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Knapweeds, Starthistles, and Basketflowers

KNAPWEEDS, STARTHISTLES, AND BASKETFLOWERS OF NEW MEXICO

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Introduction

Knapweeds, starthistles, and basketflowers are primarily weedy and often noxious invaders of range lands, roadsides, old fields, and disturbed sites. Knapweeds and starthistles are all alien plant species in New Mexico, coming originally from the Mediterranean and Eurasian regions of the Old World. Many of these species are now found throughout much of the world, though, having adaptations that aid in dispersal, rapid germination and growth, and avoidance of predation. They are detrimental invaders of range lands, being low in palatability as forage and poor protectors of the soil against erosion. Basketflowers, however, are indigenous to North America, and often occur in less disturbed or less weedy habitats.

Belonging to the tribe Cynareae of the family Asteraceae, the species of this group are characterized by an absence of ray flowers, the disk flowers at the periphery of the head being enlarged to simulate rays, and an oblique attachment of the achene on the receptacle (except for one species). Phyllaries are spiny, fringed, or chaffy, and are sometimes long and stout, capable of inflicting a pernicious wound. Each disk flower in the head produces an achene. The pappus may be absent or present as a crown of stiff bristles at one end.

There are about 450 species of knapweeds, starthistles, and basketflowers in the world, mostly in the Old World. The taxonomy of this group is complex and difficult, and the species are sometimes classified in several different genera. We follow a more traditional approach here, placing all of the New Mexico species but one in the genus Centaurea, with Russian knapweed assigned to the genus Acroptilon. The name Centaurea commemorates the centaur, the mythical creature of Hippocrates, half horse and half

man. The name Acroptilon (meaning feathery tip) refers to the plume-like bristles at the tip of the phyllaries.

Indentification Key to the Species

1 Flower heads strongly and conspicuously spiny, the spines 5-25 mm long ... go to 2
1 Flower heads lacking spines, or if slightly spiny, the spines less than 5 mm long ... go to 4

2 Stems not winged; flowers purplish; achenes without a pappus ... 1. PURPLE STARTHISTLE
2 Stems winged; flowers yellow; at least the achenes in the center of the head with a pappus ... go to 3

3 Terminal spine of the phyllaries 5-10 mm long; both marginal and central florets with a pappus 1.5-3 mm long ... 2. MALTA STARTHISTLE
3 Terminal spine of the phyllaries 10-25 mm long; marginal florets lacking a pappus, the central florets with a pappus 3-5 mm long ... 3. YELLOW STARTHISTLE

4 Plants rhizomatous; phyllaries entire with translucent margins, not toothed nor fringed ... 4. RUSSIAN KNAPWEED
4 Plants lacking rhizomes; phyllaries toothed, fringed. or slightly spiny ... go to 5

5 Leaves, at least the lower ones, dissected ... go to 6
5 Leaves entire or only toothed ... go to 7

6 Phyllaries both fringed and with a short terminal spine or lobe 1-4 mm long; pappus absent ... 5. DIFFUSE KNAPWEED
6 Phyllaries fringed but without a terminal spine or lobe; pappus 2-3 mm long ... 6. SPOTTED KNAPWEED

7 Flower heads 1-2 cm wide ... 7. CORNFLOWER
7 Flower heads 2-5 cm wide ... go to 8

8 Phyllaries medium to dark brown, bearing 9-15 pairs of lobes at the tips ... 8. ROTHROCK'S BASKETFLOWER
8 Phyllaries straw colored, bearing 4-8 pairs of lobes at the tips ... 9. AMERICAN BASKETFLOWER

1. PURPLE STARTHISTLE

(Caltrop, maize thorn)

Centaurea calcitrapa Linnaeus

Description: Plants bushy, normally biennial, but sometimes also annual or short-lived perennial, from a taproot. Stems rigid, highly branched, with longitudinal white lines but not winged from the leaf bases, cobwebby-hairy to glabrous, 20-80 cm tall. Basal and stem leaves divided once or twice into spiny-toothed segments, generally 2-4 cm long but smaller near the flower heads. Flower heads urn-shaped, 1-2.3 cm tall. Phyllaries straw-colored, ending in a stout spine grooved or flattened on the upper surface and 1-3 cm long, with 2-3 pairs of lateral spines at the base. Flowers purple, the peripheral flowers not enlarged. Achenes tan to light brown with darker shading, 2.5-3 mm long, lacking a pappus.

Habitat and Distribution: Indigenous to the Mediterranean region and introduced to North America in California as a seed contaminant; adventive in New Mexico along roadsides and in disturbed ground of farms and cropland [Chaves, Otero counties].

Comments: Purple starthistle is very similar to Iberian starthistle (Centaurea iberica Trev.), not yet found in New Mexico, and which differs in having achenes topped by a pappus. This species is also sometimes confused with malta starthistle, which has a much less bushy growth form. The young heads of purple starthistle are reportedly edible like an artichoke. The specific epithet, calcitrapa (Latin, "heel-traps"), alludes to its resemblance to caltrops, iron balls with four spikes that were used during warfare to empede cavalry or armored vehicles.

2. MALTA STARTHISTLE

(Tocalote, Napa starthistle)

Centaurea melitensis Linnaeus

Description: Plants annual or biennial from an unbranched taproot. Stems erect, branched, rough-hairy, winged by the decurrent leaf bases, 30-100 cm tall. Basal leaves lobed, spatula-shaped in outline, with a short stalk, rough-scabrous, 3-5 cm long. Stem leaves narrowly lanceolate, entire or sparsely toothed, sessile, 1-4 cm long, the base of the leaf running down the stem as wings (decurrent). Flower heads ovoid, solitary or 2-3 clustered at the tips of the branches, 1.5-2 cm tall. Phyllaries straw-colored but tinged with purple or brown, with sparse wooly hairs, ending in a stiff, flattened spine 5-10 mm long, with 2-4 short lateral spines at the base and a pair of shorter lateral spines about mid-length. Flowers yellow, the peripheral ones not enlarged. Achenes light brown with longitudinal lines, about 3 mm long, with a pappus of unequal bristles 1.5-3 mm long, the base with a slight hook.

Habitat and Distribution: Indigenous to southern Europe and introduced in North America; now found in scattered localities in the western states; adventive in southern

New Mexico along roadsides, abandoned crop fields, and along ditches [Chaves, Doña Ana, Eddy, Grant, Hidalgo, Luna, Otero counties].

Comments: Both malta and yellow starthistles have winged stems and yellow flowers, but malta starthistle differs in having shorter phyllary spines with a tiny pair of lateral spines about midlength. Purple starthistle is much more bushy in its growth form. The specific epithet, melitensis, refers to its occurrence on Malta.

3. YELLOW STARTHISTLE

(St. Barnaby's thistle)

Centaurea solstitialis Linnaeus

[Leucantha solstitialis (L.) Löve & Löve, Calcitrapa solstitialis (L.) Lam.]

Description: Plants annual or biennial from stout taproots, usually flowering the first year. Stems stiffly upright, freely branched, winged by decurrent leaf bases, with sparse cottony hairs, 20-100 cm tall. Basal leaves spatula-shaped in outline, deeply lobed, early deciduous, similar to dandelion rosettes. Stem leaves linear to lanceolate, entire, sessile, cottony-hairy and grayish, the base of the leaf running down the stem as wings (decurrent). Flower heads solitary at the tips of the branches, ovoid, 1.5-2 cm tall. Phyllaries straw-colored, ending in a stiff round spine 1-3 cm long, with 2-4 short lateral spines at the base. Flowers yellow, the peripheral ones not enlarged. Achenes dark brown to tan, 2.5-4 mm long, of two types; inner achenes with a pappus of stiff bristles 2-5 mm long; peripheral achenes lack a pappus.

Habitat and Distribution: Native to Eurasia and introduced to the United States in California sometime between 1824 and 1869, presumably with alfalfa seed; adventive in New Mexico along roadsides and disturbed ground [Chaves, Grant, San Miguel counties].

Comments: Yellow starthistle may cause "chewing disease" in horses (see discussion under russian knapweed). The inner, plumed achenes of yellow starthistle drop from the flower heads when mature, are blown for short distances by the wind, and germinate readily with the first favorable conditions. The peripheral, plumeless seeds are not released, however, and remain within the flower head until the phyllaries deteriorate during the fall or winter; these seeds germinate under higher temperatures and produce seedlings with longer roots. It is suspected that some seeds of yellow starthistle can remain viable in the soil for up to 12 years. Various song birds feed heavily on the seeds and contribute to the spread of yellow starthistle across the western United States. The specific epithet, solstitialis alludes to the summer flowering period.

4. RUSSIAN KNAPWEED

(Turkestan thistle, creeping knapweed)

Acroptilon repens (L.) DeCandolle

[Centaurea repens L., Centaurea picris Pall.]

Description: Plants perennial, forming dense colonies from shoots arising from the widely spreading black roots. Stems erect, openly branched, 20-100 cm tall, with loose cobwebby hairs when young. Basal leaves spatula-shaped, entire to toothed, thinly hairy, bluish green, 3-8 cm long, 1-2 cm wide. Stem leaves shallowly lobed or toothed, 1-5 cm long, 2-7 mm wide, becoming smaller and entire near the flower heads. Flower heads numerous, terminating the branches, 1-2 cm tall. Phyllaries greenish to straw-colored, not spiny, the lower (outer) phyllaries with a broad translucent tip, the upper (inner) phyllaries with a narrowed plume-like tip. Flowers pink or purplish, the peripheral ones not enlarged. Achenes ivory-white, 3-3.5 mm long, attached horizontally at the base rather than at an angle as in the other knapweeds, with long (6-11 mm) white bristles at the tip (pappus) when young, but these deciduous from the achene as it matures.

Habitat and Distribution: Native to Eurasia, russian knapweed was introduced to North America in 1898 with alfalfa seed; it now occurs in every western state and in many of the eastern ones; adventive in New Mexico mostly along roadsides, but also in pastures, crop fields, and orchards; our most common knapweed [Bernalillo, Catron, Cibola, Lincoln, McKinley, Otero, Quay, Rio Arriba, Sandoval, San Juan, Santa Fe, Socorro, Taos counties].

Comments: Russian knapweed and yellow starthistle are toxic to horses, producing a neurological disorder known as "chewing disease." The disease is characterized by an acute inability of the animal to eat or drink, and resembles Parkinson's disease in humans. Chewing disease occurs suddenly after prolonged ingestion of the plants over many days. Russian knapweed is usually not palatable to horses because of its bitter quinone-like taste, but some animals may acquire a preference for yellow starthistle and eat it even though other good forage is available. Infestations of russian knapweed may survive almost indefinitely because of it's ability to produce aerial shoots from the spreading root system. A stand in Saskatchewan, Canada, has persisted for almost 100 years. The specific epithet, repens, refers to the creeping growth of the rootstocks.

5. DIFFUSE KNAPWEED

(spreading knapweed, tumble knapweed)

Centaurea diffusa Lamarck

[Acosta diffusa (Lam.) Sojak]

Description: Plants generally biennial, but sometimes annual or perennial. Stems upright, 10-60 cm tall from a deep taproot, highly branched, angled with short stiff hairs on the ridges, eventually breaking off and rolling in the wind to disperse the achenes. Basal leaves stalked and divided into narrow hairy segments, 3-8 cm long, 1-3 cm wide, deciduous. Stem leaves smaller and less divided, sessile, becoming bract-like near the flower clusters. Flower heads broadly urn-shaped, solitary or in clusters of 2-3 at the ends of the branches, 1.5-2 cm tall. Phyllaries yellowish with a brownish margin, sometimes spotted, fringed on the sides and terminating in a slender bristle or spine 1-5 mm long. Flowers white, rose-purple, to lavender, the peripheral ones not enlarged. Achenes tan to brown, about 2.5 mm long, lacking a pappus, or bristles rarely present to about 1 mm long.

Habitat and Distribution: Endigenous to the Mediterranean region but now found scattered throughout much of the northern United States, less common elsewhere; adventive in New Mexico along roadsides [Colfax, San Miguel counties].

Comments: Diffuse knapweed is a highly competitive and aggressive plant that threatens to over-run pastures and range lands in the western United States. It is especially adept at moving along right-of-ways and farm roads and can spread rapidly through an area. Its spread into vegetated areas is retarded (though not prevented) by associated grasses that remove moisture and nutrients from the rooting zone of diffuse knapweed seedlings. There is some evidence that diffuse knapweed chemicals have the potential to inhibit the germination of other seeds, thereby giving it a competitive advantage in the soil. This species may hybridize with spotted knapweed, making identification of some specimens difficult. Occasionally, diffuse and other knapweeds are sold in floral bouquets. The specific epithet, diffusa, describes the open branching pattern of mature plants.

6. SPOTTED KNAPWEED

Centaurea biebersteinii DeCandolle

[Centaurea maculosa and Acosta maculosa of various works]

Description: Plants perennial, sometimes short-lived, from a stout taproot. Stems erect, 1-several from the base, branched above, ridged, loosely cobwebby, 30-80 cm tall. Basal leaves spatula-shaped in outline, usually deeply divided, 5-15 cm long. Stem leaves divided into narrow segments 1-3 mm wide, glabrous or usually wooly-hairy, becoming bract-like near the flower heads. Flower heads broadly urn-shaped, solitary at the ends of the branches, 1-2 cm tall, sparsely hairy or glabrous. Phyllaries with vertical veins below the black-spotted tip (often colorless in white-flowered forms), the tips fringed with comb-like lobes, the terminal lobe shorter than the others, not spiny. Flowers pink to

purple, sometimes white, the peripheral ones enlarged and sterile. Achenes dark, with lines, 2.5-3.5 mm long, usually with a pappus of stiff bristles 2-3 mm long.

Habitat and Distribution: Native to Europe and coming to North America as a contaminant in alfalfa and clover seeds, now widespread throughout much of the United States; adventive in New Mexico along roadsides [Colfax County].

Comments: Spotted knapweed is a serious pest of range lands, pastures, and open fields in many areas in the northern United States. It spreads rapidly along roads and into disturbed areas, the achenes and flower heads being carried by the wind, foraging animals, or trucks driving through knapweed patches. Studies indicate that spotted knapweed is capable of invading not only disturbed sites, but also ungrazed, good condition range land. In addition, seeds of spotted knapweed remain viable in the soil for at least eight years, and probably longer.

7. CORNFLOWER

(Bachelor's-button, blue-bottle, hurtsickle)

Centaurea cyanus Linnaeus

[Leucacantha cyanus (Lam.) Nieuwland & Lunell]

Description: Plants annual or winter annual from taproots. Stems upright, 2-10 cm tall, loosely wooly-hairy when young but losing this as they mature. Basal leaves lanceolate, lobed or toothed. Stem leaves narrow, linear to lanceolate, not divided or toothed, white-wooly on the lower surface, 4-15 cm long, 2-5 mm wide. Flower heads urn- or bowl-shaped, solitary at the ends of the branches, 1-2 cm tall. Phyllaries ovoid to lanceolate, with fine vertical lines, the edges papery and fringed, lacking spines. Flowers blue, purple, pink, or white, the peripheral ones funnel-shaped and enlarged but sterile. Achenes yellowish-brown to blackish, 3.5-4 mm long, tipped by orange-brown pappus of bristles 2-4 mm long.

Habitat and Distribution: Introduced from the Mediterranean region as a flower-garden ornamental; adventive in New Mexico along roadsides, fields, disturbed ground, and waste places; known definitely as an escape only in southern New Mexico, but expected elsewhere [Doña Ana County].

Comments: A favorite garden flower, cornflower is an easily cultivated annual that has many varieties and colors. Because of it ornamental value, it has spread throughout the world. The flowers retain their color upon drying and are often used in arrangements of dried flowers or in wreaths. The common name of hurtsickle comes from Europe, where the tough stems of plants infesting wheat field blunted the sickles of farmers. The specific epithet, cyanus, refers to the striking blue color of its flowers.

8. ROTHROCK'S BASKETFLOWER

Centaurea rothrockii Greenman

Description: Plants annual (or biennial?), from a taproot. Stems erect, ridged, glabrous, sparingly branched above, 30-100 cm tall. Basal and stem leaves lance- to spatula-shaped, entire to slightly toothed, glabrous to somewhat sandpapery, 3-12 cm long. Flower heads solitary at the ends of the stems, broadly bowl-shaped, 3-5 cm tall, 2-5 cm wide. Phyllaries composed of two parts: lower part entire, tan to light green with vertical lines; upper part medium brown to dark brown, the edges fringed with 9-15 pairs of elongate papery lobes. Flowers usually either all purple or all yellow, sometimes a mixture, the peripheral ones much enlarged. Achenes brown to black, 4-5 mm long, tipped by a pappus of bristles 6-14 mm long.

Habitat and Distribution: Endigenous to North America, from southwestern United States to south-central Mexico; in New Mexico in mountain meadows, wooded canyons, and along streams and roadsides [Grant, Sierra, Socorro counties].

Comments: Rothrock's basketflower is relatively little known in New Mexico, hiding in wooded canyons in the southwestern mountains. It is not at all weedy, and prefers natural, undisturbed habitats, in contrast with American basketflower, which is often found in old fields and along roads. It takes its name from Joseph Trimble Rothrock, surgeon and botanist for the Wheeler Expedition to southwestern United States in 1873-1875.

9. AMERICAN BASKETFLOWER

(American knapweed, thornless thistle)

Centaurea americana Nuttall

Description: Plants annual, from a taproot. Stems simple or branched in the upper portion, ridged, glabrous, 30-180 cm tall. Basal and stem leaves narrowly spatula-shaped to lanceolate, sand-papery, entire or sparsely toothed, 3-8 cm long, 5-15 mm wide. Flower heads solitary at the ends of the main stem or branches, broadly bowl-shaped, 3-5 cm tall, 2-6 cm wide. Phyllaries composed of two parts: lower part entire, straw-colored to light green with vertical lines; upper part light to dark straw-colored, the edges fringed with 4-8 pairs of elongate papery lobes. Flowers usually of two kinds: the central ones yellow or white; the peripheral ones purple or pink and much enlarged. Achenes dark-colored, 4-5 mm long, tipped by a pappus of bristles 6-14 mm long.

Habitat and Distribution: Endigenous to North America from central United States to east-central Mexico; in New Mexico in prairies, plains, open fields, and roadsides, often in disturbed ground [Chaves, Doña Ana, Eddy, Grant, Lincoln, Luna, Otero, Quay, San Miguel, Socorro, Torrance counties].

Comments: American basketflower typically occupies weedy, disturbed habitats, but it is not a noxious invader, such as the knapweeds and starthistles. Its showy flower heads make beautiful dried flower arrangements.

ADDITIONAL READING

Roché, B.F, Jr. Knapweed Newsletter. Washington Interagency Knapweed Committee, Cooperative Extension, Washington State University. Roché, C.T. & B.F. Roché, Jr. 1993. Identification of Knapweeds and Starthistles in the Pacific Northwest. Pacific Northwest Extension Publ. 432. &

In Memoriam: Barton H. Warnock, 1911-1998

Barton H. Warnock, 1911-1998

by Billie Turner, University of Texas at Austin

Reprinted from Plant science Bulletin 44(1):78-80. 1998.

His body was found slumped over the steering wheel of his car, face peering pensively out of the windshield across a section or two of Creosote bushes. He died of a heart attack about 20 miles northeast of Alpine, Texas along the highway to Fort Stockton (the place of his birth), the motor of his four wheel drive Bronco still running (how appropriate!).

The Department of Public Safety in Alpine was alerted by some anonymous truck driver on the morning of June 16 that he had observed a car beyond the road shoulder that had apparently been driven through a barbed wire fence, coming to rest about 100 yards off the tarmac: "maybe you should check it out." And they did, not knowing that the newly purchased vehicle was purring away the passing of a legendary Botanist.

As soon as the state troopers peered into the window of the car they were startled, one of them remarking, "By damn, why it's the doc," very casual like Southwesterners are prone to be facing death.

Nearly everyone in Texas west of the Pecos River knew Barton as the doc. To them he was a legend. And that's what the byline on the front page of the Alpine Avalanche read, BOTANICAL LEGEND IN WEST TEXAS DIES AT 86. And The Big Bend Quarterly (vol. II, No. 4) headed their eulogy of the man with this masthead, "LIKE TAKING A WALK WITH THE CREATOR." Clearly the man was a revered figure, to them at least,

those who still trod the open range in scuffed boots and rusty spurs, driving pickups and cursing the blue skies "cause it ain't gonna rain today, maybe never," looking at their new growth of gramma grasses (they were botanists too!) with hope and fear (not showing either in their faces, true Texans). Barton belonged to the ranchers. He was their systematist. From El Paso to the Pecos, Barton knew them all, who owned what spread, how many sections, what kind of plants dominated, and why; he even knew the history of their places better than they did, having outlived most of the original owners.

Interestingly, Barton spent much of his time after retiring from his Professorship at Sul Ross State University, Alpine, as a plant collector and "curator" of ranch herbaria. He set up numerous small collections in one or two herbarium cases at the ranch headquarters of the bigger spreads in the trans-Pecos so that the ranch owner, or his manager, or the owners children (now too remote from ranching to be concerned) might know what their land grew and where.

Dr. Warnock was always an enigma to me, mainly because he seemed such a simple cuss to sport a Ph.D. I was an acquaintance of his for fully fifty years and in our many one-on-one conversations, never managed to probe successfully into any of his views on things psychological. Sometimes he would dumbfound me, however, with a remark from out of nowhere, "Turner, do you believe that there are really homosexuals in this world?" And after some briefly expressed incredulousity on my part as to the question itself, he would let the topic drop, as if the question was merely the flicker of a moment. I mention this because, to me, he was one of the most intellectually naive professors to pass his shadow over my shoulder. Indeed, the mention of some of the more banal intellectual questions in our discussions, such as "the meaning of life? why we do what we do?" etc., would nearly always result in his retreat into some avuncular world unfamiliar to me: quoting homilies, or inventing these on the spot. Such conversations lived short lives.

But he did channel the course of my professional life. As a prelaw student at Sul Ross State College in 1947, age 22 and fresh out of the military, feeling my future, thinking I'd be a great lawyer, fighting the cases that counted, putting my learning on the line for the "...scorned, the rejected, the men hemmed in by the spears..." I was ever an idealist! So constituted in frame and bent, I enrolled in a freshman biology course at Sul Ross. Barton was the teacher.

Meeting Dr. Warnock (aged 36 at the time, fresh out of graduate school at The University of Texas, Austin, with a Ph.D. in plant ecology, his doctoral thesis entitled "A vegetational study of the Glass Mountains" [a sliver of elevated limestone about 30 miles east of Alpine, aligned in a north-south direction, beginning near Marathon and extending northwards into Pecos Co., where it soon peters out into flat lands dominated by Creosote and Black Brush]), changed my career, if not my life. How? He wooed me with words, smiles, and competition; noting that I excelled in his class with little effort and much enthusiasm, he began to ask me out on his collecting forays. Weird fellow, I thought, collecting plants in sets of four? I asked. "For exchange," he replied. "What's that?" I replied, "I mean 'for exchange' ?" And so it would go mile after mile, picking up the

beginnings of botany, the names of plants, where the grew, what they were related to, those kinds of beginnings...

And he talked about other aspects of life too, the trivial aspects, often foolishly stated, like "Your wife nearly always knows what's best," uttered with a sincere little laugh, and a mischievous look, as if joshing. But he wasn't; for him this was seemingly true; for me it was idle chatter.

Anyway, I loved those field trips, beautiful landscapes, botanical unknowns, populations of this or that species strewn along highways and mountain crests, some of them even undescribed, Barton would venture, often adamantly so. "Now I know this plant is new, but every time I send it off to Dr. Tharp [his doctoral mentor at The University of Texas] it always comes back as so-and-so, but I know damn well it's not."

Lots of botany, laughter, teasing, and competition. I still remember one of his challenges: faced with an ascent of about 2000 feet up to the top of Altuda Peak, an isolated protrusion about 15 miles east of Alpine overgrown with oaks and miscellaneous shrubbery, Barton hollered out suddenly, "Beat you to the top Turner, you find your own way." And he took off in a trot up a broad gully at the base of the peak. I snickered, thinking, "Like hell, you will," and took off up my own little gully, knowing that my young legs would get there first. But they didn't. When I got to the top, there was the doc, smiling like a pig eating swill, remarking casually, "What took you so long, Turner? Been waiting here ten minutes or so." That kind of manner and mien in the man appealed to me: fully contagious, like teachers ought to be.

That kind of contagion and teaching careened many a Sul Ross student into graduate schools in botany departments across the country. To name but a few (those introduced to botany via Barton's tutelage), other than myself: A. Michael Powell, currently Professor at Sul Ross, having replaced Dr. Warnock upon the latter's retirement; John Averett, currently Professor of Biology and Chairman at Georgia Southern University; John Bacon, Professor of Biology at the University of Texas, Arlington; Tom Watson, independent researcher, now retired; not to mention the numerous Masters Degree students who became high school science teachers, wildlife researchers and yet other dedicated biological workers of this or that ilk.

While Dr. Warnock never published his doctoral thesis, noted in the above (a fine study for its day, the various plant communities beautifully documented with full page photographs, etc.), he did publish, a number of taxonomic papers, mostly having to do with new species from the trans-Pecos, often with co-authors, such as Dr. M. C. Johnston, who briefly occupied a faculty position at Sul Ross during his long and productive academic career. But such papers did not create his legendary status; rather, the latter was largely due to the publication of several books on the wildflowers of trans-Pecos, Texas. These include:

1970. Wildflowers of the Big Bend country, Texas. Sul Ross State Univ. 155 pp. 1974. Wildflowers of the Guadalupe Mountains and the Sand Dune Country, Texas. Sul Ross

State Univ. 176 pp. 1977. Wildflowers of the Davis Mountains and the Marathon Basin, Texas. Sul Ross State Univ. 274 pp.

At the time of his death he had put together a fourth volume on the wildflowers of the trans-Pecos region, and this should be published in due course by some press other than Sul Ross. At least I was informed by Barton that such a text was ready to go to press.

All of the above wildflower books, except for the soon to be published text, were published in collaboration with Peter Koch, now deceased, who provided a large array of colored photographs for the books (several hundred or more to a text, six to a page, of varying quality, including everything from bryophytes to sunflowers).

Probably, Dr. Warnock would not have ventured into the wildflower publication business except for a bit of personal vanity and competitiveness (the "I'll show them" syndrome). Barton, in the late 1960s, began to think of himself as the botanical guru of the trans-Pecos, which he was, in a sense, as noted in the above. At least, I think he thought that most taxonomists in the United States knew of his work in that area, might even be aware that he had personally collected over 26,000 numbers from this region and that they would surely back his proposal, submitted to the National Science Foundation, to produce a Flora of the trans-Pecos. Barton even gave a paper before the American Society of Plant Taxonomists in which he outlined his ambitious plans, beguiling the professional audience with 24 carat smiles, and charming them with cowboy quips and humbling homilies. I was in that audience and felt he did a wonderful job of salesmanship. He thought the same. But it wasn't to be. His trans-Pecos flora project was rejected by his peers, nearly all of whom had been in the audience. Why? Not because they thought he couldn't do it, but simply because they were all aware, as was Dr. Warnock, that there was to appear shortly A Manual of the Vascular Plants of Texas by Correll and Johnston, this having been underwritten by the National Science Foundation over a ten year period or more.

Dr. Warnock never recovered from this rejection by his peers. He became bitter towards the taxonomic community, irrationally so, refusing to loan specimens of his holdings to yet other institutions and, upon occasion, even refusing professional visitors the courtesy of examining the SRSC herbarium sheets, in situ. I tried to explain to him that the tax payers might see little point in supporting the production of two floras of the same region, albeit overlapping. Alas, to no avail; he saw all of this as a personal vendetta. To my knowledge he never forgave the taxonomic establishment; thereafter he strode his own path, never again collecting plants in sets of four for exchange purposes; indeed he became disdainful of academic institutions in general, especially the bigger ones that thought they could call the plays, lay down the rules, pass judgment on the little fellows, something like that I think, drove him into his alienation from the larger systematic community.

But as Shakespeare put it, "Sweet are the uses of adversity, which, like the toad, ugly and venomous wears yet a precious jewel in its crown." Had not the doc suffered the ignominy of rejection he would surely have squandered years working on a mundane

flora of the trans-Pecos that would have raised but few eyebrows. As it turned out, his competitive zeal and desire to show the academic elites that he didn't need their support, made possible his trans-Pecos, if not statewide, sainthood.

Dr. Warnock really has had appreciation aplenty. Numerous taxa from the trans-Pecos and elsewhere have been named in his honor, including an endemic Texas genus, Warnockia (Lamiaceae). In addition, a building on the Sul Ross campus bears his name, as does a state park facility along the Rio Grande in Presidio County, Texas; few botanists can claim such edificial honors.

It is ironic, that had the legendary botanist, Art Cronquist, died of a heart attack driving in the environs of New York City (where he resided), car motor still purring away, it is likely that the first official persons on the scene might peer through the window and comment, "Boy, that's some big Swede," as if he had little legendary status on Long Island, an area infinitely smaller than the trans-Pecos region where the doc received instant recognition from the first persons on the scene. So who is the bigger legend? In the international community, of course, it was Cronquist; but in the confines of the trans-Pecos, it was Warnock.

I would like to add that Cronquist is said to have had his heart attack while in a herbarium gazing down at a specimen of Mentzelia from his beloved state of Utah. Warnock had his heart attack in the field gazing across an expanse of Creosote (Larrea tridentata). How appropriate for both! And as to their legendary status? Each was an epic figure in their own milieu, as it should be.

Botanical Literature of Interest

Taxonomy and Floristics

Allred, K.W., C. Darigo, & R.D. Worthington. 1998. Additions to the moss flora of New Mexico. Evansia 15(3):95-98. [reports 35 new records for the state]

Arizona-Nevada Academy of Science: Installment 4 of treatments of the Arizona Flora, Vol. 30(2), Celastraceae, Convolvulaceae, Gentianaceae, Loasaceae, Molluginaceae, Oxalidaceae, Papaveraceae, Pontederiaceae.

Ball, P.W. 1998. Carex mckittrickensis (Cyperaceae), a new species from western Texas. Novon 8(3):220-224. [to be looked for in adjacent se NM]

Burk, W.R. 1998. In Memoriam -- Heinz Dietrich Lubrecht (1908-1997), botanical bookseller and friend. Sida 18(1):371-376. Corbridge, J.N. & W.A. Weber. 1998. A Rocky Mountain Lichen Primer. University Press of Colorado. 47 pp.

Cuerrier, A., L. Brouillet, & D. Barabe. 1998. Numerical and comparative analyses of the modern systems of classification of flowering plants. Bot. Rev. 64(4):323-355.

Ivey, R.D. 1998. Flowering Plants of New Mexico. 3rd ed., 4th printing. 505 pp. Publ. by the author, 9311 Headingly Court NE, Albuquerque, NM 87111 [Eminently useful]

Monro, A.K. & P.J. Stafford. 1998. A synopsis of the genus Echinopepon (Cucurbitaceae: Sicyeae), including three new taxa. Ann. Missouri Bot. Gard. 85(2):257-272. [with a key to species]

Munoz, J. 1998. A taxonomic revision of Grimmia subgenus Orthogrimmia (Musci, Grimmiaceae). Ann. Missouri Bot. Gard. 85(3):367-403.

Peterson, P.M. & J. Ortiz-Diaz. 1998. Allelic variation in the amphitropical disjunct Muhlenbergia torreyi (Poaceae: Muhlenbergiinae). Brittonia 50(3):381-391.

Rancho Santa Ana Botanic Garden. 1998. Evolution and Taxonomy of Southwestern Plants. 13th Annual Southwestern Botanical Systematics Symposium. Aliso 17(2).

Snow, N. 1998. Caryopsis morphology of Leptochloa sensu lato (Poaceae, Chloridoideae). Sida 18(1):271-282.

Stutz, H.C. & S.C. Sanderson. 1998. Taxonomic clarification of Atriplex nuttallii (Chenopodiaceae) and its near relatives. Sida 18(1):193-212.

Todsen, T.K. 1998. Penstemon metcalfei (Scrophulariaceae), a valid species. Sida 18(2):621-622.

Trock, D.K. & T.M. Barkley. 1998. Seven new nomenclatural combinations and a new name in Packera (Asteraceae: Senecioneae). Sida 18(2):385-388. [auroid group of Senecio]

Turner, B.L. 1998. Texas species of Glandularia (Verbenaceae). Lundellia 1:3-16.

Turner, B.L. 1998. Plant Systematics: Beginnings and Endings. Aliso 17(2):189-200. [delightful historical reading]

Weakley, A.S. & P.M. Peterson. 1998. Taxonomy of the Sporobolus floridanus complex (Poaceae: Sporobolinae). Sida 18(1):247-270.

Welsh, S.L. 1998. John Charles Fremont, Botanical Explorer. St. Louis: Missouri Botanical Garden Press.

[There are numerous reports and discussions concerning rare New Mexico plants on the New Mexico Rare Plant Technical Council web site: http://biology.unm.edu/~chelo/nmrptc1.html]

Miscellaneous, Agriculture, Ecology, Etc.

Evans, H.E. 1997. The Natural History of the Long Expedition to the Rocky Mountains. Oxford University Press, New York. 268 pp.

Hart, C.R., A. McGinty, & B.B. Carpenter. 1998. Toxic Plant Handbook. Texas Agric. Ext. Serv. B-6072. 122 pp.

Peterson, R.S. & C.S. Boyd. 1998. Ecology and management of sand shinnery communities: A literature review. Gen. Tech. Rep. RMRS-GTR-16. Fort Collins, CO: U.S.D.A., For. Serv. 44 pp.

Journals, Newsletters, Etc.

Gila Native Plant Society Bulletin. P.O. Box 457, Silver City, NM 88062-0457.

Lundellia: Journal of the Plant Resources Center of the University of Texas at Austin. Carol Todzia, Plant Resources Center, Dept. Botany, Univ. of Texas, Austin, TX 78713. [1st issue with articles on Glandularia and Hymenoxys.]

Native Plant Society of New Mexico Newsletter. Tim McKimmie, 1105 Circle Drive, Las Cruces, NM 88005.

New Mexico Naturalist's Notes. P. Knight & R. Sivinski, eds. Sponsored by Marron & Associates, Inc. 7809 Fourth St. NW, Albuquerque, NM 87107. (505) 898-8848.

New Plant Distribution Records

New Plant Distribution Records

New records for New Mexico are documented by the county of occurrence and the disposition (herbarium) of a specimen.

— Richard Spellenberg (Dept. Biology, New Mexico State University, Las Cruces, NM 88003)
Polygonum aubertii L. Henry (Polygonaceae): Rio Arriba Co. (NMC).

— Kelly Allred (Dept. Animal & Range Sciences, New Mexico Staet University, Las Cruces, NM 88003
Bupleurum americanum Coult. & Rose (Apiaceae): Lincoln Co. (NMCR).

— Richard Worthington (P.O. Box 13331, El Paso, TX 79913)
Carex muriculata F.J. Hermann subsp. muriculata (Cyperaceae): Eddy Co. (NMCR).

— James McGrath (P.O. Box 2605, Tijeras, NM 87059)
Menyanthes trifoliata L. (Menyanthaceae): Rio Arriba Co. (UNM).