

veloped a variety of programs for faculty and students and now has collaborations of various kinds with some 60 institutions.

The shifts in Exxon R&D strategy occurred at a time when the company at large was adjusting to the fall in demand for oil and operating in what one staff member calls a "shrinkage mode." Along with closing some refineries and other facilities and cutting back the work force worldwide, the company also reduced R&D budgets and employment including ER&E's.

The Clinton lab project had a high enough priority to proceed despite the retrenchment. David says that corporate

research had outgrown the Linden site. The concentration of people and equipment was causing concern about safety hazards. Also, working arrangements in the postwar-vintage buildings were clearly inefficient. A country-wide search for a new site was conducted, but a decision to remain in the area was prompted by a survey finding that a move requiring long distance resettlement would result in the loss of as many as half the professionals.

The new labs are an example of "design from the inside out," says David, who had a direct hand in devising a layout aimed at "producing good science and technology." This gave the archi-

tecs limited latitude and what resulted is very agreeable inside but gives a slightly stern, institutional impression outside. The labs' solid appearance—company wags call it Fort Exxon—might be said to symbolize basic research finding a permanent home at Exxon.

Is Exxon again gambling on a particular energy scenario? David says that anyone who has an R&D strategy fixed on one future is in for trouble. "The lead time is long in this business, and you have to have contingency plans," says David. "Our R&D strategy for some time has been to provide the tools to move in whatever direction is necessary."—JOHN WALSH

Population Studies Age Prematurely

The university base for world population studies is suffering a "premature hardening of the arteries" according to a report prepared for the Ford Foundation. Many programs are overly academic in emphasis and divorced from the realities of developing countries, says the study, prepared by Jack and Pat Caldwell of the Australian National University's Department of Demography.

The foundation commissioned the report for an assessment of its population program. Support grants tapered off in the late 1970's, although Ford continues to put some money into population-related activities.

Ford money totaling about \$45 million established the first programs on world population and was their mainstay during the heyday of the field in the 1960's. Ford gradually withdrew as the government got involved.

Although this is the way of foundations, the Caldwells' report strongly suggests that Ford should get back in the business of bolstering graduate programs—not only because of the magnitude of the problem but because population programs need a source of flexible funding to foster innovative research and more direct involvement with developing countries.

There are two wings to population studies. Demography programs, where people are usually trained for academic professions, are generally housed in departments of sociology. Population experts are also trained in schools of public health, where they are usually prepared to administer family planning programs.

During the 1960's, as new ties were being formed in Third World countries, population studies had an activist cast, and often came in conflict with more traditional academic thinking. The Caldwells say that as foundation funding dwindled, programs became more dependent on their universities and have succumbed to pressures for academic conformity.

The report indicates that the programs in schools of public health continue to sustain contact with the Third World. Nonetheless, in many of these schools, the training emphasis has shifted from family planning programs to general health management.

Population studies associated with social science pro-

grams "regard the present period as a crisis" and "have a feeling of their Third World involvement slipping away from them," say the Caldwells. These programs have gained security and respectability but at the expense of flexibility and innovation.

The Caldwells see an urgent need for seed money to support basic research on culture and fertility. The authors say the country has been "misled" by the success of family planning in East Asia into thinking the same pattern will bring results elsewhere—despite, for example, the dismal failure of family planning to become established in Africa.

The authors are critical of the heavy emphasis on statistical research. Incessant analysis of World Fertility Survey data tapes "are not bringing population programs closer to the Third World experience," says the report. Research projects supported by the Agency for International Development are narrowly defined and usually confined to operations.

Queried by *Science*, several program directors voiced general agreement with the thrust of the Caldwells' analysis. Samuel Preston of the University of Pennsylvania said "most LDC [less developed country] demographic analysis is done primarily in computer centers," and "the field lacks ideas."

They also note that the field still enjoys infusions of private money. Part of the gap left by Ford is being filled by the Hewlett and Mellon Foundations.

Population research is still a very new field. It is only in the last decade that accurate projections of world population have been available. The report offers an ironic perspective on the current Administration's thinking: until the 1950's, the prevailing view was similar to President Reagan's—that demographic transitions would naturally accompany economic development. As early as 1944, demographer Kingsley Davis called this view into question, warning that if India followed the pattern of the West's demographic transition, its population would reach 750 million by 2024. Even Davis, who was considered an alarmist at the time, was wide of the mark: India's population is already approaching 740 million.

—CONSTANCE HOLDEN