

## The health of American universities

The health of US society is uniquely coupled to that of its universities. To a greater degree than any other country, this nation has considered basic research and graduate education to be inextricably linked and symbiotic. Our country looks to its universities both for new knowledge and for the young trained minds prepared to use science and technology effectively. But just at a time when much is expected of our universities, after more than a decade of retrenchment and belt tightening, higher education finds itself with obsolete equipment, aging facilities and growing shortages of both faculty members and students in many important fields.

The problems are real and ubiquitous, a panel of the White House Science Council has found during its examination over the past 18 months (see page 65).

The panel concluded that the problems cannot be solved just by spending more money, although increased support for university research is clearly necessary. What is required is a rethinking of the fundamental relationships linking the Federal government, the universities and US industry. It is time to take an honest look at the real costs of university-based research and how those costs should be borne. We must return to the viewpoint that Federal support of research should be treated as a long-term investment in the nation's future rather than as a procurement of products and services.

If we are to have an acceptable future in an increasingly technological and competitive international marketplace, and if we are to respond adequately to national needs in the areas of economic competitiveness, national security and quality of life for all our citizens, the time has come when a new partnership must be forged involving the Federal government, universities and the private sector. And we must be realistic about the very real limitations on the extent to which industrial support, important as it is, can replace that from the Federal government.

The panel concluded that relatively minor changes in the way the Federal government supports university research can greatly increase the effectiveness and flexibility of that support and at the same time cut through the burgeoning paperwork and bureaucracy that is threatening the vitality of academic life in this country.

It was the panel's goal to structure a Federal government-university interface that would minimize friction and unnecessary reporting while maintaining essential accountability; at the same time it would in the steady state provide a cash flow that would enable universities to maintain and modernize their facilities and equipment at a level commensurate with the

demands being made upon them. To reach an acceptable steady state in timely fashion, however, we also recommend establishing a 10-year interim facilities fund within NSF.

Also critical to our future is a continuing flow of able, dedicated students. To this end, and in recognition of the special leadership demands that will be made upon our most able youth, the panel recommended a new program of merit-based, portable scholarships for undergraduate study with the goal of including the most able 1% of each entering class in mathematics, engineering and the natural sciences. It is essential that this new program be complementary to the present need-based programs, which have served the nation extremely well in giving access to higher education to many who would otherwise have been denied it and in making our universities and colleges more interesting places.

We recognize fully that these and other recommendations imply additional funding devoted to our national science and technology base. We recognize too that in the time of Gramm-Rudman-Hollings it will be very difficult to find such funding. But at the same time, Congress, the Administration and the nation as a whole are focusing as never before on our great dependence upon our universities and colleges. The challenge is to mobilize this general and often ill-defined concern to constructive purpose.

No matter what the eventual scenario, one thing stands clear. Hard choices lie ahead for the universities. They alone are responsible for making the decisions concerning people, programs and facilities that will enable them to remain healthy and vital within the level of resources available to them.

Let there be no misunderstanding. Unless we scientists and engineers take the time to become acquainted with these problems and challenges, and unless we as individuals become involved in their resolution, the national higher-education enterprise that we pass on to our children will be, for the first time in our history, less strong, less challenging and less healthy than the one we inherited.

Physicists have traditionally responded enthusiastically and effectively to such challenges. This is the time for action; by debating and—we would hope—supporting the recommendations for change, each of us can make a real and lasting difference.

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