

A Newsletter for the flora of New Mexico, from the Range Science Herbarium and Cooperative Extension Service, College of Agriculture and Home Economics, New Mexico State University.

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An Evolutionary Perspective on Strengths, Fallacies, and Confusions in the Concept of Native Plants

Stephan Jay Gould

[From *Arnoldia*, Spring 1998. Professor Gould passed away May 20, 2002]

An important, but widely unappreciated, concept in evolutionary biology draws a clear and careful distinction between the historical origin and current utility of organic features. Feathers, for example, could not have originated for flight because five percent of a wing in the early intermediary stages between small running dinosaurs and birds could not have served any aerodynamic function (though feathers, derived from reptilian scales, provide important thermodynamic benefits right away). But feathers were later co-opted to keep birds aloft in a most exemplary fashion. In like manner, our large brains could not have evolved in order to permit modern descendants to read and write, though these much later functions now define an important part of modern utility.

Similarly, the later use of an argument, often in a context foreign or even opposite to the intent of originators, must be separated from the validity and purposes of initial formulations. Thus, for example, Darwin's theory of natural selection is not diminished because later racists and warmongers perverted the concept of a "struggle for existence" into a rationale for genocide. However, we must admit a crucial difference between the two cases: the origin and later use of a biological feature, and the origin and later use of an idea. The first case involves no conscious intent and cannot be submitted to any moral judgment. But ideas are developed by human beings for overt purposes, and we have some ethical responsibility for the consequences of our actions. An inventor may be fully exonerated for true perversions of his intent (Hitler's use of Darwin), but unfair extensions consistent with the logic of original purposes do entail some moral demerit (most academic racists of the nineteenth century did not envision or intend the Holocaust, but some of their ideas did fuel the "final solution").

I want to examine the concept of "native plants" within this framework, for this notion encompasses a remarkable mixture of sound biology, invalid ideas, false extensions, ethical implications, and political usages both intended and unanticipated. Clearly, Nazi ideologues provided the most chilling uses.¹ In advocating native plants along the *Reichsautobahnen*, Nazi architects of the Reich's motor highways explicitly compared their proposed restriction to Aryan purification of the people. By this procedure, Reinhold Tuxen hoped "to cleanse the German landscape of unharmonious foreign substance."² In 1942 a team of German botanists made the analogy explicit in calling for the extirpation of *Impatiens parviflora*, a supposed interloper: "As with the fight against Bolshevism, our entire Occidental culture is at stake, so with the fight against this Mongolian invader, an essential element of this culture, namely, the beauty of our home forest, is at stake."³

At the other extreme of kindly romanticism, gentle arguments for native plants have stressed their natural "rightness" in maximally harmonious integration of organism and environment, a modern invocation of the old doctrine of *genius loci*. Consider a few examples from our generation:

Man makes mistakes; nature doesn't. Plants growing in their natural habitat look fit and therefore beautiful. In any undeveloped area you can find a miraculously appropriate assortment of plants, each one contributing to the overall appearance of a unified natural landscape. The balance is preserved by the ecological conditions of the place, and the introduction of an alien plant could destroy this balance."⁴

Evolution has produced a harmony that contrived gardens defy."⁵

Or this from President Clinton himself (though I doubt that he wrote the text personally), in a 1994 memorandum on "environmentally and economically beneficial practices on federal landscaped grounds": "The use of native plants not only protects our natural heritage and provides wildlife habitat, but also can reduce fertilizer, pesticide, and irrigation demands and their associated costs because native plants are suited to the local environment and climate."⁶

This general argument, of course, has a long pedigree, as well illustrated in Jens Jensen's remark in *Our Native Landscape*, published in his 1939 *Siftings*: "It is often remarked, 'native plants are coarse.' How humiliated-

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Botanice est Scientia Naturalis quae Vegetabilium cognitionem tradit.
— Linnaeus



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ing to hear an American speak so of plants with which the Great Master has decorated his land! To me no plant is more refined than that which belongs. There is no comparison between native plants and those imported from foreign shores which are, and shall always remain so, novelties." ⁷

Yet the ease of transition between this benevolent version and dangerous *Volkist* nationalism may be discerned, and quite dramatically, in another statement from the same Jens Jensen, but this time published in a German magazine in 1937:

The gardens that I created myself shall . . . be in harmony with their landscape environment and the racial characteristics of its inhabitants. They shall express the spirit of America and therefore shall be free of foreign character as far as possible. The Latin and the Oriental crept and creeps more and more over our land, coming from the South, which is settled by Latin people, and also from other centers of mixed masses of immigrants. The Germanic character of our cities and settlements was overgrown. . . . Latin spirit has spoiled a lot and still spoils things every day. ⁸

How slippery the slope between *genius loci* (and respect for all the other spirits in their proper places as well) and "my *locus* is best, while others must be uprooted, either as threats or as unredeemable inferiors." How easy the fallacious transition between a biological argument and a political campaign.

When biologically based claims have such a range of political usages (however dubious, and however unfairly drawn some may be), it becomes particularly incumbent upon us to examine the scientific validity of the underlying arguments, if only to acquire weapons to guard against usages that properly inspire our ethical opposition (for if the biological bases are wrong, then we hold a direct weapon; and if they are right, then at least we understand the argument properly, and can accurately drive the wedge that always separates factual claims from ethical beliefs).

Any argument for preferring native plants must rest upon some construction of evolutionary theory—a difficult proposition (as we shall see) because evolution is so widely misconstrued and, when properly understood, so difficult to utilize for the defense of intrinsic native superiority. This difficulty did not exist in pre-Darwinian creationist biology, because the old paradigm of "natural theology" held that God displays both his existence and his attributes of benevolence and omniscience in the optimal design of organic form and the maximal harmony of local ecosystems (see William Paley for the classic statement in one of the most influential books ever written). ⁹ Native must therefore be right and best because God made each creature for its proper place.

But evolutionary theory fractured this equation of existence with optimality by introducing the revolutionary idea that all anatomies and interactions arise as transient products of complex history, not as created optimalities. Evolutionary defenses of native plants rest upon two quite distinct aspects of the revolutionary paradigm that Darwin introduced. (I shall argue that neither provides an unambiguous rationale, and that many defenders of native plants have mixed up these two distinct arguments, therefore rendering their defense incoherent.)

The Functional Argument Based on Adaptation

Popular impression regards Darwin's principle of natural selection as an optimizing force, leading to the same end of local perfection that God had supplied directly in older views of natural theology. If natural selection works for the best forms and most balanced interactions that could possibly exist in any one spot, then native must be best for native has been honed to optimality in the refiner's fire of Darwinian competition. (In critiquing horticulturalists for this misuse of natural selection, I am not singling out any group for an unusual or particularly naive misinterpretation. This misreading of natural selection is pervasive in our culture, and also records a primary fallacy of much professional thinking as well. ¹⁰)

In *Siftings*, Jens Jensen expressed this common viewpoint with par-

ticular force:

There are trees that belong to low grounds and those that have adapted themselves to highlands. They always thrive best amid the conditions they have chosen for themselves through many years of selection and elimination. They tell us that they love to grow here, and only here will they speak in their fullest measure. ¹¹

I have often marvelled at the friendliness of certain plants for each other, which, through thousands of years of selection and elimination, have lived in harmonious relation. ¹²

The incoherencies of this superficially attractive notion may be noted in the forthcoming admission, in a work of our own generation, that natural does not always mean lovely. Natural selection does not preferentially lead to plants that humans happen to regard as attractive. Nor do natural systems always yield rich associations of numerous, well-balanced species. Plants that we label "weeds" will dominate in many circumstances, however transiently (where "transient" can mean more than a human lifetime on the natural time scales of botanical succession). Such weeds are often no less "native"—in the sense of evolving indigenously—than plants of much more restricted habitat and geography. Moreover, weeds often form virtual monocultures, choking out more diverse assemblages than human intervention could maintain. C.A. Smysers et al. admit all this, but do not seem to grasp the logical threat thus entailed against an equation of "natural" with "right" or "preferable": "You may have heard of homeowners who simply stopped mowing or weeding and now call their landscapes "natural." The truth is that these so-called no-work, natural gardens will be long dominated by exotic weed species, most of which are pests and look downright ugly. Eventually, in 50 to 100 years, native plants will establish themselves and begin to create an attractive environment," ¹³ But not all "weed" species can be called "exotic" in the sense of being artificially imported from other geographic areas. Weeds can be indigenous too, though their geographic ranges tend to be large, and their means of natural transport well developed.

The evolutionary fallacy in equating native with best adapted may be simply stated by specifying the essence of natural selection as a causal principle. As Darwin recognized so clearly, natural selection produces adaptation to changing local environments—and that is all. The Darwinian mechanism includes no concept of general progress or universal betterment. The "struggle for existence" can only yield local appropriateness. Moreover, and even more important for debates about superiority of native plants, natural selection is only a "better than" principle, not an optimizing device. That is, natural selection can only transcend the local standard and cannot operate toward universal "improvement"—for once a species prevails over others at a location, no pressure of natural selection need arise to promote further adaptation. (Competition within species will continue to eliminate truly defective individuals and may promote some refinement by selection of fortuitous variants with still more advantageous traits, but the great majority of successful species are highly stable in form and behavior over long periods of geological time—not because they are optimal, but because they are locally prevalent.)

For this reason, many native plants, evolved by natural selection as adaptive to their regions, fare poorly against introduced species that never experienced the local habitat. If natural selection produced optimality, this most common situation could never arise, for native forms would be "best" and would prevail in any competition against intruders. But most Australian marsupials succumb to placentals imported from other continents, despite tens of millions of years of isolation, during which the Australian natives should have attained irreplaceable incumbency, if natural selection worked for optimality rather than merely getting by. And *Homo sapiens*, after arising in Africa, seems able to prevail in any exotic bit of real estate, almost anywhere in the world!

Thus the first-order rationale for preferring native plants—that, as locally evolved, they are best adapted—cannot be sustained. I strongly

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suspect that a large majority of well-adapted natives could be supplanted by some exotic form that has never experienced the immediate habitat. In Darwinian terms, this exotic would be better adapted than the native—though we may well, on defensible aesthetic or even ethical grounds, prefer the natives (for nature's factuality can never enjoin our moral decisions).

We may, I think, grant only one limited point from evolutionary biology on the subject of adaptation in native plants. At least we do know that well-established natives are adequately adapted, and we can observe their empirical balances with other local species. We cannot know what an exotic species will do—and many, and tragic, are the stories of exotics imported for a restricted and benevolent reason that then grew like kudzu to everyone's disgust and detriment. We also know that natives grow appropriately—though not necessarily optimally—in their environment, while exotics may not fit without massive human "reconstruction" of habitat, an intervention that many ecologically minded people deplore. I confess that nothing strikes me as so vulgar or inappropriate as a bright green lawn in front of a mansion in the Arizona desert, sucking up precious water that already must be imported from elsewhere. A preference for natives does foster humility and does counteract human arrogance (always a good thing to do)—for such preference does provide the only sure protection against our profound ignorance of consequences when we import exotics. But the standard argument—that natives should be preferred as best adapted—is simply false within Darwinian theory.

The Geographic Argument Based on Appropriate Place

This argument is harder to formulate, and less clearly linked to a Darwinian postulate, but somehow seems even more deeply embedded (as a fallacy) into the conventional argument for preferring native plants. This argument holds that plants occupy their natural geographic ranges for reasons of maximal appropriateness. Why, after all, would a plant live only in this-or-that region of 500 square kilometers unless this domain acted as its "natural" home—the place where it, uniquely, and no other species, fits best. Smyser et al., for example, write: "In any area there is always a type of vegetation that would exist without being planted or protected. This native vegetation consists of specific groups of plants that adapted to specific environmental conditions."¹⁴ But the deepest principle of evolutionary biology—the construction of all current biological phenomena as outcomes of contingent history, rather than optimally manufactured situations—exposes this belief as nonsense.

Organisms do not necessarily, or even generally, inhabit the geographic area best suited to their attributes. Since organisms (and their areas of habitation) are products of a history laced with chaos, contingency, and genuine randomness, current patterns (although workable, or they would not exist) will rarely express anything close to an optimum, or even a "best possible on this earth now"—whereas the earlier notion of natural theology, with direct creation of best solutions, and no appreciable history thereafter (or ever), could have validated an idea of native as best. Consequently, although native plants must be adequate for their environments, evolutionary theory grants us no license for viewing them as the best-adapted inhabitants conceivable, or even as the best available among all species on the planet.

An enormous literature in evolutionary biology documents the various, and often peculiar, mechanisms whereby organisms achieve fortuitous transport as species spread to regions beyond their initial point of origin. Darwin himself took particular interest in this subject. During the 1850s, in the years just before publication of the *Origin of Species* in 1859, Darwin wrote several papers on the survival of seeds in salt water (how long would they float without sinking? would they still germinate after such a long bath?). He determined that many seeds could survive long enough to reach distant continents by floating across oceans—and that patterns of colonization therefore reflect historical accidents of available pathways, and not a set of optimal environments.

Darwin then studied a large range of "rarely efficient" means of transport beyond simple floating on the waves: for example, natural rafts of intertwined logs (often found floating in the ocean hundreds of miles from river mouths), mud caked on birds' feet, residence in the gut of birds

with later passage in feces (Darwin and others studied, and often affirmed, the power of seeds to germinate after passage through an intestinal tract). In his usually thorough and obsessive way, Darwin assiduously collected information and found more than enough means of fortuitous transport. He wrote to a sailor who had been shipwrecked on Kerguelen Island to find out if he remembered any seeds or plants growing from driftwood on the beach. He asked an inhabitant of Hudson Bay if seeds might be carried on ice floes. He studied the contents of ducks' stomachs. He was delighted to receive in the mail a pair of partridges' feet caked with mud; he rooted through bird droppings. He even followed a suggestion of his eight-year-old son that they float a dead and well-fed bird. Darwin wrote in a letter that "a pigeon has floated for 30 days in salt water with seeds in crop and they have grown splendidly." In the end, Darwin found more than enough mechanisms to move his viable seeds.

"Natives," in short, are the species that happened to find their way (or evolve *in situ*), not the best conceivable for a spot. As with the first argument about adaptation, the proof that current incumbency as "native" does not imply superiority against potential competitors exists in abundance among hundreds of imported interlopers that have displaced natives throughout the world: eucalyptus in California, kudzu in the American southeast, rabbits and other placental mammals in Australia, and humans just about everywhere.

"Natives" are only those organisms that first happened to gain and keep a footing. We rightly decry the elitist and parochial claims of American northeast WASPs to the title of native, but (however "politically incorrect" the point), the fashionable status of Indians" (so-called by Columbus' error) as "Native Americans" makes just as little sense in biological terms. "Native Americans" arrived in a geological yesterday, some 20,000 years ago (perhaps a bit earlier), on the geographic fortuity of a pathway across the Bering Strait. They were no more intrinsically suited to New World real estate than any other people. They just happened to arrive first.

In this context, the only conceivable rationale for the moral or practical superiority of "natives" (read first-comers) must lie in a romanticized notion that old inhabitants learn to live in ecological harmony with surroundings, while later interlopers tend to be exploiters. But this notion, however popular among "new agers," must be dismissed as romantic drivel. People are people, whatever their technological status; some learn to live harmoniously for their own good, and others do not to their own detriment of destruction. Preindustrial people have been just as rapacious (though not so quickly perhaps, for lack of tools) as the worst modern clear-cutters. The Maori people of New Zealand wiped out a rich fauna of some twenty moa species within a few hundred years. The "native" Polynesians of Easter Island wiped out everything edible or usable (and, in the end, had no logs to build boats or to raise their famous statues), and finally turned to self-destruction.

In summary of my entire argument from evolutionary theory, "native" plants cannot be deemed biologically best in any justifiable way (note that I am emphatically not speaking about ethical or aesthetic preference, for science cannot adjudicate these considerations). "Natives" are only the plants that happened to arrive first and be able to flourish (the evolutionary argument based on geography and history), while their capacity for flourishing only indicates a status as "better than" others available, not as optimal or globally "best suited" (the evolutionary argument based on adaptation and natural selection).

Speaking biologically, the only general defense that I can concoct for natives—and I regard this argument as no mean thing—lies in protection thus afforded against our overweening arrogance. At least we know what natives will do in an unchanged habitat, for they have generally been present for a long time and have therefore stabilized and adapted. We never know for sure what an imported interloper will do, and our consciously planted exotics have "escaped" to disastrous spread and extirpation of natives (the kudzu model) as often as they have supplied the intended horticultural or agricultural benefits.

As a final ethical point (and I raise this issue as a concerned human being, not as a scientist, for my profession can offer no direct moral insight), I do understand the appeal of the ethical argument that we should

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leave nature alone and preserve as much as we can of what existed and developed before our very recent geological appearance. Like all evolutionary biologists, I treasure nature's bounteous diversity of species (the thought of half a million described species of beetles—and many more yet undescribed—fills me with an awe that can only be called reverent). And I do understand that much of this variety lies in geographic diversity (different organisms evolved in similar habitats in many places on our planet, as a result of limits and accidents of access). I would certainly be horrified to watch the botanical equivalent of McDonalds' uniform architecture and cuisine wiping out every local diner in America. Cherishing native plants does allow us to defend and preserve a maximal amount of local variety.

But we must also acknowledge that strict "nativism" has an ethical downside inherent in the notion that "natural" must be right and best, for such an attitude easily slides to the Philistinism of denying any role to human intelligence and good taste, thence to the foolish romanticism of viewing all that humans might accomplish in nature as "bad" (and how then must we judge Frederick Law Olmsted's Central Park), and even (in an ugly perversion)—but realized in our time by Nazi invocation of nativist doctrine—to the claim that my "native" is best and yours only fit for extirpation.

The defense against all these misuses, from mild to virulent, lies in a profoundly humanistic notion as old as Plato, one that we often advance in sheepish apology but should rather honor and cherish: the idea that "art" must be defined as the caring, tasteful, and intelligent *modification* of nature for respectful human utility. If we can practice this art in partnership with nature, rather than by exploitation (and if we also set aside large areas for rigidly minimal disturbance, so that we never forget, and may continue to enjoy, what nature accomplished during nearly all of her history without us), then we may achieve optimal balance.

People of goodwill may differ on the best botanical way to capture the "spirit of democracy"—from one end of maximal "respect" for nature by using only her unadorned and locally indigenous ("native") products, to the other of maximal use of human intelligence and aesthetic feeling in sensitive and "respectful" mixing of natives and exotics, just as our human populations have so benefited from imported diversity. Jens Jensen extolled the first view: "When we are willing to give each plant a chance fully to develop its beauty, so as to give us all it possesses without any interference, then, and only then, shall we enjoy ideal landscapes made by man. Is not this the true spirit of democracy? Can a democrat cripple and misuse a plant for the sake of show and pretense?"¹⁵

But is all cultivation—hedgerows? topiary?—crippling and misuse? The loaded nature of ethical language lies exposed herein. Let us consider, in closing, another and opposite definition of democracy that certainly has the sanction of ancient usage. J. Wolschke-Bulmahn and G. Groning cite a stirring and poignant argument made by Rudolf Borchardt, a Jew who later died trying to escape the Nazis, against the nativist doctrine as perverted by Nazi horticulturists: "If this kind of garden-owning barbarian became the rule, then neither a gillyflower nor a rosemary, neither a peach-tree nor a myrtle sapling nor a tea-rose would ever have crossed the Alps. Gardens connect people, times and latitudes. If these barbarians ruled, the great historic process of acclimatization would never have begun and today we would horticulturally still subsist on acorns. . . . The garden of humanity is a huge democracy."¹⁶

I cannot state a preference in this wide sweep of opinions, from pure hands-off romanticism to thorough over-management (though I trust that most of us would condemn both extremes). Absolute answers to such ethical and aesthetic questions do not exist in any case. But we will not achieve

clarity on this issue if we advocate a knee-jerk equation of "native" with morally best, and fail to recognize the ethical power of a contrary view, supporting a sensitive cultivation of all plants, whatever their geographic origin, that can enhance nature and bring both delight and utility to humans. Is it more "democratic" only to respect organisms in their natural places (how, then, could any non-African human respect himself), or shall we persevere in the great experiment of harmonious and mutually reinforcing geographic proximity—as the prophet Isaiah sought in his wondrous vision of a place where the wolf might dwell with the lamb and such non-natives as the calf and the lion might feed together—where "they shall not hurt nor destroy in all my holy mountain."

Endnotes

- 1 J. Wolschke-Bulmahn and G. Groning, "The Ideology of the Nature Garden: Nationalistic Trends in Garden Design in Germany During the Early Twentieth Century," *Journal of Garden History* (1992) 12(1): 73-80; G. Groning and J. Wolschke-Bulmahn, "Some Notes on the Mania for Native Plants in Germany," *Landscape Journal* (1992) 11(2): 116-126; 1. Wolschke-Bulmahn, "Political Landscapes and Technology: Nazi Germany and the Landscape Design of the Reichsautobahnen (Reich Motor Highways)," *Selected CELA Annual Conference Papers: Nature and Technology*, Iowa State University, 9-12 September 1995, vol. 7.
- 2 Quoted in Wolschke-Bulmahn, "Political Landscapes," from a 1939 article.
- 3 Quoted in Groning and Wolschke-Bulmahn, "Native Plants."
- 4 C. A. Smyser et al., *Nature's Design: A Practical Guide to Natural Landscaping*, Emmaus, PA., 1982, xi.
- 5 K. Druse and M. Roach, *The Natural Habitat Garden*, New York: 1994, viii.
- 6 President William J. Clinton, *Memorandum for the Heads of Executive Departments and Agencies*, Office of the Press Secretary, 26 April 1994.
- 7 J. Jensen, *Siftings: The Major Portion of "The Clearing," and Collected Writings*, Chicago, 1956, 45.
- 8 Quoted in Wolschke-Bulmahn, "Political Landscapes," 13.
- 9 W. Paley, *Natural Theology*, London, 1802.
- 10 See S.J. Gould and R.C. Lewontin, "The Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme," *Proceedings of the Royal Society of London B* (1979) 205: 581-198; see S. J. Gould, "Exaptation: A Crucial Tool for an Evolutionary Psychology," *Journal of Social Issues* (1991) 47(31): 43-65.
- 11 Jensen, *Siftings*, 47.
- 12 Ibid., 59.
- 13 J. Smyser et al., *Nature's Design*, vii.
- 14 Ibid., xi.
- 15 Jensen, *Siftings*, 46.
- 16 Wolschke-Bulmahn and Groning, "The Ideology of the Nature Garden," 80.

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Botany is the natural science that transmits the knowledge of plants.
— L innaeus



Frontera — The Last Word?

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[In response to the mention of Charles Wright's collection site, *Frontera*, by Richard Spellenberg in our last issue (" *Cleome multicaulis* on the Rio Grande in southern New Mexico?"), Tom sent me a copy of his article in *La Posta* (July 1990), reprinted here with permission. — ed.]

In August of 1848, Thomas Frank White, in the company of United States troops, arrived in the El Paso area. White's purpose was to establish a custom house at the port-of-entry between the United States and Mexico along the Camino Real from Santa Fe to Chihuahua. The road crossed the Rio Grande at Vado de Los Muleros (Mule Driver's Ford), just north of the pass between the Franklin Mountains and Cerro de Los Muleros (now Sierra de Cristo Rey). This location is about eight miles from the cathedral in El Paso del Norte (now Ciudad Juarez), and about one mile northwesterly of the pass itself. The road south from the crossing was the easier way to go to El Paso del Norte since it avoided the canyons and arroyos of the pass and went around the westside of Cerro de Los Muleros. This is the road used by Wislizenus on his journey to Mexico in 1846.

White built a store and a house and cultivated the surrounding land, which became known as Rancho Frontera or White's Rancho [Frontera #1 on map]. Several months later he was appointed prefect of the area by Colonel John M. Washington, Military Governor of New Mexico. In a letter dated November 28, 1848, White informed the prefecto of El Paso del Norte that he had received instructions from the Governor of the Territory of New Mexico "to extend my jurisdiction as a magistrate of this territory over the towns situated on the east side of the Rio del Norte below the town of El Paso". He stated that his authority would extend to the settlements of Ysleta, Socorro, and San Elizario. He issued grants of land and collected taxes in the name of the Territory.

In 1849, White asked Major Jefferson Van Horn, commanding the troops at Fort Bliss, to aid him in collecting taxes. Van Horn sent a letter to Colonel John Munroe, then Military Governor of New Mexico, asking for guidance. Col. Munroe replied on December 28, 1849, that the military should support the civil authority of the Territory of New Mexico and aid the New Mexico officials in the administration of justice until the boundary between New Mexico and Texas was settled.

White's control apparently remained in effect until El Paso County, Texas, was fully organized. It is difficult to determine the exact date since many of the alcaldes appointed by White remained as officials after reorganization under Texas laws. On May 1, 1850, the Governor of Texas appointed T. F. White as notary for the El Paso area, so White held appointments from both New Mexico and Texas at the same time, which just adds to the confusion.

The "Record of Appointments of Postmasters - New Mexico" shows Frontera, Socorro, and San Elizario all authorized in Socorro County, New Mexico, on April 17, 1851, with White the postmaster at the former. All three were simultaneously discontinued on March 12, 1852, perhaps because the postal authorities in Washington realized that Texas and New Mexico had reached a settlement of their boundary dispute. The earliest post office for El Paso County shown in the "Records of Appointments of Postmasters—Texas" are El Paso and San Elizario, both authorized July 26, 1852, after the flood that wiped out Frontera (see below).

When U. S. Boundary Commissioner John F. Bartlett arrived in the area in November 1850, White offered his ranch as a base of operations. By letter of December 23, 1850, he gave Bartlett two options. The first was to buy the whole ranch for \$3,000 and the second, to buy two acres for an observatory for \$1 and to rent White's buildings for \$65 a month. In a letter of January 21, 1851, White concurred in Bartlett's acceptance of the second option.

This set the stage for Major William P. Emory, who did the actual survey of the US-Mexico border for the Boundary Commission. Emory, as shown by his diary and Field notes, worked on the survey until 1853. He stayed at White's ranch for part of this time and had his observatory on a nearby hill where he could look through the pass and see the cathedral in El Paso del Norte (his notes say the location of the cathedral was determined from the observatory using light flashes from the cathedral). He stated the elevation of his observatory as 3,780 feet. There is only one hilltop near the location of the Frontera buildings that has both this elevation and line-of-sight through the pass. Oddly enough, the current USGS map shows ruins on this hill at 3,780 and 3,800 feet [see map].

The area had experienced a drought from 1849 through 1851 so there had been no problem with the river shifting course since White had arrived. However, on the night of June 25, 1852, Emory's diary says that he awoke to a roaring noise. Emory and his assistant stepped outside into knee-deep water. They quickly gathered their surveying instruments and waded through chest-deep water to the observatory hill where they spent the night. The next morning the river was flowing at the base of the hill and their camp, along with the Frontera buildings, was gone. Thus, the river had moved east and the principal Frontera location was now on the west side of the river, which was in Mexico until the Gadsden Purchase of 1853. The Frontera buildings were later reconstructed at a new location on the east side of the river. In 1854, T. Frank's brother, Charles, was still doing business there. However, with the Gadsden Purchase, Frontera was no longer on the border and was no longer a custom house. The later location of Frontera and the new location of the river are shown on Emory's map. The new location of Frontera [Frontera #2 on map] is about two miles above the pass, rather than one mile as the original was.

The new location of the river is the same as the present New Mexico-Texas boundary. Thus, the location of the Frontera post office was actually in what is now New Mexico in the limits of the town of Sunland Park. The second location of Frontera has been marked with a stake and a buried marker. The stake is no longer there but the marker is in the railroad right-of-way near the intersection of Doniphan and Sunland Park drives in El Paso. This later location is what is shown on the early maps of the area and that is what has caused the confusion about the location of the Frontera post office in 1851-52.

Why did White change his manuscript postmarking from New Mexico to Texas? Probably because the agreement had come about the latter part of 1851. Besides, he had strong political ambitions and wanted to go along with his constituents. When his political influence began to wane, he left and went west to Fort Buchanan where he became postmaster from 1859 until the post was abandoned in 1862.

To sum up what happened to the original location of the Frontera post office [Frontera #1 on the map]: Obviously it was originally in New Mexico and under New Mexico control since Thomas Wright was a New Mexico official. At some time, probably at the beginning of 1852, the same spot was in Texas. With the flood of 1852, it was west of the river and in Mexico. With the Gadsden Purchase, it reverted to New Mexico. Sometime before the survey of 1917, the river had shifted again leaving the site again in Texas. Now, with the survey and agreement of 1930, the original Frontera site is back in New Mexico.

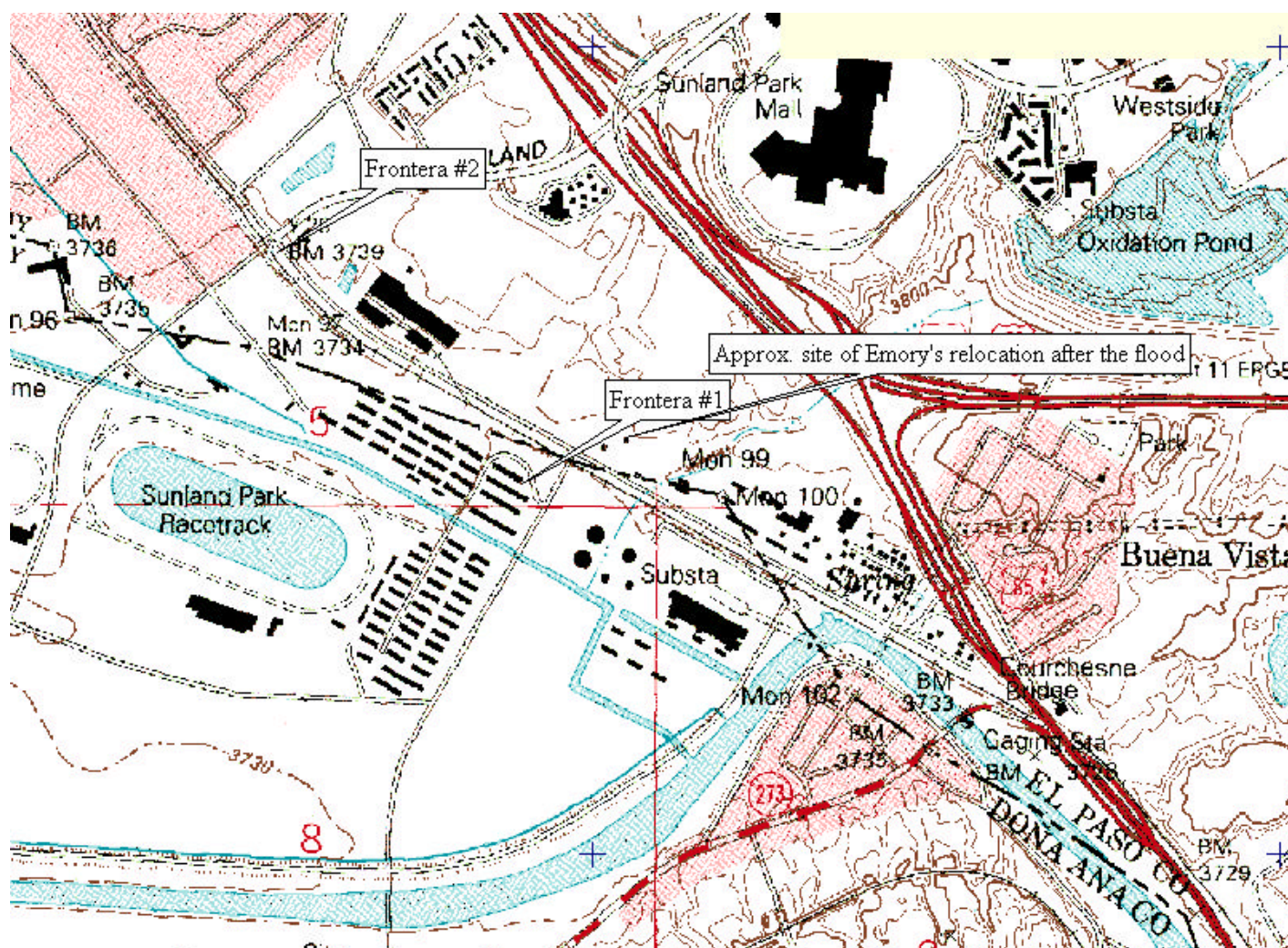
(Continued on page 6, *Frontera*)



(Frontera, Continued from page 5)

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What's In A Name?

A Short Botanical Biography of A.L. Hershey

The study of the names of New Mexico plants is a study of the history of botany, not only in the American Southwest, but throughout the world. The early years of exploration are revealed in the names of Abert, Bigelow, Fendler, James, Parry, Wislizenus, and Wright. The European origin of much of our botanical science is reflected in the lives of Beckmann, Bélanger, Bladh, Boutelou, Lindheimer, Reverchon, Roemer, Schaffner, and Schiede. We're reminded of the scientist-patrons whose careers greatly benefited from the inventory of New Mexico flora by the names Gray, Grisebach, Hackel, Hooker, and Torrey. And, of course, our own resident botanists are remembered through the names Metcalfe, Standley, and Wooton, to name a few from the early days.

A New Mexico botanist not so well known is **Arthur LeRoy Hershey**, remembered by the single eponym of *Chaetopappa hersheyi* for the mat-like cliff-daisy endemic to steep limestone ledges in the Guadalupe Mountains of southeastern New Mexico and western Texas.

Little is known about A.L. Hershey. His birth and early years are unknown to us. He first came to New Mexico in 1934, in time for the beginning of the fall semester at the New Mexico College of Agriculture and Mechanic Arts. He had obtained his bachelor's degree from Kansas State College in 1927, an M.S. from Iowa State in 1930, staying on for a Ph.D. in 1934, and was beginning his botanical career as an assistant professor of biology. His work for both the Master's and Doctoral degrees was on corn, studying the ontogeny, structure, and development of the stem and leaves. As an assistant professor from 1934-1944, and an associate professor from 1945-1949, Hershey taught many of the general biology and botany courses at the college. He also became the resident plant taxonomist at the college, teaching courses in southwestern flora, plant systematics, trees and shrubs, and the like, as well as responding to plant identification queries from county agents and citizenry throughout the state. There are no photos of Hershey in any of the college yearbooks, *The Swastika*.

John W. 'Bus' Riley, of Las Cruces, remembers taking General Botany with "Doc Hershey," as he was called by all the students. This was in 1946, Bus's first semester in college after WWII. He remembers him as a fairly short, somewhat heavysset man, perhaps about 5'8" and 180 lbs. One summer Hershey helped Bus get a job at the ag lab studying fringed tapeworms in sheep. He recollects that Hershey was unmarried and lived alone.

A partial search of the biology herbarium at New Mexico State University (NMC) revealed New Mexico collections by Hershey from 1933 [error for 1934?] through 1959. His formal (or at least numbered) collecting apparently began when he came to New Mexico, as his number 13 shows up in October 1934, a specimen of *Panicum obtusum* from Ropes Springs, Doña Ana County. Specimens were found from 21 different counties and 28 plant families, with Doña Ana County and the Fabaceae, respectively, being most heavily represented.

Some of Hershey's wanderings through New Mexico turned up novelties, both for the state and for science. He reported at least 17 species new to the state in three short publications in *Leaflets of Western Botany*, in 1938, 1940, and 1944, the last in collaboration with Philip Leyendecker, Jr. The only new species based on a Hershey collection, *Chaetopappa hersheyi*, was found in the Guadalupe Mountains during explorations in 1939, and was named by S.F. Blake in 1946. His only other known publication was in 1945, an Agricultural Experiment Station bulletin discussing poisonous plant problems in the state.

The course catalogs reveal that spring semester 1949 was Hershey's last at New Mexico College. It is not known why he left or where he went. His botanical activity apparently ceased, as he is absent from botanical bibliographies and inventories after this time.

Publications of A.L. Hershey

Notes on plants of New Mexico—I. *Leaflets of Western Botany* 2(8):138. 1938.

Notes on plants of New Mexico—II. *Leaflets of Western Botany* 2(15):257-258. 1940.

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Some poisonous plant problems of New Mexico. *Agric. Exp. Sta. Bull.* 322. 1945. 23 pp.

Eponymy

Chaetopappa hersheyi S.F. Blake [A new *Chaetopappa* from the Guadalupe Mountains of New Mexico and Texas. *Proceedings of the Biological Society of Washington* 59:47-48. 1946.]

Acknowledgments

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