



# Castilleja

*A Publication of the Wyoming Native Plant Society*

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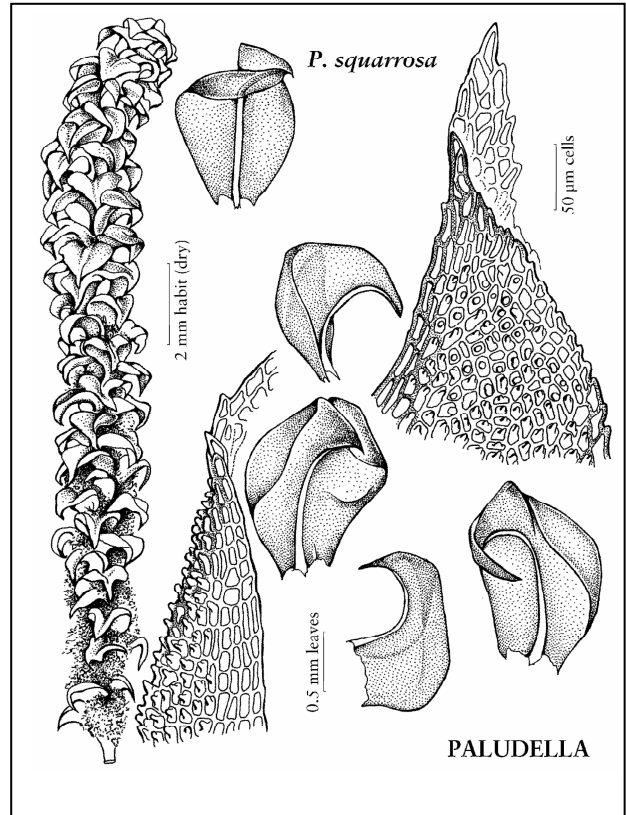
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**Have We Got the Mosses!**

Contrary to a recent statement issued by the Wyoming Tourism and Travel Division (Casper Star-Tribune, 5 March 2006; front page), Wyoming is endowed in mosses, even to the point of local abundance! The most current published checklist (Eckel 1996) recognizes 315 species and varieties.

Now and then, agencies as well as vascular plant botanists and ecologists need a reminder of what they **don’t** know. Bryology (study of mosses) is in that domain for most of us. I tried to include moss species in a study of peatlands in the Snowy Range (Medicine Bow Mountains). In the first test-run site, I quickly ran out of known moss genus names and relegated one exquisite, extensive, mat-forming moss to the descriptive name of “falcate-hairy”. Not to be outdone, another botanist in the group suggested that it resembled a sea cucumber with its tubular, inflated appearance, and the “sea cucumber” common name proved easier for the rest to remember. Later ID attempts took it to *Paludella squarrosa*, and verification by a real bryologist came back with exciting messages.

*Paludella squarrosa* is a circumboreal species collected less than 10 times in the Rocky Mountains of the U. S., and is recognized on lists of rare mosses in Colorado and Montana. It was reported once in Wyoming (Lawton 1971; in Eckel



*Paludella squarrosa*. Illustration by Patricia Eckel. Wyoming Native Plant Society appreciates the permission of the Flora of North America Association to reprint the *Paludella* illustration from Volume 27 of the *Flora of North America North of Mexico*, due to appear this year as the first of the three bryophyte volumes.

1996), also known from Michigan, New York and Vermont. What does this mean for the species in Wyoming? ...It means that we need to launch a Wyoming list of moss species of *potential* concern, as a preliminary collection of such questions, and a framework to apply answers. Stay tuned. BH

Reference

Eckel, P. 1996. Synopsis of the mosses of Wyoming. Great Basin Naturalist 56(3): 197-204.

## WNPS News

2006 Scholarship Winners: The 2006 Markow WNPS Scholarship winners are Nancy Bockino (University of Wyoming) who will test hypothesized relationships between pine bark beetles and fire in lodgepole pine; Robert Harms (University of Nebraska) who is undertaking the first floristic survey thesis of Wyoming lichens, in the Snowy Range; and Adam Rollins (University of Arkansas), doctoral candidate who will conduct the first study of myxomycetes in eastern Wyoming and their ecology in the greater grassland biome. These studies are awarded \$300. The project merit (soundness and significance) of all submissions were outstanding. Thanks go to all who apply... and to all in WNPS who support scholarships.

Wyoming Native Plant Society  
P.O. Box 2500, Laramie, WY 82073

### WNPS Board – 2005-06

President: Bonnie Heidel	742-9523
Vice President: Laura Hudson (2005)	745-8236
Vice President: Lynn Moore (2006)	472-3603
Sec.-Treasurer: Ann Boelter	745-5487
Board Members: Mike Evans,	326-8217
Curtis Haderlie (2006)	690-4381
Katherine Zacharkevics (2005)	

*The 2006 Board officially takes over at the annual meeting.*

Newsletter Editor: Bonnie Heidel (Laramie; bheidel@uwyo.edu)  
Teton Chapter: PO Box 82, Wilson, WY 83014 (Joan Lucas, Treasurer)  
Bighorn Native Plant Society: PO Box 21, Big Horn, WY 82833 (Jean Daly, Treasurer)  
New webmastermind: Melanie Arnett (Laramie; arnett@uwyo.edu)

Treasurer's Report: Balance as of 8 March: General Fund: \$1249.50; Markow Scholarship Fund: \$1184.00. Total Funds: \$2433.50.

By-Laws vote reminder: Voting is open on the proposed WNPS By-Laws amendment up until the time of the annual meeting on July 15. See the December issue for submitting your vote by mail as a proxy vote. New members are also being sent the December issue and encouraged to vote.

(The friendly WNPS post-office-box-picker-uppers who moonlight as botanists invite you to send mail-in votes in spring rather than in summer.)

Contributors to this issue: Bonnie Heidel (BH), Adam Siepielski (AS), Jennifer Whipple (JW) and hosting Pinedale members. Comments, as always, are welcome!

Annual Meeting: Now is the time to plan ! Mark **July 15-16** on your calendar and see the announcement on p. 4.



New Members: Please welcome the following new members to WNPS: Derek Artz (Columbia, SC); Judy Biscan (Shaker Heights, OH); Bobbi Holder (Cody); Mark Hughes (Cheyenne); Alison King (Pinedale); Mike Kintgen (Littleton, CO); Lance McNeas (Morgan, UT); Daryl Mergen (Colorado Springs, CO); Vicki Regula (Laramie); Brad Rogers (Buffalo); Estelle Ruben (Casper); Bettina Sparrowe (Daniel); and Kathi Squires (Wilson).

### *Message from the President*

Does it make sense to feature a moss on the cover of *Castilleja* when Wyoming Native Plant Society (WNPS) currently has one bryologist member? Does it make sense to offer a Wyoming Native Plant Society scholarship to support the first documentation of myxomycetes in eastern Wyoming grasslands when WNPS has two mycologist members? Will native plant gardening articles alienate taxonomists or taxonomy articles disenfranchise gardeners? ... What about weeds? What about everyone else?

Every WNPS matter represents a wrestling match. The Information Age that buries us in news and data isn't going to bring us balance or bring us any closer to the plant life around us. If we want to learn about our surroundings, tread outside the realm of familiarity, and grasp a greater community in the spectrum of member botany interests, then WNPS needs to be open to the phenomenal breadth of native plant life in Wyoming.

As I write this, a snow plow zips past my window, and I wish that this issue presented simple promises of spring flowers that affirmed what we already know. Yes, spring flowers will come,... and a whole lot more. BH

## **YELLOWSTONE HERBARIUM MOVES!**

By Jennifer Whipple

The Yellowstone National Park herbarium (YELLO) has settled gratefully into its new home in the newly completed Heritage and Research Center. The new facility is located in the Park adjacent to the school in Gardiner, Montana. Previously, the herbarium was housed in the Yellowstone Center for Resources in Mammoth, with the herbarium cabinets squeezed into a small room that also doubled as my office. There was almost no room for examining specimens let alone actually processing specimens.

Even though botanists have been collecting in Yellowstone since before the Park's establishment, all of the specimens ended up at major herbaria or at the home institution of the collectors. H.S. Conard began an extensive collection in Yellowstone in 1924 to 1926 which was the nucleus for the current collection. Additional collectors added material especially Herma Baggley during the 1930's and Ray Davis in the early 1950's. The arrival of Don Despain precipitated a period of intense collecting associated with producing a vegetation map for the park. At the time of Don's arrival in 1972, the herbarium collection was part of the museum collection, and stored in the building that is now the Albright Visitor Center in Mammoth. Since access was difficult, Don orchestrated the eventual separation of the herbarium from the museum

collection, and the location of the herbarium in a large room on the third floor of the Administration Building. The need for more office space resulted in the herbarium moving first into a smaller room in the Administration Building, and then in 2000 into the building housing the Yellowstone Center for Resources. After being the nomad collection, the herbarium is now in permanent quarters for the foreseeable future.

The new facility has a designated room for the herbarium storage proper, with tables down the center of the room beside the rows of cases along the walls. Additionally, the herbarium preparation room also has room to work and examine specimens. My office is even in a separate room, directly adjacent to the herbarium prep room. What an improvement! Now we are actively processing specimens and adding to the collection which numbers approximately 9000 specimens at this time. These specimens primarily represent the vascular plant flora of Yellowstone. There are also bryophyte and lichen collections, and a fungi collection primarily collected by Kent McKnight in Yellowstone and Grand Teton National Parks.

The herbarium is available for anyone who is interested in seeing or using the facility. Please call ahead to make an appointment with me at 307 344-2226 or write to Jennifer Whipple, National Park Service, P.O. Box 168, Yellowstone National Park, WY 82190 [jennifer\_whipple@nps.gov]. Remember, botanists are in the field most of the summer, so the best time to utilize the facility is in the off-season. Come visit and enjoy all of our space! JW

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### **Herbarium Database of Grasses**

A new, web-accessible database of grasses of western South Dakota and eastern Wyoming, including the Black Hills and Bearlodge Mountains, is now posted by the Black Hills State University Herbarium: <http://www.bhsu.edu/artsscience/asfaculty/mgabel/> ; then go to "Database" (Card et al. 2006). There are 208 grass species represented in a compilation of information from 15 herbaria (including RM) and over 10,000 specimens. It currently includes information searchable on species, county and collector; with information on locality, habitat, collector and date.

#### Reference

Card, Curtis, Elke Kuegle, Elaine Ebbert and Mark Gabel. 2006. A database of the grasses of western South Dakota and eastern Wyoming including the Black Hills and Bear Lodge Mountains. Black Hills State University, Spearfish, SD.



*-See you in Pinedale!*

## **2006 Wyoming Native Plant Society Meeting**

Pinedale, Wyoming

July 15 & 16, 2006

This event will be based at Fremont Lake Campground (Bridger-Teton NF), assembling at 9:30 am on Saturday, July 15 for tours. A wild food foray will be held Friday night and a Saturday Dinner Social hosted locally on Saturday night. The May newsletter will provide a map of tours and more information. All events are open to all members and non-members at no cost.

Pinedale accommodations are limited in summer so plan ahead! This announcement contains camping and lodging information. An exciting slate of events are in-the-making, and a pre-registration to survey member interest is at the bottom of this page. Please send your pre-registration form in to Pinedale organizers as soon as possible. Look for details in the May issue.

### **Guided Tours:**

**The Mesa Tour**, featuring plants of the sagebrush steppe.

**The Kendall Warm Springs Tour**, featuring usual & unusual riparian plants.

**The Fremont Lakeside Tour**, examining a diversity of native plants, with the other eye and ear cocked toward birding

**The Soda Lake Tour**, featuring the aspen community

### **Workshops and Other Activities:**

**Painting**, learn the basics of painting flowers and landscapes.

**Native Plant Cultivation**, the easy, the hard, and the impossible

**Edible Plant Foraging**, get pointers, then gather condiments for Saturday night supper.

**Campfire Dinner Social**, hosted by the Sage and Snow Garden Club

**WNPS Business meeting**

If you are interested in attending please pre-register by sending the info below to: [kail@wyoming.com](mailto:kail@wyoming.com)  
or to WNPS, PO BOX 932 Pinedale, Wyoming, 82941

Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Address: \_\_\_\_\_

Email: \_\_\_\_\_

Please CIRCLE the two top tours you are interested in taking (above). Please CIRCLE any of the workshops you are interested in taking. Please note if you want to purchase one of the available Fremont Lake campsite reservations for July 15-16 (see next page). \_\_\_\_\_

Please indicate any other interest in participating: \_\_\_\_\_

## Camping options:

A very limited number of camp sites are now reserved for WNPS members at the USFS Fremont Lake Campground, 3 miles north of Pinedale, for the nights of July 14-15 (Fri-Sat). These spots cost \$33 each for the two nights. For details on the spots and to pay for them, please contact Carmel Kail ASAP at 367-3058 or [kail@wyoming.com](mailto:kail@wyoming.com).

All other campground sites at Fremont Lake and vicinity are available on a first-come first-serve basis (includes Half Moon Lake, and Elkhart Park), all within 15 miles of Pinedale. Fremont Lake Campground offers 54 campsites, Half Moon Campground has 17 sites, and Trails End Campground at Elkhart Park has 14 sites. Pit toilets, picnic tables, fire rings, and campground hosts are provided at each of these three campgrounds. Potable water is provided at Fremont and Trails End Campgrounds, but not at Half Moon Lake Campground. Most of these campsites cannot be reserved in advance, so campers should get to these campgrounds as early as possible on Friday. Pinedale members are willing to help hold available campsites, with prior arrangements.

Informal, dispersed camping sites (lacking all amenities) are available throughout the Forest at no cost. For information on camping rules and opportunities on the Forest, contact the USFS-BTNF Pinedale Ranger District at 367-4326 or see their website at [www.fs.fed.us/btnf/offices/pinedale](http://www.fs.fed.us/btnf/offices/pinedale)

Some RV and other improved camping sites are also available (first-come first-serve) though the Bureau of Land Management. For more information, call the Sublette County Visitors' Center at 367-2242. Ask to have the "Better Than Yellowstone" brochure and the "Wyoming Public Lands Recreation Opportunities" map mailed to you.

## Other Lodging Options:

**Through March 31**, the Chambers House B&B in Pinedale will hold rooms for Wyoming Native Plant Society members, for the nights of July 14-15 (Fri-Sat). Rates run between \$65 and \$115 per night. Reserve your room by calling The Chambers House at 367-2168. For information on other lodging establishments in the area, check <http://www.pinedalechamber.com/lodging.htm>, or call the Sublette County Visitors' Center at 367-2242.

*Accommodations in Pinedale during July are very hard to come by and get booked full early, so please don't delay. The previous weekend is the Green River Rendezvous, with pageant, parade and rodeo, so consider coming a week early!*



### Alpines in All Directions: Plants of the Western Cordilleras

The North American Rock Garden Society (NARGS) will be sponsoring the International Interim Rock Garden Plant Conference, which will be hosted by the Wasatch Chapter. The Conference will run from Friday, July 21st through Wednesday, July 26th, and will be based at the Snowbird Ski and Summer Resort in Snowbird, Utah. The announcement is posted at <http://www.nargs.org/IIRGPC.html>.

A double-barreled format is offered consisting of both a lecture series AND three-day field trips. The lecture series is at Snowbird, with knowledgeable and entertaining speakers who will educate you about the plants and the ecosystems you will see in the field. Speakers include such noted authorities as Noel Holmgren, James Reveal, Sean Hogan, Rick Lupp, Lorraine Yeatts, and others.

The three-day trips will roam far afield, to areas (and states!) not visited during past Annual Meetings:

- Ruby Mountains, eastern Nevada
- Cedar Breaks, southern Utah
- **Snowy Range, southern Wyoming**
- **Teton Mountains, western Wyoming** and Bear River Range, northern Utah

Of special interest to Wyoming Native Plant Society (WNPS) members, a five-day post-conference fieldtrip around Wyoming includes opportunities to rendezvous in Riverton at the culmination of the expedition, visiting the **Wind River Range** on July 31. This trip is already full, but WNPS members can join the Riverton Rendezvous). For information on the late morning Riverton Rendezvous, July 31, contact: Joyce Fingerut [[alpinegarden@comcast.net](mailto:alpinegarden@comcast.net)].

You do NOT have to be a member of the North American Rock Garden Association to attend. Complete registration information and fee information is posted at: <http://www.nargs.org/IIRGPC.html> with details about the speakers and fieldtrips; or contact the WNPS editor if you do not have internet access and would like the email posting mailed to you.

## What's a tree to do?

### **Interactions between nutcrackers, squirrels, and bird-dispersed pines**

By Adam Siepielski

(Editor's note: The following article highlights doctoral thesis research conducted with the support of the 2005 Wyoming Native Plant Society scholarship.)

Seed dispersal strategies are an important facet of the natural histories of plants. Most plants benefit from seed dispersal by having their seeds moved from the immediate vicinity of the parent plant, thereby reducing the chances of seed predation and competition with their siblings, among other benefits. Limber pine (*Pinus flexilis*) is among the 20 pine species that rely on birds, namely Clark's nutcrackers (*Nucifraga columbiana*), to disperse their seeds. Unlike most pines, bird-dispersed pines lack the wings on the seeds that slow their descent to the ground allowing them to be dispersed by wind. If you watch a group of nutcrackers in the fall, you will see them using their bills to shred the tough cone scales or reach between open cone scales of limber pine to remove the seeds. During the fall an individual nutcracker will bury up to an estimated 98,000 seeds a year! Nutcrackers rely on these seeds throughout the winter and spring and into early summer as a resource for themselves and their offspring. However, many buried seeds are not retrieved by nutcrackers and some may germinate into new trees before beginning the cycle anew.

The interaction between nutcrackers and limber pine is an example of a mutualism. Both nutcrackers and the trees benefit from the interaction. Trees provide nutcrackers with a nutritious food while the nutcrackers disperse the seeds. But there are costs. Many of the seeds are eaten, and in some years no cones are produced. Hence the interaction is very dynamic. Nutcrackers, however, are not the only animals that eat the seeds of limber pine. In fact, the most important seed predator of limber pine is likely the pine squirrel (*Tamiasciurus* spp.), which are common to many of the coniferous areas throughout the Rockies (including much of Wyoming) and Sierra Nevada. Like nutcrackers, squirrels remove large numbers of seeds each year from limber pine and other conifers. Unlike nutcrackers, however, squirrels are a seed predator, not a seed disperser—the pines do not benefit from having their cones harvested by

squirrels. Because squirrels do not provide a benefit like nutcrackers, this creates a conflict of interest where both nutcrackers and squirrels coexist with these conifers.

Trees that minimize cone harvest by pine squirrels while maximizing seed harvest by nutcrackers will produce the most seedlings. These trees have a reproductive advantage and therefore come to represent more and more of future generations. This is simply how natural selection causes populations to evolve over time. One of the most important functions of conifer cones is to protect seeds, thus what you might expect is that where pine squirrels occur seeds are well-defended by larger cones. Where pine squirrels are absent, such well-defended seeds are not necessary. Thus, in regions where pines squirrels are absent we expect that trees that invest less in seed defenses should be more attractive to nutcrackers and have more of their seeds dispersed. Over time these trees producing more seeds and allocating less to defenses should increase in the population. I have measured tree preferences of both pine squirrels and nutcrackers, which is a method to measure natural selection exerted by these animals, and not surprisingly they strongly prefer to forage on trees with less-defended cones.

If you look at limber pine cones from mountain ranges in the Great Basin where squirrels have been absent for 10,000 or more years, and compare these cones to limber pine from throughout the Rockies (i.e., along Happy Jack Road in Wyoming) or Sierra Nevada where squirrels are present you will notice they are very different (see Figure 1). Cones in the Great Basin are much smaller, with thinner cone scales, than cones in the Rockies or in the Sierra Nevada, but even though the cones are smaller they have twice as many seeds. This makes sense when we consider the preferences of squirrels (as seed predators) and nutcrackers (as seed dispersers), and is a wonderful example of how natural selection influences conifer cone structure.

These patterns are also replicated in another related bird-dispersed pine, whitebark pine (*Pinus albicaulis*), which occurs throughout the Rockies (i.e., along Togwotee Pass in Wyoming), and Sierra Nevada, which further supports the hypothesis that these



piners are evolving in response to the balance of natural selection exerted between nutcrackers and pine squirrels.

This work highlights the importance of taking a broad perspective on how organisms interact in nature. It also emphasizes why protection of numerous areas is important, because the ways organisms interact with each other do not occur in the same way in every location, and this interaction diversity itself is equally important to conservation as are the species themselves. AS

Suggestions for further reading:

Lanner, R. 1996. Made for each other: A symbiosis of birds and pine. Oxford University Press, New York.

About the author: Adam M. Siepielski is a PhD candidate in the Department of Zoology and Physiology at the University of Wyoming. He can be reached via email at [asiepiel@uwyo.edu](mailto:asiepiel@uwyo.edu)

Figure 1. Photograph of a limber pine cone from the Rocky Mountains/Sierra Nevada (left), where pine squirrels are present; and of a limber pine cone from the Great Basin (right), where pine squirrels are absent. Photographs by Adam Siepielski.



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## One Long Year for *Yermo*

On March 5, 2005, an opal-hunting frenzy was launched by release of a 12-page Wyoming Geological Survey report on gem-grade opal deposits along the "Central Rim" in Fremont County, WY (Hausel and Sutherland 2005). The boom escalated with newspaper publication of the primary townships of opal resources (Farquhar 2005). The same terrain bears abandoned claims on other minerals that have resurging interest.

Twelve months and many mining claims later, the biggest botanical treasure remains in limbo. The site of the only population of *Yermo xanthocephalus* (desert yellowhead) is near the area of the latest boom, and lies entirely on Bureau of Land Management (BLM) lands.

*Yermo xanthocephalus* was designated as a Threatened species under the Endangered Species Act on March 14, 2003, with later designation of critical habitat for 360 acres almost exactly a year later (March 16, 2004.) Critical habitat designation does not pre-empt mineral development.

A mineral withdrawal proposal was initiated last spring, but has yet to be submitted to the BLM national office and thus for publication in the Federal Register. The Lander BLM Field Office may submit the requisite mineral report, environmental assessment and briefing paper to the BLM state office in Cheyenne by the end of March, from where it will be forwarded on to the BLM national office in Washington D.C.

The process to withdraw the mineral estate takes up to six months once it reaches the national BLM office, so the withdrawal is unlikely to happen any earlier than next fall. (From information compiled by B. Heidel and others).

### References

- Hausel, W.D. and W.M. Sutherland. 2005. Geology - Opal Deposits of Granite Mountains, Central Wyoming. 2005. Wyoming Geological Survey, Laramie, WY. Posted at: <http://www.wsgs.uwyo.edu/metals/>
- Farquhar, B. 2005. Opal rush swamps officials. *Casper Star Tribune*, March 10, 2005.

## Species and Ecosystem Assessments

Check out the Species Conservation Project of the U.S. Forest Service – Rocky Mountain Region (<http://www.fs.fed.us/r2/projects/scp/>) in coming months for a flurry of species conservation assessment and ecosystem assessment reports being posted. The last of over 200 plant and animal assessments will be completed in 2006, representing the majority of sensitive species in the Region. Close to 20% are Wyoming plant species. Complementing this effort, Terrestrial Ecosystem Assessments (TEAs) are being done for large ecosystems. Historic range of variation (HRV) and current landscape condition (CLC) assessments combine to disclose historic and current patterns, natural and human disturbances, and ecological risks and restoration opportunities for vegetation communities and landscapes. Aquatic/ Riparian/ Wetland Ecosystem Assessments (ARWAs) are done for groups of small watersheds nested in larger river basins and sub-basins. There are ecosystem assessments for four of the large national forests in Wyoming. The Species Conservation Project provides a scientific foundation for programs and projects across the national forests and grasslands in the Region. BH

**The Wyoming Native Plant Society**, established in 1981, is a non-profit organization dedicated to encouraging the appreciation and conservation of the native flora and plant communities of Wyoming. The Society promotes education and research on native plants of the state through its newsletter, field trips, and annual student scholarship award. Membership is open to individuals, families, or organizations with an interest in Wyoming's flora. Members receive *Castilleja*, the Society's quarterly newsletter, and may take part in all of the Society's programs and projects, including the annual meeting/field trip held each summer. Dues are \$7.50 annually. To join or renew, return this form to:

**Wyoming Native Plant Society  
P.O. Box 2500  
Laramie, WY 82073**

Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Email: \_\_\_\_\_

\_\_\_ \$7.50 Regular Membership

\_\_\_ \$15.00 Scholarship Supporting Member

*(\$7.50 goes to the Markow scholarship fund)*

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