

Challenge to the university

Unless it changes, the conventional university could lose its place as intellectual pacesetter



Since the university was established eight centuries ago, it has been dividing and redividing itself into academic cells. What was once called philosophy became history, political science, mathematics and biology. These in turn divided into further specialities.

While the trend to specialization has often been deplored, it has never been stopped. As a result, there are indications that universities may now be in serious trouble, unable to deal with broadly scaled contemporary problems such as urban deterioration and environmental pollution.

Segregated into academic departments, professors cannot generate the knowledge that would help solve today's human problems. The threat, as voiced at a recent joint meeting of two university associations—the National Association of State Universities and Landgrant Colleges and the American Association of State Colleges and Universities—is that intellectual leadership could move to nonprofit research institutes which are unhindered by specialization.

"There is a real threat," says Dr. James T. Bonnen, Michigan State University economist, "that in the long run human resources will dribble away from the university." Nonprofit groups such as the Urban Institute are becoming substitutes for the university, he says. "Students are quite right when they say we behave in an immoral fashion. Our intense specialization results in an inability to solve problems."

Dr. Bonnen is currently heading a two-year investigation of the role of the university in public affairs, sponsored by the landgrant institutions as a group.

He says the die will be cast within five or six years; then it will be obvious whether universities or their nonprofit substitutes will lead in urban affairs.



Dr. Garrison: change unlikely.

Dr. William L. Garrison, director of the Center for Urban Studies at the University of Illinois, believes the process has already begun. "The nonprofit institutes are the places of intellectual excitement today," says Dr. Garrison. He believes that unless academics can reforge the disciplines into a shape more relevant to contemporary life, universities will turn into diploma mills. And he sees as slim the chances that university departments will reshape themselves.

Even centers set up to handle urban problems fall prey to the tyranny of academic departments, mainly because the academic field is where scholars find their money, says Dr. Garrison.

At such university centers, "individuals from disciplines X, Y and Z, undertake their X, Y and Z activities with little ability to interact or communicate among themselves," he says. In some cases research teams have filled a few gaps in knowledge, but they have not added notably to fundamental understanding. Dr. Garrison does not ex-



Dr. Bonnen: professions static.

clude his own academic center.

At least three sources of resistance to change came to light at the joint meeting held in Washington this month.

- Most faculty members are not aware of the problem. Complained one administrator: "Some faculty members see this (urban affairs) as interesting and exciting, but it's an uphill battle with the rest."

- More and more power is centered in academic departments as universities grow in size. According to Dr. John J. Corson, consultant to the Carnegie Corp. and a former Princeton University professor, "the more power exercised by the department, the more surely will the educational program suffer from a narrow provincialism."

- Professions in the various disciplines act as guilds, protecting the traditional departmental structure. They often set requirements for accreditation and are "a very static force," says Dr. Bonnen.

A fourth problem lies in confusion

over the meaning of urban affairs. As Dr. Garrison explains, the word takes in virtually all of modern urban life and deals with deep questions concerning the future of society. In social sciences particularly the hypothetical distinction between basic and applied science becomes shaky indeed. But academics have not accepted this fact, says Dr. Bonnen, and participation in urban research is still controversial on many campuses.

"The academic has never been forced to give up his old beliefs. He has the idea that outstanding scholarship is a distilled essence of theory and abstraction." In fact, says Dr. Bonnen, this has not been true for some time. Universities are very much at the center of a society where power has shifted from production centers to knowledge centers.

Dr. Bonnen believes a change in academic values may be enough to refocus the university without major changes in structure or power. Dr. Corson disagrees. He believes that the university president must persuade departments to shift over some of their power to the administration. "The president must wrack his imagination to find ways to break down the isolation and the stultifying authority of the department," says Dr. Corson. "Not only does the future of the university hang on his ability effectively to put himself in charge, but the well-being of our society increasingly depends on his success."

Dr. Garrison suggests a third tack: restructuring the faculty around cores of knowledge. One move in this direction has occurred at the University of California's Irvine campus where the School of Social Sciences has no departments and only two programs.

One of these is a cross-cultural program focusing on development, both human and economic; the other is a program in formal analysis with the emphasis on mathematics and statistics.

Students may choose either the developmental or analytical approach and are taught by professors from many disciplines. The campus gives its professors flexibility by assigning them a certain fraction of its resources each year. A professor may move from one program to another, taking his financial and secretarial services with him.

Even should the university adapt itself to demands of contemporary society it will be years before the academic world can come up with the knowledge needed for today's problems. Drs. Garrison and Bonnen predict 20 to 50 years.

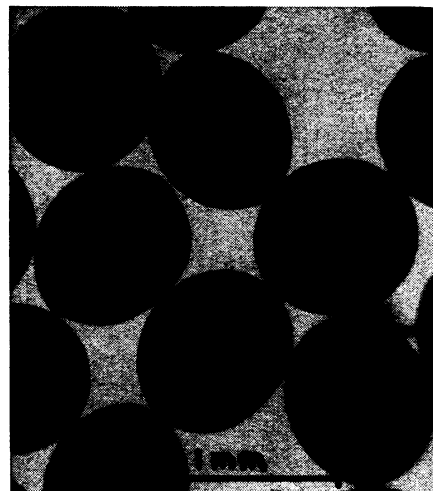
"We're going to go through a rough, rough period," says Dr. Bonnen. "There will be ad hoc political solutions long before we have social science decisions."

REMOVES POISONS

Edible kidney developing



George Washington University



Case Western Reserve

Cumbersome kidney machines may be reduced by ingestible microcapsules.

Some organs can go awry without any immediate threat to survival. But if the kidneys fail, the body cannot carry on. The kidneys cleanse poisons from the blood, maintain the body's balance of salts and water, and daily flush a quart or two of urine from the system.

Kidney failure kills about 60,000 persons a year in the United States; 8,000 to 10,000 of them could be saved by treatment on an artificial kidney machine. But these machines are cumbersome, expensive and few. Persons who need them must spend two to three nights a week in a hospital, hooked to the dialyzing machine. Because there are neither enough machines nor enough qualified teams to handle these patients, for every one accepted for an artificial kidney program, eight are turned away to die.

A simple, total substitute for the human kidney—or even the bulky artificial one—is a long way off. But scientists at Cleveland's Case Western Reserve University are already developing a substitute that attacks the problem from a different angle: with a capsule that is administered orally and contains a chemical system that can do at least part of the kidney's job.

Dr. Robert Sparks, after three and a half years of research, reports encouraging results from preliminary attempts to perfect an ingestible system that will duplicate the kidney's job of removing poisons, particularly urea, creatinine and uric acid. Dr. Sparks, a chemical engineer, has been working with Dr. Olgierd Lindan, a medical doctor. Animal and human testing of the capsule kidney are planned for the near future.

They use nylon balloons as capsules, Dr. Sparks explains. About 1.5 millimeters, these contain an enzyme called

urease, as well as other chemical reactants and resins. When swallowed, they would go to the gastrointestinal tract. There, urea would pass through the capsules' membrane walls and come in contact with the urease which would break down the urea into ammonia and carbon dioxide. Especially formulated resins hold the ammonia inside the capsule, which is finally excreted, and the small quantity of carbon dioxide would be readily eliminated through the bloodstream and lungs.

Dr. Donald Gann, director of Case Western Reserve's biomedical engineering division, predicts that within three to five years it will be possible for persons with sick kidneys to take these capsules, perhaps several times a day, to keep their blood free of poisons.

Though it would not eliminate their need of an artificial kidney, it might make it possible to lengthen the time between treatments, Dr. Gann suggests, from the present two to three nights a week to one every two weeks or so. That would release time on the machines for use by other patients.

Another, and perhaps more immediate, use of microcapsules would be to add them to dialyzing fluid within artificial kidneys.

If poisons could be trapped and handled by microcapsules, the volume of fluid could conceivably be cut from some 100 quarts to 10 to 15 quarts, greatly reducing the size of the machine and possibly pointing the way to development of small machines patients could more readily use at home.

Development of chemical systems that can be built into tiny, ingestible capsules are also potentially useful in eliminating drugs from the body after an overdose.