The Plant Press

THE ARIZONA NATIVE PLANT SOCIETY

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AFRICAN SUMAC (*RHUS LANCEA*)

ANTOINETTE SEGADE

In 1975 I purchased my first Tucson home, attracted largely to three lovely African sumac shade trees gracing the east side of the yard The day that I moved in my childhood passion took over and I promptly climbed each one in turn, pausing to survey my newly acquired kingdom. I was ecstatic. Twenty-five years, many observations, and much data later, I have a few second thoughts.

Rhus lancea is a truly remarkable tree in many ways - both positive and negative The first specimens I ever saw grew in splendid isolation, one on each side of the walkway that led to the entrance of the main library on the University of Arizona campus. They had been brought to Arizona in the 1920 's by Homer L. Shantz. (See page 4)

In 1975, the three *Rhus lanceas* in my yard were the only ones in the neighborhood visible from my rooftop. The same vantage point on April 9, 2000, revealed 12' to 20' volunteer *Rhus lanceas* in every yard except one. The sole exception was the yard belonging to a neighbor who had listened to my comments about this species, thought it over, and then turned his into firewood, which he gave away.

MORE INSIDE:

While *Rhus lancea* has some positive features for the landscape, it has some very serious negative ones both for the landscape and the environment.

Good characteristics from the landscape point of view. The trees are:

1. aesthetically pleasing
2. appropriately scaled for urban housing
3. fast growing
4. good shade providers
5. effective screens for undesirable views
6. almost completely resistant to Texas root rot (*Phymatotrychum omnivorum*)
7. highly drought tolerant
8. pest-free (none observed)
9. abundant, perennial sources of seeds for birds during times of scarcity
10. sources of food for honey bees from November to mid-February
11. unattractive to termites
12. habitat for fauna - carpenter bees favor large broken branches for boring holes; birds like the thick foliage for concealment
13. habitat for various fungi.

They meet many of the criteria for a fine residential landscape tree.

However, *Rhus lancea* also has some negative characteristics which are so extreme they must be seriously con-sidered when deciding to plant one or remove one.

One serious problem is that the plant is highly allergenic. Not only does it

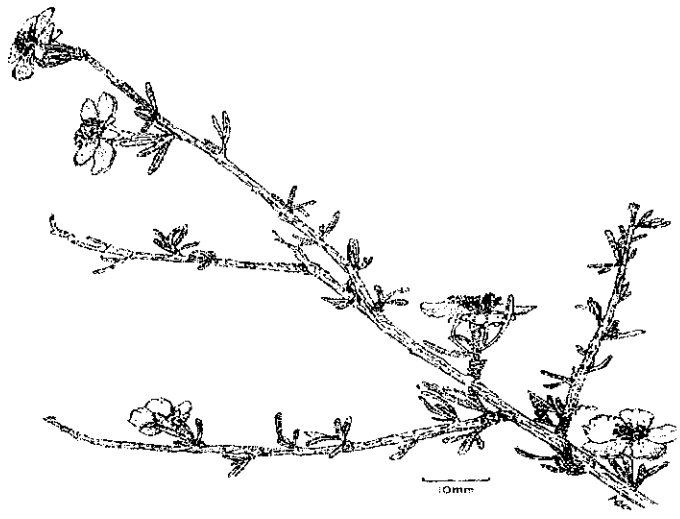
Rhus cont. on page 10

CONSERVATION EFFORTS FOR *PURSHIA SUBINTEGRA*, ARIZONA CLIFFROSE

JOYCE MASCHINSKI

One of the most serious threats to native plant conservation is development. Where human populations are increasing, there have arisen more conflicts between human needs and preservation of nature.

For many years the people of Cottonwood have been planning to meet one of their critical needs - to alleviate traffic congestion by extending Mingus Avenue over the Verde River to connect with Cornville Road. Unfortunately, the proposed roadway cuts through the heart of the largest and most fecund population of the endangered Arizona cliffrose. There are only four populations in existence, all in central Arizona.



Using information that we have been gathering on the Arizona cliffrose population since 1995, Joanne Baggs and Joyce Maschinski presented maps detailing the locations of seedlings and reproductive adults to the Yavapai County officials working on the road extension. Further, The Flagstaff Arboretum offered its opinion to the environmental consultants and U.S. Fish and Wildlife Service about the impact of the road building on this endangered species and endorsed the proposal to protect 370 acres of the habitat .

There are several consequences of the road extension. First, more than 400 plants, adults and seedlings, will be destroyed. Second, the extremely restricted habitat of this endangered species will be destroyed. Unlike many common plants that have a wide range of tolerances to varying soil and moisture conditions, the endangered Arizona cliffrose is tremendously picky. Although our studies indicate that its seeds will germinate off of the restricted fingers of habitat, most seedlings die from desiccation of the microsites where adults occur. These special fingers of habitat have unique soil and water conditions. Thus, destroying habitat translates to fewer homes for the species unless experiments help us determine alternative sites where the species can persist. Third, the road will not only create a disturbance through the population, but it will bisect it. Many studies have shown that disturbance generates avenues for weed invasion. Weeds can outcompete the Arizona cliffrose for water and space. The disturbance may also encourage the spread of hybrids (*Purshia subintegra* crossed with *Purshia stansburriana*) into the pure stands of Arizona cliffrose. Similarly, studies of other species have shown that fragmenting a population can lead to reductions in viable seed production and restriction of gene flow. And this species is endangered.

Recent reintroduction attempts in the Verde Valley indicate that there may be a glimmer of hope for saving some of the plants lost to construction. To test whether plants propagated from cuttings or seeds could survive if transplanted back into the wild habitat, we set up 3 experiments. In November 1999, we introduced 150 plants that received 1 gallon of water each week for 5-months. We repeated the experiment in February 2000 again introducing 150 plants that will receive water for 5 months. In a third experiment, we introduced 100 plants that were watered for 4 weeks. One-half of these are still being watered as in the first two experiments, whereas the other half is receiving no

more water. As of May 2000, plants transplanted in November suffered 5% mortality, whereas those transplanted in February suffered much greater mortality and those receiving only 4 weeks of water have suffered 25% mortality. We anticipate that mortality will be even greater if natural precipitation is meager this year. The important thing is that some of the plants are surviving thus far and that these experiments are helping us define which particular microsites may be suitable sites for reintroduction. We will continue to monitor the reintroduction experiments to determine if these preliminary results hold for the long-term.

Joyce Maschinski is Director of Research for The Arboretum at Flagstaff.

NEW MEXICO XERISCAPE CONFERENCE

OCTOBER 21-22
ALBUQUERQUE, NEW MEXICO

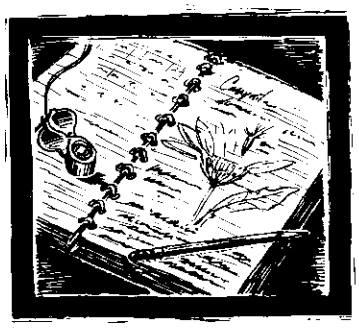
This is the seventh annual xeriscape conference which is held at different locations each year. Featured speakers include Sandra Postel, Jim Knopf, Judith Phillips, Judy Mielke, and David Salman.

For more information see the web site: www.xeriscapenm.com or call 505 343-4121

Volunteers planting *Purshia subintegra*.
Photo: Arboretum at Flagstaff

OUTSTANDING ARIZONA BOTANISTS V: HOMER LEROY SHANTZ

BARBARA TELLMAN



Homer Shantz was one of America's leading botanists in the first half of the twentieth century, but was far more - a pioneer ecologist, plant geographer, soil scientist, and strong advocate for conservation of natural resources. He was one of the most important founders of the Saguaro National Monument

Shantz was born on a farm in Michigan in 1876 and developed a love of nature at an early age. He got his introduction to the West when the family moved to Colorado. Later he earned a Ph.D. in Botany from the University of Nebraska. After teaching botany for a few years, he joined the USDA Bureau of Plant Industry and traveled throughout the West studying plant physiology with the goal of developing a method to assess the agricultural and grazing potential of the land, using information about the native plants, soils, etc. He took thousands of photographs throughout the West which form the basis of a large photo collection. In later years he rephotographed many of the same places to document environmental change. He was the coauthor of a vegetation atlas of the United States published by the U.S. Geological Survey in 1924. The early versions of the maps for this can be seen at the University of Arizona's Special Collections Library. They are huge hand-colored maps with legends identifying various vegetative communities - early versions of the Brown and Lowe vegetative communities map, so to speak. He was becoming nationally known for his work in botany, geography, and ecology and for his studies of drought-and salt-resistant plants.

In 1919 he joined the Smithsonian African Expedition on which he was the physiologist in charge of plant geography. This began his lifelong fascination with studying and visiting Africa. He made two trips across Africa from Capetown to Cairo, spending 13 months on the road and from Cairo to Capetown, an eight month journey. His last African trip was at the age of 81, when he rephotographed many of the sites he had visited earlier to document changes in vegetation and desertification. While there he hunted big game, but claimed that it was never for sport, only for meat. He was captivated by many of the plants he saw and imported hundreds of species for trials in the U.S. He is said to have been the first to bring *Rhus lancea* to Arizona and planted some on the University of Arizona campus. (See *Rhus lancea* article on page 1). He also brought back thousands of herbarium specimens.

In 1928 he came to Tucson as President of the University of Arizona. Here he became actively involved in a wide range of causes. He brought some outstanding scholars to the campus in the fields of geology, geography and biology and encouraged the work of people already at the University, such as G.E.P. Smith, Arizona's "father of hydrology" who worked tirelessly for sensible water management in Arizona. Among his many interests was music. He was a horn player and during his administration the College of Fine Arts was formed. He developed a passion for the Sonoran Desert and its unusual plants and wildlife and made close friends with members of the local botanical community, including the staff of the Smithsonian Laboratory on Tumamoc Hill.

In the 1920s, homesteaders were beginning to occupy the Rincon Mountains east of Tucson, home of one of the greatest saguaro stands in the southwest. The Natural History Society of which Shantz was an active member tried unsuccessfully to get the federal government to buy the land as a federal reserve. The upper portions of the Rincon Mountains were already part of the Coronado National Forest and heavily used for grazing. Shantz persuaded the Board of Regents to allow him to spend $50,000 to buy 6,400 acres of the best saguaro habitat. This was to be used as a botanical laboratory and as a new location for the Steward Astronomical Observatory, since city lights were already degrading the telescope viewing at the University. Herbert Hoover declared the area a National Monument in 1933 and years of wrangling followed over the University's land which finally became part of the Monument.

While the purchase was vital to saving the core of the saguaro stand, it probably played a major role in Shantz's departure from the University in 1936 when a new conservative Board of Regents felt the money had been wasted. His letter of resignation was highly critical of the Board of Regents. A local Democratic Party publication gossiped about what had happened, claiming the "Phelps Dodge Corporation has taken over the University system."

He left to become chief of the Division of Wildlife Management of the U.S. Forest Service where he emphasized the interactions of plants, animals, soils. climate, fire, and human factors. This culminated in his comprehensive textbook of ecology. The table of contents is mind-boggling in its breadth of topics that range from what we know today as the tradi-tional concerns of ecology to economics and human social issues. The manuscript is in the University of Arizona library, but it does not appeared to have been published. Perhaps it was too far ahead of its time.

His love of the desert continued while he was in Washington. his 1937 National Geographic article, The Saguaro Forest, was probably the first popular national article on the Saguaro National Monument and featured many of his excellent photos. He later returned to Tucson where he taught botany part time and continued to enjoy and study the Sonoran Desert.

Shantz died at the age of 82 while on a rephotography expedition in Spearfish, South Dakota. His numerous publications reveal an incredible range of interests and expertise. Some of the topics are American species of Brachinecta and their habitats, blue-green algae, plant succession on abandoned roads, conservation of grazing resources on public lands, plant physiology and human welfare, and fire as a tool for brush management. He wrote the Desert Living Handbook for Boy Scouts and his major work, The Vegetation of Africa.

Barbara Tellman is editor of the Plant Press and a Senior Research Specialist at the Water Resources Research Center, University of Arizona.

CHIRICAHUA WORKSHOP

The 20th annual Chiricahua Workshop will take place from the afternoon of Friday, September 1, through midday on Monday, September 4, 2000, at the Southwestern Research Station in Cave Creek Canyon near Portal.

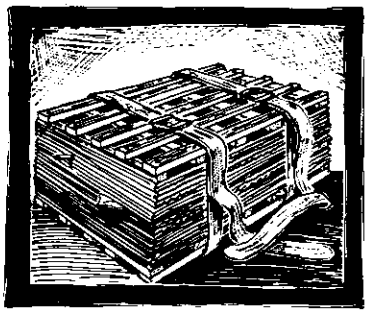
Our excellent workshop leaders include Kevin Dahl, ethnobotanist and Executive Director of Tucson Audubon Society; Matt Johnson, Program Manager and Seed Bank Curator, Desert Legume Program; Pinau Merlin, Tucson-based naturalist, writer, photographer, and artist; and Don Swann, wildlife biologist, Saguaro National Park.

The Chiricahua Workshop is open to ANPS members only. All members are sent workshop announcements and registration forms through the mail. Reservations are on a first-come, first-serve basis. If you did receive an announcement, contact ANPS for information.

ANPS ANNUAL MEETING

The 2000 Annual Meeting will be held in Sierra Vista in October 21 and 22. The San Pedro River will be the theme of the meeting, with speakers talking about the history of the area, interesting and sensitive species, water issues related to the river, the San Pedro Riparian Conservation Area, and the nearby mountains. Field trips on Sunday will go to a beaver reintroduction site on the San Pedro, Ramsey Canyon, and Fort Huachuca. Camping will be available at Greyhawk Ranch where the Saturday evening campfire dinner will be held. Announcements with details will be mailed to all members in August and will be on the ANPS web site.

FLORAS OF ARIZONA NATIONAL PARKS AND MONUMENTS V. HUBBELL TRADING POST NATIONAL HISTORIC SITE



This is the fifth checklist in our series of floristic species lists for various national parks, monuments, and historic sites in Arizona. These lists were obtained from the World Wide Web at http://ice.ucdavis.edu/nps, an online database created and maintained by the Information Center for the Environment (ICE) at the University of California at Davis. This is a very useful web site, providing lists of plants and animals from parks throughout the United States. Names appearing on these lists, however, have not been verified by ICE and may have some nomenclatural problems. Each list will be edited by ANPS member Steve McLaughlin for synonymy (the same plant species occurring under two or more Latin names), exotic species will be identified by an asterisk (*), and updated nomen-clature will be provided along with Latin binomials that may be more familiar to ANPS members.

Hubbell Trading Post National Historic Site occupies 160 acres in central Apache County, at an elevation of 6200 feet. It was founded in the mid 19th Century by John L. Hubbell and is still an active trading post. The ICE list is based on a publication by K. N. Gandhi and S. L. Hatch 1987, A checklist of the vascular plants of Hubbell Trading Post National Historic Site, Ganado, Arizona; Phytologia 62: 487-497. The ICE list, however, includes just 107 of the 132 taxa listed by Gandhi and Hatch. The following check-list includes the species omitted on the ICE list. Furthermore, where Gandhi and Hatch recognize a species to subspecies or variety, the ICE list gives a separate entry for the genus and species, implying the presence of the typical variety, which does not appear on the Gandhi and Hatch list; these have been omitted from the list below.

Thirty-seven of the 132 taxa on the checklist are exotics–28% of the total flora. While this is a high percentage it is typical for floras from such small areas. In addition, Gandhi and Hatch did not include cultivated species–crops and ornamentals–on their list, just native and naturalized plants. The original survey was done from June 20 to July 12, 1986, and thus likely missed both some early and late season annuals.

Steve McLaughlin is a professor at the University of Arizona's Office of Arid Lands Studies with special interest in economic botany and

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HUBBELL TRADING POST NATIONAL HISTORIC SITE

This Historic Site recognizes the oldest continuously operating trading post on the Navajo Reservation/ The trading post was purchased by John Lorenzo Hubbell in 1878, and the Hubbell family operated the post until it was sold to the National Park Service in 1967. It is still active, and operated by a non-profit organization that maintains the trading traditions the Hubbell family established. The site consists of the original 160 acre homestead, with the trading post, family home and visitor center as the primary attractions.

Summer hours are 8 a.m. - 6 p.m. MST, daily. Winter hours are 8 a.m. - 5 p.m., daily. The park is closed on Thanksgiving day, Christmas Day, and New Years Day. Note: The Navajo Reservation, uses Daylight Savings Time.

Hubbell Trading Post is located one mile west of Ganado, on highway 264. Visitors traveling on I-40 can take highway 191 north to Ganado, or from Gallup, New Mexico, take highway 666 north to highway 264.

For Information:: Hubbell Trading Post National Historic Site, P.O. Box 150, Ganado, AZ 86505, (520) 755-3475 or www.nps.gov

PLANTS OF HUBBELL TRADING POST NATIONAL HISTORIC SITE

* indicates exotic species
\+ indicates species added from Gandhi and Hatch (1987, Phytologia 62: 487-494).

I. Ferns and Fern Allies
Equisetaceae
Equisetum arvense — Field horsetail

II. Gymnosperms
Cupressaceae
Juniperus monosperma — One seed juniper

Ephedraceae
Ephedra torreyana — Torrey's jointfir

Pinaceae
Pinus edulis — Two needle pinyon

III. Dicotyledons
Amaranthaceae
Amaranthus blitoides — Prostrate pigweed
+*Amaranthus wrightii* — Wright's pigweed

Apiaceae
+*Cymopterus purpureus*

Asclepiadaceae
Asclepias subverticillata — Whorled milkweed

Asteraceae
+*Achillea millefolium* — Yarrow
+*Ambrosia* sp. — Ragweed
+*Artemisia tridentata*
Carduus nutans — Nodding plumeless thistle
+*Chaetopappa ericoides*
Chrysothamnus nauseosus ssp. *graveolens* — Rubber rabbitbrush
Cirsium ochrocentrum — Yellowspine thistle
**Cirsium vulgare* — Bull thistle
+*Cirsium* sp. — Thistle
Conyza canadensis — Canadian horseweed
Erigeron divergens — Spreading fleabane
Grindelia nuda var. *aphanactis* — Curlytop gumweed
Gutierrezia sarothrae — Broom snakeweed
Helianthus ciliaris — Texas blueweed
+*Helianthus petiolaris* — Prairie sunflower
Heterotheca villosa — Hairy goldenaster
Hymenopappus filifolius var. *lugens* — Idaho hymenopappus
Hymenopappus filifolius var. *pauciflorus* — Fineleaf hymenopappus
Hymenoxys richardsonii var. *floribunda* — Colorado rubberweed
Iva axillaris — Povertyweed
**Lactuca serriola* — Prickly lettuce
Machaeranthera canescens ssp. *glabra* (*M. linearis*) — Cutleaf goldenweed
Malacothrix fendleri — Fendler's desert dandelion
Senecio flaccidus var. *flaccidus* (*S. douglasii* var. *longilobus*) — Threadleaf groundsel
**Taraxacum officinale* — Common dandelion
Thelesperma megapotamicum — Hopi tea greenthread
**Tragopogon dubius* — Yellow salsify
Xanthium strumarium — Rough cockleburr
Xylorhiza tortifolia — Mojave aster

Boraginaceae
+*Cryptantha barbigera* — Bearded cryptantha
+*Cryptantha cinerea* var. *jamesii*
Lappula occidentalis var. *cupulata* — Flatspine stickseed

Brassicaceae
**Alyssum parviflorum* (*A. minus*) — European madwort
**Camelina microcarpa* — Littlepod falseflax
**Capsella bursa-pastoris* — Shepherd's purse
Dimorphocarpa wislizeni — Tourist plant
**Lepidium perfoliatum* — Clasping pepperweed
Lesquerella intermedia — Mid bladderpod
Physaria chambersii — Chamber's twinpod
+**Sisymbrium altissimum* — Tumble mustard
Stanleya pinnata — Desert princes plume
+*Streptanthus cordatus* — Twist flower

Cactaceae
Opuntia macrocentra var. *macrocentra* — Redjoint pricklypear
Opuntia whipplei — Whipple cholla

Capparaceae
Cleome serrulata — Rocky Mountain beeplant

Chenopodiaceae
Atriplex canescens Fourwing saltbush
Atriplex confertifolia Shadscale saltbush
**Chenopodium album* Lambs quarters
**Kochia scoparia* Common kochia
**Salsola kali* ssp. *tragus* Prickly Russian thistle Tumbleweed

Convolvulaceae
**Convolvulus arvensis* Field bindweed

Elaeagnaceae
**Elaeagnus angustifolia* Russian olive

Euphorbiaceae
Chamaesyce fendleri Fendler's sandmat
Chamaesyce glyptosperma Ribseed sandmat
Chamaesyce maculata Spotted sandmat
Croton texensis Texas croton

Fabaceae
Astragalus castaneiformis Chestnut milkvetch
Lupinus kingii King's lupine
**Medicago lupulina* Black medick
**Medicago sativa* Alfalfa
**Melilotus albus* White sweetclover
**Melilotus officinalis* Yellow sweetclover
+Oxytropis lambertii Lambert locoweed
+Parryella filifolia
**Trifolium repens* White clover

Geraniaceae
**Erodium cicutarium* Redstem stork's bill

Hydrophyllaceae
+Nama retrorsum

Lamiaceae
Dracocephalum parviflorum American dragonhead
**Marrubium vulgare* Horehound
Mentha canadensis Canadian mint

Linaceae
Linum aristatum Bristle flax

Loasaceae
Mentzelia pumila Dwarf mentzelia

Malvaceae
**Malva neglecta* Common mallow
Sphaeralcea ambigua Desert globemallow
Sphaeralcea coccinea Scarlet globemallow
Sphaeralcea fendleri Fendler's globemallow
Nyctaginaceae
Mirabilis linearis Narrowleaf four o'clock
Mirabilis multiflora Colorado four o'clock
Tripterocalyx carnea var. *wootonii* Wooton's sandpuffs

Oleaceae
+Menodora scabra

Onagraceae
+Gaura parviflora Lizardtail
Oenothera caespitosa Tufted evening primrose
**Oenothera speciosa* Pink ladies

Papaveraceae
Argemone munita Flatbud pricklypoppy

Plantaginaceae
*+*Plantago major* Common plantain
Plantago patagonica Woolly plantain

Polemoniaceae
Gilia subnuda Coral gilia

Polygonaceae
Eriogonum cernuum Nodding buckwheat
**Polygonum aviculare* Prostrate knotweed
**Polygonum lapathifolium* Curlytop knotweed
Rumex salicifolius var. *mexicanus* Mexican dock

Portulacaceae
Portulaca oleracea Little hogweed

Ranunculaceae
Ranunculus cymbalaria ssp. *saximontanus* Alkali buttercup

Salicaceae
Populus fremontii Fremont's cottonwood
Salix exigua Sandbar willow

Scrophulariaceae
Castilleja linariifolia Wyoming Indian paintbrush
Veronica americana American speedwell

Solanaceae
+Chamaesaracha coronopus Small groundcherry
Lycium pallidum Pale wolfberry
Physalis longifolia Longleaf groundcherry
Solanum rostratum Buffalobur nightshade
Tamaricaceae

+**Tamarix chinensis*	Salt cedar
Verbenaceae	
Verbena bracteata	Bigbract verbena
Zygophyllaceae	
+**Tribulus terrestris*	Puncture vine
IV. Monocotyledons	
Agavaceae	
Yucca angustissima	Narrowleaf yucca
Cyperaceae	
Scirpus americanus	American bulrush
Juncaceae	
Juncus xiphioides	Irisleaf rush
Liliaceae	
Calochortus nuttallii	Sego lily
Poaceae	
**Aegilops cylindrica*	Jointed goatgrass
**Agrostis stolonifera*	Creeping bentgrass
Aristida purpurea var. *longiseta*	Red threeawn
**Bromus japonicus*	Japanese brome
**Bromus tectorum*	Cheatgrass
**Dactylis glomerata*	Orchardgrass
Elymus trachycaulus	Slender wheatgrass
+*Hordeum jubatum*	Foxtail barley
**Hordeum murinum* ssp. *leporinum*	Leporinum barley
Oryzopsis hymenoides	Indian ricegrass
+*Pascopyrum smithii* (*Agropyron smithii*)	Western wheatgrass
+*Poa fendleriana*	Muttongrass
**Polypogon monspeliensis*	Annual rabbitsfoot grass
+**Puccinella distans*	Weeping alkaligrass
Sporobolus airoides	Alkali sacaton
Stipa nelsonii ssp. *dorei* (*S. columbiana*)	Dore's needlegrass

Ed. Note: This is the next to last in Steve's National Parks and Monuments plant list series. Anyone with relatively short plant lists is invited to submit them to the editor for consideration.

ANPS PUBLICATION AWARDS

Each year the ANPS board grants money from its Publications Fund to assist applicants in publication of materials related to native plants. This year the board received 4 requests for the $3,000 available and the Board awarded money to two of them:

Robert Zahner received $1,000 to help with publishing costs for the Year 2000 edition of the *Arizona Register of Big Trees*.

Marge Norem received $1,000 to help underwrite expense for the publication of *Desert Plants*.

In addition, the Board considered a request from Linda Brewer to help with the publication costs for the recently completed *Arizona Rare Plant Guide*. The Board decided to fund this request for a total of $5,000. $1,000 that came from the Publication Award money and the remainder came from the ANPS general fund.

An invitation to submit applications for the 2001 publication awards will be in the Autumn Plant Press.

ANPS AWARDS OF EXCELLENCE

Each year ANPS members are asked to nominate people who have made outstanding contributions to the preservation of native plants, furthering of the use of native plants in landscaping, or education about native plants.

This year ANPS made two awards.

William Feldman was recognized for his work as Director of the Boyce-Thompson Arboretum, including landscaping and educational activities. Bill is a former ANPS President and is active in many plant preservation activities.

Julia Fonseca was recognized for her work in conserving native plants and their habitats. Julia is a former conservation chair for ANPS and has been highly effective in riparian preservation in her work at the Pima County Flood Control District where she manages natural riparian areas and leads scientific activities for the Sonoran Desert Conservation Plan.

An invitation to submit nominations for the 2001 awards will be in the Autumn Plant Press.

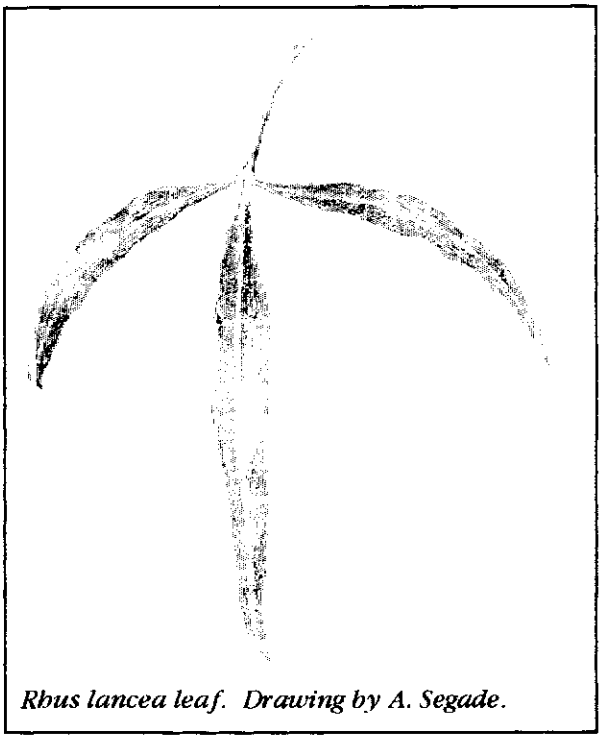
Rhus continued from page 1

produce vast quantities of irritating pollen, but it does so primarily from November to mid-February. This is unfortunate for those who are sensitive to its pollen since such people are also almost invariably allergic to other plant pollens which are produced mainly in the spring and fall. The result is a virtual year-round pollen season accompanied by the usual symptoms of itching, sniffling, sneezing, coughing, excessive mucus, hoarseness, sore throat and post-nasal drip, which, in time can, and often does, lead to con-ditions such as chronic allergic bronchitis and asthma. When sufficiently severe, the conditions can be life threatening. In addition, those with severe allergies who cannot tolerate oral prescription drugs due to adverse reactions, and who must rely upon desensitization injections to obtain relief, can no longer get them. The manufacturer stopped making the antigen because it was not profitable, since only a few people needed it.

The second important negative characteristic, its invasiveness, should be of special concern for those interested in the preservation of natural areas. The tree is invasive because of its copious seed production and its adaptability to a wide range of growing conditions and localities. Natural seed dispersal is primarily by birds because the round, wrinkled, five mm long seeds are too heavy to be transported by the wind. Some of the birds that I have observed eating the seeds include English sparrows (*Passer domesticus)*, house finches (*Carpodacus mexicanus*), white crowned sparrows (*Zonotrichia leucophrys*), mocking birds (*Mimus polyglottos)*, cardinals (*Richmondena cardinalis*) and quail (*Lophortyx gambelii)*. In urban areas, both resident and migratory birds eat the seeds and then excrete them in and around favorite perching places such as shrubs and trees, where they fall into protective cover beside patio walls and fences where mowers can't reach and under overhead utility lines which are often located in alleys that are rarely visited or maintained.

I have observed healthy individual specimens and young stands of *Rhus lancea* in numerous places in Tucson such as Arroyo Chico in Colonia Solana and other washes and in a Nature Study area at Agua Caliente Elementary School.

Riparian areas are especially vulnerable, as they are heavily utilized by migratory and resident birds that



Rhus lancea leaf. Drawing by A. Segade.

disperse the seed, rapidly extend its local range, and introduce it into new places. The impact is becoming obvious in some ecologically sensitive areas.

This recently developing invasion into natural areas does not bode well for some native species. This is especially true in riparian areas which are noted for both species diversity and population density. The most important problems that they put the natives under increased stress due to competition for available water, nutrients, sunlight and space, and alteration of narrowly species-specific habitats and niches.

Rhus lancea's invasiveness is the result of a combination of the following factors:

1. It produces seeds copiously, which leads to the rapid development of pure stands.
2. Its canopy, especially in riparian areas, drainages, and small washes becomes extremely thick. The resulting shade is very deep, and continuous throughout the year, as the trees are not deciduous. Eventually most native species are shaded out, since they evolved to respond to the summer filtered shade and winter sun, conditions created by most native deciduous trees and shrubs.
3. The profuse leaf litter (average to inches deep in natural areas) forms a mulch, effectively preventing germination of other plants by blocking soil contact and limiting penetration of

water and sunlight.
4. It can survive a wide range of growing conditions from dry, rocky slopes to lush riparian areas
5. It is tolerant of extreme and extended drought periods
6. It is very difficult to remove when established.

In addition to the environmental considerations, property owners should be aware in addition to the aforementioned problems of leaf litter (which is a fire hazard) and control of volunteers, the strong, invasive root system is difficult to remove. Volunteer control is difficult, as the *Rhus lancea* initially sends down a deep taproot which must be severed below ground level to prevent regrowth. Small specimens, when pulled, frequently break off just above ground level and regenerate. Those with a trunk diameter greater than one inch generally have an additional three to five nearly horizontal brace roots which also must be severed.

This strong root system can be troublesome in several ways. Block walls are no obstacle for the brace roots. A good example is in the northeast corner of my yard, where the roots have broken the footing and opened a crack in the wall, The upper and lower sections of the cracked wall are offset by 7/8 of an inch. These roots also are capable of entering tiny cracks in sewer lines and drip systems where they proliferate and cause obstructions. In addition, the brace roots are not confined to the area under the crown of the tree, but frequently extend a considerable distance outward.

In conclusion, *Rhus lancea* has fine qualities. However, its problem-causing characteristics, especially with regard to conservation and protection of natural areas, are insidious, and may draw little attention until it is too late for efficient and effective action.

I would like to share my experiences concerning a single female African sumac (yes, they are dioecious - the pistillate, or female, seed-forming flowers are on one tree, and the staminate, or male, pollen producing flowers are on another). This particular tree is approximately 15 years old, with a trunk diameter of 18 inches. It has never received supplemental water, has survived at least three known attacks of Texas root rot and at present carries an apparently dead crown. One foot above ground level however there is new growth consisting of seven slender branchlets on its trunk This year I removed one hundred and eleven seedlings from beneath and in the immediate vicinity of its crown. Of these, there were twelve seedlings more than three feet high and seven seedlings more than four feet high. The rest were up to two and a half feet tall. There are about fifty more individuals left to remove. It is definitely a survivor - one with some questionable attributes for landscape use, and some definite long term severe negative consequences for the natural environment. (Also see page 14).

Antoinette Segade is a retired teacher and prolific native plant photographer. She is a member of the ANPS board.

An illuminating incident illustrates the need to include a description on how to identify the African sumac. A friend in Tucson recently asked me to indicate which weeds in his garden should be pulled. I did so, mentioning the seedling African sumacs in particular. A week later I re-checked the garden and the new weed pile for any overlooked flora. He had pulled everything except the sumac. It looked very healthy.

It is a member of the Anacardiaceae family a distinction that it shares with poison ivy (*Rhus radicans*). It is generally a multi-trunked tree to 25 ft. in height, open and spreading in appearance and the outer branchlets graceful and weeping in habit.

Leaves are divided into three willow-like leaflets three to five inches long. When crushed and rubbed hard, they often have a faint but sharp distinctive odor which can be used for identification. The female trees bear clusters of yellow-tan berries which are wrinkled and about five mm in diameter when dry. Many often remain on the tree throughout the year.

Roots, which often travel well beyond the canopy, are easy to identify, The outer layer is brown, with a very thin reddish inner lining which becomes visible when the root is scraped. The rest of the interior portion is off-white to tan.

BOOK REVIEWS

MARCIA TIEDE

THE SIERRA PINACATE
by Julian D. Hayden; photographs by Jack Dykinga, with essays by Charles Bowden and Bernard L. Fontana 96 pages. (University of Arizona Press, 1998; part of the Southwest Center Series. $24.95)

This book is a slender tribute to the "rogue scholar" (to borrow a phrase from Bowden), ethnologist and archaeologist Julian Hayden, who died in March 1998, shortly before this book was published. Hayden's passion for reconstructing the human experience in the prehistoric Southwest began in childhood and was nurtured by his archaeologist father. In the 1930s and 1940s Hayden did work on the Anasazi site of Keet Seel, the Snaketown site, the Pueblo Grande ruins, the Ventana Cave site, and an ancient coastal site near San Diego. After a hiatus developing an excavation contracting business, Hayden returned to his real (but never again professional) calling, in the wake of a trip to the Pinacates in the company of an archaeologist and Alberto Celaya, who had explored the region as a boy and guided naturalist Carl Lumholtz there in 1909.

From 1958 on Hayden did systematic mapping of the Pinacates, including hundreds of miles of ancient trails, still clearly visible until the introduction of cattle to the region in 1965. What he found there reinforced his controversial belief that humans have been present in the New World for about 40,000 years. Recently developed methods for interpretation of "desert varnish" (thin layers of oxides and clay which are formed by microbes that vary according to climatic conditions) on stone artifacts appear to support his theory. The Pinacates were particularly suited for Hayden's pursuit due to their isolation, the ability of the desert pavement to retain any sign of disturbance, and the abundance of human leavings, to his well-trained eye.

Hayden's text gives factual background: geological context, short- and long-term shifts in climate and how they have affected vegetation, evidence for early human populations and their relationship to modern native populations, and impacts of improved accessibility. He also describes the tall tales and personalities linked to the area, and moments of personal revelation.

Over the years Hayden became known as the grand old man of the Pinacates. He led others there, the fellow contributors to this book among them. Bunny Fontana, an expert in Southwestern history, describes Hayden's life and the significance of his theories. Chuck Bowden sketches his personality and the depths of his knowledge and experience. Jack Dykinga's velvety color photographs of the volcanic Pinacate landscape (some of them aerial) and vegetation are interspersed with black-and-white photographs by Hayden. Alberto Búrquez, ecologist at the Universidad Nacional Autonoma de México in Hermosillo, adds a summary of the recent establishment of a biosphere reserve to protect the Pinacates and neighboring Gran Desierto, in response to growing population and accompanying stresses (such as woodcutting) on the region. The texts by Hayden and Búrquez are repeated in Spanish. A bibliography of Hayden's writings is included.

DESERT: THE MOJAVE AND DEATH VALLEY
photographs by Jack Dykinga; text by Janice Emily Bowers 143 pages. (New York: Harry N. Abrams, Inc., 1999. $49.50)

In this independently accomplished collaboration, two desert lovers apply their skills of description to the Mojave Desert. Their purpose, according to Bowers, was "to make new friends for the Mojave Desert, and to remind old friends that despite the changes they deplore, the desert still needs their good will." The project benefited from the extraordinary El Niño rains of 1997-98.

Dykinga's super-saturated, surreal color photographs of the Mojave's landforms and vegetation (eighty in all) take center stage. A stark contrast to the remote sameness of Edward Weston's classic 1930s black-and-white Death Valley overviews, Dykinga's images provide close-up evidence as to the variability of salt formations, cracked clay, dune ripples, lakebed pavements, and volcanic debris found. Dykinga's images immortalize expanses of birdcage evening primrose, poppies, lupine, owl's clover, and desert sunflower; as well as close-ups of prickly pear and other flowers. He savors the colors and textures of aging or dying plants—several yucca studies illustrate this. Each image is captioned with location, and the scientific and common names of plant species. The plant names were contributed by Bowers, a botanist with the U.S. Geological Survey. As Dykinga notes in his acknowledgments, "She has

Cont. on page 13

LANDSCAPE TIPS : *ABUTILON PALMERI*

MARY F. IRISH

My neighbors are undergoing one of those dramatic garden cleanup efforts that most of us hope to avoid completely. They are clearing, cleaning and culling the remains of decades of feathery cassia, aloe vera and Agave lophantha that have been allowed to grow and prosper unfettered. As the shredder consumes more and more debris, beds open up and it becomes time to consider the possibilities. We began by looking for something for a raised planter under the bedrooms. What they wanted was a species that was attractive, needed only minimal care, and would thrive on the northeast side of the house. We found the answer with Indian mallow (Abutilon palmeri).

There are 8-10 species of Abutilon native to Arizona but this is the only one that is in cultivation as far as I know. Indian mallow is native at low elevations, 1000-3000 ft in southern Arizona, including Maricopa County, south into Sonora, Mexico and Baja California. It grows along drainages of the foothills of the McDowell Mountains just outside Scottsdale city limits as well as the Catalinas in Tucson and elsewhere. It is fairly common but is easily overlooked; it is often found under a large palo verde or ironwood as part of the profusion of plants deposited in those natural bedding areas of the desert. This offers a cultivation clue.

In the same family as hibiscus and globemallow (*Malvaceae*) its charming apricot orange flowers are about one inch across which are held in a sparse, upright inflorescence above the foliage. Bloom begins as early as March and continues intermittently through summer and into early fall. Pruning the spent blooming stalk encourages a tidier plant and continued flowering.

The foliage is marvelous. The leaves are 3-3.5 in long and 2-2.5 in wide, heart shaped with an irregular serrated edge, and velvety soft to the touch. The thick layer of hairs gives the leaf a light grey-green color. Plants can become rangy over time and an annual hard pruning in the early spring, or just after the first bloom, helps keep it tidy. Well grown individuals may be up to 8 ft tall, but it is easily kept to much smaller size by pruning.

Indian mallow grows best in filtered light or with morning sun only. Too much afternoon sun or reflected heat causes the plant to stunt, yellow and experience severe drought stress. Indian mallow thrives in almost any soil that is well drained, but a good organic mulch is beneficial during the summer. Rarely needing more than natural rainfall in the winter, this species should be watered at least once a week in the hottest part of the summer.

I was first introduced to this charming shrub by a wonderful man who brought me plants he grew in his backyard for Desert Botanical Garden plant sales As far as I know he is still the principle source for this plant in the Phoenix area, but it shouldn't be that way. This species is easily grown from seed. This is a superb ornamental plant that will enhance any garden whether you are facing the renovation of an old garden or the establishment of a new one.

Mary Irish is a freelance gardening writer and former curator with the Phoenix Desert Botanical Garden. Her new book, Agaves and Succulents will be reviewed in the fall issue.

Book Reviews from page 12 been the silent collaborator on two previous books, supplying scientific names and enthusiasm while making my work seem credible."

The essays accompanying these images represent Bowers' gift for thoughtful observation, quite apart from her analytical work as a scientist. The images and texts are informally clustered around themes—dunes, Joshua trees, the Racetrack (a playa where the stones "slide" in unpredictable ways), the riotous wildflowers of "a good spring," water, and the self-indulgent but transcendent experience of desert hot springs. There are also passages devoted to Bowers' quest to encounter kit foxes and her observations of a past debris flow in a canyon, which facilitated birdwatching by bringing the treetops closer to the ground; and the patina that abandoned junk (a desert mainstay) takes on before crumbling into oblivion. As in her previous writings, Bowers weaves together personal memories, the rewards of patient watching, and subtle humor, laced with a stimulating dose of historical and cultural reference points.

Marcia is President of the Tucson ANPS Chapter, on the ANPS State Board, and Curatorial Specialist at the University of Arizona's Center for Creative Photography.

CONSERVATION UPDATE

JEFF KRAMER, CONSERVATION CHAIR

IRONWOOD NATIONAL MONUMENT CREATED

The desert ironwood, *Olneya tesota*, an old growing tree and nurse plant for Sonoran desert flora and fauna, is gaining recognition for its role in healthy desert ecosystems. As if knowing their enhanced status, they recently bloomed in a proud display of light lavender much to the pleasure of those who noticed, and those seeking the nectar.

Over the past few months, ironwood trees and their associated habitat, have become another focal point of Southern Arizona conservation issues. Publication of the Desert Ironwood Primer*, and other praiseworthy efforts, brought ironwood issues into the political arena. The Sonoran Desert Conservation Plan process, discussed in earlier issues of the Plant Press, identified the area around Ragged Top Mountain west of Marana in Pima County as prime ironwood country in need of additional protection. The Board of Supervisors invited Interior Secretary Bruce Babbitt to visit the area in the company of Arizona Sonora Desert Museum experts, including ANPS stalwart, John Wiens. Secretary Babbitt was enthusiastic and agreed to ask President Clinton to establish protection for ironwood forests. The Coalition for Sonoran Desert Protection also had a proposal for what they called the Morris K. Udall Ironwood Forest - Upland Corridor National Monument. This proposal included prime ironwood habitat in the Ragged Top, Sawtooth, and Silverbell Mountains, where some of the highest ironwood distribution densities have been found. The proposal also includes the preservation of significant wildlife corridors connecting the central Arizona uplands, and Sonoran desert habitat. The Ironwood Alliance, ANPS, Desert Watch, Audubon, the Desert Museum, and others have worked to educate the public about the beauty and species diversity of *ironwood forests and the need to protect them. Pima County staff worked with landowners in the area (ranchers, ASARCO, and others) and gained their enthusiastic support for the designation.

On June 9, less than three months after Pima County asked for creation of the monument, President Clinton used an executive order to set aside 129,000 acres of federal land in northern Pima County and southern Pinal County to save the ironwood tree and its surrounding desert ecology. This action laid the groundwork for preserving an additional 61,000 acres of state and private land within monument boundaries. Those lands will join the monument when the federal government buys or trades for them. BLM will draw up a management plan for the area and local conservation groups will work with them to assure that the area is managed sensitively. Grazing will continue at least for the near future.

**Desert Ironwood Primer. Biodiversity and Uses Associated with Ancient Legume and Cactus Forests in the Sonoran Desert.* Arizona Sonora Desert Museum. Feb. 2000. For more information contact the Museum www.desertmuseum.org

MONITORING EXOTIC SPECIES

The invasion of exotic plant species has been the focus of considerable research and concern worldwide. Localized efforts to control problematic species have been reasonably successful. As a result, ongoing mapping and eradication programs are being implemented in several areas. Monitoring programs will provide an early warning of exotic plant invasions, and will help to identify new species of concern.. As an example, popular landscape plants such as African Sumac (*Rhus lancea*) have adapted well to the Sonoran Desert. This species is spreading rapidly into the desert areas and arroyos within Tucson. Other species such as buffel grass, threaten to permanently alter desert ecosystems. (See page 1)

A task force has formed to identify, map, and physically remove invasive plants in the Tucson Mountains. Since a group is also needed to monitor exotics on a regional basis, ANPS will attempt to fill that role. ANPS will create a GIS data base for exotic plant distribution in the area. Members interested in sharing data, compiling existing research information, or performing field work are encouraged to participate. Hopefully, this work will also increase public awareness and encourage regulations limiting the use of seriously invasive, non-native plants. We would like to know of exotic plant issues in your area. Please forward your information to "ANPS Task Group" at 5444 E. Fairmount, Tucson, Arizona 85712.

The Southwest Exotics Mapping Project, based in Flagstaff, is monitoring exotic species in the Southwest. The ANPS task force will be a collaborator with this project. For more information check out the SWEMP web site at www.usgs.nau.edu/swemp/

HIGH TECHNOLOGY FOR EVERYONE

Technology that has been available mostly to government, business, or large educational institutions is rapidly becoming available to anyone with a computer, or the need for better field equipment. Two examples are Orthophotography Software and Global Positioning Systems.

Very high quality orthophoto coverage is now available to internet users at government web sites, or from inexpensive software packages. With the push of a button you can obtain a photo image of many places in the United States. In some areas of the country, air photo or satellite coverage is very accurate. In Pima County the product is good enough to zoom in on specific plants and trees. Some products even feature data layers that can show elevation contours, approximate property boundaries, and even owner-ship information. Software packages can include USGS topographic maps and remote sensing imaging such as infrared. Whether you need detailed coverage of a field project, or you want a photo of your favorite birding or camping site, its now available.

Inexpensive Global Positioning Systems (GPS) which had accuracy limits of 10 to 100 meters are now accurate to within 3 to 5 meters if used properly. This is a result of the Defense Departments termination of the Selective Availability (SA) interference program designed to prevent hostile nations from using our satellites for weapons guidance. The accuracy that can now be achieved makes the most inexpensive GPS systems a valuable tool for all field uses. Using my Magellan 2000 XL model GPS, I made control observations at several Department of Transportation high order control points. All of my readings were within 6 meters of the known coordinates for each point. The better the GPS unit, the better the accuracy.

Jeff Kreamer is ANPS Conservation Chair and also serves on the board of the Ironwood Alliiance and Tucson Audubon Society. He is a professional surveyor for Pima County.

The *Plant Press* is one of the benefits of membership in the Arizona Native Plant Society. It is published three times a year, in October, February and July. Barbara Tellman, Editor, encourages members to contact her with suggestions for feature stories, book reviews, and short articles about plant-related activities and issues throughout the state. Contact her at 520 792-4515 or bjt@ag.arizona.edu

ABOUT THE BOARD

Mima Falk has been president of the Arizona Native Plant Society fox six years and on the state board for ten years. She is the State Plant Ecologist for the U.S. Fish and Wildlife Service, where she works primarily with Threateend and Endangered Species. Before that she was Plant Ecologist for the Coronado National Forest where she woked mainly on plant inventories and surveys. She is an active member of he Science Technical Advisory Team for Pima County's Sonoran Desert Conseration Plan. She is also quite involved in the Society for Plant Conservation with her husband Don, and has a five-year old daughter.

Lynn Kaufman has served as the ANPS Vice President since 1997. She has been a co-organizer of the Chiricahua Workshop for the past four years. She also served as editor of the Desert Bird Gardening booklet, a collaborative effort between ANPS and Tucson Audubon Society. Her speciality is birds and gardening, and she contributes to a bimonthly column in Birdwatchers Digest. She recently authored Birds of the American Southwest, available from Rio Nuevo Publishers in November. Lynn is on the staff at the Tucson Botanical Gardens. In her spare time, she enjoys botanizing and birding.

CENTRAL HIGHLAND CHAPTER CHANGES

Heidi Romppanen has assumed the presidency of this chapter because Jeff Hogue, the former president has moved to California. Heidi is starting a native plant nursery in the Prescott area and is especialy interested in propagating plants using native gene pools for specific areas.

NEW ANPS T-SHIRTS

The beautiful ANPS T-shirts are now available in beige. The drawing is still Margaret Pope's drawing of *Ipomoea cristulata* twined around *Hibiscus coulteri*. The shirts are available from some local shops, such as the Tucson Audubon Gift Shop and Desert Botanical Garden for $16. To order by mail, send $16 plus $2.95 per shirt for postage to Marge Norem, ANPS, P.O. Box 41206, Tucson AZ 85717. Specify the size(s) wanted. Order forms are available on the ANPS web site www.azstarnet.com/~anps/

NEW MEMBERS WELCOME

People interested in native plants are encouraged to become members. People may join chapters in Central Highlands (Presoctt), Flagstaff, Phoenix,Tucson, and Yuma or may be members only of the statewide organization. For more information, write to ANPS at the address below, visit the Web site www.azstarnet.com/~anps/ or contact one of the people below.

State Presidents:	Mima Falk	520 387-6281
Central Highlands (Prescott)	Heidi Romppanen	520 427-9457
Flagstaff President:	Ana Novak-Goodman	4716 E. Hightimber Lane, Flagstaff
Phoenix President:	Kathy Rice	602 808-9304
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Membership Form:

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