Knowledge in the Making

In Landscape Architecture—Dr. Samuel Ocaña Garcia, governor of Sonora, Mexico, has announced that his state will proceed with plans to develop a Sonoran Desert museum at Hermosillo. The initial plans, for a living museum similar to the Arizona-Sonora Desert Museum near Tucson, were drawn up by UA landscape architecture student Philip J. Zellner. Each fifth-year student in the landscape architecture program completes an off-campus independent study project. Zellner chose to propose a counterpart to the existing Arizona-Sonora Desert Museum, to map out a plan with some cost estimates, and to present the proposal to Ocaña. The student selected 450 acres of state-owned land near Hermosillo as a suggested site for the museum. He also developed a brochure about the planned museum that the Sonoran government can use in recruiting private investment for the project. Another year or more of specific planning, as well as successful fundraising, will be needed before construction can begin. Besides his presentation to Ocaña, Zellner has presented his museum proposal to several groups in Sonora, to the scientific Gulf of California Symposium in April, to the Arizona Governor's Commission on Environment and to the Arizona-Sonora Desert Museum. The plans call for the sharing of many programs between the Hermosillo and Tucson museums. For his project, Zellner received a top award from the Landscape Architecture Foundation during a national meeting of landscape architecture students in March.

In Nutrition and Food Science—Dr. Darrel E. Goll's basic biochemical research points toward a long-range possibility of dramatic increases in the efficiency of meat production. He has been studying an enzyme in animal muscles that catalyzes the breakdown of some muscle protein. Finding a way to alter the amount or activity of this enzyme might decrease the rate at which muscle cells destroy their own protein. That could improve the efficiency with which domestic animals turn feed into meat.

Goll and his colleagues have discovered that the protein-breakdown enzyme, protease, exists in two forms, an "on" form and an "off" one. They have purified both forms and are analyzing the differences. They have also found and purified a specific protein from muscle cells that inhibits both forms of the protease. Besides manipulation of enzyme levels, another application of this work could be chemical tests for measuring either the enzyme or the inhibitor in living animals. Such a test, as an indication of a young animal's growth potential, could be useful in selective breeding programs. The research may also have medical importance in the understanding of muscular dystrophy and the damage to heart muscle following a heart attack, both of which involve abnormal breakdown of muscle proteins.

In Agricultural Economics—Dr. Roger A. Selley, Dr. James C. Wade, and Extension specialists including Charles E. Robertson are developing and adapting computer programs useful for managing individual farm and ranch operations. Some programs are designed for use with remote terminals hooked up by phone to a central UA computer. Others are being developed for various small computers and programmable calculators practical for farm use. Some of the programs will compute break-even costs for alternative irrigation systems, evaluate beef cow herd replacement strategies, analyze risk-management problems and calculate cattle ranch costs. Many other agricultural computer programs and data systems, developed by other Land-Grant universities and by commercial companies, are available to computer users through software distributors and computer networks.

In Plant Sciences—Dr. Dale Smith and Dr. Albert K. Dobrenz are studying the levels of phosphorus and magnesium in alfalfa from many parts of Arizona. Insufficient amounts of these essential elements prevent plants from producing as much hay as possible. Last year the agronomists tested alfalfa tissue from 49 farmer fields in seven counties. Tissue tests found plants from almost three-fourths of the fields deficient in phosphorus. Soil tests from the same fields showed no correlation between levels of these elements in the soil and their levels in the plant tissue. Greenhouse tests using soil from a field where alfalfa had been low in both elements showed that adding phosphorus to the soil improved alfalfa growth significantly. Added magnesium also significantly improved growth, but only when plants had adequate phosphorus. Smith and Dobrenz are continuing both greenhouse and field studies. Meanwhile, they suggest that alfalfa growers seeking maximum production should have tissue tests run on the second or third cuttings of the crop to see that all needed nutrients are reaching the plants in adequate concentrations.