indicates that on privately owned glades where grazing occurs, grazing disturbance seems to favor increases in numbers of individuals and vigor of the leather Flower (Sexton, 1983). Although cattle do not eat this plant, it is not known which aspect of disturbance--removal of competition or compaction of the soil--is responsible for the observed increase. The research currently in progress seeks to examine and quantify the effects of removal of competition and litter on C. fremontii var. riehlii by measuring any increases in abundance between the treated and control plots and between the different treatments.

Current research on this plant (Sexton, 1983, 1984; Learn, 1983) includes its biogeography, evolution and pollination biology. It is hoped that this study will provide insight into the role grazing disturbance plays in the dynamics, maintenance and preservation of the Leather Flower and provide data applicable to the development of glade management plans.

Methodology

At Victoria Glade near Hillsboro, Jefferson Co., Missouri, 56 random quadrats of 1 m^2 were selected from a grid measuring 10 m x 10 m. Half (28) of these quadrats contained at least one individual of C. fremontii var. riehlii; the other half (28) contained no individuals. Selection of these random quadrats utilized a BASIC random selection program on Prime Super-mini computer. After selection of these random quadrats, four different treatment regimes were assigned at random (7 quadrats per treatment for those with occurrences and 7 quadrats per treatment for those without). The different treatment regimes consist of: (1) no treatment (Y1 or N1); (2) clipping of vegetation to ground level (Y2 or N2); (3) clipping of vegetation to ground level and removal of litter (Y3 or N3); (4) clipping of surrounding vegetation to a height of 10 cm (Y4 or N4). "Y" indicates the initial presence of individuals; "N" indicates quadrats without initial occurrences.

[1]Route 1, Box 260-1A, St. Clair, Missouri 63077

Clipping and litter removal took place every other week throughout the growing season, which for purposes of this study is considered to end on 15 September each year (scheduled to end in 1986). The initial occurrence of each individual was mapped. Measurements of growth include occurrences of new individuals within each quadrat, flower number per individual plant, and fruit set for individual plant.

1984 Results

At the inception of the project, 92 individuals were counted in the 28 "Y" plots. The chart below summarizes the occurrence of new individuals.

New Individuals

Cuttings	1	2	3	4	5	6	7	Totals
Y1								
Y2								
Y3		1	1		1			3.00
Y4				1				1.00
N1							1	1.00
N2								
N3		1	7					8.00
N4		3					1	4.00

Speculation on the meaning of these results is premature. However, it is interesting to note that of the 17 new individuals observed over the course of the summer, 11 were found in the quadrats where litter removal followed clipping of the surrounding vegetation.

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In Memory of Erna R. Eisendrath

The death of Erna Eisendrath on March 23 was a cause of great sorrow to the many people in the State who knew her. Erna had a positive and widespread influence on Missouri botany. She was one of the founding members of our Native Plant Society and served as Editor of Missouriensis from the first issue in 1979 until the winter of 1983, and she subsequently continued her enthusiastic support of the organization. She served on the faculty of Washington University from 1960 to 1981 and inspired a love of the flora of Missouri among the many students of all ages who took her botany courses.

Erna was a woman of many achievements but one of her greatest satisfactions seemed to derive from the accomplishments of her students and friends. This genuine interest in and encouragement of others was one of the reasons for the devotion she inspired in so many.

The following paper, which Erna presented to the Webster Groves Nature Study Society Botany Group on March 21, 1985, is a good example of the unique combination of scholarship, warmth, and charm she always provided. It is a fine legacy for all of us who cherish her memory.

Waiting for George

Well, I am going to talk tonight only about botanical affairs hereabouts prior to 1835.

In 1835 George Engelmann arrived in St. Louis. Since this is my subject and that is my date, I probably should have called this talk "Waiting for George," but I only thought of that after the last issue of the WGNSS Journal had gone out. And it's probably just as well since that title is sort of misleading. Actually George did get here as Godot did not. Anyway, George did get here, as Beckett's characters did not, and the people who did get here also were not waiting; unlike Beckett's characters, they actually were a very active bunch of people. As we will find out, they were very busy fellows. And it has been fascinating to dig up what I could about them at that remarkable facility that we have at the Missouri Botanical Garden, the library, where the librarians have been extremely helpful, and of course I needed them a great deal. That help was actually necessary because the sources of information about my characters are scattered all over the place, and I was relieved to see that the author of the best book on the whole subject of the trans-Mississippi western botany said in her book that "I have seen but little reference in the literature to collecting around St. Louis until Stanford, Lindheimer, and Engelmann arrived on the scene." So it really was a job to pick up what happened here before 1835. It is fascinating when you are as old as I am, which is three-quarters of a century old, to realize absolutely nothing went on, certainly nothing botanically, but very little as far as settlement went on on the west banks of the Mississippi River, until the date 1732 when a first tiny settlement was made at Ste. Genevieve by a few very plucky French people who were driven out very shortly because the weather was so terrible. But actually that's only two and a half centuries ago and when you're 75 years old and more that doesn't seem so darn long. Actually it was 30 years after 1732 before our town was born, and it was some time after that, after 1784, before the first attention of any botanist was brought to this area, and that was pretty snide attention, but the botanist was so important, such a big name, that I can't resist bringing him in. This botanist was André Michaux. He definitely reached the east bank of the Mississippi River, where he collected plants in 1795. That's definitely known. Whether he actually crossed the river is not proven by the records. But he did write at the time that our city was "in a prosperous condition," so that's good enough for me. Especially as he also described in his great Flora Borealis Americana, published in Paris in 1803, several plants growing along the Missouri River. Now some people raise questions as to whether he actually found these or whether they were picked and brought to him near Cahokia where he was living. But his descriptions were definitely made by him and that, again, was good enough for me. So I accept he fact that he found the plants on the Missouri River near St. Louis. So before I mention the plants themselves, I wanted to run through a quick

curriculum vitae of Michaux himself. He'd been sent to America in 1785 by the French government, which was before the Revolution of course, to locate plants that might be useful in the old country. One reads that during his first year here Michaux actually managed to ship home 5,000 tree shoots, a dozen cases of seeds and even some live grouse. Think of that in the late 18th Century!

It's no wonder that he came to the attention of Thomas Jefferson (minister to France, 1785-89; Secretary of State, 1790-93) who, years before the Lewis and Clark Expedition was organized, was already toying with the ambitious prospect of learning something about the completely unknown territory that lay to the west of our river. Jefferson urged that funds be raised to send "some competent person on such a quest," and a committee to back Michaux was established (American Philosophical Soc. in Philadelphia), but its mission failed: some say because the French government ordered Michaux not to take their offer; others that Jefferson changed his mind after hearing rumors that Michaux was a French spy (McKelvey, 1955: note, p. 68)! Nonetheless, as I've already said, Michaux did get close to the area of present-day Cahokia in 1795, and reported after that "in rupibus ripariis flumenis Missouri," "on rocky bluffs along the shores of the Missouri River," there was to be found Aster argenteus Michaux, now A. sericeus Vent. forma sericeus, the "Silky Aster" (as late as 1913 ed. of Britton & Brown, A. argenteus still given as synonym).

Growing "ad ripas sabulosas flumenis Missouri," "on the gravelly shores of the Missouri," Michaux also reported our "Wild Wormwood," Artemisia caudata Michaux var. caudata. (You'll find it interesting to check Steyermark's county distribution maps for both of these.) Michaux also reported, of course, a great many plants growing along the Mississippi, but as the maps of his travels show, one doesn't know just where along the river banks, or on which side, he found them.

Our next characters don't come on scene for almost another decade, and when they do appear, it is without benefit of an accompanying botanist! There was no replacement on the Lewis and Clark Expedition for Jefferson's suggestion of Michaux; the only information about plants that accompanied the great adventure was that stored in Lewis' head after taking a crash course before leaving home, and the two books he carried with him: Dr. Benjamin Barton's Elements of Botany, and something of Linnaeus'--I imagine the Species plantarum that was then relatively new (1753). However, Lewis is described as having been almost an "instinctive naturalist" as well (Kastner, 1969), and, as we all know, that helps!

Members of the expedition were in the St. Louis area for some time before take-off on May 21, 1804, and during that time Lewis became acquainted with Pierre Chouteau, who gave him a cutting of what was known as the "Osage Apple"; Lewis sent this back to Jefferson, with the comment that Chouteau had "introduced the tree to his garden from an Osage village some distance to the west" (McKelvey, 1955) and that "the savages esteem

the wood of the tree for the purpose of making their bows" (Cutright, 1969). Our "Osage Orange" is among the first specimens sent back to Jefferson from the expedition, but we all know that Maclura pomifera (Raf.) C. Schneider is not a native Missourian, so we must follow Lewis and Clark as they proceeded upstream from St. Charles, finding the Missouri's current so hard to buck that there was ample time to observe the scenery and to go ashore quite often. They noted that oaks, ash, sycamores, and cottonwoods were growing along the river bank as they took off, but that, as they proceeded westward, this forest was supplanted by what they called "open meadow."

When Lewis reported on these to the American Philosophical Society in Philadelphia, he described going off into the woods near the mouth of the Osage River and finding "many curious plants and shrubs." Among these were what he called "Yellow Root," and described as "a Sovereign remedy for a disorder in this quarter called the Soar Eyes" (our "Golden Seal," Hydrastis canadensis L.) and a "Wild Ginger," described by Lewis as "a strong stomatic stimulant." (Asarum canadense L., like the Hydrastis, was named by Linnaeus, apparently from specimens sent to him from Canada.)

So far we've had rather "slim" botanical "pickins"; from now on they'll be better, but note how long we will have to wait--actually until the last day of 1809, when John Bradbury arrived in town. He, like Michaux, had been sent to this country to search out unknown plants, but his purposes were slightly different, as his patrons were the Botanical Society of Liverpool; he was not in search of useful plants as was Michaux. As did everybody who was anybody in those days, Bradbury visited Jefferson before starting off, and was advised by him to make St. Louis his center of operations (Spaulding, 1908). Having arrived at a rather unpropitious moment for botanizing, Bradbury had to wait until the first signs of spring in 1810, when he began making excursions of 80-100 miles in length into what he described (and I'm sure quite rightly!) as "the wilderness." That autumn (1810) he sent a large collection of plants back to Liverpool, but there seems to be no complete list of same, so one must fall back on a list called "Some of the More Rare and Valuable Plants Discovered in the Neighborhood of St. Louis and on the Missouri," published (in 1817) in his Travels in the Interior of America, 1809, 1810, 1811. Since, in 1811, Bradbury took a long trip up the Missouri, one must scrutinize the list carefully, if the subject is limited as is mine, thank heaven!; so I include only those plants that Bradbury mentions specifically as having been found near St. Louis.

One is the same aster as was reported by Michaux, Bradbury saying that it was "abundant on the prairie behind St. Louis." There, too, he also found our "Shooting Star," Dodecatheon meadia L., and, from the same area, reports what he called Martynia proboscidea Gloxin, our Proboscidea louisianica (Miller) Thell., the strange-looking "Unicorn Plant" (Family Martyniaceae; Scrophulariales).

Bradbury also found our Lead Plant, Amorpha canescens Pursh, growing on a prairie four miles west of town, and this must have been among the plants

that he shipped home in the fall of 1810, because it is now attributed to one of the few unlikeable characters one runs into in this field, a seemingly very aggressive gentleman named Frederick Pursh, who actually vandalized the work of Bradbury as well as that of a good many others. I've been amazed to find how often his name appears, rather like a Wagnerian leit-motif, in the history of botany west of the Appalachians, even though Pursh himself (fide Graustein, 1967) never crossed those mountains! It was Pursh who, in a series of complicated mischances, finally got the great chance for himself of being the first to publish on the Lewis and Clark plant specimens (McKelvey, 1955) and, to come back to where we were, it was Pursh who wrecked the botanical ambitions of John Bradbury. Here's why:

When this very decent Britisher arrived home with full intention of working with the plants he had shipped in November 1810, he found (as he wrote) that Pursh "has been suffered to examine the collection...and to describe almost the whole, thereby depriving me both of the credit and profit of what was justly due to me." Hence, the Lead Plant is Amorpha canescens Pursh, and the same is true of a number of other of Bradbury's finds; I think we'll never know how many, though, since his heart was broken by this annexation of his material, and Bradbury never again hoped for credit.

Which statement brings another (and very fascinating) man into our study, a man who was one of the great naturalists of all time, to whom great credit is given at the Garden with his bust over the door of the Linnaean house, and the obelisk erected in front of the old Museum building in his name. Thomas Nuttall comes in at this point because of a close association with John Bradbury during November 1810, the year during which Bradbury himself was most active hereabouts.

Nuttall (like Bradbury) was also from Liverpool, but the two men were not connected, as far as I know, through this association. Nuttall had come to this country quite on his own, with the professed desire to become a printer by means of which activity he hoped to make enough money and still have enough spare time to pursue a cherished objective of studying the natural history of the New World (Graustein, 1967). The first thing he did on landing in Philadelphia in 1808 was to go botanizing; the second, to go in quest of the book that Lewis had carried with him in 1804, Professor Benjamin Barton's Elements of Botany (published in 1803, the first botanical text published by an American). The visit to Barton in search of the book led to momentous events, events that led me into a murky area of botanical history that furnishes tidbits to anyone in search of ancient botanical gossip!

It seems that Barton hired Nuttall as his assistant almost as he (Nuttall) entered his (Barton's) door. And why would he have done so? The first reason is clear and irreproachable: Pursh had for years been his (Barton's) right-hand man, but had recently left his employ so that the Professor (of Natural History and Botany at the University of Pennsylvania) needed a botanically oriented helper.

A second reason is where the murkiness sets in: it also seems that Barton thought himself responsible for describing the plant specimens brought back by the Lewis and Clark expedition, but recognized that he was not prepared, scientifically or perhaps even timewise, to do so. At any rate, he had not begun the job when Nuttall appeared in 1808 and so it is suspected that Barton wished to send an associate west to acquaint himself with the vegetation and to bring back information that Barton would then use under his own name. Furthermore, and making the murkiness almost impermeable, we find that "ole devil" Pursh had this to say in his Flora Americana septentrionalis, published in 1814:

> Soon after returning from a collecting trip in the northern states in 1806 I had the pleasure to form an acquaintance with Lewis (and) a small but interesting collection of dried plants was put into my hands by this gentleman in order to figure and describe those I thought new for the purpose of inserting them in the account of his Travels (McKelvey, 1955).

In view of Pursh's subsequent reputation, this statement is, of course, suspect, but even if it was true, one must believe that Lewis, if he did indeed give plant specimens to Pursh, did so with the intention that they get into the hands of Barton, in whose employ he, Pursh, then was. Whatever the truth, it was finally Pursh who got credit for describing the Lewis and Clark plants, so we let it go at that, and return to Nuttall, to find, as it's interesting to note, that a scheming employer would probably have had no difficulty pulling the wool over Nuttall's eyes. One companion on a trip said of him (Kastner, 1969) that

> Mr. N. is engaged in a pursuit to which he appears to be singularly devoted and which seems to engross every thought to the total disregard of his own person and sometimes to the inconvenience of the party he accompanies. When the boat touches shore, he leaps out and no sooner is his attention arrested by a plant...than everything else is forgotten. The inquiry is made, 'where is the fool?' The answer, 'He is gathering roots.'

On the same trip, it was discovered when the party's leaders checked firearms against a threatened Indian attack that the barrel of Nuttall's gun was tightly packed with soil; nobody ever decided whether this was due to his having used it as a spade, or as a safe place in which to store the seeds he collected!

Nuttall is an intriguing character partly because, despite his seeming naiveté, he got around a great, great deal, even as far as the then so-called Sandwich (now the Hawaiian) Islands, from which he returned on the same ship as Richard Henry Dana, who mentioned him (Nuttall) in Two Years Before the Mast as "Old Curious" and described him in terms that well back up the dealing out of this nickname; and also because "Old Curious" also managed to publish some very important books: in our field, The Genera of North American Plants and a Catalogue of the Species

to the Year 1817 (2 vols. in 1818), and The North American Sylva: Trees not Described by F. A. Michaux (son of André, who was first on our limited stage) (3 vols. published in 1842-49); also a Journal of Travels into the Arkansas Territory During the Year 1819 (published in 1821) AND, believe it or not (besides numerous papers in scientific journals) a Manual of the Ornithology of the United States and Canada!

Well this has been a long foray out of our time sequence, and I must go back now to the autumn of 1810 when Nuttall was here awaiting the take-off of the expedition known to history as the "Astorians," trappers in the employ of John Jacob Astor, in search of furs. Actual take-off time was not until March 1811, after which Nuttall spent two years exploring the great plains of the West, so he could well have been of service to Barton; but as we now know, by the time he returned, Pursh had taken over!

The timing of his arrival in St. Louis, however, was perfect for our purposes, because of the association with Bradbury to which I referred earlier. Here's one reason: one of the plants that Bradbury was to mention later in that list of "rare and valuable plants" to which I've referred was the beautiful evening primrose known to us until very recently as Missouri's own Oenothera missouriensis Sims; as you all surely know, Warren Wagner, in the winter issue of Missouriensis 1981 (Vol. 2, No. 3) proved convincingly that the plant is more properly named O. macrocarpa Nutt. Bradbury described finding it "near St. Louis," but Warren narrowed the area to Jefferson County, somewhere near the sandstone outcropping known as "Sandy Ridge," thus delighting me, as I have spent a good deal of time in that area over many years.

Since Nuttall and Bradbury botanized together in November, they could only have seen the plant in fruit, and so the specific epithet would naturally have come to mind! The actual material they (Nuttall and Bradbury) collected can still be seen in the herbarium of the Academy of Natural Sciences in Philadephia (fide Wagner), a specimen consisting of only a few leaves and a large, 4-winged capsule. But subsequently the plant was beautifully illustrated in Plate 1592 of the 1814 edition of Curtis Botanical Magazine, and described by its then editor, John Sims, as "found by Mr. Nuttall in the neighborhood of the Missouri, in North America."

As sort of a footnote, it's interesting to note that, in the same article in which he traced proper nomenclature for the evening primrose, Wagner also mentions two other of Bradbury's discoveries that were shown to Nuttall: the latter is given credit for one of the synonyms for today's Bumelia lanuginosa (Michaux) Pers. var. albicans Sarg., in parentheses, but guess who gets squeezed into the parentheses that follow the synonym for Grindelia squarrosa (Pursh) Dunal; why Pursh, of course!

And Nuttall, with or without Bradbury, kept plenty busy during the months before the Astorians were to take off, noting the minerals that interested him in the area, and finding (as do we all) that it had a

great deal to offer. And, of course, he paid attention to the trees and what little he could find of other plants during the winter. It must have been based on rather unrewarding specimens that he reported finding in the area of St. Louis, and went on to describe for the first time the "White Sage," Artemisia ludoviciana Nutt., the specific epithet actually saying that he found it here; Baptisia leucophaea Nutt., the "Long-bracted Wild Indigo"; and Stylophorum diphyllum (Michaux) Nutt., the lovely "Celandine Poppy." In all of them the Latin binomial is followed by the attribution, Nutt., although Michaux precedes him in parentheses, in the poppy's name.

But what I think was Nuttall's greatest find hereabouts is unfortunately not attributed to him--Silene regia Sims is attributed to the same John Sims I mentioned a moment ago--and here is why: Nuttall collected seeds from plants he later described as "growing spontaneously in great abundance in the environs of St. Louis on the Mississippi" (King, 1981). These were planted in the garden of Aylmer Lambert, vice president of the prestigious Linnaean Society of London, where they obviously did well, because it was Lambert who showed the blooming plants to Sims, and it was Sims who described them for posterity and had them illustrated (also for posterity) in the beautiful plate 1724 published in 1815. Nuttall later described the plant as "one of the most splendid species in existence" and I don't think anyone would argue with him.

We actually left John Bradbury back in England, where he found to his despair that Pursh had taken over his collections. Subsequently he returned to this country, and to St. Louis, where he lived until his death--thought to have occurred around 1821 (fide Spaulding 1908).

But we know that Bradbury was still alive in 1819, because when members of Major Long's expedition, sent out to explore the country between the Mississippi and the Rockies, reached St. Louis in that year, the next actor on our limited stage, William Baldwin, wrote with pleasure that "the venerable Mr. Bradbury called on me yesterday, and his company had a most exhilarating effect on my health and spirits" (McKelvey, 1955).

And the poor fellow needed just that: although widely travelled, and with much experience in practicing both medicine and botany, Baldwin had long suffered from what is now thought to have been TB, and was probably sent on the first government-sponsored expedition ever to have included scientists, in the hope that the trip would improve his health (McKelvey, 1955). But this hope faltered as the ship carrying them down the Ohio, an early steamboat called the "Western Engineer," itself faltered badly, and the hope flickered out as the boat wheezed up the Mississippi and then struggled against the current of the Missouri. On July 22, 1819, Baldwin noted:

> I have at last the mortification to inform you without hesitation that a steamboat is not calculated for exploring. (McKelvey, 1955)

Although capable of this humorous touch, Baldwin wrote from the town of Franklin, only 180 miles above St. Louis, where he had been left by the Long Expedition because of his increasingly poor health, but he had collected 100 or so species on the trip from St. Louis upstream, and continued collecting in the vicinity of Franklin, where he died on August 1. Baldwin is not often mentioned in the literature, and we remember him primarily because of the species of "ironweed," Vernonia, named for him, but I couldn't resist making a slide from one page of the Account of the Long Expedition, published in 1823 by Edwin James, brought out to replace poor old Baldwin. Although James' name appears at the bottom of the page, his report is taken from Baldwin's own notes--continued, please note, right up to a very few days before his death.

Such accounts from various exploring expeditions that came our way resulted in interesting others in the vegetation of our area, and several came on their own to have a look for themselves. One of these was an amateur in our field, Dr. Lewis C. Beck, described nonetheless as an "arduous young botanist" who, in 1820, at the age of 22, had already been practicing medicine in Schenectady for two years before heading out our way. By 1826 Beck had botanized so successfully that he published a list of about 200 species in The American Journal of Science and Arts, better known as "Silliman's Journal."

Among the plants Beck published was one he called Monarda bradburiana Beck, which he found blooming in July "in the barrens north of St. L." Beck says that he "named this beautiful and very distinct species in honor of the late John Bradbury...as a tribute to the memory of a highly valued friend and distinguished botanist." Unfortunately, it has rather recently been found that this is the same species that Nuttall had called M. russelliana Nutt., so Bradbury and Beck both lost out on that one!

However, our lovely "Green Trillium" is still T. viride Beck var. viride, and it still blooms, as Beck said it does, on the "shady banks of streams, (near) St. Louis, in May"; and Bidens beckii Torrey (once Megalodonta), the "Water Marigold," is still in Steyermark (1963), although in the 60's Julian had strong doubts that it was ever a Missouri plant. Finally, Julian himself once credited the "Little Ladies' Tresses" to Beck, although it is now more properly known as Spiranthes tuberosa Raf. var. tuberosa. So the young doctor did well during his short period in our area but, even though he went on to publish on mosses, ferns and the Botany of the Northern and Middle States (Rodgers, 1942), there is not much said about him in the literature.

In connection with a visit to St. Louis, the same can be said about Thomas Drummond, a Scot who had already achieved quite a reputation, both as a natural history explorer in western Canada and, later, as Curator of the Belfast Botanical Garden. In April 1831 Drummond set out from the east for the express purpose of collecting, and with rules set as to how he would sell his collections as a commercial project. That he

anticipated great success with dried plant specimens is evidenced by the fact that he sent ahead some two tons of herbarium paper (McKelvey, 1955; quoting Torrey); he eventually landed in Texas, but did stop in St. Louis en route, during July of 1831, but was so ill at the time that he lost many specimens collected en route because of his inability to dry them himself. He did, however, do some collecting and sent a collection of roots from the area to his sponsor, William Jackson Hooker, himself a great collector (Iceland, Ceylon, Europe), at the time busy teaching botany at the University of Glasgow, and editing the Journal of Botany, in which he published results of Drummond's work (Hooker became Director of Kew in 1841) in several different volumes, which I've not checked through.

Drummond's few comments about our area are itneresting (McKelvey, 1955):

> There (is) very little variation in the plants of the Mississippi about St. Louis, from those of the more northern territories. I flattered myself all along that, when I reached that place, I should be in the Prairie country; but there is nothing of the kind: the woods consisting of stunted Oak, with very few timber trees.

For future reference, note this in conjunction with earlier reports of prairies just outside of St. Louis and James' Account (Thwaites, 1905) in which he explains loss of prairies when humans prevent fires.

As you've all surely picked up by now, we have in our native flora a number of plants with specific epithets obviously referring to this man Drummond.

But the St. John's wort, the Rough-leaved Dogwood, the goldenrod and the aster were all described by others, to whom they are attributed. I presume such descriptions were made from among Drummond's collections, but I don't know where he found the plants.

The last fellow I'm going to drag in among those "waiting for George" was an interesting man, again (like all those I've mentioned except Beck, Baldwin, and Lewis and Clark) a foreigner. This one was actually a minor German noble (described as a "princeling"): Alexander Philip, better known as Maximilian von Wied. Prior to arriving in this country in 1832, Max had already travelled widely, pursuing an avid interest in natural history which led him westwards until, as he wrote, "on March 1833, to his great joy, St. Louis was beheld" (McKelvey, 1955). He reported a great deal about our town in his Travels in the Interior of North America (1839-41, translated to English 1843), and a great deal about the difficulties of steamboat travel up the Missouri, apparently no easier for his ship, the "Yellowstone," than it had been for Baldwin's "Western Engineer" 14 years earlier (1819).

With most of its passengers what Maximilian described as "the lowest class of servants of the (American) Fur Company" (McKelvey, 1955), the

Yellowstone left St. Louis on April 10 and moved slowly enough that Maximilian commented on the blooming trees along the river bank, especially "wild plum" and "redbud": "I could not help remarking that, in this country, most of the trees and bushes have their flowers before their leaves."

Further along, where he found "Oaks of many kinds in blossom" on April 13, he went ashore near "Cote-sans-Dessein" (near the mount of the Osage River, just east of present Jeff City), which he described as:

> An old French settlement of 6-8 houses, where the monocotyledonous plant is found which is called here the Adam and Eve. Its roots consist of 2 bulbs, joined together, of which it is said that, when thrown into the water, one swims and the other sinks (McKelvey, 1955).

This of course was Aplectrum hyemale (Willd.) Torrey, but this interesting bit of information about its corms isn't reported by Bill Summers, who otherwise knows all there is to know about Missouri's orchids.

That pretty much completes what I have to say about those who preceded George Engelmann as botanizers in our area, and all I have said is marvelously summarized in this part of a map (opp. pg. 108), that comes from a huge but wonderful tome entitled Botanical Exploration of the Trans-Mississippi West, published by the Arnold Arboretum of Harvard in 1955, and written by Susan Delano McKelvey, to whom I owe a great debt of gratitude for much more of the material I've used than just this map.

And I also owe you people an explanation, now, of what I said early on; namely, that the year in which Dr. Engelmann arrived in St. Louis, 1835, "marked a botanical watershed" in several ways.

The first such reason is sort of a gut-feeling of my own, and one that I really can't defend. It goes like this: among those men I've mentioned, several came to this area as agents of British or Europeans interested in learning about the American flora; their efforts were in no way concerted, and most of them sent their botanical finds back to the "old country," where, also, their work was later published. On the other hand, however, Engelmann himself was of course not an American; he came to St. Louis to stay, and he came with a fine education, and well grounded in botany, having studied at three German universities and winning his medical degree from the University of Wurtzberg partly on the basis of a thesis on the subject of floral teratology, or morphological monstrosities. He had also already travelled rather widely on this continent, always paying attention to what he described as "my favorite study, the natural sciences, especially botany" (Rodgers, 1942). So it's not too surprising that within a very few years after starting to

practice medicine here, Engelmann had established relations with the two most active and widely recognized botanists in this country, John Torrey and Asa Gray, both with scientifically based interests in the flora of this country. Thus Engelmann became the apex of an isosceles triangle based on the two men who lived closer together and worked extremely closely, completing Part 1 of their great Flora of North America in 1838 (Rodgers, 1942). Torrey had been planning this for many years and accumulating materials. Interestingly, William Darlington's introduction to Part 1 published in Am. Journal of Sci. & Arts, January 1839, points out the fact that to date work on the plants of NA has "been limited in scope...incomplete in contents, the material thus existing in detached masses and scattered through numerous volumes" (Rodgers, 1942). Obviously, as this work proceeded, the cooperation of Engelmann was to become part of "the plastic operation of (the) master hand (that would) reduce these 'masses' into one consistent body" (Rodgers, 1942). He was able to direct plant explorers who arried in St. Louis to areas that needed botanizing, and he was also able to influence them to send their finds (or reports of them) to the authors of the great Flora. The combined efforts of these three men changed St. Louis from being simply a frontier town from or around which individuals botanized, often entirely on their own, into the hub of a scholarly pursuit putting botanical collections in the service of American science. The second reason for the importance of the period of Engelmann's arrival in St. Louis is really only indirectly associated with him, but gives me a convenient tie-in for my title "waiting for George." This is the fact that, at long last, American botanists were at about this time to "join the crowd" of Europeans and British who had already adopted what is called the "Natural System" of plant classification.

Except for possibly one paper by Beck in which he had toyed with the idea of adopting the system developed by de Jussieu in France and the de Candolles in Switzerland, American botanists had been sticking to the system developed previously by Linnaeus, the system known as the "sexual system" because it pigeon-holed plants into groups based solely on the count of their stamens and their pistils. This was quite artificial, in that it recognized none of the much more obvious similarities among flowers that, even long before the time of Darwin, had made it quite apparent that they must be somehow related. It was on such similarities that the Natural System was based.

The Americans who clung to the Linnaean System were simply being retarditaire in not adopting the Natural System before they did, although in its time (the latter part of the 18th Century) the Linnaean System had been extremely useful as a means of categorizing the tremendous number of new plants that were pouring into Europe from all over the world for identification by Linnaeus himself and others.

And it had not only been useful, but it had also furnished certain people with a good deal of tongue-in-cheek fun...for reasons apparent in this slide of part of it as "Englished" by Erasmus Darwin (Charles' grandfather) and others, in 1789. According to this, that aster found by Michaux, the Aster sericeus with which we began, would have been classified under Syngenesia polygamia superflua, translated to read "Husbands joined together at the top [as are of course, the anthers of the Asteraceous florets]; living with both wives and concubines [the "wives" being the pistils of perfect or bisexual flowers; the "concubines," the pistils of ray florets that are imperfect or unisexual]," and these are described as being "superflua" for the obvious reason that since the males have wives, there is no need for concubines! (Stearn, 1957; introd. to Linnaeus, 1753)

It's not surprising that this created quite a stir among certain botanists: a Russian (Siegesbeck) described the whole system as "loathsome harlotry"; an early 19th Century reviewer stated that "no botanical textbook should bring the blush of injured modesty to the cheeks of the innocent fair" (Stearn, 1957; introd. to Linnaeas, 1753).

Nonetheless, right up to 1826, the innocent fair of this country who were interested in botany had no other than this licentious system to use, although most of them perhaps didn't know the meaning of the Latin. But in 1826 the man who was to become so close to Engelmann, John Torrey, had created almost as much of a stir as had Linnaeus himself when, in publishing a third paper on the plant specimens he had received from the Long expedition, finally succumbed to the realization that, although the Linnaean system was simpler to use, it was in no sense either as accurate or as logical as the Natural System.

The stir made by Torrey's decision to introduce the latter into American Botany was actually brought to a boil by the frothing of a fellow named Amos Eaton, himself the author in 1817 of A Manual of Botany for the Northern States--organized, of course, on the basis of the Sexual System. Eaton announced that he thought Torrey was doing something similar to publishing a Bible written by Satan, and stormed that "no book has probably excited such consternation and dismay," prophesying "horror" and "an awful catastrophe to all previous learning" (Kastner, 1969).

History records no such cataclysmic results: Torrey's move brought American botany into easy communication with workers overseas, and certainly had a great deal to do with preparing the way for the coming George, and the wonderful working relationship that would soon develop between Engelmann and the partners, Torrey and Gray.

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Book Review: Wildflowers of Arkansas

Virginia K. Wallace[1]

A new book is available for wildflower enthusiasts: Wildflowers of Arkansas by Carl G. Hunter, published by the Ozark Society. Hunter, Assistant Director of the Arkansas Game and Fish Commission, enlisted the cooperation of 24 of Arkansas' best amateur and professional botanists to ensure a complete and accurate book.

Wildlfowers of Arkansas covers 600 species in 80 families, representing a good cross-section of Arkansas' flora. Hunter includes information on Arkansas' physiographic regions, a glossary, a section of line drawings of the structure of flowers and plants, and a list of references for further study. Also included is a paragraph description of each of the 80 plant families. The book's outstanding feature, however, is the photography. Hunter examined more than 20,000 slides for the most detailed and accurate images to include in the book. The result is 484 superb color photos tht are a valuable identification aid.

The book is arranged in taxonomic order, and a brief description of each species is printed on the page facing the photo, eliminating the need to flip back and forth from photo to description. Hunter states in the introduction that the purpose of the book is to enable anyone interested in wildflowers to identify (to at least family or genus) almost any species found in Arkansas. I think beginners might have some difficulty with the taxonomic arrangement (a color arrangement is simpler). Other than that, however, the book meets its objective.

Although written for Arkansas, many of the species presented are found in Missouri as well. This will be a welcome addition to the library of any Missouri wildflower enthusiast. The book sells for $24.95 paperback or $32.95 hardbound, and is available from Ozark Society Books, Box 3503, Little Rock, Arkansas 72203.

[1]Botanist, Missouri Department of Conservation.

Mark Twain National Forest News

During April, May, and June, Forest users and those with an interest in management of the Mark Twain National Forest will have an important task. A proposed plan for managing the Forest's lands and resources has been made, and now public review is needed according to Forest Supervisor Leon Cambre. Cambre said, "The public review period will run from April 5, 1985, through July 7, 1985, and comments from the public must be postmarked by midnight on the closing date."

The Proposed Land and Resource Management Plan sets specific objectives for the wildlife, recreation, and wilderness, timber, range, water and soil resources on the one and a half million acre National Forest. It also sets management standards and guidelines for activities to be undertaken for the next ten years.

"The long range management plan being proposed is the first for the Mark Twain developed under the requirements of the National Forest Management Act of 1976. The Act required resource planning considering interrelationships of the various resources--a change from previous resource management planning in that Congressional recognition and requirements provide planning direction," Cambre said.

The Proposed Land and Resource Management Plan is part of a package of planning documents on its way to the public for review and comment. Also included is a Draft Environmental Impact Statement which describes and compares seven management alternatives and analyzes the consequences of each. Any one of the seven alternatives could be implemented as the final plan. Completing the package are Proposed Plan and Alternative map sets and a tabloid-type information overview of the Proposed Plan and the Draft Environmental Impact Statement.

"The public is encouraged to become involved. Much has been invested in this planning effort already, both by the Forest Service and the public. In order to come up with the best possible plan for the Mark Twain, public review and comments are needed, " Cambre said.

Interested persons are encouraged to become familiar with the Proposed Plan and the various management alternatives. Review copies of the Plan are available at all Mark Twain National Forest offices and 36 selected public library locations. Copies of the information overview newspaper are also available from Mark Twain offices. A limited number of the full documents are available through the Forest Supervisor's Office, 401 Fairgrounds Road, Rolla, Missouri 65401.

Public Libraries

Barry-Lawrence Consolidated Library (Cassville)
Birch Tree Public Library
Callaway County Public Library (Fulton)

Cape Girardeau Public Library
Current River Regional Library (Bunker)
Current River Regional Library (Van Buren)
Doniphan Public Library
Douglas Co. Public Library (Ava)
Fort Leonard Wood Library System
Joplin Public Library
Kansas City Public Library
Kinderhook Regional Library (Lebanon)
Mid-Continent Public Library (Independence)
Oregon County Libraries (Alton Branch)
Ozark Regional Library (Fredericktown Branch)
Ozark County Library (Gainesville)
Ozark Regional Library (Ironton)
Ozark Regional Library (Viburnum Branch)
Piedmont Public Library
Pack Memorial Library (Mountain View)
Poplar Bluff Public Library
Rolla Free Public Library
Salem Public Library
So. West Missouri State University Library (Springfield)
Springfield-Greene County Library
St. Louis County Library (S. Lindbergh)
St. Louis Public Library (Main)
Taneyhills Community Library (Branson)
Texas County Library (Houston)
Thomas Jefferson Library System (Jefferson City)
University of Missouri Main Library (Columbia)
Washington County Public Library
West Plains Public Library
Willow Springs Public Library
Winona Public Library

Confusion of Terms

Edgar Denison[1]

In recent years we have been exposed to a number of terms applied to landscapes, which up to now were descriptive of definitive biomes, but are now used to designate different ecological situations. Here are three of them.

Tundra

Originally referred "generally to the treeless zone of the Arctic" delineated by "shallow soils, a permanently frozen substatum, supporting lichens, mosses and short grasses (1). Then, some years back, tundra was suddenly used to describe alpine meadows and the Encyclopedia Americana took notice of this, saying "Alpine tundra is in most respects similar [to the above, E.D.] although it has no permafrost, is often subjected to heavy summer rains, and harbors many endemic plants and animals."

Besides these three fundamental differences between Arctic Tundra and Alpine Meadows, there is the absolute difference between flat square miles of monotomy and the endless variety of alpine meadows hanging on mountain sides or located in kettles leading to cirques, plus countless possibilities of habitat.

Why, then, force the alpine community to accept a designation which does NOT describe it? What was wrong with "Alpine Meadow" as long as it was understood that such habitat was above treeline. Application of "tundra" to alpine habitat is misleading and should be abandoned.

Fen

This designation is a newcomer, pushed into being by local ecologists. Of four major, multivolumed encyclopedias, none contained the term fen. Finally, I found it in Webster, New 20th Century Dictionary, and learned that "a fen is a marsh, bog or fen. Low land covered wholly or partially with water but producing sedges, coarse grasses or other aquatic plants; boggy land, a moor or a marsh."

"Other aquatic plants" makes sedges and coarse grasses aquatic, something I did not know so far.

As in the case of "tundra" the use of "fen" is objectionable under our midwestern conditions because the definition does not fit. Nearly uniformly we deal with small meadows, which during only part of the year are drenched by water, associated with local springs and their run-off. What was wrong with Steyermark's calcareous spring water valleys? This was meaningfully descriptive, while fen is neither, and, in addition, a close to unknown term in the U.S. as indicated by its absence from four current encyclopedias.

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If we have a marsh, let's call it a marsh. Likewise with bog, though I doubt that we have one in our State. My plea, let us get rid of the term "fen."

Savanna or Savannah
"A tropical or subtropical grassland that usually contains scattered trees and shrubs. Usually in regions of from 40" to 60" rainfall, interrupted by distinct dry seasons. Main areas: Africa, South America, Australia, Southern Asia."[2]

As of late we are being apprised that we have savannas in Missouri, upland habitats with few trees on poor soils which do not support an understory growth of shrubs.

All of us have seen pictures of the African savannas, those endless stretches of land with a few single trees, spaced far apart. This habitat is either lush green in the rainy season or montone brown in between rains. Quite obviously, there is no landscape in the middle west even remotely comparable to the description given. A few scattered, small trees on a knob on poor soil, keeping shrubs out but permitting the invasion of upland prairie species, do NOT make a savanna.

The term is misleading when applied to an entirely different habitat of very restricted occurrence. Its use is unfortunate and not needed.

The proliferation of terms to describe habitats arises from the recent and mushrooming efforts to divide and subdivide our land into ecosystems, the work of ecology students. Ecology has been defined as "the quantification of the obvious" by an ecologist. It is hard to understand what all this work of inventorying and tabulating will accomplish. Necessarily, the ever-increasing division and subdivision leads to a desire to give names to these. There is no harm in this as long as we do not apply existing, well-defined terms to situations to which they do not apply.

Let us keep the tundra in the Arctic, the fens in England, and the savannas in Africa or wherever.

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[2] information from Encyclopedia Americana

Spring in Springfield

Virginia K. Wallace[1]

Nearly 30 MONPS members and guests attended the field trips and board meeting held at SMS in Springfield recently (April 17 and 28). There was a variety of activities for members to choose from on Saturday.

Propagation-minded members had the opportunity to salvage plants for their gardens from the Ruth and Paul Henning State Forest near Branson. The salvage was conducted on the site of a new 50-car parking area to be built this fall, and was open to MONPS members and Branson area residents. According to area manager, Bob DeWitt, nearly three dozen people participated in the salvage; approximately one-fourth of those were MONPS members. Participants came from as far as Kansas City and Fort Leonard Wood, and even Oklahoma. Don Kurz, Natural History Land Specialist with the Conservation Department, was on hand to help identify plants and provide information on care.

"Everyone who came took home about four to six boxes or buckets full of plants," said Don. "Most of the better plants were moved." The "better plants" included Blue Wild Indigo, shooting star, phlox, verbena, Missouri Primrose, larkspur and Pale-purple Coneflower. The horticulturist from Silver Dollar City came to see about obtaining plants to use in a glade planting they are planning. All in all, the salvage was a success: many people have wildflowers for their gardens and the plants have a chance to survive.

For the spring wildflower enthusiasts in the group Wally Weber led a local spring flora field trip on Saturday. Nearly 30 people piled into a University bus and a van and traveled to a private woodland near Fordland (east of Springfield) to view pink-flowered May apples and yellow lady slipper orchids. The next stop was a limestone glade, also privately owned, where participants saw Blue Wild Indigo, adder's tongue fern (Ophioglossum engelmanni Prantl), quill wort (Isoetes butleri Engelm.), wild hyacinth and other spring glade plants. Travis Nelson also managed to find several scorpions.

Saturday evening Wally Weber and his wife Irma hosted a social at their home. There was plenty of time for socializing and catching up on the latest finds. Merv Wallace gave a report on his newly formed "Missouri Wildflowers" nursery and brought some plants he is growing. The highlight of the evening was Paul Redfearn's slide show of his two-month collecting trip to China last summer. He showed slides of many wildflowers from China, including one we all thought looked familiar, which turned out to be yellow star grass (Hypoxis hirsuta (L.) Cov.). The evening ended with reminders to set clocks ahead one hour so as not to miss Sunday's trip.

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[1]Botanist, Missouri Department of Conservation

Sunday dawned gray but dry and by 8:30 most of the 29 tired but eager botanists had assembled. We again boarded a University bus and headed to Wilson's Creek National Battlefield. The object of this half of the trip was a little winter annual mustard, Lesquerella filiformis Rollins, which was found in abundance. Commonly known as bladderpod, it is known from only a few limestone glades in southwest Missouri and is under review for federal listing. In addition to Lesquerella a spiderwort, Tradescantia tharpii E. S. Anderson & Woodson, was putting on a particularly spectacular display.

After much prodding and prompting the group drove to Halltown Glade to see the elusive Geocarpon minimum Mackenzie. Found on glades of Channel Sandstone, this species is also under review for federal listing. Because of the early Spring the Geocarpon was almost gone, though a few good specimens were found and much photographed. In addition to Geocarpon we also saw Selenia aurea Nutt. One-flowered Cancer Root (Orobanche uniflora L.), resurrection fern (Selaginella rupestris (L.) Spring) and Isoetes. In a nearby canyon we saw Bradley's spleenwort, Asplenium bradleyi D. Eaton.

It had been a perfect day, we reflected as the bus headed east on Highway 60. The reflecting was short-lived, however, as the bus suddenly lost power and coasted to a stop about 15 miles from Springfield. The mechanics in the group determined that the engine coil had fallen out "somewhere back there." Fortunately, botanists are excellent at spotting small objects in the grass and Wally Weber finally found the coil. Bill Summers and Merv Wallace successfully replaced it and we continued to Springfield with no further incidents.

It was a long and busy weekend, but all who attended had a good time. If you haven't yet attended a meeting, please do. We see a lot of plants, learn a lot of names (both people and plants) and the company's not too bad either.

Notes

Asclepias meadii Torrey--Imagine my surprise seeing this species listed in a recent book as recommended for prairie gardens. Is it that common outside Missouri? The book: Landscaping with Wildflowers and Native Plants, published in 1984 by the Chevron Chemical Company. Page 64.

--Edgar Denison

EDGAR DENISON AWARD

Students interested in field studies of native Missouri plants are encouraged to apply for grants from the Edgar Denison Fund to cover travel costs. To apply, write to N. R. Morin describing the nature of the study, goals to be achieved through the fieldwork, and precise localities to be visited and estimated round-trip mileage. - Nancy R. Morin, Missouri Botanical Garden, P. O. Box 299, St. Louis, MO 63166, 314/577-5180.