Desert Plants

A quarterly journal devoted to broadening knowledge of plants indigenous or adaptable to arid and sub-arid regions, to studying the growth thereof and to encouraging an appreciation of these as valued components of the landscape.

Frank S. Crosswhite, editor

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(review and editorial)

Arizona
The Land and the People

Tom Miller, editor. Sections by Steven W. Carothers, Alvin M. Josephy, Jr., Armando Miguelez, Tom Miller, Gary Paul Nabhan, Cecil Schwalbe, Thomas Sheridan, Larry Stevens, Stephen Trimble, Peter Warren. University of Arizona Press. Tucson. 297 pp. 1986. $35.

[*Your editor was perhaps singularly the worst choice for the University of Arizona Press to ask to review this "Complete Sourcebook on Arizona." Having grown up in Arizona, he finds the book striking such emotional chords that he can not limit his comments to the parts on the desert plants and ecology alone. He would have preferred to have reviewed the book prior to publication.*]

This book has a lot going for it—numerous full-color "Arizona Highways" style photographs, a good quality of slick paper, an attractive dust-jacket; and last but not least, it issues from one of the most prestigious of presses—undoubtedly the best for its subject matter. I rather like the well-written Indian section by Alvin M. Josephy, Jr. and the charming window onto the Sonoran Desert By Gary Paul Nabhan. The production manager of the press is to be complimented for an impeccable volume.

Why, then do I not like the book? Have I required it to measure up to too high a standard to characterize the land and the people of the Arizona I love? Was I prejudiced to find a picture of Poison Ivy on page 132 labelled as *Sycamore in fall colors*? Did I object to a cluster of male pine strobili on page 56 being captioned a *Ponderosa pine cone*? Why didn't I pass over the photo of *Foothills Palo Verde in bloom* on page 99 instead of pointing out that it was really a Blue Palo Verde, a different species? What is wrong with having a *Hedgehog cactus in bloom* (page 94) in the chapter on the Sonoran Desert? Well, to begin with, the red-flowered species depicted is *Echinocereus triglochidiatus*, a plant of the high country above the Sonoran Desert, not part of it.

Then I started to become a little critical. Was the photo on page 45 really of Lee's Ferry? It seemed more apt to be a stone cabin built adjacent to the actual ferry. The picture of Chandler Heights on page 86 looked more like an earth fissure. Was the caption meant as artistic sarcasm to indicate that the person depicted was on a height above a giant fissure which might someday engulf the region? If this was an inside joke it would probably not be laughed at by the Chandler Chamber of Commerce or the residents of Chandler Heights. The photo of upland forest on page 148 was so far "up" from the land that only the uppermost tips of the branches of two trees showed; it was unquestionably a picture of a rainbow; and on and on. There is no single spillway evident on page 242 unless one sarcastically saw the entire dam of an overfull Roosevelt Lake as an unintended spillway of a dam which when spilling directly over the dam would burst. On page 251 the "channelized Salt River" passing through Scottsdale is not the river at all but merely one of several man-made canals in the Salt River Valley. For decades major rains in central Arizona have made road crossings over the Salt impassable, necessitating a detour over the Tempe bridge to go from Mesa to Scottsdale, for example. If only the Salt could have been channelized! Is the caption perhaps again artistic sarcasm? If so, it is an example of something which occurs throughout the book: overstatement or exaggeration to the point of inaccuracy.

Having been trained chiefly as a systematist, I have trouble with publications which go out of their way to rid themselves of structure in an attempt to substitute delightfulness of presentation for organization. Try to find the bibliography in this "Complete Sourcebook on Arizona" or to locate a reference to a particular book. When you find them you will see the problem which also occurs throughout the rest of the book. Although the book's dust-jacket claims that "No other book provides as comprehensive an overview of Arizona . . . ," I find the volume a series of rather erratic vignettes. The philosophy seems too often to have been to jump into the story in the middle because it was exciting, back off, then jump in somewhere else, never circumscribing the whole. Perhaps this represents a modern trend in the editing of books. Perhaps the sense of immersing one's self into a place or a personal experience

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(review and editorial)

Arizona
The Land and the People

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and then moving on to something entirely different is appealing to some people.

I found immaterial the observation on page 263 that people failed to wave to the author from their cars on a country road. I found the vignettes on "McNary Blacks" and "Tombstone Jews" poor substitutes for more traditional histories of accomplishments of these two ethnic groups. Nowhere, for example, did I find mention that Arizona was "discovered" by its first non-Indian explorer, Estéban, a black man of notable abilities. Nowhere did I find mention of Senator Barry Goldwater, or of his Judaic heritage, or of the notable legislation which he authored or supported, or that his political party thought so highly of him as to nominate him for President of the United States.

Nor did I find mention that one of Arizona's territorial Governors had been the first nominee of that same Republican Party for President of the United States. [Everyone remembers the second nominee, Abe Lincoln, who finally won.] Arizona has generated or attracted people of notable accomplishments. I think the enormity of the mountains and deserts instilled a little something extra into their bodies, their veins, their ambitions. Their upbeat accomplishments should be a part of this book. But where do we find mention of Fiorello LaGuardia, who became Mayor of New York City, or Ira Hayes, the World War II hero of my Pima Indian schoolmates in the decade of the 40's? Or Dr. Carlos Montezuma, wealthy and prominent Chicago physician at the turn of the century, who became an early activist for Indian rights? [At 4 years of age in Arizona he had been the only Yavapai Indian survivor of a battle with the Pima.] Or Dr. Walter Reed, who while stationed at Fort Lowell near Tucson became interested in a cure for yellow fever? Or the Rev. Mr. Endicott Peabody, who preached at Tombstone, helped build an Episcopal church there, and later established a famous boys' school in Massachusetts. [Among the better known boys to whom he imparted humanistic ideals was Franklin Delano Roosevelt.] I would have expected a comprehensive book to have mentioned, if not these, then at least equivalent upbeat individualists for whom Arizona has been so well known.

Instead of the book producing a road-map to understanding, so to speak, it too often carries the reader on flights of personal experience which are never connected up and do not exhaust the logical subdivisions. Scarcely the "Complete Sourcebook on Arizona." If a subject were to have ten logical parts, the book would fail to reveal this fact and might treat parts 3, 4, and 9, for example, probably because they were close to an author's experience, and probably in some arbitrary order like 4, 9, 3. For this reason, it has no use as a reference book.

The broad empty columns on almost every other page might be considered effective use of white space by a graphic design artists. I wish they had occasionally been used for diagrams, charts, maps or lists. The extensive discussion of geologic units in the Colorado Plateau section would have benefitted immensely from diagrams. Line drawings of the prehistoric animals would have been exciting. I at first supposed the book to be a replacement for *Arizona its People and Resources* previously published by the University of Arizona Press, which is a very useful reference book which I turn to frequently. If it was so intended, it does not fill the bill. Then I became confused by the titled *Arizona the Land and the People*, this being so close to *Arizona Land and People* currently published as a periodical by the University of Arizona College of Agriculture. I am hard-put to understand just what segment of the population the new book is intended for. Certainly not the academic community. Certainly not the retiree from out of state who is seriously learning about Arizona and wants to have a reference book to fall back on. Is this a coffee-table book for browsing?

The authors of sections frequently go out of their assigned sections and trespass on the territories of their neighbors. I have no complaint about the section on *Arizona's Indians*. Josephy's treatment is orderly, informative, authoritative, exhaustive, comprehensive, yet concise and in all ways commendable. Why, then, did so many of the other authors go out of their way to graze on his turf? I certainly would not have turned to the section on *Modern Arizona* for the extensive historical discussion of names for the Colorado River given on pages 255-256. So troublesome were the trespasses among sections 1, 2 and 6 that I searched for a map to see how *Mountain Islands* were defined in relation to *The Colorado Plateau* and *The Elusive Interior*. Two repetitious full-page colored maps appear giving "geographical features" (page 3) and "ecological features" (page 15), neither of which distinguishes the three units one from the other. The caption on the "ecological features" map seems erroneous, as the features depicted are all geographic. In contrast, the map accompanying *Biotic Communities of the American Southwest–United States and Mexico* (Desert Plants, volume 4, 1982) does show ecological features. If one looks at its carefully drawn delimitations of the major natural biotic communities of the state, it is obvious that when these communities are not considered (as in the presently reviewed book), the discussion of the ecology becomes imprecise.

To further complicate matters, authors of sections in "The Land" part of the book took free rein to discuss whatever they wanted, be it mostly geology (Colorado Plateau), plants, animals and Indians (Sonoran Desert), or biological concepts (Mountain Islands)! But a little knowledge of biological concepts can be a dangerous thing. I would like to know more about the forests of Arizona Cypress which ". . . covered huge expanses of North America . . ." (page 39). I question that "sotol" and "shin dagger" are the same plant (page 38) or that either has rosettes of "poison-tipped bayonets." If this is intended as artistic or poetic license, I should point out that there are species of plants which actually do have poisonous leaf tips. The statement (page 43) that "undiscovered and unde-

scribed species and unique life forms" still await explorers in Arizona, while technically perhaps true, gives the layman a false impression of the scale of "evolution" and the instability of species. It would take an expert with highly technical knowledge in some highly specialized field to be competent to discover one of these "undescribed species." Most such discoveries would probably involve programs of careful interbreeding experiments or extensive screening of specimens with the microscope.

Although one might be justified in saying that the Mojave, Sonoran and Chihuahuan deserts came into being as distinct regional facies after climate shifts of 9,000 years ago, the flat statement that "there was no deserts" (page 23) in Arizona prior to this time is erroneous. The statement that "the ancestors of many of our familiar cactus varieties" were present on south-facing slopes prior to 9,000 year ago implies that our present types arose through evolution during the 9,000-year period. Preposterous! Ancestors of our present-day plants, yes. But scarcely phylogenetic ancestors of the taxonomic units! Most of the familiar cactus varieties themselves were already on those slopes. A wide diversity of desert plants existed prior to 9,000 years ago. Their xeric habitats waxed and waned on either side of what is now the international boundary. It is incorrect to say that no desert existed; it was merely displaced to lower latitudes and longitudes whenever extreme cold dictated: especially during the glacial maximum of 17-22 thousand years ago which held sway until about 9,000 years ago. But this is a wink of the eye in Arizona's two-billion-year-old past. Geologist D. J. Lynch (J. Ariz. Acad. Sci. 11: 85. 1976) gave an excellent example of a mid-Tertiary desert buried by a lava flow in southwestern Arizona.

Yes, there was desert in southern Arizona even several million years ago. Indeed, a semipermanent subtropical area of atmospheric high pressure off the Pacific Coast of North America intensified with increasing temperature in the late Eocene, over 40 million years ago, to create increasing drought and desertification in the 23 to 30 degrees N latitude region to the east. Heat, drought and desertification have intensified to the present day, with minor trend reversals owing to the same climatic fluctuations that resulted in glaciation in the northern part of the continent in the Pliocene and Pleistocene. We should not look at the trend reversals as the primary phenomenon. Our outlook should be more comprehensive.

Why does the discussion of Bighorn Sheep on pages 41-52 omit what is perhaps the most important cause of decline: the sheep bot fly and the ensuing osteonecrosis? The omission of information can lead to gross misunderstandings by the reader: On page 102 we learn that "Among the animals limited to the Sonoran and Mohave deserts are . . . [8 species] . . . Yet there are other animals, some of them common to most hot dry regions of the Western U.S. and Mexico . . ." Contrast this equivocal statement with the comprehensive 24-page list of Sonoran Desert animals in *Reference Handbook on the Deserts of North America* (Greenwood Press, 1982). In that list one counts 63 mammals alone which are endemic to Sonoran Desert islands. One wonders why neither the 145-page chapter on the Sonoran Desert in the *Reference Handbook*, nor the 594-page *Reference Handbook* itself, for that matter, is cited in the "Reference Material" section of the University of Arizona Press book! Could this be because the *Reference Handbook* was edited by an Arizona State University professor? The *Reference Handbook* is arranged systematically. In addition to its comprehensive text it provides a bibliography of over 1,300 literature citations on the Sonoran Desert alone which could have been made available to readers of the presently reviewed book merely by citing the *Reference Handbook*. In contrast, *Arizona the Land and the People* cites 26 references on the Sonoran Desert. This is alright, but far short of the "most comprehensive" approach claimed by the dust-jacket. The running head at the top of page 283 refers to the bibliography as "suggested readings" although several obscure items are included, such as a dissertation and an unpublished report.

The book reveals a UA/Pima County bias in numerous places. It falls down in its treatment of Maricopa and Pinal Counties, perhaps to the point of being offensive. A number of counties are not even mentioned. From the book we learn of the honorable history of Tucson but on page 98 that "Phoenix looked, and continues to look, to the federal government as a benefactor." So that's where our tax money goes! On page 254 we are told that the feasibility of the Central Arizona Project has been in doubt ever since the concept was proposed in 1918. If this canal, so important to Maricopa and Pinal Counties, leaks itself to death, another of man's failings will be evident and the author can say, "I told you so." On page 244 we read that "The great urban bird [Phoenix] spreading her wings across the Salt River Valley turned a staunchly Anglo-Saxon face toward the rest of the world." Pages 244-5 paint an erroneous picture of conservatism in Maricopa County growing out of a powerful Ku Klux Klan which

> "harassed Catholics, Blacks, Mormons and Jews . . . its legacy lingered on in segregated schools, restricted public facilities, miserable farm labor camps, and occasional outbursts of racial violence directed against Mexicans, Asians, Blacks and Indians. Maricopa County became the conservative stronghold of an every-more conservative state."

Would either Senator Barry Goldwater or the Mormons of the Salt River Valley agree with this innuendo that conservatism in Maricopa County grew out of the Klan's activities?

The picture painted of Mormon settlement in Arizona on pages 237-239 is not only inaccurate, but literally pokes fun at their religion: ". . . 'Destiny's children' they called themselves, expecting an increase in rainfall and an abundance of production once they had sanctified the land with their toil. In the end, however . . . the vision of a separate and independent Zion evaporated in the dry Arizona air." The book treats the Mormons only as having founded a number of small communities in northeastern Arizona, ignoring their founding of Mesa and their immensely successful agriculturalization of the Salt River Valley! Having lived in Mesa a number of years in the decades of the 50's and 60's, I can have only the greatest respect for the accomplishments of the Mormon people; their vision cer-

tainly did not evaporate in the dry Arizona air.

A picture of the development of Arizona is presented emphasizing its having been plundered of its resources as a colonial outpost of the United States. A dismal picture is painted (page 144) of the Apaches seeing their rivers shrink and their sacred land inundated. What we might otherwise have seen as peaceful agriculture is portrayed (page 240) as having been downright vulgar: agriculture having taken advantage of "water sucked out of the bowels of the earth itself."

Admittedly there are many ways to write and edit a book. What to one person might appear as an unsystematic jumble to another might be a fascinating introduction. If "introduction" this book is intended to be, and if "novice" the reader is supposed, then a high degree of accuracy at least is still in order. How does the book fare with accuracy? The statement that Manzanita reproduces only by seed (page 141) is incorrect. It propagates readily by layering both in nature and in the nursery. The term Transition Zone is used for the wrong life zone on page 136. The claim concerning etching on page 168 was recanted in the literature by Emil Haury, its original proponent. Finding of wild Devil's-Claw in Ventana Cave strata and inferring from this that the cultivated form had not yet been domesticated is dangerous oversimplification.

On page 41 the "beardtongue or penstemon" is depicted as having "blood red tubes of nectar for hummingbirds," to have been discovered in 1915 by Forrest Shreve in Bear Canyon, and to be an endangered species! Certainly the plant depicted on page 18 (*Penstemon barbatus*, although not named to species in the caption) does have the blood red tubes of nectar for hummingbirds, but the plant which is an endangered species discovered by Forrest Shreve in Bear Canyon is *Penstemon discolor*, a species which by no stretch of the imagination has blood red tubular flowers visited by hummingbirds. One assumes that the author came across two references to *Penstemon* and thinking that all penstemons are one species, combined them. By eliminating precision through use of vague generic terms such as "beardtongue or penstemon" any of nearly 300 species from large shrubs to tiny herbs could be confused one with the other. Why throw away precision again by labelling the beautiful picture of a Western Spotted Skunk (*Spilogale gracilis*) on page 82 simply as *Skunk*?

On page 83 we read that Creosotebush "jumped continent three millions years ago when South America collided with North America." Quite to the contrary, the monographic book *Creosotebush* resulting from the International Biological Program (Dowden, Hutchinson and Ross, Inc., 1977) presents evidence that the species may have been introduced to North America a mere few thousand years ago by means of long-range dispersal by the Golden Plover or Upland Plover migrating between Argentina and the northern Hemisphere!

On page 113 we read that "Geologists believe that all of southern Arizona was once a high plateau. Through a series of earthquakes, it began to arrange itself twelve to fifteen million years ago into the mountain ranges and valleys we see today." Here is another case of oversimplification. Geologists distinguish sharply between plateaus and mountains. The province was not a simple plateau before the Basin and Range Disturbance. In fact this latter disturbance is only the last of three stages of tectonic activity after Laramide times. There were mountains. Post-Laramide mountain-building activity in the region was significant before the latest 12-15 million year period. A first stage began 38 million years ago, becoming of less importance about 24 million years ago when the second stage began. A piece of ocean crust had been subducted beneath the westward-moving North American plate, partially melting, expanding, and creating the first stage: In the Superstition Volcanic Field alone (east of Phoenix) nearly a thousand cubic miles of volcanic rock became placed over an area of 3,000 square miles! These were mountains in a fierocious sense! A second stage beginning about 24 million years ago was characterized by rotation of fault blocks of the crust and change in eruption from high silica rhyolite to low-silica basalt. Although the mountains were shaped differently than they are today, we could scarcely say that "all of southern Arizona" was a plateau. The earlier rhyolite and related high-silica rocks (of stage 1) are common in the Salt River Valley east of Phoenix, and the low-silica basalt (of stage 3) is common on and below the international boundary southwest of Tucson. But the Salt River Valley is as much a part of the Sonoran Desert as the land further south. In any event, the three stages were characteristic of the entire province when viewed comprehensively.

Having grown up in Arizona in Pinal, Yavapai and Maricopa Counties, and having spent considerable time as a youth pursuing hunting, fishing and camping in Coconino County, I strongly object to "Arizona's pretentions of frontier independence" (page 229) being labelled as "myths and fables of an Old West that never was." On page 223 we are told that it is a "fable" that "Arizona was one of the last refuges of the rugged individual, a place where frontier virtues still prevailed—self reliance, equality, free enterprise." Why, then, as I grew up to explore Arizona and to get to know many of the cowboys and other rugged individualists around Casa Grande, Coolidge, Florence, the Salt River Valley, Prescott, Skull Valley, Williamson Valley, Perkinsville, Ash Fork, the Verde Valley, Lonesome Valley, and Flagstaff didn't I realize that I was living in a dream—a mirage? The theme that keeps cropping out in this book is that people with Jeffersonian ideals failed in Arizona and that either power-hungry corporations succeeded or big government had to be called in. Why make what could have been a beautiful story dismal? It was truly the people of the Salt River Valley who formed the Salt River Project, not big government. American taxpayers didn't donate the money for the project; they lent it. Every time my father turned irrigation water into our yard in Mesa to water the fig, peach, orange, grapefruit, and lemon trees, a careful record was made so that the proper amount was paid. In actuality the Salt River Project operates much like a cooperative.

It is easy today to tell of the sins of the early copper mining industry. We read in the book how the mining men intimidated editors, threatened ministers, bought, seduced, bullied, rigged, and manipulated. Looking as I write this at my children, I can only think of the copper industry that paid for the passage to America for a Welsh

miner who was their great-grandfather. He could never have come to the New World without the promise of work made to him by a copper company. Many Sonorans voted with their feet by entering Arizona for work in the mines to establish a good life for their families. But the book avoids such "upbeat" ways of looking at things in favor of an exploitation theme where human failings are repeatedly stressed.

Colonel W. B. Thompson founded Magma Copper Company and Newmont Mining Corporation, both of which have had much to do with Arizona. Was there a place in the book presently under review for mention of his influence? No! Perhaps this was because he didn't fit the role of the corporate villain. He not only was an upbeat person, but a rugged individualist, a friend of "populist" governor G. W. P. Hunt and of the common man. He was a noted philanthropist who wanted to improve man's lot on earth. He did not intimidate editors, threaten ministers, buy sheriffs, seduce, bully or rig. He may have manipulated, yes, but always within the law and to promote the development of needed natural resources. He contributed a goodly amount of his money to the Red Cross for a humanitarian expedition to help the Russian people during their revolution of 1917 and to a non-profit institute for plant research to help eliminate world hunger. He established Arizona's Arboretum at Superior for the people of the state and kicked off what I believe was the first private fund drive of the University of Arizona with a handsome donation for the stadium. He was too upbeat for this book which ends with a dismal discussion of rampant growth, controversy over a public statue of a bandit, Central American refugees, mock frontier ambience, and an Arizona where "even drugstore cowboys are getting hard to find."

In *Arizona the Land and the People* we are repeatedly told that the people were no match for the land. The editor seems cheerful in describing the Colorado River flood of 1983 because it pointed up some human failures. After characterizing the river as having previously been "dammed, diverted, harassed, and channelled," indeed as "limp and lobotomized," he describes how the 1983 flood made the river look magnificent from the air, overrunning all compacts, accords, and treaties, drowning water-user obligations, commissions and statutes. "It showed no respect for our resource management systems, political jurisdictions, engineers, steel, retaining walls, or concrete barriers." Here we have nature portrayed as the "noble savage" and civilized man as inadequate, the recurrent theme of the book. In contrast, I particularly like a different book on land and people in the Far West, fittingly part of the *Mainstream of America* series edited by Lewis Gannett. The book is *Men to Match My Mountains* by Irving Stone (Doubleday and Company, 1956). The title is self-explanatory.—F. S. Crosswhite.

(review)

Saguaro. A View of Saguaro National Monument and the Tucson Basin

Gary Paul Nabhan. Southwest Parks and Monuments Association. Tucson. 75 pp. $8.95

This is a delightfully written booklet of six essays on Saguaro National Monument and the desert basin which intervenes between its eastern and western units. Subjects discussed are 1) plants, 2) rocks, 3) animals, 4) pools, 5) mountains, and 6) endangered species. The vignettes tend to be little informal abstracts of recent publications or manuscripts (file reports, theses) by local authors, interwoven with personal experiences of the author. A quotation is presented like a little poem to set the stage for each essay.

Personification of cacti, rocks, and other objects of nature may help to ease unsophisticated readers onto a plane with nature so as to better appreciate it. Some of the personifications, undoubtedly meant to be poetic or semantically flavorful, seem stilted, however: "Who has the tenacity to hang on to one of the *hombres* all the way around its life cycle . . .?" The latter sentence makes the saguaro an *hombre* (man) and at the same time a bucking bronco arched with rider in a circular configuration like the diagram of a life cycle. The reader undoubtedly can envision a human tenaciously clinging to the back of a spiny saguaro, arched and thrashing through its life cycle like a bronco. Reading is a two-way street. The author must paint the written picture, but the conscientious reader is obliged to develop the mental image even if it takes visionary acrobatics to do so. In the case of the bronco-like saguaro *hombre* above, a reader might resent having to envision discordant mind-altered images which, although whimsical, are descriptively misleading: the only reason a person can't stick with a given saguaro through its life cycle is that saguaros live twice as long as humans. The visions that the mind of the reader had to go through have nothing to do with it.

The essay on the rocks of the Tucson Mountains concludes that the geology there is "an ornery creature" and that it "wildly defies explanation." Nevertheless, in reading backward in the essay, the geology seems to be adequately explained. Although the rock assemblage is technically a geologic chaos, the forces which acted to produce it can be individually identified and orderly discussed. The situation itself is not chaotic. Nevertheless, after a quite adequate description of the geologic forces that operated, everything is thrown into question and made chaotic by the "ornery creature" statement. Despite the written imagery of an ornery, defiant creature, this is not the bronco that could not be broken. If we characterize it as such, we run the risk of having the public disbelieve geologic theories in general. There is a growing tendency for the public at many levels to throw up their hands and proclaim that rational theories of change, cause and effect in biology and geology are figments of our imagination and should be replaced by creationist doctrine.

The success of simile should be measured by its accuracy as well as the power of the image it evokes. I am still trying to envision the concluding remark of the essay on rocks: ". . . a rolling stone gathers no moss. It gathers history."