

# A BRIEF POLEMIC ON THE NATIVE-PLANT CULT

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The “native plant movement,” of which Doug Tallamy’s “take” on gardening is one manifestation, is deeply rooted in a philosophical error: *the assumption of stasis*.

The science of ecology, and specifically community ecology, has suffered from the harmful effects of typology from its very beginnings. In the United States, Frederic Clements was a faithful Christian who saw God’s creation as good. His view of the plant community was profoundly typological, grounded in the concept of a tightly functionally-integrated multispecies system. Taken in an evolutionary context, such integration implied coevolution on a comprehensive scale, even if the term would not be coined until several decades later. That, in turn, assumed that interspecific associations were very long-lasting, so that the component species would act as agents of natural selection on one another. Such typology mirrored the common practice in biological systematics and in both cases lent itself to hierarchical classification. But already in Clements’ time a competing school of thought, which we today identify with Henry Gleason in the U.S. (and others elsewhere), insisted that the fixity of multispecies systems was an empirical question to be tested, not an a priori; and in most cases the concept failed statistical testing. Thus emerged the “gradient” and “continuum” approaches to communities, which eventually triumphed in the American literature. (Regrettably, conservation concerns have led to a

modest recrudescence of typological community classification, basically because legal protections cannot “afford” ambiguity.

All of this concerns real-time communities. But concurrently there was an explosion of paleobotanical data, both “macro” and “micro” (pollen and spores, palynology) that conclusively demonstrated that in response to climatic and geographic changes, communities have changed more or less drastically, even within the relatively short time frame of the Quaternary. It is literally impossible to uphold a Clementsian view of community stability in geologic time, even over relatively short spans of geologic time. Thanks to the fossil record, we are (or should be) Gleasonians now.

What does all this have to do with native-plant gardening?

There is a classical axiom that you cannot step in the same river twice. Interspecific associations have always changed in response to the boundary conditions imposed by the physical environment, and we can assume that lability will continue so long as there are interspecific associations. Human activity may accelerate this process, but only quantitatively, not qualitatively.

Darwin and Wallace and their successors taught us that species evolve in response to their physical and biotic environments. A great deal of effort is being expended right now to track how the geographic ranges of species are responding to climate change. For narrow specialists, the critical question typically is whether they and their necessary resources can move quickly enough to track the distributions of their preferred or required climates.

But the identity of their “necessary resources” can often change. When species come into contact with new associates, they may be able to add them to their resource list, enhancing their ability to persist in the face

of climate change. This process has been a focus of my own research program, looking at how our “native” butterflies (I put the term in quotation marks, because the status of “nativeness” is a function of time) have been able to adapt to non-“native” plant resources. This is an ongoing process right under our noses. For example, gardeners both here and elsewhere have long planted the non-native Butterfly Bush (*Buddleia Davidii*) as an attractive nectar source, despite claims that it is invasive (at least in certain places) and the assertion by Tallamy and others that it is useless as a larval host plant of anything. The latter assertion is merely a statement of ignorance. Butterfly Bush foliage is rich in iridoid glycosides, as its scrophulariaceous lineage would predict (try tasting a leaf!) and we should not be surprised that populations of at least two subspecies of the Variable Checkerspot, *Euphydryas chalcedona*, are now breeding spontaneously on it in both the Sierra Nevada foothills and the Coast Ranges. I could go on and on with examples—we get new ones every year—and anyone who wants to learn about them is welcome to peruse my bibliography or contact me for pdfs ([theochild@gmail.com](mailto:theochild@gmail.com) or [amshapiro@ucdavis.edu](mailto:amshapiro@ucdavis.edu)). All of this was perfectly predictable given what we know about the cues Lepidoptera use in host selection, and this process is largely responsible for the existence of a decent urban and suburban butterfly fauna in California. Were it not for adaptation to non-native plants, much of that fauna would have disappeared long ago.

*And this process has been going on for a few million years.*

The biota of the British Isles has been as thoroughly studied as any in the world. Based on Godwin’s *History of the British Flora*, the British ecologist T.R.E. Southwood (1961) and Southwood and C.E.J. Kennedy (1984) attempted to determine how quickly non-native trees in the U.K. accumulated insect faunas. (In some cases for cultivated species, the precise year of introduction was known—in one case, back to the 13<sup>th</sup>

Century). A number of similar studies have been carried out, here and elsewhere. The take-home is that alien plants, whether cultivated or naturalized, *will* accumulate an herbivore fauna, partly by naturalization of their fauna in their country of origin but also by adaptation of native species to them when secondary chemistry permits—and we know something of how rapidly we should expect this to occur. And, given knowledge of secondary chemistry and plant phylogeny, we can often make testable predictions about the future ecology of exotics.

I love to cite a conversation with a distinguished British plant ecologist who was visiting Davis years ago. We (I and a bunch of grad students) took him on a field trip to the Sierra Nevada, his first. As we rose through the foothills the students began apologizing for the fact that the landscape was dominated by naturalized “weeds.” But our guest demurred, He demanded to know why they viewed the situation as a tragedy rather than a tremendous evolutionary opportunity.

I wholeheartedly agree.