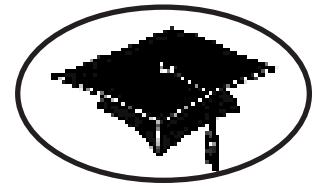

Berkeley Emeriti

TIMES



November 2007

Professor Louise Fortmann

Department of Environmental Science, Policy, and Management
Division of Society and Environment

“Doing Science Together: Why Professional Science Alone
Won’t Save the Planet and
How to Do Participatory Research that Just Might Do So”

Saturday, November 17, 2007

I am a child of the Morrill Act of 1862. My life began at Ithica where the College of Agriculture is part of the land grant system. I was raised at and received my B.S. (in political science with a minor in genetics) at Penn State. I returned to Cornell for my Ph.D. in rural sociology. And in 1984 I happily landed here at Berkeley where every year I have students who are the first in their family ever to go to college. My research focuses on property, gender, poverty, and, more recently, the democratization of science. I spent 1973-1983 doing research on agriculture and natural resource management (always also asking gender questions) in Tanzania, Botswana and Kenya. I spent my 1991-92 sabbatical in Zimbabwe doing participatory research with a village research team on the local use and management of indigenous woodlands and the effects of a gendered tenure system on tree planting by women.

My edited book, *Participatory Research in Conservation and Rural Livelihoods: Doing Science Together*, will be published by Blackwell in 2008. I currently hold the Rudy Grah Chair in Forestry and Sustainable Development in the Department of Environmental Science, Policy and Management. Two fun facts about me are — I used to be a skydiver and I cannot milk a cow, which makes me a suspect “expert” in many African villages.

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ROOTS – THE INDISPENSIBLE SUPPORT OF TERRESTRIAL PLANTS

On September 8, 2007 Professor Lewis J. Feldman of the Department of Plant & Microbial Biology revealed to those attending the UCBEA meeting fascinating insights into the form, function and behavior of roots, the usually unseen part of higher plants.

We are sometimes made aware of roots, particularly tree roots, only when they disrupt the soil surface causing damage to sidewalks and curbs. Feldman noted that cities often list species that may not be planted as street trees because of their known tendency to heave sidewalks and curbs.

Roots embedded in the soil provide the physical support enabling plants to extend their stems and leaves well above the ground, facilitating light absorption and exchange of gases essential to photosynthesis. (Aquatic plants do not rise above the water surface because, unlike soil, water cannot support static shearing stresses.) However, Professor Feldman showed remarkable examples of above ground roots: buttress roots in tropical trees extending to the trunk many feet above the ground to resist wind forces; upward growing roots that provide aeration for submerged roots; orchids roots that grow on other plants; roots on palm stems that become thorns protecting the plant; ivy roots that exude a tenacious glue anchoring the stems to walls and other plants.

Some roots store nutrients for the plant's purposes that also are harvested for human use, for example, carrots, beets and sweet potatoes.

A vital function of roots is their relentless activity in providing water and mineral nutrients to the plant. Diverse patterns of root distribution are exhibited that exploit conditions existing in the soil. Shallow spreading roots harvest water near the soil surface. Vertically penetrating roots seek water deep in the soil. Very fine root hairs, numbering billions on a single plant, greatly increase the root surface area for absorbing water and nutrients. We were told that a single wheat plant may have an absorbing root surface of as much as 400 square meters!

Downward growing roots are able to detect the direction of gravity by cells in the root cap containing dense starch grains that settle to the lowest part of the cell – a simple system that resembles an orientation mechanism in the human inner ear that uses calcium rather than starch. Experiments conducted on the space shuttle show that roots grow randomly in minimal gravity. However, results have been confounded by the small accelerations to the craft imparted by movements of the crew, giving constantly changing micro gravitational signals that are followed by the roots sensitive detection system. This complication suggests that more definitive results might be obtained at lower cost in unmanned space vehicles.

On the roots of some plants of the pea family there are nodules housing bacteria that convert the abundant atmospheric nitrogen gas into a mineral form

Continued on next page

Roots, Continued from previous page

that fertilizes the plant. In return the bacteria are sustained by nutrients from the plant. Currently plant and microbial scientists are attempting to genetically confer this symbiotic association on other crop plants, eliminating the need to get optimal production by application of nitrogen containing fertilizers.

Professor Feldman's presentation reminded his listeners that study of roots not only has practical applications for plant cultivation, but also is a challenging research area.

Larry Waldron

Have MLS Will Travel

It is a world apart from the parsonage of the Bronte sisters to Mill Valley, Marin County and the parsonage where Ann Jensen grew up. One of the new members of the Emeriti Association Executive Committee, she remembers the small, close community of her childhood leaving the house with a call that they were going hiking to Stinson Beach, being acquainted with all the small shop owners, knowing where your grade teacher lived so you could go "trick or treating" there, and spending many hours at the local library.

Leaving Marin, she attended and graduated from Occidental College in Los Angeles, then moved to Alameda County where she met her future husband, Joe, when both were counselors at Juvenile Hall. The next fifteen years were spent raising two children and enjoying time with her husband, now a general contractor.

In 1980 she attended the Library School at Berkeley, and except for one year at Stanford in the Physics Department library, she has spent her entire professional career at University libraries—Lawrence Hall of Science, Engineering, and Mathematics and Statistics.

Ann is presently on call-back at the Office of the President working with Google and Microsoft on their proposals for digitalizing University books and periodicals.

That position is over at the end of the current academic year. Perhaps you may see the Jensens on your next Untour in Europe. Special places are calling to them.

Dues Due

Persimmons, pomegranates and pumpkins at the green grocer - it must be time to pay Emeriti Association dues. The Emeriti Times in your hand should have a year printed on the address label. The number 2007 indicates you have paid dues through December of this year. Some of you have numbers that go out through the two thousand teens. Those are persons who don't flinch at green bananas.

Why pay dues when you can participate in Retirement Center events and receive enticing discounts without paying dues? A portion of your dues goes to CUCEA, Council of the University of California Emeriti Associations, which "lobbies" the President's Office on matters regarding health and welfare policies and benefits. A portion of your dues supports the UC Berkeley Emeriti Association on local campus issues, most especially parking. Your president acts as an on-going Berkeley lobbyist.

Dues are only \$15/year. You can pay at the November 17th luncheon, or you can mail your dues (payable to UCBEA) to UCB Retirement Center, 2 Boalt Hall #7200, Berkeley, CA 94720-7200. Please remember to indicate the years to be covered in the memo area of your check.

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Love's Labour Won

New text for this box...

