



Castilleja

The Newsletter
of the Wyoming
Native Plant Society

March 1996
Volume 15, No. 1

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Rosinweed (*Silphium integrifolium* var. *laeve*) is a yellow-rayed member of the aster family (*Asteraceae*) with leafy stems 1.5-4.5 feet tall. It superficially resembles sunflowers (genus *Helianthus*), but differs in having fruits produced only by the petal-like ray flowers rather than the disk flowers. In Wyoming, this species is known only from the banks of Crow Creek on the grounds of F. E. Warren Air Force Base in Cheyenne. It occurs in subirrigated alluvial floodplain meadows at the edge of thickets of coyote willow (*Salix exigua*) and Baltic rush (*Juncus balticus*). Although quite uncommon in Wyoming, this species is more widespread in the eastern Great Plains. Ill. by Walter Fertig.



Wyoming Native Plant Society

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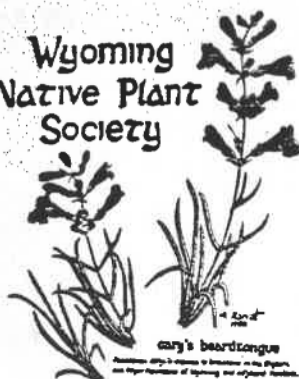
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Contributors to this issue: John Baxter, Jane Dorn, Robert Dorn, Walter Fertig (WF)

Attention WNPS Members:

Your articles about Wyoming native plants or art work are welcome in the newsletter! We are especially looking for articles on native plant lore, cultivation of natives, and interesting places to visit. Information on local activities of interest to members is also appreciated. Deadline for the February issue is 5 February 1996.

Wyoming Native Plant Society



WNPS NEWS

Annual Meeting: The 1996 WNPS annual meeting and field trip are scheduled for the weekend of August 3-4 1996 in the Snowy Range of the Medicine Bow Mountains. The Saturday field trip (August 3) will focus on alpine wildflowers in the vicinity of Medicine Bow and Brown's peak. A shorter trip on Sunday (August 4) will explore other areas of the Medicine Bow or Laramie ranges. A 1-day general plant identification workshop is also scheduled for either Friday (August 2) or Monday (August 5). Look for more details on the field trip in the May issue of the newsletter.

Tensleep Field Trip: A second summer field trip has been scheduled for the weekend of July 12-14 at The Nature Conservancy's Tensleep Preserve on the west flanks of the Bighorn Range (recently featured in the Conservancy's national magazine). Members are invited to explore the mesas, canyons, woods, and sage meadows of the Preserve and assist Preserve Managers Ann Humphrey and Phil Shephard compile a more up-to-date species list for the area. Look for more details in the May *Castilleja*.

Elections: A slate of candidates for the WNPS Board will appear on the ballot/renewal notice in the May newsletter. It is still not too late to nominate someone (including yourself) for one of these jobs!

New Members: Please welcome the following new members of WNPS: Ed Dodge (Harwinton, CT), Harry Dubas (Cheyenne), Harry and Barbara Epler (Hillsdale), William Schneider & Frances Trail (Laramie), Sandra Thorne-Brown (Laramie), and Roger Williams (Laramie).

Attention Readers: Have you found something of botanical interest to your colleagues and fellow plant lovers? Are you an academic in need of extra publications for tenure? Do you have insights on gardening with native species? Whatever your motive or interest, we would like to include articles on unusual discoveries, interesting places to visit, botanical trivia, gardening, etc. from members for the education and amusement of our readers. Send items for the May newsletter to the editor by 20 April 1996.

We're looking for new members: Do you know someone who would be interested in joining WNPS? Send their name or encourage them to contact the Society for a complimentary newsletter.

Treasurer's Report: Balance as of 25 February 1996: General Fund \$ 609.92; 1995-96 Scholarship Fund \$ 416.00; Total Funds: \$ 1025.92. WF

Wyoming Conservation Congress

April 26-28, 1996

The Wyoming Native Plant Society has joined with over a dozen other conservation groups and nature societies to sponsor the 1996 Wyoming Conservation Congress. This year's congress will focus on the ramifications of rapid industrial development in southwest Wyoming and will take place April 26-28 at the Holiday Inn in Rock Springs, Wyoming.

Festivities begin on Friday evening, April 26, with an art and photography show of the Wyoming desert and reception at the Community Fine Arts Center in downtown Rock Springs. On Saturday, April 27, Tom Throop, executive director of the Wyoming Outdoor Council, will open the Congress with an audiovisual presentation. This will be followed by a discussion panel on development of southwest Wyoming featuring representatives of conservation groups, BLM, oil and gas industry, state government and others.

Jim Baca, former national director of the BLM, is scheduled to be the keynote speaker over lunch. In the afternoon, 10 mini-sessions will be held on a variety of topics, including cumulative impacts of oil and gas development, water & habitat, Holistic Resource Management, and rare and unusual plants (presented by the Wyoming Native Plant Society).

Fifteen different field trips into the desert are planned for Sunday, April 28 (weather permitting). I will be leading a botanical field trip to the Twin Buttes-Black Mountain Wilderness Study Area south of Green River. With luck we will find Opal phlox (*Phlox opalensis*), Echo spring parsley (*Cymopterus lapidosus*), Eastwood-plant (*Chamaechaenactis scaposa*) and other desert species.

For more information or to register, please contact Wyoming Outdoor Council, 201 Main Street, Lander, WY 82520 or call (307)332-7031 or e-mail wyliz@wave.sheridan.wy.us. WF



Editorial

Russian Olive A Pest???

The reprinted article on the Russian Olive invasion which appeared in our previous newsletter presents an opportunity to explore some basic principles. These principles are:

- 1) it is ver risky to assume that problems in one area are the same in other areas;
- 2) the majority of our riparian habitats are quite different from presettlement riparian habitats;
- 3) humans are part of the natural world and therefore of evolution, so anything they do is natural;
- 4) landscapes are dynamic, not static. We will explore these briefly one at a time.

Russian Olive is apparently rather aggressive in some areas to the south of us. The assumption is that this must be true wherever this species has been introduced. In Wyoming, with two exceptions, the species is not aggressive at all. The exceptions are along the Big Horn and lower Shoshone rivers, both in the Big Horn Basin. In these two areas, apparently unlike the situation to the south, the Russian Olive habitat has become a haven for wildlife, especially in winter. Winter is the limiting season in Wyoming, so the importance of Russian Olives to wildlife is magnified. Yes, Russian Olives do support large numbers of European Starlings, but they also support many more desirable species. Their abundant fruits are regularly consumed by Wild Turkeys, deer, pheasant, squirrels, rabbits, rodents, Cedar and Bohemian Waxwings, Evening Grosbeaks, American Robins, flickers, and many other birds. Any one who has tried to penetrate a Russian Olive thicket will appreciate its value for escape cover. Russian Olive stands are one of the better places to find an abundance of Yellow Warblers all summer long. In a survey for screech owls in Wyoming, we found Russian Olive to be the only significant woody understory species at locations where owls were found (W.Birds 25:35-42). This does not necessarily mean that Russian Olives are important for screech owls. They may or may not be. As introduced species go, Russian Olives seem to be one of the better ones. Should we also exterminate alfalfa because it occupies large areas where there was once native vegetations?

If we compare riparian habitats before settlement to those of today we find, in most cases, that trees and shrubs were much less abundant prior to settlement. This was apparently due to the frequent floods and greater flow volumes prior to dam construction and diversion for irrigation. Post settlement stream manipulation allowed willows and cottonwoods to

become better established and persist. But we are now seeing mature cottonwoods dying out and not being replaced by younger ones. In some cases, other species are taking over including Russian Olive and *Tamarix*, the latter a potentially much more serious pest than the former. In short, man has modified riparian habitats to the extent that native trees and shrubs are not persisting, and in some cases introduced species are out competing natives. Controlling the introductions will not necessarily bring back the natives.

Since humans are part of the natural world, they are part of evolution. It follows that anything they do is natural. Introducing exotics was not wise in most cases, but it was a natural part of evolution. Not doing something may have just as much evolutionary significance as doing something.

Finally, landscapes are (and always have been) changing constantly, through succession, through introductions, through climatic changes, through hundreds of other influences. Are terms like presettlement or pristine meaningful?

In summary, it would seem that we would be better off expending our time and resources on something besides Russian Olive control, at least in Wyoming. Perhaps studying its autecology and benefits would be more productive. RD

Exploring Southwest Wyoming: Hickey and Sage Creek Mountains

By Walter Fertig

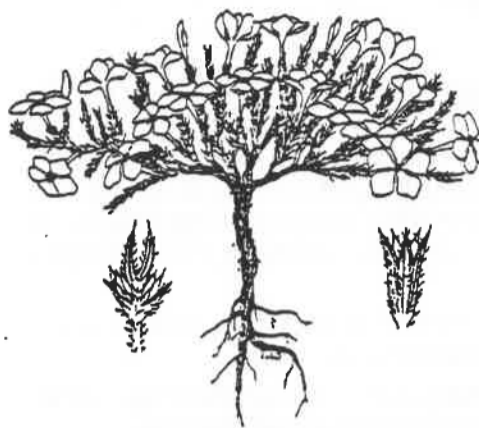
One of the most scenic views in Wyoming is the Uinta Mountains looming above the horizon of WY State Highway 414, heading south from the aptly named town of Mountain View. The scenery in the foreground, however, is rarely considered to be as picturesque. The stretch from Mountain View to Lonetree threads through barren gray clay-shale badlands and uninspiring, low, mesa-like mountains. Gas wells, powerlines, and radio towers are the only objects to catch the eye of most motorists.

This seemingly uninteresting area is in fact a little-known mecca of rare and beautiful wildflowers. Unusual soil types, harsh climatic conditions, and geographic isolation have combined to create a unique flora that includes several species found nowhere else in Wyoming (or the rest of the world!).

Barren badland slopes and flats that parallel the highway contain a mosaic of cushion plant and Gardner saltbush (*Atriplex gardneri*) communities with occasional pockets of Utah juniper (*Juniperus osteosperma*) and sagebrush on the uplands and greasewood (*Sarcobatus vermiculatus*) in the bottoms. The fine-textured clays and shales of the more erosive slopes appear from a distance to be a lifeless moonscape. Closer inspection, especially in late spring, reveals a variety of low-growing, colorful wildflowers, including hollyleaf clover (*Trifolium gymnocarpon*), large-fruited biscuitroot (*Lomatium macrocarpum*), Hooker's sandwort (*Arenaria hookeri*), and Indian paintbrush (*Castilleja angustifolia* var. *dubia*).

One of the more "common" species on these bare slopes is actually one of the rarest (at least globally): the Opal phlox (*Phlox opalensis*). This regional endemic of southwest Wyoming and adjacent Utah was first collected by Aven Nelson in 1898, but remained unnamed until Robert Dorn described it in 1992. Opal phlox can be recognized by its large white (or occasionally pink) 5-lobed flowers, prickly, woolly leaves, and silvery-green stems. Until this past summer, it was thought to occur in only 4-5 locations in the vicinity of Opal, Wyoming and the Green River. Surveys have since found it to be much more widespread and abundant in the state. The plant's ability to thrive in poor, heavy soils may make it suitable for development as a garden plant elsewhere in Wyoming.

The Moab milkvetch (*Astragalus coltonii* var. *moabensis*) is another handsome plant found in the valley between Hickey and Sage Creek Mountains.



Above: Opal phlox (*Phlox opalensis*). This species often co-occurs with the much more widespread Hood's phlox (*P. hoodii*). *P. opalensis* differs in having much larger flowers (usually well over 1/2 inch wide vs. 5/16 inch in *hoodii*) and loosely tufted stems with elongate, silvery-membranous internodes. Opal phlox is also found on clay-shale soils, often with a layer of scattered chert or sandstone, instead of sandier sites favored by *P. hoodii*. Ill. by Jane Dorn.

This tall, leafy member of the pea family has deep pink-purple flowers and long-stalked drooping pods. It is known from only one other location in Wyoming.

Many of the plants of the badlands are not especially showy, at least until they are examined up close with a hand lens. Divergent wild-buckwheat (*Eriogonum divaricatum*) is one such plant. It is a low annual with round green basal leaves and tiny flowers borne in a short, dichotomously branched inflorescence. Only under magnification do the flowers reveal their hidden beauty: delicate yellow petals suffused with red and bearing small glands. Like many other species in the area, this plant is rare in Wyoming but common to the southwest in the Great Basin.

Rough roads lead to the top of Sage Creek and Hickey mountains, although the summits can also be reached with a short but steep hike. The summits themselves are relatively flat and covered with a pediment of coarse gravel and cobbles of Oligocene age. These mesa-like summits are remnants of a once-continuous erosional plain that sloped off the north side of the Uintas.

Most of these summit plains are covered by sagebrush grasslands. The rim of the summit plateaus, however, have a unique cushion plant community adapted to thin soils and extreme winds. Many of the plants found in this community are mat-forming perennials, with short-stalked flowers and woolly herbage. These kind of adaptations are more typical of alpine species found at elevations nearly 2000 feet higher.

The rim habitat is home to two recently described members of the sunflower family: Uinta greenthread (*Thelesperma pubescens*) and Cedar Mountain Easter



daisy (*Townsendia microcephala*). The only other place where these species can be found is Cedar

for several other rare species while still allowing existing oil and gas development in the bottom of the valley.



Above: Divergent wild-buckwheat (*Eriogonum divaricatum*), one of the few annual species of buckwheat in Wyoming. This species was discovered in several new locations in the state in 1995, thanks in part to plentiful spring rainfall. Like other desert annuals, this species may not appear in unfavorable drought years. Ill. by W. Fertig.

Mountain, just to the east of Sage Creek Mountain (and a botanical hotspot in its own right).

Uinta greenthread was first discovered on Sage Creek Mountain in 1979. Surveys in recent years have found it to be locally abundant within its narrow habitat. Oil and gas development and recreational use of its habitat are potential threats, but most of these activities can be rerouted away from areas of occupied habitat.

Townsendia microcephala remained unknown until Robert Dorn discovered it in 1989 on Cedar Mountain. In 1994, I was able to find several small colonies on Sage Creek Mountain (growing side-by-side with Uinta greenthread). The tiny white-rayed flowers of this species are about half the size of a penny and easily overlooked unless you get down on your belly. Cedar Mountain Easter-daisy co-occurs with Nuttall's Easter-daisy (*T. nuttallii*), yet another regional endemic species discovered by Dorn. Nuttall's Easter-daisy appears to bloom at least 2-3 weeks earlier than *T. microcephala* and hybrids are not known to occur. So far, Cedar Mountain Easter-daisy has not been found on Hickey Mountain, despite an abundance of habitat and my full day of hands-and-knees exploration.

The rims of Hickey and Sage Creek mountains have been recommended for designation as Areas of Critical Environmental Concern (ACECs) by the BLM in the draft Resource Management Plan for the Green River Resource Area. The ACECs would provide protection from surface disturbances for *Thelesperma pubescens* and *Townsendia microcephala*, but would not provide similar protection for the myriad of interesting plants in the foothills badlands. Expanding these boundaries downslope would include habitat



Above: Uinta greenthread (*Thelesperma pubescens*). This species is endemic to rim outcrops of Bishop Conglomerate on the west slopes of Hickey, Sage Creek, and Cedar mountains in Sweetwater and Uinta counties, Wyoming. The species is listed as Sensitive by the US Forest Service (Wasatch-Cache National Forest) and has been recommended for BLM Sensitive status. The US Forest Service recently developed a Conservation Strategy designed to manage populations of this species on Forest Service lands on Hickey Mountain. Ill. by Jane Dorn.

Botany Briefs Continued from p.6

New Wyoming Records of Parasitic Fungi in 1995: The following parasitic fungi species were documented for the first time in Wyoming in 1995: *Erysiphe cichorachearum* on *Artemisia tripartita*; *Syncompella tumefaciens* on *Artemisia tripartita*; *Puccinia subnitens* on *Stellaria media* and *Amaranthus blitoides*; and *Puccinia burnettii* on *Krascheninnikovia lanata*. JB

Fossil Plants of the Bighorn Basin: One of the most unusual plant communities in Wyoming is found on Big Cedar Ridge in the Bighorn Basin southwest of Ten Sleep. Unlike other communities in the state, however, this one is composed entirely of fossils buried during a volcanic ash flow 70 million years ago. The site, discovered by Smithsonian Institution paleobotanist Scott Wing in 1990, is one of the most significant fossil plant finds in recent years because of the great number of whole plants that are preserved, rather than scattered fragments of plants as is more typical at most fossil sites. Intensive excavation of the area in 1992 resulted in the discovery of over 100 new plant species dating from the Cretaceous Period.

The BLM Worland District has recently proposed withdrawing a 260 acre tract containing the fossil beds from mineral development. Under the BLM's management plan, the area would still be open for hobby fossil collecting by the public. The area has been recommended for designation as an Area of Critical Environmental Concern by the Sierra Club and Wyoming Outdoor Council. WF

Botany Briefs

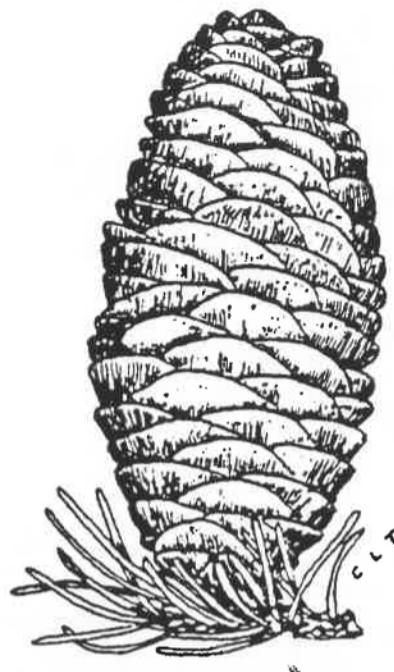
Botanical News from Wyoming and the Rocky Mountain Region

Even More New Species for Wyoming: In addition to exploring wild areas for new species and county records, Bob Dorn also spent time in 1995 snooping around the more civilized parts of the state for unusual plants. As a result, he discovered three new species (all escaped exotics) for the state's flora. *Falcaria vulgaris* is an introduced umbel from Eurasia found west of Douglas (Converse County). *Hemerocallis fulva* (Day-lily) is a large, orange-flowered garden favorite originally native to Asia, but now found in eastern North America, Europe, and Niobrara County, Wyoming. This species resembles our native wood-lily (*Lilium philadelphicum*), but has long, sword-like leaves and unspotted, yellowish-orange blossoms. *Coreopsis lanceolata* is a native of the eastern Great Plains that is expanding its range both eastward and westward following roadsides. It differs from *C. tinctoria* in having yellow ray flowers without a reddish-brown base and having mostly unlobed leaves. *C. lanceolata* is currently known only from Platte County in Wyoming. WF

Rexford Daubenmire 1910-1995: To anyone who has ever sampled vegetation or attempted to classify habitat types, the name Rexford Daubenmire is synonymous with forest and grassland ecology. Last August this namesake of the "Daubenmire frame" passed away, leaving behind a rich legacy of academic achievements. In the early 1950s Daubenmire introduced a radical new classification scheme that emphasized the potential vegetation of a site, rather than the existing vegetation. This classification approach is now widely used by government agencies and the timber industry to manage forest and rangelands. Daubenmire spent most of his academic career at Washington State University where he authored several influential texts on plant ecology. WF

Changing Names: Don't look now, but some of your favorite plant names are being changed! Over the past several years plant taxonomists (many of them using your tax dollars!) have made these nomenclatural changes, often replacing cherished old names with confusing new ones. A sampling of their heinous work includes:

- *Abies bifolia*: Anatomical and chemical studies



Above: Cone of subalpine fir, "*Abies bifolia*" (better known as *Abies lasiocarpa*). Fir cones differ from other conifer cones in being borne erect on stems and in shattering at maturity. Ill. by C. L. Porter from "Wyoming Trees" (1979).

have lead some researchers to question the naturalness of *A. lasiocarpa*, the familiar subalpine fir. In Volume 2 of the Flora of North America, published in 1993, Rocky Mountain populations of subalpine fir were recognized as their own species, *A. bifolia* (a name first used for it in 1863). *A. lasiocarpa* is still a good species, but is now restricted to the Pacific coast.

■ *Swertia radiata*: Perhaps you are more familiar with this charismatic plant under its old name, *Frasera speciosa* (green gentian). The recommendation to change this name actually comes from a 1941 publication, which has only recently been adopted in most floras (including Dorn's latest edition of the Vascular Plants of Wyoming in 1992).

■ *Ericameria nauseosus*: Remember *Chrysothamnus*? It may be a thing of the past, but not due to extinction. In 1990, rubber rabbitbrush (*C. nauseosus*) and three other species were combined with similar species from *Haplopappus* in the genus *Ericameria*. Loran Anderson, a leading expert on *Chrysothamnus*, recently proposed transferring the remaining species of *Chrysothamnus* to *Ericameria*, in order to avoid unnaturally dividing the group.

In all seriousness, such changes are the natural (and desirable) end product of continued taxonomic research, and while name changes may be inconvenient, they are necessary. WF

Botany Briefs continued on p.5



Twig Talk: Winter Botany in Wyoming

By Walter Fertig

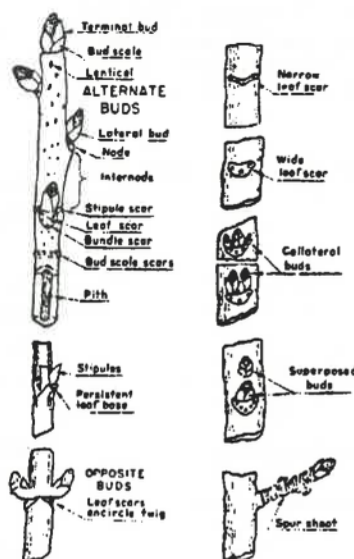
Just as a palm reader can tell your fortune by looking at various wrinkles on your hands, a winter botanist can learn the identity of a leafless shrub or tree by reading clues found on overwintering twigs and stems. All it takes is a little understanding of the morphology of twigs, a hand lens, a guide book, and the desire to commune with nature when the thermometer is advising you otherwise.

In "botanicales", the term "twig" refers only to the end portion of a branch formed during the past season of growth. Twigs are set off from older parts of the stem by a ring of scar tissue called the end bud scar. This ring marks the point of attachment of last winter's terminal bud. The age of a branch can often be determined by counting the number of sets of bud scale scars.

Buds are embryonic branches that bear miniature leaves or flowers. The buds are often covered by one or more leathery scales. The number and orientation of bud scales can be useful in identification. For example, blueberries and whortleberries (*Vaccinium*) can be recognized by their buds consisting of 2 erect, non-overlapping scales, while willows (*Salix*) are easily identified by their single, large bud scale. Most winter shrubs and trees in our region have numerous bud scales that overlap like roof shingles. One exception is Canada buffaloberry (*Shepherdia canadensis*) which exposes its embryonic leaves directly to the elements without the cover of a bud scale.

Twigs typically have a single terminal bud at the tip of the stem and several lateral or axillary buds. Oaks (*Quercus*) are an exception in that they typically have a dense cluster of terminal buds. Lateral buds are produced in the axil of stem leaves and always have a semicircular or triangular leaf scar at their base. The leaf scar represents the point of attachment of the old leaf and is covered by a layer of corky protective cells. Each leaf scar contains one to several tiny dots or lines called bundle scars, remnants of the vascular strands of the leafstalk. The size and shape of leaf scars and the number and shape of bundle scale scars can be important features for identification.

Most woody shrubs and trees in the Rocky Mountain region have alternate lateral buds and leaf scars (occurring singly at each stem node). A smaller group of species has opposite buds and leaf scars (occurring in opposing pairs at each stem node). Among this latter group are the maples (*Acer*), dogwoods (*Cornus*), elderberries (*Sambucus*), snowberries (*Symphoricarpos*), buckbrushes (*Rhamnus*),



Above: Bud and twig characteristics of shrubs and trees in winter. Ill. from "Winter Guide to Rocky Mountain Browse Plants" by the Colorado Dept. of Game and Fish (1956).

ashes (*Fraxinus*), buffaloberries (*Shepherdia*), and honeysuckles (*Lonicera*).

A number of other structures can be helpful in identification when present. The presence of thorns (sharp-tipped modified branches, often with leaf scars) helps identify hawthorns (*Crataegus*), while remnant spines (derived from stipules) and prickles (epidermal outgrowths) serve to identify gooseberries (*Ribes*) and roses (*Rosa*), respectively. Stubby branches crowded with leaf scars called spur shoots are characteristic of many cherries (*Prunus*) and serviceberries (*Amelanchier*). Warty lenticels, glandular dots, and presence or absence of hairs are other surface stem characters that may be useful in keying unknown species. Remnant leaves and fruits may also be of great value.

A number of useful guides to winter plant identification have appeared, many of which are now, unfortunately, out of print. William Harlow's "Twig Key to the Deciduous Woody Plants of Eastern North America" (1941) and William Trelease's "Winter Botany" (1918) are two classics, which deal mostly with species of the eastern United States. Western guides include Gilkey and Packard's "Winter Twigs of Northwestern Oregon and Western Washington" (1962), Morris, Schmutz, and Stickney's "Winter Field Key to the Native Shrubs of Montana" (1962), "Winter Guide to the Native Shrubs of the Central Rocky Mountains" by the Colorado Dept. of Game and Fish (1956) and the Peterson Field Guide "Western Trees" by George Petrides (1992).

Armed with one of these guides, a hand lens, and the basics of twig morphology, you should now be able to identify most shrubs and trees you encounter during Wyoming's nine months of winter.

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 publication, and may take part in all of the Society's programs and projects, including the annual meeting/field trip held each summer. Dues are \$5.00 annually.

To join the Wyoming Native Plant Society, return the membership form below to:

Wyoming Native Plant Society
1604 Grand Ave.
Laramie, WY 82070

Name _____

Address: _____

☐ \$5.00 Regular membership

☐ \$15.00 Scholarship Supporting Member
(\$10.00 goes to the annual scholarship fund)

Musings of a Mycologist

By John "Barney" Baxter

(all-seeing, all-omniscient*, famous seer, soothsayer, and former Roto-Rooter repair person)

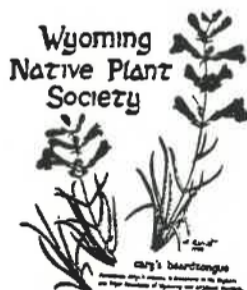
Speaking of poisonous mushrooms, on September 25 in the year 1534, Pope Clement VII died of mushroom poisoning. On that fateful day the weather was inclement and the mushrooms were in Clement.

Talk about coincidences! In that same year, Catherine de Medici introduced truffles from Italy to France. Soon the French, aided by their hogs and dogs, were frantically digging for truffles. Eventually the French landscape was so pitted by truffle holes it looked like the surface of the moon.

In later years, truffles became popular in England. During World War II the British soldiers used to sing "Pack up your truffles in your old kit bag and smile, smile, smile."

My dentist ran out of novacaine, so I crossed *Artemisia nova* with *Artemisia cana* and now he's back in business.

*I know this is redundant, but then so is *Arctostaphylos uva-ursi*.



WYOMING NATIVE
PLANT SOCIETY
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