Monarchs and Their Roots

Subtle chemical traces in the wings of monarch butterflies have revealed that about half of the population hail from the U.S. corn belt, according to a study in the 22 December *Proceedings of the National Academy of Sciences*. New ways of eradicating milkweed, the butterflies' primary sustenance, could take a heavy toll on monarchs, researchers believe.

In what may be the world's most massive long-distance insect migration, each autumn tens of millions of the orange-and-black butterflies fly an average of 2500 kilometers, from southern Canada and the eastern half of the United States, to winter at a dozen hectare-sized sites in the mountains of central Mexico. Researchers have had some success at recovering tagged monarchs, but no one knew whether butterflies from particular locations in the North clumped at particular wintering sites.

Diet has now provided the key. Plant matter ingested during the caterpillar stage contains carbon and hydrogen isotope ratios linked to local rainfall patterns and climate. So chemist Leonard Wassenaar and biologist Keith Hobson of Environment Canada in Saskatoon, Saskatchewan, enlisted volunteers to hand-rear caterpillars on milkweed at dozens of sites throughout their breeding grounds. The researchers then compared the carbon and hydrogen in the wing membranes of the resulting butterflies to that from 597 dead adults at the winter roosts.

Midwestern Monarch perched atop a milkweed, its crucial support plant.

What they found was that about half of the dead monarchs grew up in a swath of the Midwest just a few hundred kilometers wide from Nebraska to Ohio. "This is a snapshot in time, so we don't know whether this reflects the historical pattern," says Wassenaar. Nevertheless, he notes, it raises concern that new herbicide-resistant corn and soy crops—which allow farmers to kill milkweed after plants have sprouted—could devastate monarch food supplies.

Entomologist Chip Taylor of the University of Kansas in Lawrence, director of the conservation group Monarch Watch, says he is "alarmed" by the finding: "We didn't know that so many monarchs come right out of the agricultural heartland, which is undergoing this tremendous change."

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Genetic Gauntlet Thrown

"To me the challenge for the year 2000 and beyond is [understanding] the genetic control of behavior, and to reduce behavior down to problems in cell biology so people will come to this meeting rather than the neuroscience meeting."

—Paul Sternberg of CalTech, speaking at last month's meeting of the American Society for Cell Biology in San Francisco.

Consumers Get Say In Mental Research

Like AIDS and breast cancer activists before them, mental health activists are demanding more control over research related to their cause—and they're getting it. Starting next month, the National Institute of Mental Health (NIMH) will include laypersons as voting members of the scientific peer review panels that rank research proposals for purposes of funding. To "broaden the range of perspectives," says NIMH, every panel will have at least two members who have had "personal experience with mental disorders," supported a family member with a disorder, or represented "the interests and perspectives of persons with mental disorders" (see www.nimh.nih.gov/grants/pubpart1.htm).

"If this new approach builds bridges and strengthens trust, everybody will be pleased," says psychiatrist Roger Meyer of the Association of American Medical Colleges. But whether that will happen "remains to be seen."

NIMH spokesperson Clarissa Wittenberg says the agency is aware that some researchers do not favor using nonscientists as scientific reviewers. But she says patients have been voting on grant proposals for years on AIDS and breast cancer panels with "very positive" results.

South African Brain Drain

The departure of scientists and other professionals from South Africa—what one scientist calls South Africa's "massive intellectual diaspora"—shows no signs of abating, according to a new survey.

Before the end of apartheid in 1994, South Africa was a brain magnet. Between 1983 and 1987, for example, 12,287 professional and technical workers immigrated, more than compensating for the 8275 who left. But government figures for 1994 through early 1998 show 9548 leaving versus 4828 arriving, for a net loss of 4720. And the real number of emigrants is probably twice the official one, says economist Dave Kaplan, director of the Science and Technology Policy Research Institute at the University of Cape Town (UCT).

The latest bad news comes from the Institute for Democracy in South Africa, a nongovernmental group. Of 725 South African professionals it surveyed, 13%—including black as well as white Africans—said they are "very likely" to leave the country within the next 5 years. The principal motivation is no longer economic: People instead cited concern for personal safety because of rising crime rates. The departures are hurting industry, where jobs in fields from telecommunications to mining are going begging, says Khotso Mokhele, president of the Foundation for Research Development, the government's funding agency.

In an attempt to counteract the brain drain, UCT and the French Institute of Scientific Research for Development and Cooperation a year ago launched a program to get expatriate South Africans involved in research, technology transfer, and other relationships with businesses and universities back home (www.uct.ac.za/org/sansa). Called South African Network of Skills Abroad, the program has contacted 28,000 South African university graduates living abroad and has so far heard back from about 1500. "If we can tap into even a small part of this [population] it could make a significant contribution to our S&T effort," says Kaplan.