

The Plant Press

THE ARIZONA NATIVE PLANT SOCIETY

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Tracing Arizona's Natural Heritage Program—1979-1991

by Linda Brewer

Little more than a decade ago Arizona had no single repository for information relating to rare plants, animals and biotic communities. Then, in 1979, the Arizona Natural Heritage Program, an inventory of our rare and endangered plants and animals, was begun here by The Nature Conservancy. The first such program had been started in South Carolina in 1974 as a cooperative effort between The Nature Conservancy and the South Carolina State Wildlife and Marine Resources Department. Four years later, Arizona became the 23rd state to receive a Conservancy-sponsored natural heritage program. Today there are 48 heritage programs nationwide under various names, and 12 more in Latin America.

A prodigy of The Nature Conservancy, natural heritage programs were designed by the Science Department at Conservancy headquarters in Arlington, Virginia, in the early 1970s as a national network for use in "biological land conservation planning at the state level." Natural heritage programs focus on collecting and recording information on species and ecological communities—their locations, specific habitats, numbers, dates encountered, etc. They are used to evaluate the distribution of rare species or communities and to determine species or community status (establish state and national—and ultimately global—ranking, rarity, or threatened condition). From the beginning it was the goal of the Conservancy to turn over the management of these programs to the states, once they were off the ground.

Who is now the keeper of the natural heritage flame in this state? The Arizona Game and Fish Department's Nongame Wildlife and Endangered Species Program which stores, manages, and updates all this information. The program's current official appellation is "The Nongame Data Management System," but you may still hear it referred to as "the Heritage Program." Old tags die hard.

Although The Nature Conservancy has transferred the management of the system to the Arizona Game and

Fish Department (AGFD), the Conservancy remains involved by continuing to provide both funding and data. It has made a three-year grant to AGFD for a data entry assistant to the system and continues to supply the system with pertinent data collected on the Conservancy's preserves and through its other programs in Arizona.

How is the Nongame Data Management System designed, funded and managed? Initially, the project was described in the Conservancy Heritage Program Manual as a "'permanent,' 'dynamic' atlas and data-bank" (not to be confused with *database*). While the system is computerized to facilitate the storage and digestion of information and the production of reports, it is more than just a store of bits or bytes. The computerized data files are supplemented by extensive paper files containing maps, photographs, and other reference materials. The information stored is analyzed and interpreted through reports now generated by AGFD.

"Permanent" emphasizes the intent for the indefinite continuation of the program by every means possible; and "dynamic" is the word used to emphasize the continually developing nature of this store of information, as well as the potential for change in the interpretations and guidance we can take from it. Because the natural world and the elements that shape it change with time, sites and species need intermittent review. As new information is added to the system, a continuous reevaluation of the status of the state's plant and animal populations is generated.

Back in 1979, when it was still the baby of The Nature Conservancy's Science Department, names familiar to many Plant Society folks filled the ranks of those collecting data. Frank Reichenbacher, Tom Van Deventer, Scott Mills, Doug Koppinger, Terry Johnson, and others trudged about over countless miles of desert and mountain habitat with notebooks, plastic bags, forceps, and other essential data-gathering and self-protective paraphernalia. The Conservancy had raised the funds to initiate the program, intending a two-year establish-

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With winter past the mid-point and spring equinox just weeks away, this issue of *The Plant Press* anticipates what could be an above-average year for wildflower blooms with the publication of three varied articles: botanist Clair Button's White-margined Beard-tongue contribution to the column "Our Unique Arizona Flora;" horticulturist Judy Mielke's news item about the first-ever wildflower conference in Arizona; and an exposé by Dr. William R. Feldman which cautions against the illegal removal of wildflowers from alongside Arizona's public roads.

It is especially timely to have Bill Feldman's article in this issue as he is the newly appointed President of ANPS. At the November, 1990 board of directors' meeting, ANPS Treasurer Horace Miller announced that Dr. Feldman had accepted a nomination for president following Karen Reichhardt's resignation last September. The board voted unanimously in favor of Bill's appointment.

Bill has been a member of ANPS for many years and was active in the meetings of its Tucson Chapter before moving to Superior in 1984 to assume his current position of Director of the Boyce Thompson Southwest Arboretum. Bill has a Ph.D. in Horticulture and a minor in Arid Lands Resource Science from the University of Arizona. His masters thesis addressed the subject of wild populations and yield parameters of Jojoba and his doctoral thesis addressed the physiological and nutritional aspects of Jojoba propagation. Bill has taught classes in Nursery Management and Tropical and Subtropical Horticulture at the University of Arizona and presently serves on the American Association of Botanical Gardens and Arboreta (AABGA) Collections Committee.

Some members may know Bill from his talks at the ANPS-sponsored Annual Chiricahua Workshop or from ANPS field trips into White Canyon and other places of botanical interest. As an introduction I can think of none better than Bill's thoughtful article itself. We can look forward to other submissions from our new president in future issues and to a possible resumption of "Notes from the President" as a regular feature. Welcome Bill!

With this issue *The Plant Press* introduces Corinna Gries, Ph.D. as feature editor for "The Conservation Page." Dr. Gries is a post-doctoral associate at A.S.U. who received her Ph.D. in 1988 from Christian Albrechts Universität in Kiel, West Germany. Her thesis subject was nutrient accumulation and root physiology of *Phragmites australis* (common reed), growing in a biological waste water treatment facility. In Germany, Corinna was extensively involved in plant mapping. Her other major interests are phyto sociology (plant community studies) and palynology (pollen record analysis from pollen found in ice age era bogs). At A.S.U. Corinna has taught classes in plant ecology and general botany. Currently she is studying the sensitivity of lichens to air pollution in the Southwest. I am most pleased that Corinna has accepted the editorship of our conservation information page—she will bring fresh perspectives to the issues.

At its November, 1990 meeting the Arizona Native Plant Society Board of Directors approved a Field Ethics Statement and Code of Conduct for Plant Collectors. These documents appear in print for the first time in this issue. Former ANPS President Karen Reichhardt is credited with the leadership that initiated the development of this policy and Vice-President Mark Dimmit is credited with drafting the documents and incorporating changes proposed by various board members along the way.

This Winter, 1991 issue of *The Plant Press* is dedicated to Geoffrey Platts, whose firm yet kind expression of concern brought to the forefront the society's need for a field ethics statement and plant collecting code of conduct.

Karen Enyedy Breunig

Plant Discovery Made at Annual Meeting

Flagstaff's new city hall, park, and library complex served as the site of the 1990 ANPS annual meeting where approximately seventy members gathered on September 22nd and 23rd for lectures, business, and a panel discussion on conservation issues. The 1990 annual meeting had as its theme "Arizona's Non-flowering Plants." On Saturday, Tom Nash III, Ph.D., professor at Arizona State University, enlightened us with an overview of the diversity of Arizona's lichens; Michael Windham, Ph.D., professor at the University of Utah, summarized the diversity of ferns and fern allies in his talk "Ferns of Arizona;" and Thomas Whitham, Ph.D., professor at Northern Arizona University, delivered "Plant Hybrid Zones as Focal Points of Biodiversity," a lecture which explained his research studies on aphid distributions across hybridizing stands of cottonwoods (*Populus angustifolia* and *Populus fremontii*) along the Weber River in Utah and his most recent studies of beetle and other insect populations in hybridizing stands of eucalyptus in Australia.

During a box lunch on the park grounds outside the city hall, members from Flagstaff, Sedona, and other parts of Northern Arizona met with former Tucson Chapter President Barbara Tellman to discuss the possibility of reactivating the Flagstaff Chapter. A tour of the Arboretum at Flagstaff, led by Director Wayne Hite, followed the lectures and the day ended with a dinner hosted by the N.A.U. School of Hotel and Motel Management.

Field trips into side canyons of Oak Creek Canyon were led on Sunday by Dr. Tom Nash and Dr. Michael Windham. An exciting and most encouraging discovery was made concerning the population of *Pellaea lyngholmii*, one of the rarest fern species in the U.S. Known from only 25 individuals in three Sedona area locations before this field trip, some 75 new individuals were discovered in one of the formerly identified locations on Sunday's hike, bringing the total number of known individuals to approximately 100. This discovery added a final highlight to what was altogether a highly rewarding annual meeting event.

Wildflower Pillage Along Arizona's Highways and Byways

by William R. Feldman, Ph.D.

This past April, during our Arid Land Plant Show at the Boyce Thompson Southwest Arboretum, my enjoyment of this wonderful event was shattered by news received from a group of our loyal Tucson friends and volunteers. These stalwarts reported seeing crews of young men with large sacks uprooting whole lupine plants along great stretches of US 89, the Pinal- Pioneer Parkway. As I am sure you will recall, the spring of 1990 produced one of the most profuse and lovely roadside blooms in a number of years along the highways of Pinal and other Arizona counties. The plants being taken were still in full bloom, with very little mature seed on them. Little or no seed would be laid down from the year's prolific bloom to ensure similar displays of natural beauty in coming years.

Thinking that this activity was undoubtedly illegal, we called the Pinal County Sheriff's Dept. and were told that a deputy would return the call. When the deputy did call back, we learned that "picking flowers along the road" was not illegal. At this point we decided to go to the site of the pillage in person. Along with me went Mr. Matt Johnson of DELEP (Desert Legume Project), who had witnessed the depredations earlier in the morning. It was now about 11:00 a.m., and we encountered a group of about seven young men resting under an Ironwood tree along the Parkway and awaiting pickup by their crew chief. The men seemed to be an untrained labor crew that was being paid by weight for the vegetation taken. We did not identify ourselves as state employees and said that we were in the market to purchase seed. The men did not speak English, and none were very forthcoming about for whom they were obtaining the seed. Finally, the crew chief arrived in his pickup truck to carry off the workers and their "harvest." Just before getting into the truck one of the men took a stick and scratched five letters in the soil. Those letters spelled the name of the largest commercial seed dealer in the Phoenix metro area and probably in the state of Arizona.

Later the same day we began checking into the legal status of such wholesale seed pillage along our highways. We spoke to Arizona Department of Transportation personnel who assured us that the activity that we witnessed was indeed illegal under the Arizona Transportation Code sections 28-1870-A.7 and 28-1871. In particular, section 28-1870-A.7 defines misuse of a public highway in the following terms: "A. A person who commits or causes to be committed any of the following acts is guilty of a petty offense: 7. Knowingly removes, damages or destroys any tree or shrub standing on a highway right-of-way." In a call to Mr. Frank Reyes, Pinal Co. Sheriff, the Sheriff was very supportive of increased enforcement of these statutes and assured us that this would be

communicated to all Pinal Co. field deputies. This is where all of us come in. If at any time during the year, but particularly during the peak wildflower months of February through May [or May through October in Northern Arizona], you should witness wholesale, systematic wildflower "harvest" in the right-of-way along our state's highways, please act. Note the milepost and any geographic landmarks and report the activity to either the local sheriff's department or the DPS (1-800-525-5555) as soon as possible. Be prepared to cite section 28-1870-A.7 of the Arizona Transportation Code.

Our roadside wildflowers are a source of great color and beauty which many travel into our rural counties expressly to see and enjoy. The growing movement to use wildflowers in regionalist landscaping designs is a good one, but let's not suffer the wholesale pillage of our superb natural stands of roadside wildflowers in order to supply seed for the creation of these designs. Instead, as with native woody plants, let's encourage the field production of these wildflower species as some seed dealers are currently doing. Finally, when purchasing this type of seed, please make sure to enquire as to how it was produced or obtained.

Bill Feldman is the newly elected President ANPS and the Director of the Boyce Thompson Southwest Arboretum. This article is reprinted from FOTA Notes, the newsletter of the Friends of the Arboretum.



Desert Lupine (seedling)
Lupinus Sparsifolius

Pressed Pages: In the Author's Voice

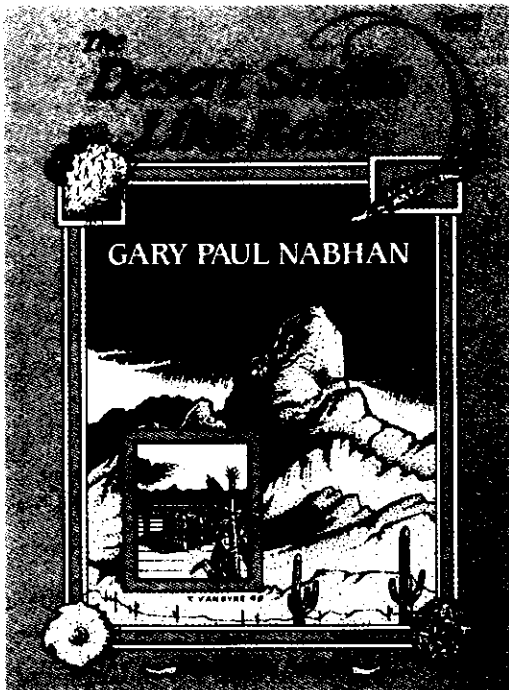
by Karen Enyedy Breunig

Natural history material dominates the book shelves of many ANPS members. Audio cassette recordings of natural history books can add a new dimension to these personal libraries. Books on cassette tapes have well-known advantages to those who spend long periods on the road; and to those with visual impairments. But now a new group of natural history cassettes, released by Roberts Rinehart Publishers and produced by The Audio Press, offers something reaching beyond convenience—the personal element of books read in the voice of their own authors.

The Audio Press began offering natural history cassettes four years ago. Roberts Rinehart marketing manager, Carrie Jenkins, explains that while their audio selections are not a formal series, they are linked by a common mission: "Press owner DeWitt Daggett has sought to produce recordings of living environmental writers reading their own works. The writers selected are ones who follow somewhat in the tradition of John Muir," she says. Included in the spoken word "series" are works authored and read by Ivan Doig, John Nichols, Wallace Stegner, the late Edward Abbey, and ANPS member and John Burroughs Medal-winning author Gary Paul Nabhan. Their 1990 collection included Gary's *The Desert Smells Like Rain*, and a complimentary recording of this title was sent to *The Plant Press* for review. Members who would like to borrow it for chapter meetings or other ANPS events may contact editor Karen Breunig.

A collection of five new books on tape will be released by Roberts Rinehart in March, 1991. Four of these latest offerings are listed below, along with Gary's Nabhan's 1990 release. They are rich in both the science and poetry of the best in natural history writing and they bring an

New Audio Cassette Recording



integrity of communication that comes only through the inflections provided by an author's own voice.

The Practice of the Wild; written and read by Pulitzer Prize winning author Gary Snyder. 3 hrs., 2 cassettes, \$16.95.

Learn of the Green World; a collection of essays from the works of Colin Fletcher, who also wrote *The Man Who Walked Through Time*. Read by the author. 3 hrs., 2 cassettes, \$16.95.

Wild to the Heart; a collection of essays including material on the Uinta high country of central Utah, the Mississippi backwater and the limestone hills of central Texas, written and read by Rick Bass. 3 hrs, 2 cassettes, \$16.95.

The Island Within; written and read by Pacific-northwest anthropologist Richard Nelson, who reflects on understanding place and man's relationship to geography. 3 hrs., 2 cassettes, \$16.95.

The Desert Smells Like Rain, read by author Gary Paul Nabhan. This title contains stories from his book by the same name and from *Gathering the Desert*. (2 1/2 hrs., 2 cassettes, \$15.95.)

Tapes are available at bookstores or may be ordered through the mail by sending the correct amount plus \$2.50 for postage and handling to Roberts Rinehart, Inc. Publishers, P.O. Box 666, Niwot, Colorado 80544-0666. (303) 652-2921. Or write/call for a free catalog.

Heritage Program *continued from page 1*

ment period before transfer to the state. Not-unusual delays, however, found the Conservancy overseeing the program during four years of field work and undertaking the centralization of existing data from museums and universities. Much of the funding during those years was raised through Heritage Program contracts.

Today, most of the funding for the program comes from state sources and federal contracts. With its transferral in 1982 to what was at that time the Nongame Branch of AGFD (then under the direction of Terry Johnson), the state legislated a funding source through the "Wildlife Check Off" on our Arizona tax returns. (Don't forget to give this year!) Approximately \$250,000 annually now comes to AGFD's Nongame Wildlife and Endangered Species Program from this tax check off, and some of these funds support the Nongame Data Management System. Funds from The Heritage Fund Initiative (Proposition 200), which passed on the ballot last November, may bring fresh fodder to the program this year. Derived from undesignated lottery proceeds, nearly \$10 million annually will be distributed to the Arizona Game and Fish Department (and another \$10 million to the State Parks Department) for conservation and enhancement of natural (and historic) heritage. While not specifically earmarked for use towards the Nongame Data Management System, at least a portion of this new money is expected to be used to support it.

A lesser portion of the system's funding comes from private sources: from individuals, from The Nature Conservancy grant mentioned, and from organizations like the Arizona Native Plant Society. ANPS has occasionally

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Our Unique Arizona Flora: *White-margined Beard-tongue*

by Clair Button



A remote habitat and a sparse population has kept the White-margined Beard-tongue, *Penstemon albomarginatus*, in relative obscurity for years. It is known from one location each in western Arizona and southeastern California and from three locations in Clark County, Nevada.

This attractive perennial wildflower has an adaptation to desert survival which is truly unusual for the penstemon genus and is not typical of other desert penstemons. It appears to die back to its fleshy roots, with all leaves and stem parts breaking down each year and completely decomposing above ground.

Nearly every plant of mature size produces numerous flower stalks of from 6 to 10 inches tall. The flowers are closely clustered on the stems and vary in color from pale pink to nearly lavender. The leaves are entire, succulent, distinctively oval, and green with a narrow white margin. With the sun at a low angle, even flowerless plants can sometimes be spotted at a distance because of the shiny reflection off the leaf surfaces.

Like many other members of the figwort family (*Scrophulariaceae*), the White-margined Beard-tongue can take advantage of disturbance in its habitat. Where soils have been disturbed but where vehicular traffic is now limited, it becomes one of the first species to colonize old roads and pipeline routes. It is a prolific seeder in favorable years, and has good potential for horticulture and for commercial production.

The California and Nevada populations are being threatened by development and off-highway vehicles, making the future of the plant somewhat uncertain in those states. Arizona currently has the largest documented population of this species. During a 1990 inventory, Bureau of Land Management (BLM) employees found the White-margined Beard-tongue scattered throughout a 100 square mile area on the outwash plain west of the Hualapai Mountains, extending to the town of Yucca. Just below the foothills, parts of the habitat are very flat and nearly pure sand, dominated by a cholla-Joshua Tree forest. Descending westward, the plain breaks into a series of ridges and wide washes in Creosote Bush/Joshua Tree habitat. The BLM Kingman Resource Area has proposed to increase (block up) the amount of federally owned habitat of this species, which was classified as a federal Category 2 candidate in 1990. If approved, almost 60 square miles, as proposed in the BLM Kingman Resource Area's Resource Management Plan and Draft Environmental Impact Statement, would be designated as a biological reserve and Area of Critical Environmental Concern (ACEC) and managed to promote the continued survival of this unusual penstemon.

Clair Button is a former ANPS board member and a botanist with the BLM assigned to the Phoenix District office.

New Release: "Desert Ground Covers & Vines" Landscaping Brochure

Just in time for spring planting in the desert Southwest, the ANPS Tucson Chapter's Urban Landscaping Committee has released "Desert Ground Covers & Vines." This is their third brochure in a series of publications which describe some of the best plants available for landscaping use in southwestern desert regions. The brochure is an important addition to its predecessors, "Desert Trees" and "Desert Shrubs," for ground covers provide the understory that is too often missing in desert landscapes; and vines have a niche all their own, providing shade, color, and intrigue. Gene Joseph, of Plants for the Southwest, Inc., served as brochure editor.

The plants selected for the series are decorative, drought tolerant and therefore low water using, hardy, and either Arizona natives or, if from other regions, are plants which are not invasive and do not threaten native plant communities. *Maurandya antirrhiniflora* (Snapdragon Vine) and *Ipomea longifolia* (Morning Glory), two natives often admired along the trail on ANPS-sponsored field trips, are just two of the beauties profiled in the new "Desert Ground Covers & Vines" brochure. In Phoenix, the brochure will be available at the Desert Botanical Garden shop; in Tucson

at the Tucson Botanical Garden, at the Saguaro National Monument and Organ Pipe National Monument, Audubon, Tohono Chul, Haunted Bookstore, Coyote's Voice bookstore, and B & B Cactus. Or, brochures can be ordered direct from ANPS using the form provided.

GROUND COVERS AND VINES	SHRUBS	TREES		SUBTOTAL
_____	_____	_____	X 1-9 at \$2.00 ea.	_____
_____	_____	_____	X 10-49 at \$1.50 ea.	_____
_____	_____	_____	X 50 at \$1.00 ea.	_____
Prices include postage and handling.			TOTAL	_____
Name _____				
Address _____				
City _____		State _____		Zip _____
Mail with check or money order to Arizona Native Plant Society: P.O. Box 41206, Tucson, AZ 85717				



*The
Founding
Organization
1979-1982*

given small donations to AGFD's Nongame Wildlife and Endangered Species Program to help with its efforts to protect native plants. Bruce Palmer, AGFD Nongame Habitat Specialist, who is responsible for the Nongame Data Management System says: "A relatively small contribution from ANPS may not seem significant, but the value of such a gesture far exceeds its actual monetary amount because it represents the concern of the whole Plant Society."

Who are the users of the Nongame Data Management System? Its primary users are public and private agencies, institutions, and organizations within the state, although, as mentioned, the system was designed to be integrated into a national network of other state heritage programs and it thus receives some use from entities outside Arizona. Because all projects and management plans on federal lands need to be studied for their potential impact on sensitive species, the federal land managing agencies make frequent use of the system. The Bureau of Land Management (BLM) uses the information so regularly that it has direct access to some portions of the database. (The Forest Service may soon have limited direct access as well.) County and local governments may also conduct environmental evaluations before embarking on development projects of their own, thus benefiting from the program. Environmental consultants use the system, and even some private developers consult the system in order to minimize disturbance to sensitive species. Other users include universities, museums, research institutions, and The Nature Conservancy and other non-profit environmental organizations.

Requests come in daily for ecological information on sites all over Arizona. Bruce Palmer estimates that 1200-1500 requests for information are received each year, from a wide variety of users. For example, in April of 1990 when the Arizona Native Plant Society surveyed the linear dune field of the BLM Cactus Plain Wilderness Study Area for *Pholisma arenarium*, data on known locations for this federally listed Category II plant were provided by the Nongame Data Management System.

When I first heard about the Natural Heritage Program (Nongame Data Management System), the question that came to mind was "Where do they find all the manpower to cover the grounds of the entire State of Arizona?" Some portion of the labor, I knew, continued to come from The Nature Conservancy, whose ecologists and stewardship staff spend a good part of their time in the field. However, much of it comes from the Habitat Program staff at the Arizona Game and Fish Department, and some comes from the staff of other public agencies who use the system. Additionally, observations have come from private individuals, even informed amateurs. That is where you come in. Native Plant Society members are encouraged to participate in this exhaustive inventory.

Although AGFD holds information on over 700 species—most of them vertebrate animals and vascular plants—there are still many gaps that need to be filled, particularly with plants. The staff of the Nongame Wildlife and Endangered Species Program has inherited an enormous job. With many parts of Arizona relatively unexplored by botanists, the over 6,000 locations listed as having threatened and special status species could use a plant-lover's help. Many sites have not been reviewed for several years, and particular plants (approx. 400-plus individual species) are federally listed, requiring continual observation.

Those plant society members who "adopt-a-plant" with Julia Fonseca (see "The Conservation Page" in this and in the Fall, 1990 issue of *The Plant Press*) can be particularly helpful. David Bertelsen, who has been observing the rare *Abutilon parishii* with 60-80 hikes a year over the same trails, recently discovered that his botanical notes can provide valuable information yet absent from the databank. Like David, others of you may already have something to contribute. Julia points out that the absence of species is also valuable information. If you are looking in optimum habitat in a location nearby an existing population of a listed species (or a species qualified to be listed), it is notable to enter into the database that this species was not found during a careful search.

For use in adding information to its Data Management System, the Nongame Wildlife and Endangered Species Program provides standardized forms (called "Species Occurrence Record(s)" AGFD Form #9070) to carry and fill out. Use of these forms helps insure that each sighting will be backed up by the information needed to plug it into the state program, and that sightings will share a consistent, comparable evaluation format across the country. Forms may be obtained from Peter Warren at The Nature Conservancy in Tucson, or from the Arizona Game and Fish Department's Wildlife and Endangered Species Program in Phoenix. ANPS field trip leaders are encouraged to carry and use the forms on society-sponsored outings.

In the past, field work for the Heritage Program turned up surprises, good and bad. Some species, like the Arizona thirteen-lined ground squirrel and the grasshopper sparrow, turned out to be more common than previously thought. Others, like the masked bobwhite, less so, and in need of protection. Priorities change with available information. Obviously, the more information, the better. If you'd like to help collect information, your participation is welcome. One other thing that ANPS folks can do is provide slides or photographs of species being monitored and reference the photos to their specific locations (range and township, section, quarter section, and landmarks, if any).

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*The
Program's
Manager
since 1982*

PROVISIONAL PLANT LIST OF TENT ROCKS AREA (also known as TEEPEE ROCKS)

Compiled by Alma Greene and Jean Searle; Updated June 30, 1990

Location: Coconino National Forest; R 6 E, T 13 N Sections 19 & 20. From the General Crook Hwy go SE 1 mile on Forest Service Road 708. Drive over the cattle guard and park; walk up the dirt road to the left to a view overlooking the Tent Tocks, an open area with no trail. Elevation 3400 ft.

FAMILY	SPECIES	COMMON NAME
Acanthaceae	Anisacanthus thurberi	Chuparosa
Agavaceae	Yucca baccata	Banana Yucca, Datil, Blue Yucca
Agavaceae	Yucca elata	Soaptree Yucca
Anacardiaceae	Rhus trilobata	Squaw-bush
Asclepiadaceae	Asclepias asperula	(Antelope Horns?)
Asclepiadaceae	Asclepias (latifolia?) ¹	(Broadleaf Milkweed?)
Asclepiadaceae	Matelea porducta	Matelea
Asclepiadaceae	Sarcostemma cynanchoides	Milk Vine
Berberidaceae	Berberis haematocarpa	Red Mahonia, Red Barberry
Boraginaceae	Lappula redowskii	White-bristle Stick-seed
Boraginaceae	Cryptantha (crassisejala &/or nevadense)	Cryptantha
Boraginaceae	Pectocarya linearis	Slender Pectocarya
Cactaceae	Coryphantha vivipara	Coryphantha
Cactaceae	Echinocereus (fendleri?)	Hedgehog Cactus
Cactaceae	Opuntia acanthocarpa	Buckhorn Cholla
Cactaceae	Opuntia leptocaulis	Desert Christmas Cactus
Cactaceae	Opuntia phaeacantha	Englemann Prickly Pear
Cactaceae	Opuntia violaceae	Purple Prickly Pear
Cactaceae	Opuntia whipplei	Whipple Cholla
Caryophyllaceae	Silene antirrhina	Sleepy Catchfly
Celastraceae	Canotia holacantha	False Paloverde
Chenopodiaceae	Chenopodium sp.	Goosefoot, Lamb's Quarters
Cleomaceae	Polanisia trachysperma	Clammy-weed
Compositae	Acourtia wrightii	Brownfoot
Compositae	Artemisia ludoviciana	Artemisia
Compositae	Brickellia sp. ²	Brickellia
Compositae	Chaenactis (steviooides?)	Chaenactis, Esteve Pincushion
Compositae	Cirsium sp.	Thistle
Compositae	Encelia (frutescens?)	Brittlebush
Compositae	Ericameria laricifolia	Turpentine Bush
Compositae	Erigeron (flagellaris?)	Fleabane (with runners)
Compositae	Erigeron sp.	Fleabane
Compositae	Gnaphalium sp.	
Compositae	Gutierrezia sarothrae	Broom-Snakeweed
Compositae	Melampodium leucanthum	Blackfoot Daisy
Compositae	Microseris linearifolia	Starseed, Starpoint, Silverpuff
Compositae	Parthenium incanum	Mariola
Compositae	Senecio longilobus	Groundsel, Butterweed
Compositae	Senecio multilobatus	Groundsel, Butterweed
Compositae	Stephanomeria pauciflora	Wire Lettuce
Cruciferae	Arabis perennans	Rock Cress
Cruciferae	Descurainia pinnata	Tansy Mustard
Cruciferae	Draba cuneifolia	Wedge-leaf Draba
Cruciferae	Lesquerella sp.	Bladderpod
Cruciferae	Sisymbrium irio	London Rocket
Cruciferae	Thysanocarpus curvipes	Lace-pod
Cucurbitaceae	Marahgilensis	Wild Cucumber
Cupressaceae	Juniperus monosperma	One-Seed Juniper
Cupressaceae	Juniperus osteosperma	Utah Juniper
Ephedraceae	Ephedra viridis	Mormon Tea
Euphorbiaceae	Euphorbia sp.	Spurge
Fagaceae	Quercus turbinella	Shrub-Liveoak
Fouquieriaceae	Fouquieria splendens	Ocotillo
Fumariaceae	Corydalis aurea	Golden Corydalis, Golden Smoke
Geraniaceae	Erodium cicutarium	Filaree
Hydrophyllaceae	Phacelia sp. (1)	Phacelia
Hydrophyllaceae	Phacelia sp. (2)	Phacelia
Krameriaceae	Krameria parviflora	Range Rattany
Labiatae	Hedeoma drummondii	Mock Pennyroyal

Labiatae	Marrubium vulgare	Horehound
Leguminosae	Acacia constricta	White Thorn Acacia
Leguminosae	Astragalus	Locoweed
Leguminosae	Astragalus nuttallianus	Nuttall Milkvetch
Leguminosae	Cassia bauhinioides	Two-leaf Desert Senna
Leguminosae	Lupinus sp. ³	
Leguminosae	Lotus humistratus	Hill Lotus
Leguminosae	Mimosa biuncifera	Wait-a-minute
Leguminosae	Phaseolus (angustissimus?)	Bean
Liliaceae	Allium nevadense var. aristatum	Onion
Liliaceae	Calochortus nuttallii	Mariposa Lily
Liliaceae	Calochortus (flexuosus?)	Mariposa Lily
Liliaceae	Dichelostemma pulchellum	Bluedicks
Linaceae	Linum (puberulum?)	(Plains Flax)
Loasaceae	Mentzelia albicaulis	Stickleaf
Malvaceae	Abutilon parvulum	Indian Mallow
Malvaceae	Sphaeralcea sp. (1)	Globe Mallow
Malvaceae	Sphaeralcea sp. (2)	Globe Mallow
Martyniaceae	Proposidea parviflora	Devil's Claws
Nyctaginaceae	Allionia incarnata	Trailing Four o'Clock
Nyctaginaceae	Mirabilis multiflora	Colorado Four o'Clock
Oleaceae	Forestiera neomexicana	Desert Olive
Onagraceae	Oenothera sp.	(see below) ⁴
Onagraceae	Oenothera (albicaulis?)	Evening Primrose (yellow)
Onagraceae	Oenothera (caespitosa?)	Evening Primrose (white)
Papilionoideae	Dalea formosa	Feather Plume
Plantaginaceae	Plantago purshii	Pursh's Plantain, Indian Wheat
Polemoniaceae	Gilia sinuata	Desert Gilia
Polemoniaceae	Microsteris gracilis	Microsteris, Slender Phlox
Polemoniaceae	Eriastrum (eremicum?)	Eriastrum
Polemoniaceae	Linanthus aureus	Desert Gold
Polygonaceae	Eriogonum deflexum	Wild Buckwheat
Polygonaceae	Eriogonum trichopes	Wild Buckwheat
Polygonaceae	Eriogonum wrightii	Wright's Wild Buckwheat
Polygonaceae	Rumex hymenosepalus	Wild Rhubarb
Portulacaceae	Calyptidium monandrum	Sand Cress
Primulaceae	Androsace occidentalis	Rock Jasmine
Ranunculaceae	Anemone tuberosa	Anemone
Ranunculaceae	Delphinium scaposum	Barestem Larkspur
Rhamnaceae	Ziziphus obtusifolia	Graythorn
Rutaceae	Ptelea (angustifolia or pallida)	Hop Tree
Sapindaceae	Sapindus saponaria	Soaptree
Scrophulariaceae	Castilleja (chromosa or integra)	Indian Paint Brush
Scrophulariaceae	Linaria sp.	Fairy Bouquet (blue, non-native)
Scrophulariaceae	Maurandya antirrhiniflora	Snapdragon Vine
Scrophulariaceae	Mimulus rubellus	Pygmy Monkeyflower
Scrophulariaceae	Orthocarpus purpurascens	Owl-clover
Scrophulariaceae	Penstemon eatoni	Eaton Penstemon
Solanaceae	Datura meteloides	Sacred Datura
Solanaceae	Lycium pallidum	Desert Thorn, Wolfberry
Solanaceae	Lycium sp.	Desert Thorn
Solanaceae	Nicotiana (attenuata or trigonophylla)	Tobacco
Solanaceae	Solanum eleagnifolium	Horse-nettle
Ulmaceae	Celtis reticulata	Netleaf Hackberry
Umbelliferae	Lomatium nevadense	Wild Parsley
Umbelliferae	Cymopterus multinervatus	Purple Cymoperis
Umbelliferae	Daucus pusillus	Wild Carrot
Verbenaceae	Aloysia wrightii	Lippa
Violaceae	Hybanthus verticillata	Green Violet
Zygophyllaceae	Kallstroemeria sp.	Calltrop

- 1 large leaves, reddish-brown when new
 2 californica or grandiflora
 3 small plant very hairy flowers red-violet, not showy
 4 no basal leaf rosette; hgt. 6" incl. wht. flr. at top

Send additions/revisions/corrections to Jean Searle at 150 Color Cove Rd., Sedona, AZ 86336.

The Arizona Native Plant Society

Field Ethics

INTRODUCTION

The Arizona Native Plant Society recognizes the importance of collecting plants for educational and scientific purposes. The primary justification is that it contributes to an increased knowledge of and appreciation for the native flora.

Specifically:

Collecting of vouchers (dried specimens in herbaria) is necessary for a number of reasons: Vouchers are essential for documenting the identity and distribution of plant taxa. Diagnostic features can seldom be seen from photographs, or even from an intact plant in the field (they are either microscopic or concealed within other structures). In Arizona, new species and range extensions are still being discovered every year. Many species are difficult to identify, and only if the original specimens can be examined is it possible to verify that a record for a plant is correct. Finally, taxonomists frequently revise taxa, and the vouchers must be reexamined to determine which new taxon a plant belongs in. Repeated collections in well-known localities are also valuable. Long-term studies document the changes in species composition through time.

Collecting is also necessary for introducing new species into horticulture. Even for species already available from commercial sources, additional collections provide new genetic material which can be used to improve cultivated strains.

Incidental collecting for purposes of plant identification, teaching, nature demonstrations, and like purposes enhance individual knowledge, promote public education, and increase environmental awareness.

If done with proper care and consideration of the impact on plant populations and the sensibilities of observers, most plant collecting is not detrimental. Rarely is it necessary to take an entire plant. For most perennials, a small portion of a plant is sufficient to make an herbarium specimen, and the roots are usually left undisturbed. Annuals are almost always present in large numbers. Seeds and cuttings are the preferred propagules for bringing wild plants into cultivation, and their taking rarely causes any impact.

However, the repercussions of our expanding population are threatening many species and habitats, so it is necessary to conduct plant collections so that they don't contribute to the decline of any population. Therefore ANPS has created this code of conduct for individuals and a set of rules for leaders of ANPS-sponsored field trips. We urge members to adhere to the code and encourage others to treat native plants with respect.

THE CODE OF CONDUCT FOR PLANT COLLECTORS

Two important questions should be considered before taking specimens: 1) Will the collection of this plant (or part thereof) contribute to educational or scientific advancement?; and 2) What will be the effect of this collection on the population of this species? The following guidelines should be used to answer these questions and to minimize impact on the environment:

1. Collecting should be done inconspicuously. Chance observers may not understand the reasons for such activity and conclude that they may do likewise. Remember that simple picking of wildflowers has decimated a number of species. If someone appears while you are collecting, take the time to explain what you are doing, and that you are being careful not to deplete the populations.
2. Undirected collecting should be discouraged in most locations. It often results in duplication of specimens without an increase in knowledge, and it may result in the inadvertent taking of rare plants.
3. Collect only common species except for serious study. Instructors in particular are encouraged to use common species for demonstrating collecting techniques and plant structures.
4. Collectors should obey all national, state, local, and tribal laws, and should obtain all necessary permits before collecting.

5. Collectors should be aware of the rare and endangered species in their regions. If you encounter an unfamiliar plant which appears to be rare or may be jeopardized by collecting, consider taking notes and photographs rather than a specimen. Casual collectors should not take such plants. Collection for scientific or educational purposes should not jeopardize such populations. The roots of rare perennials should not be collected unless necessary for identification and the specimen is destined for an herbarium. Before collecting a rare plant, ask yourself the following questions:
 - 1) What will you do with the specimen?
 - 2) Is this site likely to be well known? If so, do not duplicate other collections.
 - 3) Can you take a specimen without threatening the population?
 - 4) Report locations of rare plants to the Arizona Game and Fish Department, Nongame Program, and to the agency which manages the land.
6. In many habitats trampling causes more damage than collecting. Drive only on established roads. Don't park on vegetated shoulders. Walk carefully, and keep to existing trails as much as possible. Do not take groups of people into fragile habitats or populations of rare species. Do not create new disturbances.
7. Possession of a camera does not exempt one from the above rules.
8. **FIELD TRIPS:** In order to minimize the impacts of our field trips and to make them as enjoyable as possible, all field trip participants are required to comply with the code of conduct. It is the responsibility of each chapter president or field trip coordinator to see that field trip leaders are aware of their responsibilities. It is the responsibility of field trip leader(s) to make sure that all participants are informed of the rules and expectations for their behavior before beginning the trip. Leaders must know the rules and regulations of land owners and land management agencies before beginning a field trip, and must obtain any necessary collecting permits if collecting is intended. In addition to the rules in the code of conduct, leaders shall determine which of the following rules will be in effect on a given trip:
 1. Most field trips are to locations where plants are protected by law. Casual, indiscriminate collecting is prohibited on most trips. If a participant finds an interesting plant, the leader's attention should be called to it, and he/she will determine whether it may be picked without causing undue decline in the population. Field trip leaders may waive this rule in certain situations, such as in large fields of abundant or weedy plants, or for specific surveys.
 2. Collecting for personal use is prohibited on ANPS- sponsored trips unless the land owner or manager specifically allows it; this includes non-living objects such as rocks and plant skeletons. (Seeds/fruits of common species are exempt from this rule.)
 3. Many people go on field trips to enjoy fresh, unpolluted air. If you must smoke, be conscientious about staying downwind from the rest of the group. Be aware of fire hazards, and carry out the butts (they are deadly to wildlife).
 4. Take out all your trash. This includes biodegradables, which decompose slowly in arid environments. Deeply bury solid personal waste and toilet paper, and never defecate near bodies of water.
 5. No animal, wild or domestic, is to be disturbed unnecessarily. Educational demonstrations with captured reptiles, amphibians, and small mammals (except endangered species) are acceptable; handle them carefully and release them exactly where they were captured. Rocks, logs, etc. moved to look for wildlife should be replaced as precisely as possible. Don't knowingly approach birds on nests. Be as quiet as possible.
 6. Leave gates as you find them.
 7. Gathering of firewood is usually not allowed. Most field trip sites are too heavily visited to sustain such harvest.
 8. In summary, use common sense. Endeavor to leave a natural site exactly as you found it.

The Native Landscaper: *Introductions to Little Known and Seldom Grown Species*

Chihuahuan White-thorn: *by Matthew B. Johnson*

Nomenclature: *Acacia neovernicosa*, Chihuahuan White-thorn (Viscid Acacia); Family Leguminosae.

Synonyms: *Acacia constricta* var. *vernica*, *Acacia vernica*.

Description: Erect, open, sparingly-branched, multiple-stemmed shrubs 2-4 m height and 1-3 m spread. The bark is smooth and pink to reddish in color. The twigs are usually armed with paired, sharp, white spines to 2.5 cm long, but are sometimes unarmed. The leaves are oily-green in color, winter deciduous, bipinnate, 1-2.5 cm long, with 1-4 pairs of pinnae. The fragrant, bright yellow flowers are borne in rounded heads about 1 cm in diameter. Chihuahuan White-thorn flowers from May into September. The narrow reddish-brown pods ripen in the late summer and autumn and are conspicuous when produced in profusion. The leaves, stems, and pods are densely glandular-viscid.

Habitat and Distribution: Dry rocky hills, slopes, and bajadas in Chihuahuan Desertscrub, semi-desert grassland, and occasionally into lower oak woodland. 1,110-1,750 m (3,500-5,500 ft.) elevation (in Arizona). Southeast Arizona in Cochise County and extreme eastern Pima County, southern New Mexico, southwest Texas, and southward through the Chihuahuan Desert Region of northern and central Mexico. Chihuahuan White-thorn is often abundant on soils of limestone origin.

Propagation, Cultural Requirements and Maintenance: Seed of Chihuahuan White-thorn germinates readily following scarification. Over 95% of fresh seed have been observed to germinate in planting trials. Plants to 25 cm tall can be produced in one season in 1-gallon containers. No information is available on asexual propagation (cuttings) of Chihuahuan White-thorn. Chihuahuan White-thorn appears to be hardy to -18°C (0°F). It will survive with little supplemental irrigation once established but responds to occasional deep watering in hot weather. In habitat, annual precipitation averages 200-375 mm (8-15 in) and falls mostly during the summer. Chihuahuan White-thorn prefers well-drained soil. No problems with pests or diseases have been observed.

Landscape Application: Chihuahuan White-thorn is a distinctive and rather unique landscape subject. The skeletal, angular-branching growth habit, and sparse foliage produce an effect unlike that of other desert landscape plants. Larger shrubs are attractive in silhouette and can be used against a wall or at the crest of a hill or berm. Chihuahuan White-thorn is suitable for desert landscapes. It casts sparse shade and may be used in cactus and succulent gardens with smaller shrubs to provide a vertical element. The naturally upright growth habit of Chihuahuan White-thorn permits planting in small spaces. Whereas this shrub may not appeal to everyone, it has a unique and untamed appearance which makes it worthwhile for use in appropriate settings. Fragrant flowers, minimal maintenance and cold hardiness are other positive aspects to consider.

Drawing of Chihuahuan White-thorn by Lucretia Breazeale Hamilton; courtesy of The University of Arizona Press.

References:

- Benson L. and R. A. Darrow. 1980. *Trees and Shrubs of the Southwestern Deserts*, 3rd ed. The U. of A. Press, Tucson, AZ.
Kearney T. H. and R. H. Peebles. 1951. *Arizona Flora*. University of California Press, Berkeley, CA.
Vines R. A. 1960. *Trees, Shrubs and Woody Vines of the Southwest*. University of Texas Press, Austin, TX.

Heritage Program *continued from page 6*

Using the information in the system, concrete suggestions for land management are often generated by the AGFD staff in order to help public agencies preserve natural diversity. In the last year or so widespread pesticide use projected for an area containing rare species, including *Pediocactus paradinei*, was averted based in part on information in the Data Management System.

Whereas anyone can contribute to the database, reports and other information in the Data Management System are not available to the general public, for reasons of confidentiality. Endangered species collection is a federal offense, but it is not uncommon. The reports are avail-

able, though, to those organizations and agencies who are involved in a project that would have some impact on management of a natural area. Overall, the system may be the state's greatest single tool for use in preserving biodiversity. The Arizona Native Plant Society can play a positive role in the system by understanding how it works, using it, and supporting its continuance.

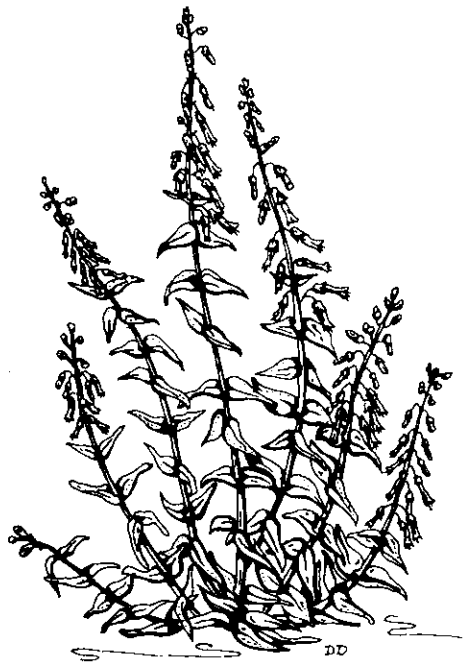
My thanks to Bruce Palmer, who oversees the Nongame Data Management System at the Arizona Game and Fish Department, for his help with this article.

Linda Brewer is a member of the Arizona Native Plant Society's Tucson Chapter and is Membership Coordinator at The Nature Conservancy office in Tucson.



Desert Botanical Garden Hosts Wildflower Conference

by Judy Mielke



Drawing by Dyan del Gaudio

Arizona will host its first wildflower conference ever March 14th through 16th at the Hilton Pavilion in Mesa. The three-day conference, "Creating Landscapes with Wildflowers and Native Plants" features expert lecturers from throughout the desert Southwest. It is being co-sponsored by the Desert Botanical Garden and the National Wildflower Research Center in Austin, Texas.

The program should appeal to both landscape professionals (landscape architects, installers and maintenance contractors) and laypersons interested in native plants and wildflowers. Topics range from the philosophical to the practical: plant ecology, regionalism, design, plant selection, maintenance, theme gardens, revegetation, water conservation, and research—all using native plants and wildflowers.

Arizona Native Plant Society members will be making substantial contributions to the conference. ANPS President Bill Feldman will moderate the morning session on Friday, March 15th; and former president Karen Reichhardt will speak on "The Ethics of Native Plant Collection" at Friday's luncheon. ANPS Vice-President Mark Dimmitt of the Tucson Chapter will participate in Saturday's "Success Stories" session, talking about the "Native Trees," "Native Shrubs," and "Native Groundcovers and Vines" brochures produced by the ANPS Urban Landscaping Committee. Henry M. Cathey, Ph.D., Director of the National Arboretum in Washington, D.C., is featured as the keynote speaker. His theme is "Conservation and Native Plants." Saturday's activities include a choice of field trips. Participants can either tour

desert wildflower areas around Phoenix, or tour outstanding residential and commercial native landscapes in the area.

Two exciting post-conference trips are also planned; the first, a one-day float down the Salt River. Expert guides will interpret the natural history of the lush riparian habitat. "A Sonoran Desert Adventure" is the other alternative, which features stops at Boyce Thompson Southwestern Arboretum, Arizona-Sonora Desert Museum, Organ Pipe Cactus National Monument and other wildflower "hot spots." Tucson's El Presidio bed and breakfast inn will host the group overnight. Located in the heart of the El Presidio Historical District, the inn's garden has been restored to the style of the period, and was featured on last year's Tucson Botanical Garden tour of Gardens.

Regular registration is \$135; \$145 at the door. Daily registration is also available. DBG members, NWRC members and students may deduct \$10.00 from the registration cost. For more information on the conference contact the Desert Botanical Garden at 1201 N. Galvin Parkway, Phoenix, AZ 85008; (602) 941-1225.

Judy Mielke is an ANPS member and Senior Horticulturist at the Desert Botanical Garden in Phoenix.

Spring Plant Sale Schedule

Arboretum at Flagstaff

May 4th 10am-2pm

Arizona-Sonora Desert Museum

April 13-14 9am-4pm

Boyce Thompson Southwest Arboretum

April 6-14 8am-5pm

Desert Botanical Garden

Members Preview March 22 3-6pm

Public Sale March 23-24 9am-5pm

Desert Survivors, Inc. (Tucson)

April 6-7 8am-4pm

Tucson Botanical Garden

Members Preview March 23 8-10am

Public Sale March 23 10am-4pm

March 24 10am-2pm

In Memoriam: William G. McGinnies (1899-1990)

by Horace P. Miller

Dr. William G. McGinnies, one of a group of leading botanists and horticulturists who founded our Arizona Native Plant Society, died on November 17, 1990 at the age of 91.

In addition to his efforts in helping found the society, Dr. McGinnies served as President for a two year period during the years 1980-1982. In recognition of his important contributions to ANPS, he was then elected, along with Dr. Howard Scott Gentry, an Honorary Life Member of our Board of Directors in 1983.

A distinguished scholar in the plant sciences, Dr. McGinnies received his B.S. degree from the University of Arizona and his Ph.D. from the University of Chicago. From 1926-1935 he was Professor of Botany and Range Ecology at the University of Arizona. During the period 1935-1938 he was with the Soil Conservation Service on the Navajo Indian Reservation and from 1938-1941 he was in charge of range research at the U. S. Forest Service Experiment Station in Tucson. Later (1942-1944) he worked at the Guayule Rubber Project in California and from 1944-1960 he was Director of the U.S. Forest Service Experiment Stations in Fort Collins, Colorado and Columbus, Ohio. Then, once again, he responded to the call of the desert and, in 1960, came back to the University of Arizona to become Director of the Tree Ring Laboratory. In 1964, he became the Director of the University's Office of Arid Lands Studies. His retirement from Arid Lands came in 1972, when he became Director Emeritus.

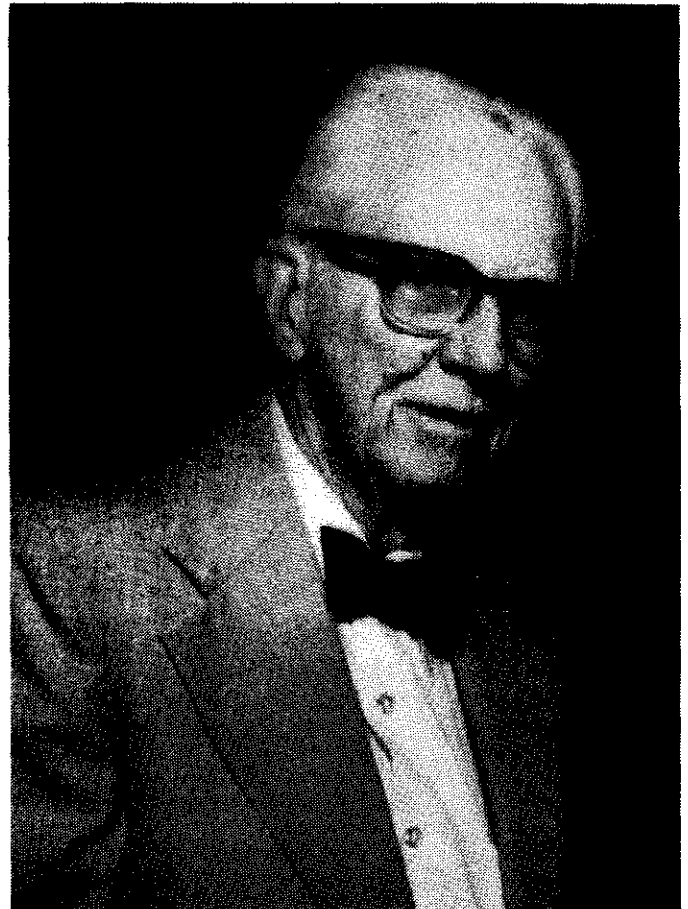
Dr. McGinnies published a large number of scientific papers, but most of us will remember him for two very important books. He was the principal editor of the massive and basic 788 page volume, *Deserts of the World*, published in 1968 by the University of Arizona Press. Then in 1981 appeared his valuable book on the famous Carnegie Desert Laboratory on Tucson's Tumamoc Hill, *Discovering the Desert*. It also was published by the University of Arizona Press. The importance of these two books cannot be overstated.

Dr. McGinnies is survived by his wife, Rose and by three grandchildren: Anne Myers and Mary Jo McGinnies, both of Aurora, Colorado; and William P. McGinnies of Alexandria, Virginia. Also surviving is a sister, Mrs. Jessie Bauer of Boulder, Colorado and a daughter-in-law, Mrs. Iris McGinnies of Fort Collins, Colorado.

Some years ago, a scholarship fund was estab-

lished in Dr. McGinnies' name by the University of Arizona. Should you want to contribute to that fund, send checks made out to "University of Arizona Foundation—McGinnies Fund" and mail to: Office of Arid Lands Studies, 845 N. Park Avenue, Tucson, AZ 85719.

The Tucson Chapter of ANPS has remembered Dr. McGinnies by renaming the ANPS-sponsored wildflower garden at the Tucson Botanical Gardens in his honor.



William G. McGinnies

(Photo courtesy of Office of Arid Lands Studies; University of Arizona)

*A man is ethical only when Life, as such,
is sacred to him...that of plants and
animals as that of his fellow men...
and when he devotes himself helpfully
to all life that is in need of help.*

Albert Schweitzer