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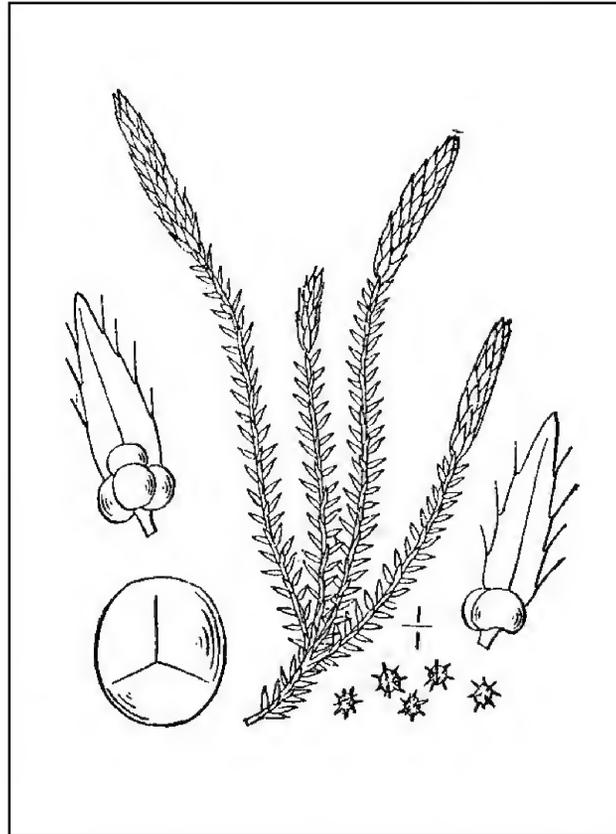
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Giants in our Midst

Selaginella selaginoides (low spike-moss) is a giant among plants in assessing climate change over geological time, and a lesser-known part of the Wyoming flora and U.S. Forest Service Rocky Mountain Region sensitive species list.

Selaginella selaginoides rarely tops 10 cm, so it is hard to imagine it producing such a profusion of microspores that their relative abundance might be used to gauge prevailing climate conditions. Yet, it has a palynological stature that belies its size in the field. Presence and abundance of *S. selaginoides* microspores have been determined to correspond with climatic cooling episodes and shifts from forested landscapes to open boreal-alpine environments in both North America (Baker et al. 1989, Garry et al. 1990, Heusser and Peteet 1988) and in Eurasia (Demske et al. 2002, Ambrosiani and Robertsson 1992).

Selaginella selaginoides is not a moss but a distinct member of the *Selaginella* genus, primitive vascular plants that hearken back almost unchanged to the Pennsylvanian (Lellinger 1985). It differs from other species of *Selaginella* in that it does NOT have a distinct bristle at the leaf apex, leaves with dorsal grooves, or a 4-angled strobilus. It is the only member of the genus in Wyoming that is restricted to wet habitats.



The fertile stems of *Selaginella selaginoides* (low spike-moss) are topped by a strobilus that produces two kinds of spores. Megaspores (lower left) are dispersed by a catapult system, and microspores (lower right) are dispersed by the wind. From: Britton, N.L., and A. Brown. 1913. *Illustrated flora of the northern states and Canada*. Vol. 1: 49. Courtesy of Kentucky Native Plant Society. Scanned by Omnitek Inc.

There are six known occurrences of *Selaginella selaginoides* in Wyoming, represented by eight collections, including recent records of Erwin Evert, Walter Fertig and Jennifer Whipple from the upper Green River Basin and from Yellowstone National Park. It occupies wetland settings in foothills and montane valleys that appear to have cold conditions – including a cooled wetland of geothermal origin in Yellowstone National Park! (Continued on p. 3)



WNPS News

Ho! Ho! – Please renew early in 2006. See the mailing label for the calendar year through which you are paid, and contact the Secretary-Treasurer (boelter@uwyo.edu) if you need record of the month when you last paid. Include your email address if you would like to receive announcements about wnps-related fieldtrips and events – this is on a trial basis to announce activities across the state that don't mesh with newsletter schedules.

By-Laws: WNPS By-Laws *can* be amended if we get the same level of response as last year after correcting our protocol. The WNPS By-Laws require response of 2/3 of the membership at an annual meeting, and any revisions to the membership fees require response of a quorum of the membership at an annual meeting. Therefore, the proposed By-Laws amendments are presented in this issue as a proxy vote and are printed in full, including a new life member category. Whether or not you will plan on attending the 2006 annual meeting, please sign and send in this proxy vote with your renewal!

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

WNPS Board - 2005

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Contributors to this issue: Walter Fertig (WF), guest-contributors Sarah Gage (SG) and Elaine Gordon (EG), and Bonnie Heidel (BH). Comments, as always, are welcome!

Treasurer's Report: Balance as of 2 December: General Fund: \$803.22; Markow Scholarship Fund: \$977.50; Total Funds: \$1780.72.

Annual Meeting: The Wind River Range and upper Green River Basin will be our 2006 annual fieldtrip/meeting destination! The date and itinerary will be announced in the March newsletter. Thanks to Pinedale organizers for stepping up (contact: Carmel Kail; kail@wyoming.com; 307-367-3058).

New Members: Please welcome the following new members to WNPS: Jennifer Banks (Laramie), Craig Delphey (Woodinville, WA), Meghan Mutch (Clearmont), and Brianna Schoessow (Laramie).

Wyoming Plant Conference: We are scoping whether a 2006 Wyoming Plant Conference is feasible. Comments are invited (contacts: Jennifer Whipple, jennifer_ripple@nps.gov; or Bonnie Heidel, bheidel@uwyo.edu).



Message from the President

What is a Bot-?

A "bot" is nothing more than a botfly maggot. The word root for "botanist" (*botan*) is little less obscure; a Greek derivative from the words for pasture, grass, and fodder.

The botanical splinter-sciences (agriculture, horticulture, forestry, range, etc.) claim all too few allegiances and limited commonality in formal training with botany. The Wyoming general public is not apt to run into bot-people because almost all the ones who teach facets of botany are sequestered in Laramie, there are almost none in government agencies, and the realm of the rest is out of the limelight.

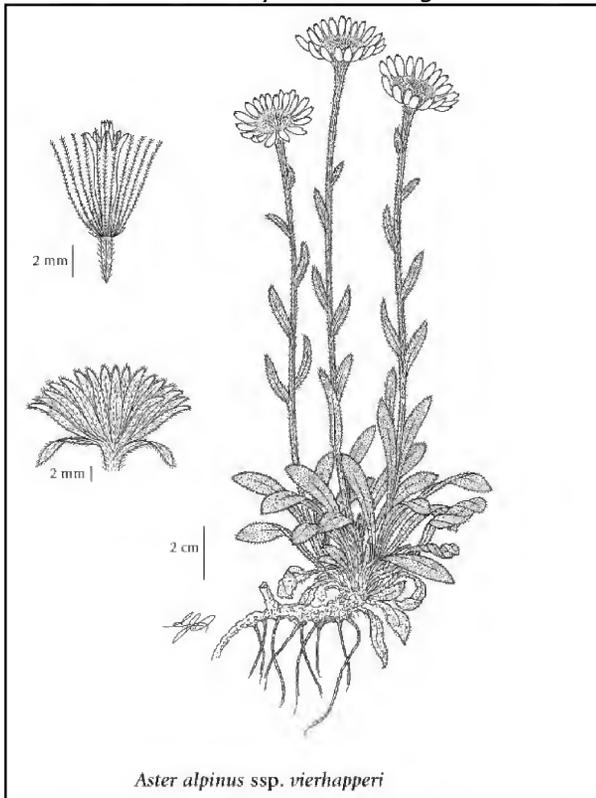
For all of this identity limbo, the need has never been greater to present the botanical breadth and framework in Wyoming's natural world, and promote an appreciation. The "native plant" moniker of our organization is a more inclusive term, though plant nativity does not have the same familiarity as "wild" and "domesticated" distinctions in the Animal Kingdom, and inclusion of hobbyists is not meant to exclude scientists.

In short, I believe that all botany disciplines and all members are integral to this organization and these ideas. ...If I could have one wish, it is to wish YOU a botanically Happy New Year. BH

Botanica

(Or Odds and Ends from the Botanical World)

by Walter Fertig



From: Douglas, G. W. et al. 1998. Illustrated Flora of British Columbia, Vol. 1. Posted by: Klinkenberg, Brian. (Editor). 2004. E-Flora BC. [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver.

Asters back in Wyoming Flora Despite the best efforts of North American systematists to remove the genus *Aster* from our midst (now placed in the segregate genera *Almutaster*, *Eucephalus*, *Eurybia*, *Ionactis*, *Oreostemma*, and *Symphytotrichum*), one species has made it back into the state's flora. In 2004, Luc Brouillet announced the discovery of *Aster alpinus* ssp. *vierhapperi* from Beartooth Pass in Park County, Wyoming (*Sida* 21(1):459-461). The Alpine aster is recognized by its low stature (stems less than 20 cm tall), single-headed flowers with white to purplish rays, leafy pubescent bracts, and pubescent, spoon-shaped basal leaves. It is readily confused with large-flowered *Erigeron* species. *Aster alpinus* is widely distributed in Siberia and northern Eurasia and occurs sporadically in the Rocky Mountains from Alaska to central Colorado. Alpine aster belongs to a mostly Eurasian group, allied to the true species of *Aster*, though at least one researcher has proposed carving out a new genus *Diplactis* for *A. alpinus* and its closest relatives. WF

Two Thousand Year Old Seeds Sprout The Judean date palm once formed extensive forests throughout ancient Palestine and served as an important source of food, fiber, shade, and medicinal drugs. The palm was wiped out by the first or second centuries AD, a victim of warfare and desertification.

Nearly thirty years ago, archaeologists excavating the ruins of King Herod's palace on Mount Masada discovered a stash of Judean date palm seeds. Carbon dating indicated that the seeds were 2,000 years old. In 2005, ethnobotanist Elaine Solowey of the Arava Institute for Environmental Studies in Israel acquired three of the Masada seeds to study whether they might still be viable. Solowey planted the seeds on the day of the Jewish Festival of Trees (25 January 2005) after soaking them in warm water and applying gibberellic acid and rooting hormones. To Solowey's surprise, one of the seeds germinated after five weeks and produced a small shoot with three leaves. The seedling, named Methuselah, is the new record-holder for having germinated from the oldest known seed, eclipsing the previous mark of 1,200 years for a species of Chinese lotus.

Date palms are dioecious (with separate male and female plants) and the sex of Methuselah is not yet known. It may be possible to vegetatively propagate additional specimens from this one surviving plant to build up a larger number of Judean date palms, though without at least one male and one female the species won't be able to form a viable breeding population. Still, the resuscitation of a once extirpated species from surviving seed provides some hope for other plants considered long extinct. WF

Giants in our Midst – *continued from p. 1*

Extant sites of *S. selaginoides* at temperate latitudes have been characterized as Pleistocene refugia (Heusser and Igarashi 1994) in the sense of Pielou (1979), i.e., land areas that remained ice-free during colder climates and with local conditions that still harbor earlier floristic elements.

What does the future hold for *Selaginella selaginoides* in Wyoming? The answer is not clear. If palynological research elsewhere in its range is any indication, there is more at stake than meets the eye. BH

(References are listed on p. 12)

Canada Thistle: Time for a Name Change

By Elaine Gordon

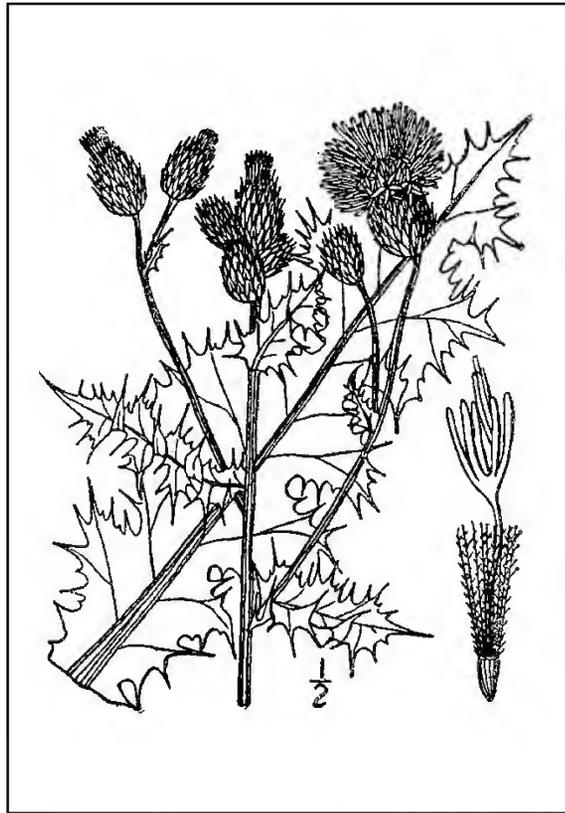
(Editor's note: Among the lesser-publicized facets of international relations are plant species common names. The following article is reprinted from *Iris* 46:3-4, newsletter of the Alberta Native Plant Council, and shortened, with permission.)

Anyone can change a common plant name. All it takes is enough people using a name and spreading the word until it is the most popular one around. In North America "Canada" thistle (*Cirsium arvense*) is the most often used common name for this obnoxious weed, but it is also known as creeping thistle and California thistle. In France it is goes by "chardon des champs", Germany it is "Ackerdistel", and in Spain ask for "Cardo cundidoe". It's time we all got together and change the name "Canada thistle" to its most widely-used European name, **creeping thistle**. Here are some interesting facts about Canada thistle (hereinafter known as creeping thistle) just in case you ever wanted to know.

Carolus Linnaeus in 1753 wrote of this plant, "It is the greatest pest of our fields". Creeping thistle is the only species of thistle with rhizomes, which is how it got its European name. It is native to Europe or Eurasia (origins are quite fuzzy ...) and was introduced to North America early in the 17th century. It's thought that its introduction was a case of mistaken identity by early settlers who thought they were bringing crop seed. Or it may have been brought with hay seed. As early as 1795 the state of Vermont declared it a noxious weed. Apparently it grows at its best between 37' and 59' latitude, which puts us [Alberta] smack-dab in the middle of its favourite conditions.

It's too bad it's such a problem, because the flowers are actually really beautiful. The plants themselves are either male or female, although up to 26% of the male plants may have female flowers too. The flowers of creeping thistle are almost always insect-pollinated, and studies indicate that more insect species visit creeping thistle than any other thistle species because it puts out copious nectar that is easily accessible. So, there you have it: actually one good thing about creeping thistle - it's great for some insects. However, the benefit that insects get from creeping thistle is out-weighted by its negative impact on native plant communities, which ultimately leads to a negative impact on overall insect diversity.

The actual number of seeds can vary from 100-64,300 viable seeds per square meter (Australia data). Seeds have a feathery pappus to facilitate wind distribution, but for many of them, the pappus breaks off and they are left in the floret so they will germinate near their mom.



CREeping THISTLE (*Cirsium arvense*). From: Britton, N.L., and A. Brown. 1913. *Illustrated flora of the northern states and Canada*. Vol. 3: 553. Courtesy of Kentucky Native Plant Society. Scanned by Omnitek Inc. Usage Guidelines.

Interestingly, seeds cannot germinate on rubble or turf. Not that that stops creeping thistles from spreading. Root systems are the primary method of colony expansion - as if that's news to anyone trying to get rid of it! Seriously though, their rhizomes can grow as much as 6 m in one season, putting up numerous shoots all along its length. Meanwhile, their vertical roots store water and nutrients in their many small branches. No wonder it takes years of pulling and digging to deplete it enough to actually kill it. Horizontal rhizomes grow within 15-30 cm of the soil surface, in a straight line for 60-90 cm, then bend down and grow vertically. Another horizontal system is usually initiated at the downward bend. This bend is where the root system is thickest-up to 2 cm in diameter. The vertical root happily grows on down up to 6.8 m. (if it can). Individual roots live up to two years but new root buds develop in autumn after the aerial shoots die. Root buds are inhibited by the presence of the leaves and stem tissue, due to a competition for water. So, if you mow the leaves and stem it encourages formation of root buds and a zillion more shoots cheerfully emerge, particularly encouraged with a bit of humidity.

(Continued, p. 5)

In nature, roots are susceptible to damping off. They are very drought tolerant in established plants, but dry winters can result in mortality due to dessication of roots. Cold weather? Hah! They laugh at the cold since they easily develop cold tolerance with increased exposure. Deep roots are likely susceptible to freezing, but they are so deep that they are well insulated.

First Nations people quickly became familiar with creeping thistle and used an infusion of its roots for mouth diseases. Some considered it to be "tonic, diuretic and astringent". The young shoots and roots can be used in the same ways as asparagus and they were eaten in Russia. The flowers supposedly make good honey.

The problem with controlling creeping thistle is that most methods kill everything around it so that little or no native vegetation is left. The roots are too deep for most pesticides and fire must be used early or it will actually encourage growth. Usually a combination of biological control, prescribed fire or mowing may help control them, but these applications must be repeated for at least two years. Burning during dormant periods usually (but not always) reduces creeping thistle by encouraging the spread of native vegetation. Also, burning must be done early in spring. If done too late, biomass and shoot density will actually increase. Seedling density also increases following summer fire. In some wetlands, burning has no effect on thistle density. When spot applications of pesticides are used (e.g., Roundup), root buds and re-growth of secondary shoots is reduced. These seem to have greater impact on plants at the bud to flowering stages than in younger plants, and work the best in August.

Mowing, as we saw earlier, encourages growth unless it is repeated over and over for only about four years. Terrific!! Covering them so that they cannot photosynthesize can kill plants, or they may actually be choked out by competitive species such as alfalfa and the sweet clovers, after which, you have to get rid of those...

More interesting stuff. Seeds are available online. Yes! 850 euros will get you 1000 g of seeds. A steal--considering that there are 800 seed/g.

We have to admire their tenacity. Someone said that after a nuclear war the only living things left on earth will be cockroaches. Don't be too sure.

... So, here's to a new name: creeping thistle! Spread it far and wide - - the name, that is!

[Additional information on CREEPING THISTLE, with literature citations, is presented at:
(<http://tncweeds.ucdavis.edu/esadocs.html>)]

A Weed-Wary Word to Wyoming Gardeners

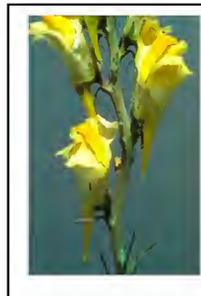
[From announcement forwarded by members]

The seed packets may have labels with romantic-sounding names such as meadow mixture and wedding wildflowers, while others tout backyard biodiversity and make reference to Earth Day. When growing 19 such packets of wildflower mixes, however, University of Washington researchers found that each contained from three to 13 invasive species and eight had seeds for plants considered noxious weeds in at least one U.S. state or Canadian province.

And what makes it nearly impossible for gardeners who want to be conscientious is that a third of the packets listed no contents and a little more than another third had inaccurate lists. Only five of the 19 correctly itemized everything.

"I can't recommend using any wildflower seed mixes," says Lorraine Brooks, who did the work at the UW's Center for Urban Horticulture while earning her bachelor's degree.

The seed mixes in this experiment were produced at or distributed from a variety of U.S. and Canadian locations. Brooks and Sarah Reichard, UW assistant professor of forest resources, say gardeners are better off using their favorite plants, or seeds for their favorites, to control what's grown in their yards.



Gardeners might be surprised at the flowers and seeds on the market that are considered invasive or noxious... Yellow toadflax (*Linaria vulgaris*) is listed as a noxious weed in Washington, Oregon, Idaho and 11 other states and provinces [including Wyoming]. With yellow flowers tinged with orange that resemble snapdragon blossoms, toadflax was found in four of the wildflower mixes. One listed it.

Even labels that refer to wildflowers as native should be avoided because everything is native to someplace, but that place may not be where you live, Reichard says.

In closing, here are a couple of the key questions to be considered by consumers:

- Should a consumer buy wildflower seed mixes that don't list their contents?
- How can consumers know that wildflower seed mixtures shouldn't be spread near or in natural woodlands, meadows or fields when they are labeled with words such as "native," "biodiversity" and the term "wildflower" itself?!

(Editor's Note: What would the world be like with a Nobel prize in Botany? an Olympic event in plant pressing? ...or an Oscar award category in Botany?)

SOMEWHERE OVER THE HERBARIUM

By Sarah Gage [sgage@seanet.com]

(Reprinted from BOTANICAL ELECTRONIC NEWS,
No. 342, of February 2, 2005)

I want to thank the members of the Academy for inviting me to speak here tonight-the first ever keynote address at the Oscars. It is a great honor, and I feel privileged to be in the company of the other incredibly talented nominees. Addressing all you glittering stars here in the Kodak Theatre, and all of you, the billion-some movie fans in the worldwide television audience, well, truly it's stunning!

As you know, I am an educator as well as a botanist, so to introduce my topic I want to start out with a quiz. Please don't get nervous; you'll get to grade yourself! But see if you can identify the movie in which the following botanically oriented character appears:

1. This timid botany professor compares his bride to the delicate windflower, *Anemone nemorosa* (1941).
2. A fern taxonomist-heiress is married for her money (1971).
3. A scientist is charged with preserving Earth's botanical heritage in a greenhouse-spaceship (1972).
4. The male cousin has worked as a mycologist, among other professions (1975).
5. This couple, on a plant collecting trip to Earth, gets separated from their offspring (1982).
6. A horticulturist marries an illegal alien to obtain a greenhouse apartment (1992).
7. A greenhouse volunteer has bad luck with childcare (1992).
8. An ethnobotanist with a gray ponytail, working in the Brazilian rainforest, finds and then mislays the cure for cancer (1992).
9. Giant reptiles terrorize a palaeobotanist (1993).
10. A toothless, stringy-haired plant fanatic wades a swamp in search of a rare orchid (2002).

...How did you do, Jack? And you, Nicole?

The answers will follow, I promise.

The function of this quiz is to point out to you how often we don't notice what is right in front of us. Scholars tell us that one of the best ways to learn is to have questions in mind, to always be looking for something.

As a movie lover and a botanist, I notice when plants and botanists show up in film. It's an Aha! moment. And believe me, these moments don't occur as often as I would like. In my remarks tonight, I want to subject the movies to the lens of botanical science - the study of the foundation of all life on the planet.

Without the photosynthetic mechanism of green plants to capture the sun's energy, life on earth would not exist. Their role in our daily lives as food, fuel, fiber, medicine, building material, and aesthetic objects gives them importance as a film subject.

Is it just that familiarity breeds contempt? Yet how many people are actually familiar with the plants (or the botanists) around them.

One of our roles as botanists is to name the diversity of plants, and by naming it, make it visible. A first question we all ask is "what is it?" You have to know what to call something if you are to see it well.

Plants of power and mystery do crop up in the movies every now and then. The bloodthirsty plant in "Little Shop of Horrors", the tree that kept Merlin captive in "Camelot", the edelweiss in "The Sound of Music", and the poppies in the "Wizard of Oz" -these and more populated the movies I grew up with. As my eye for plants developed, I also noticed some botanical howlers. The Southern California oaks and chaparral out back of Los Angeles stood in for "the West" in countless westerns. I saw green clothespins holding on the bean leaves in "The Milagro Beanfield Wars". "The Last of the Mohicans" featured tall shrubs of "Rhododendron" in what was supposed to be upstate New York. If you film in South Carolina, the botanists in the audience are going to figure it out.

(Continued, p. 7)



I don't mention these botanical gaffes to demean my colleagues, the "greens" staff whose names are buried in the credits. Their work often creates remarkable and diverse impressions, such as the gardens in "Howard's End" and "A Room with a View", or the topiaries in "Edward Scissorhands". No doubt the greens workers, like most botanists, labor under difficult conditions, tight schedules, and budgetary constraints.

Plants in movies are rarely central to the plot, even if they figure large in the setting. The same can be said of botanists in film. Their work seldom drives the plot, unlike that of cops, murderers, and spies. You'll see that botanists frequently portray stereotypes or personify societal anxieties.

Throughout the nineteenth century, botany ruled. Clubs, outings, and specimen exchanges enrolled participants in the tens of thousands. When botany was so popular, it was considered a genteel and healthy activity for girls and women, thus tainting it as an endeavor for boys and men. Botany held less value than more masculine pursuits.

One editorial lamented that "the boy who, having an eye to see and a heart to feel the beautiful in nature, undertakes to master the charming science is taunted as a 'girl-boy' and as unmanly."

By 1887, when botany was shifting from the study of natural history and an emphasis on taxonomy to more experimental work in fields such as plant physiology and ecology, the journal "Science" published an article titled "Is Botany a

Suitable Study for Young Men?" It argued that botany was indeed appropriate for men who were "able-bodied and vigorous brained."

Botanists of various stripes have been popping up in films since the 1920s, and in the first half of the twentieth century they reflected this idea, that botany wasn't quite a manly profession. This attitude shows up in films such as "Local Boy Makes Good" (1931) in which a timid, bookish botany major pines for a beautiful coed. He is a proverbial ninety-eight pound weakling, but one who overcomes his limitations (and his interest in botany) to win a track meet and get the girl. In the French film classic "Grand Illusion" (1937), Erich von Stroheim plays the stern and upstanding German commandant of a World War I prisoner of war camp, complete with monocle and stiffly buttoned uniform. He summons an imprisoned aristocratic Frenchman to his office. When the Frenchman observes the one bright spot of color in the prison, a potted geranium on the windowsill, the commandant says scornfully "We are not just "botanists" here." As if to say, botanists could not be soldiers, could not be "men".

In "Ball of Fire", a 1941 movie starring Gary Cooper and Barbara Stanwyck, this botanist-as-wimp stereotype reaches its peak. Cooper plays Professor Potts, an awkward but handsome grammarian who lives with seven other scholars, including a botanist (Richard Haydn). Cooper recruits Stanwyck, a lounge singer named Sugarpuss O'Shea, to help him with his research into slang. The botanist is the only one of the scholars who is a widower, not a bachelor, so he is considered a man of the world, and capable of giving Cooper/Potts advice on love. But our botanist wears an old fashioned (even for the 1940s) high starched collar, a wing coat, a white bushy mustache, and pince nez glasses that hang from a chain. He walks with his chin thrust forward and his rear stuck out behind, slightly stooped and clearly silly. His voice emerges from halfway down his throat, as if he were gargling with marbles, and he enunciates his words with over-elaborate care.

Toward the end of the film, when the road to true love isn't running smooth for Sugarpuss and Professor Potts, the botanist tells about his long ago honeymoon in the Alps. (Continued, p. 8) He compares women with the trembling windflower, *Anemone nemorosa*, enunciating this

scientific name carefully in a cascade of syllables. He emphasizes that a woman must be treated with utmost delicacy, or like an *Anemone nemorosa* that has been visited by an unruly bee, all will be lost.

During their honeymoon, he says that his bride produced a collection of fourteen excellent watercolors, and that each evening he kissed the palm of her hand. Even now he is stunned at his boldness. ...The botanist's name? Professor Oddly.

After World War II, the climate in American films shifted for botanists. While still all male and white, they could be botanists and consummate heterosexuals. In 1949's "Family Honeymoon", the "bachelor botany professor" is plagued with a scheming ex-girlfriend after he marries a widow with three children. "The Snow Creature" (1954) features a botanist adventurer whose collecting expedition to the Himalayas nets not only plant specimens, but an abominable snowman who escapes captivity to murder and pillage in New York.

"All that Heaven Allows" (1955) features Jane Wyman as Cary Scott, an upper middle class suburban widow who falls in love with her gardener. Rock Hudson plays Ron Kirby, the gardener who is "taken with trees." He points out to Cary that she has a "Koelreuteria", or golden chain tree, growing on her patio, and that the Chinese say a house will be full of love with that species growing nearby. Their relationship really takes off when he asks her "Do you want to see my silver-tip spruce?"

Kirby/Hudson is tall, dark, and handsome, with a deep voice and a well-groomed pompadour. He wears khaki pants and plaid shirts open at the neck, showing a clean white undershirt beneath. A friend of his says that Kirby "doesn't read "Walden", he lives it!" A member of Cary's country club calls him "her nature boy." What a dreamboat! He's sensitive, his own man, and an ardent lover. What delicious irony that Rock Hudson, a gay man, plays this masculine heterosexual hero - a war veteran who pulls corks out of Chianti bottles with his teeth.

Ron Kirby/Rock Hudson has such a way with those Latin names! He's very botanically oriented although he defines himself a gardener and a nurseryman. He lives in a room next to his greenhouse. Botanists in film all tend to work in greenhouses or in the field. While in real life botanists do work in those settings, we also work in labs, libraries, herbaria, museums, and offices. You members of the Academy may not know that botany can encompass all branches of plant science, from plant physiology, plant anatomy and morphology, to the study of algae (phycology), fungi (mycology), and mosses (bryology), just as

filmmaking involves everything from costume design and catering, to accounting and acting.

Botanists can study ecosystems, whole organisms, cells, or molecules. Some botanists never set foot in the field, but most will work in a laboratory at some point, or collaborate with someone who does. Labs and offices are less picturesque than greenhouses or jungles, and I can understand why you filmmakers rarely or briefly show them in most movies.

Incidental botanist sightings occur in a number of films. In "E.T.-The Extraterrestrial" (1982) the space creatures come to earth to collect botanical specimens-that is what E.T.'s parents are doing when he gets separated from them. They are hurriedly gathering species in the dark, a difficult working situation for any botanist. In "Jurassic Park" (1993), Laura Dern plays a paleobotanist. She has just a little time to *ooh* and *ahh* over some living examples of extinct plants before she starts running for her life.

In "Cousin, Cousine" (1975), a French romantic comedy, cousins by marriage start a relationship with each other. Ludovic (Victor Lanoux), the male cousin of this pair, is a free spirit; he changes occupations every three years. The job before last was as a mycologist; he found a prize specimen of *Boletus parasiticus*. When I saw this film, the college-aged audience laughed knowingly, in a way that reminded me that most people think of fungi primarily as mushrooms, and that "mushrooms" can have a psychedelic connotation. This character's charm depended in part on his dilettantism, although in real life a three-year long acquaintance with fungi is hardly sufficient time to develop the proficiency he claims. Botany attracts a certain number of dilettantes, as do other fields, but botany also draws many obsessive-compulsive personalities. How else could people find themselves specializing in phallic and foul-smelling corpseflowers and stinkhorns?

"Silent Running" (1971) is one film in which botany is central to the plot. Bruce Dern (father of Laura Dern) plays Lowell Freeman, a scientist who continues to maintain his spaceship- greenhouse in opposition to the rest of his crew and contrary to orders from the authorities. He is trying to save Earth's plant life after the planet has become too polluted to support it. Freeman sets his spaceship greenhouse loose into the outer beyond, and his only companions are the small robots and the plants on board his ship. The robots take on more and more endearing qualities, but the dialogue devolves into a series of monologues from Dern's character, with some chirps and squeaks from the machines. At least he doesn't talk to the plants.

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This free man, a man of conscience, is torn over losing human companionship but he commits himself to preserving what remains of Earth's plant life. He'll never know the ultimate fate of his space-bound, photosynthesizing cargo. In this way, his circumstance echoes our own, whether we are botanists or not, as stewards of life on this planet with a responsibility not only to our own species but also to life as it has evolved here. This life that may be unique in the universe, despite the hundreds of science fiction films that posit otherwise.

Freeman grows long hair and a beard, and he wears a series of oh-so-seventies caftans. Although he's a man of principle, his taste in clothes strikes us now as laughable, even embarrassing. What to wear in the field is always a troubling mix of practicality and fashion.

Another botanist with sartorial difficulties emerged in the 1971 film, "A New Leaf". Walter Matthau plays Henry Graham, a monumentally self-centered rogue who has run through all his own money; to stay solvent he must marry a rich woman within six weeks. The object of his scheming is the marvelous Elaine May playing Henrietta Lowell, a socially inept and clumsy botanist and heiress who forgets to clip the tags off her new clothes. She is a fern expert, a pteridologist. The script enhances its botanical credibility by having May's character speak excitedly about receiving correspondence from "Wagner in Michigan." The late W.H. Wagner was an eminent American pteridologist at the University of Michigan for some forty-plus years. Any botanist interested in ferns will recognize his name. In the movie, Matthau's character succeeds in wooing the toothy, spectacled taxonomist. Then, on their honeymoon, he attempts to murder her by pushing her off a cliff.

Before her rescue, while clinging to the rocks, she finds a fern species new to science. She names it after her new husband.

The character of Henrietta Lowell interests me for several reasons. Despite the "gentility" of botany and thus its suitability for women, May's character is the earliest female botanist in film that I have found. Elaine May wrote, directed, and starred in the movie, but in 1971, during the second wave of feminism, she made Henrietta awkward and mannish. This perhaps follows a comedic imperative, but it also expresses society's uncertainty about women's roles during that time.

Still, the character is ultimately, determinedly her own person, with a vocation and a marriage. We see her doing what taxonomists do: finding and naming and classifying life on the planet. Her interest in science is not predicated by any ideas of usefulness for human beings, or any conservation urgency, or any spiritual

calling. She doesn't give a reason for her engagement with her study; she doesn't feel that she needs to.

Early in the 1990s, as a working botanist, I had a brush with the film industry myself. At the University of Washington Herbarium I received a call one day from an assistant set dresser for the film "The Hand that Rocks the Cradle". The movie was being filmed in Seattle. My heart beat fast, my face flushed, I was all atwitter-was this the start of my career as Botanist to the Stars? Little did I know I would end up here on stage in front of you tonight!

The set dresser asked me to look around and tell her what I saw. What was on the walls of my office? Surely I had some botanical prints they could rent for their set? I told her about the dull brown metal bookshelves, stuffed with fraying nineteenth century books. I described the smudged white walls that surrounded me, and how ranks of seven-foot tall cabinets filled most of the room. I explained that I sat in a windowless basement, with a ten-dollar wildflower calendar hanging above my desk.

In "The Hand that Rocks the Cradle" (1992), Annabella Sciorra plays Claire, who is building a greenhouse in her backyard. The house she shares with her picturesque family sits in one of Seattle's tonier neighborhoods. Unlike my office, her home is clean, bright, cheerful, and tastefully decorated with art prints and area rugs. My input didn't appear to have had much effect.

Claire also volunteers at a city park greenhouse (filmed at Seattle's Volunteer Park Conservatory), which provides another colorful backdrop. She says that the Conservatory is "one big botanist family" that talks about "root rot and the drainage properties of shredded bark." I think the script consultant who talked with my colleague at the University greenhouse paid better attention than the set dresser; drainage and root rot are big topics. In the film, Claire and her husband hire a nanny, the too-good-to-be true Peyton Flanders (Rebecca De Mornay). This woman proves to be a psychopath, and she uses the backyard greenhouse to commit a grisly, glass shattering murder. The botany here is subservient to the plot's expression of societal tension. The film demonstrates a profound misogyny, in keeping with 1990s apprehensions about yuppie women "having it all." While purportedly showing Claire's fulfilling life with her loving husband, cute kids, affluence, and satisfying avocation, the real message is that Claire should stay at home with her children. She shouldn't need a nanny.

The early 1990s were a hard time to be a woman botanist in the movies. In "Green Card", Andie (Continued, p. 10)

MacDowell plays Brontè Mitchell, a New Yorker desperate for an apartment that includes a greenhouse. This is no little rooftop hothouse built from a kit, with listing shelves of vegetable seedlings. Rather, it's reminiscent of a Victorian conservatory, with high arched ceilings and mature plantings. To be able to lease this apartment, she must convince the building's board that she is married, which is how she hooks up with Georges Faure (Gerard Depardieu), a French musician who wants to stay in the United States. At the beginning of the film, Brontè's occupation is the nicest thing about her: she facilitates the provision of garden spaces in the city. Otherwise she is a hard driving hardass, selfish, self-centered, dishonest, and unethical. During the course of the film, the sensitive artist Georges teaches the rude scientist Brontè how to be nicer, more genuine, and more compassionate.

Then consider the treatment of Dr. Rae Crane (Lorraine Bracco) in "Medicine Man" (1992). This film intends to show the environmental urgency of rainforest destruction-how the tropical rainforest is the repository of so many of the planet's resources, and yet we don't know or understand all that lives there. Sean Connery plays Robert Campbell, a botanist who has requested a research assistant from the private foundation that funds him. He's been incommunicado for the past three years but now he seems to have found something important, although he's not saying what. Rae Crane's occupation isn't explicitly stated although her self introduction implies that she is a plant biochemist. She journeys to Campbell's rainforest compound, bringing with her a gas chromatograph and the other supplies he requested.

Campbell is by turns rude, arrogant, demanding, mysterious, and officious. He expresses scorn for Crane on all levels. He ridicules her expectations for food and a place to sleep. He jeers at her boots and her lack of field experience. And he derides her gender. Bracco's character shrieks and gesticulates, repeatedly demands a bath, and threatens to withdraw funding for his research program. Clearly, they deserve each other.

All this bad behavior must be for dramatic effect, of course. We moviegoers rarely reward films in which people are nice to each other with blockbuster attendance records. In my experience, however, most scientists in remote field locations go to great lengths to extend courtesies to one another across divides of culture, gender, age, and nationality. If field biologists are new to a location or a culture, they will go without rather than presume. If they are hosting visitors, they will try their utmost to provide information and comforts to new arrivals. Incivility and arrogance can certainly be found in plant science, but among botanists in the field I have rarely encountered it.

Despite his rudeness, Connery's character is deeply, almost fanatically, committed to his research, to the rainforest, and to the people he is living among. Early in the film he subjects Crane to a medical exam so that she won't infect the native people with any diseases she might be carrying. A noble sentiment, profoundly at odds with historical precedent, but made ludicrous by the superficial medical knowledge portrayed in the exam; it is the screenplay's excuse for Campbell to probe Crane and to set up the inevitable love-thang between them. Unfortunately, this begins a long series of scientific inanities in the movie. When Connery's character says, in his mellifluous brogue, "I _found_ the cure for cancer, but I _lost_ it," he is giving voice to farcical popular misconceptions about science. The idea that one scientist, working alone in a rustic, palm-roofed, field station, could know that he had a cure for anything-let alone cancer, which is really many different diseases, well, that is so ludicrous that I choked, laughing, on my popcorn.

Now, my point here is not that I am so much smarter about the workings of science than the screenwriters who developed this script. I understand that drama has exigencies of its own, and that a Hollywood film is primarily about entertainment and not education - although we all learn from movies, whether that is their intention or not. The plot of "Medicine Man" disappoints me precisely because it has so much potential to say something true, or at least pertinent, about the tropical rainforests' importance to humans and to the planet.

At least in "Medicine Man" the botanist's work is central to the story, which isn't the case in almost all of the other movies in which botanists appear. You could replace "horticulturist and greenhouse" with "photographer and darkroom." Or "botanist on an expedition" with nearly any other kind of field scientist (e.g., geologist, zoologist, entomologist). The occupation of most of these botanically oriented characters is secondary to the main drivers of the plot, which are usually love, murder, mayhem, or all three.

With Chris Cooper's Oscar for Best Supporting Actor as John Larroche in "Adaptation" (2002) to start off the century, I have great hopes for botanical presence in films to come. Are you listening Harvey Weinstein? How about you Steven Spielberg? And you, Martin Scorsese? John Larroche is worlds away from Elaine May's timid pteridologist, but he too follows his own way. He is disrespectful of authority, convinced of his own righteous opinions, but he has a painful past that makes him sympathetic. He's no better than he has to be, but he's awfully good at what he does.

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"Adaptation" works on many levels, but John Larroche fascinates Susan Orlean (Meryl Streep), the journalist who is writing about him, precisely because of his passion. It's his passion she's hot for. Well, maybe it's the drugs, too. But her urban jadedness contrasts with his rugged, working-class enthusiasms, in a tradition that can be traced at least as far back as Lady Chatterley's lover. The cross-cultural romance is one of film's stocks in trade. Certainly the class transgression is part of the draw in "All that Heaven Allows". We see it also in "Greenfingers" (2000) when sexy lout Colin Briggs (Clive Owens) and his fellow prisoners create a garden that attracts the attention of horticulture diva Georgina Woodhouse (Helen Mirren in some fabulous hats). Clive Owen and the diva's daughter start a romance, and the diva herself takes up with one of the other gardener-convicts.

Beyond being a working class hunk, what John Larroche does in "Adaptation" is find and grow orchids. He tantalizes Susan Orlean with his obsessive curiosity. When she meets him, his interest is orchids. Before that it was fish. But when he is interested in something, he gives it his all. That rings true for me. The botanists I know tend to be impassioned about their subject. This can be lucky for them, to be so committed and engaged in their work when so many others have less passion about what they do.

Perhaps it is similar to a mania for filmmaking? In "Adaptation" we see screenwriter Charlie Kauffman (Nicholas Cage) tormented as he wrestles with the unwieldy but fascinating material of Orlean's book "The Orchid Thief". Ultimately he opts for the conventions of cinematic storytelling, with drugs, guns, car chases, and murder. This serves as a commentary on his creative struggle, but more importantly it slyly scrutinizes - and lampoons - the expectations of Hollywood and the movie consumer.

Well, this consumer loves a movie that makes me laugh and cry! Your industry understandably focuses primarily on the human condition. But while some movies do show concern for issues of social justice, more often they dwell on sensationalistic crimes, infidelities, and explosions. Film is another medium where we as a species show our almost complete focus on ourselves. This anthropocentrism may be our ultimate undoing. I suggest that the intersection of humans and nature at large - and not just big animals with sharp teeth - offer a fertile ground for the practitioners of your art.

Botanical and other scientific adventures can be exciting and rich. There are big stories to explore here. Spectacular stories could be told about the science of plants: their discovery, their use, the tragedies of habitat loss and the extinction crisis. I'm thinking about Erin Brockovich-type stories of halting development to preserve biodiversity.

I'm thinking about the heroism of Soviet scientists who literally starved to death rather than eat the seeds they were charged with preserving during World War II. I'm thinking about larger than life, colorful characters:

- Adventurous Ernest "Chinese" Wilson, who collected innumerable plants in remote valleys of China that are now familiar in our gardens.
- Cantankerous and lonely Wilhelm Suksdorf, who roamed the southern flanks of Washington's Mt. Adams and whose ideas were often at odds with the botanical establishment.
- Wealthy and spoiled Ynis Mexja, who collected plants in Mexico during the 1920s and 30s, and whose talent for self-promotion was exceeded only by her ability to alienate others.
- Brave Alice Eastwood, who rescued plant specimens from a burning building during the 1906 San Francisco earthquake, and who collected plants well into old age.
- Charismatic and exasperating Al Gentry, who knew more about tropical trees than any other scientist, who cut a swathe through the hearts of his female colleagues, and who died in a plane crash on a fog-cloaked mountain in Colombia.

These are just some of the possibilities. You are the Academy of Motion Picture Arts and Sciences! I invite you to consider how your art, your science can interact with the green life that supports us all. There are a million stories in the naked herbaria, laboratories, and greenhouses of the world.

What would happen if you make plants and our planet more central to your art? The winner would be ... all of us.

Giants in our Midst – References (cont. from p. 3)

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(Editor's note: This article was written incidental to producing a species assessment for the Rocky Mountain Region of the U.S. Forest Service, for later posting at: www.fs.fed.us/r2/projects/scp/)

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:

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