

The constant gardeners

While pottering away in a garden near you, botanists are playing an increasingly sophisticated role in studying plant diversity. They should continue to broaden their scientific reach.

Thank goodness for botanical gardens. Without them, who would compile the flora of Mesoamerica? Who would identify a rare member of the Melastomataceae family, or determine the most likely pollinator for a newly discovered orchid? Imagine the intellectual poverty of a world in which no plant researcher studied anything but the model organism *Arabidopsis thaliana*, an unprepossessing mustard cress.

Universities do still house some taxonomists and whole-organism biologists. But as they retire, they are ever more likely to be replaced with geneticists or a similarly fashionable brand of molecular biologist, and their herbaria shunted off to the nearest botanical garden. "The number of well-trained taxonomists is shrinking," warns one leading systemic biologist. "They are a dying breed."

Not that the research interests of the gardens themselves are by any means confined to taxonomy (see page 860). Many are also now involved in molecular research, much of it addressing spheres that are neglected elsewhere because they lack commercial significance. The agricultural or pharmacological potential of plants naturally dominates the research agendas of plant scientists in industrial companies and, increasingly, in university botany departments as well. That leaves the botanical gardens to study the astonishing diversity of plant species, their relations to each other and their evolutionary origins. That's a massive research agenda for which little public financial support is forthcoming.

Nonetheless, gardens have got on with their work in their usual unassuming way. Many of their botanists are able to follow their own interests more closely than their grant-dependent peers at universities. Intellectually, that's often a good thing, but politically it has crept into the gardens' institutional culture and has sometimes prevented them from engaging as fully as they might with the outside world. They often enjoy good relations with universities and the public, but there is room for even more active participation in debates on topics such as climate change, deforestation and urbanization.

Some ambitious and outward-looking projects are going forward at the larger gardens. The Royal Botanic Garden Edinburgh is planning

a £14-million (\$24-million) education centre, for example. And at the New York Botanical Garden next month, a \$23-million research centre will open whose work will include the investigation of the function of plant genes. Some academic botanists criticize this new direction as duplicative and a distraction from the garden's core work. But the genetic investigations pursued at botanical gardens are unlikely to overlap with university studies. Amy Litt, head of genomics at the centre, will investigate such diverse questions as the origins of seeds, the differences between hard and soft fruit, and the genes that determine the shapes of flowers, in part by sequencing genomes of plants such as the snapdragon.

The centre is part of the New York Plant Genomics Consortium, which includes the Cold Spring Harbor Laboratory, New York University and the American Museum of Natural History. The collaboration marks an effort by the garden to look beyond its own walls; it should be watched closely by those botanical gardeners who worry about possible marginalization within the wider research community. Some isolation has been self-imposed: there's a kernel of truth in the stereotype of the discipline as comprising a collection of reclusive eccentrics spending a lifetime on their particular interests.

As well as looking outside, botanical gardens need to work more closely with each other to

pursue the systematic collection of information about plants. Many gardens are loosely linked through an umbrella group, the Botanic Gardens Conservation International, based at Kew in London.

But this group focuses on conservation, not, for example, on the construction of databases. Several major gardens would each like their own systems to form the backbone of a global database. Closer cooperation is needed if knowledge of plants is to be integrated in a form that can be accessed by all botanists. It is past time for the largest gardens — at New York, Kew and St Louis — to work directly with each other to obtain financial backing for such a project. ■

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More than the money

Technology-transfer offices are learning from their mistakes. So should the academics that they serve.

Academic researchers and the technology-transfer offices at their universities have had a prickly relationship since the latter first won a foothold on campuses two decades ago. Scientists sometimes complain that these offices are unresponsive to immediate demands, or that their generalist staff lack knowledge

in specific scientific or technical fields. Once they do start working together, researchers too often view the hapless technology-transfer officer as a potential obstacle to the dream deal they had been plotting with industrial partners or financiers outside the university. Yet university technology-transfer offices have come a long way. It is time that truculent researchers recognized their worth and engaged with them constructively, in the common interest of the university and its surrounding community.

Staff in these offices have, over time, built up valuable expertise in helping to negotiate deals with outside parties. Although people sometimes assume that the offices are just there to earn cash for the