bish. Evidence is accumulating, however, that the socioeconomic distribution in the polys is about the same as in the universities. In other words, students from middle-class families are heavily dominant in both. One recent, fairly widely publicized study showed that there were fewer children of manual workers in one of the better known London polytechnics than in the University of Essex. Some poly directors are beginning to boast that their institutions are the first choice of some students qualified for universities. This may suggest some status changes in higher education in Britain, but there are grumblings that the polys will soon be as selective as the universities.

There may be another analogy to the British situation in the recent tendency of American colleges and universities operated by local governments to be taken over by the states. The polytechnics are locally controlled and, technically, locally financed, but the major portion of the cost of degree-level courses is already reimbursed by the national government and the Department of Education and Science wields increasing authority. As polytechnic education grows more expensive and national financing more explicit, the influences of DES will surely grow accordingly.

The big question for the polytechnics remains whether they will develop as the top echelon of the public sector and as a real alternative to the universities. Some seasoned observers find it difficult to believe that the 30 institutions in the group will remain homogeneous, but rather expect some of them to escape into the university sphere.

Skeptics have argued that the government is boosting the polytechnics because they are regarded as a lower cost substitute for universities. Salaries of polys are upgraded, and as the polytechnic faculty are now on the same salary scale as school teachers, and their pay is generally lower than that of their university peers. The pay range on the separate university scale is much greater, and university faculty at the higher levels of the scale are much better paid than top-level poly faculty. It is getting more difficult to defend the salary differential as the polys are upgraded, and as the polytechnics grow more like the universities in pay and in other respects, it is not unlikely that a sort of Trojan Horse effect will occur.

It would be ironical if the polys didn't change the pattern of postsecondary education. Only about 30 percent of British young people now complete secondary education compared with 75 percent in the United States. About 15 percent of the age group in Britain are in "further education," and perhaps 22 percent will be by 1981. Some critics believe the new education policy misses the 15-to-18 year olds who are not finding their way into postsecondary education. Higher education is not yet regarded as a right in Britain, and the tradition of academic competition and a relatively generous system of student grants has probably delayed demands for "open admissions" and special programs for minorities and students from low income families. But if the new policy does reveal this sort of a gap, it is not hard to predict what the demands will be in a later round of educational reform.—JOHN WALSH

Peer Review: Edwards Denies System Will Be Undone

A couple of weeks ago, the biomedical community at large got wind of the fact that the Nixon Administration has challenged the validity of the peer review system by which the National Institutes of Health (NIH) dispense hundreds of millions of dollars in research grants every year. Dismayed by what they were hearing, many biologists set out to assess the extent of the threat to peer review and to dissuade the Administration from any precipitous tampering with it (*Science*, 25 May).

Now Administration officials, particularly Charles C. Edwards, the assistant secretary for health in the Department of Health, Education, and Welfare (HEW), are trying to reassure everyone that the peer review system is not about to be dismantled. "If we were trying to eliminate peer review, I wouldn't be here," Edwards told *Science*. He believes that the biomedical community is overreacting. Edwards concedes that the peer review system is under scrutiny by HEW and the President's Office of Management and Budget (OMB) but says it is not under attack.

According to Edwards, when Caspar Weinberger became Secretary of HEW, he decided to take a look at the department's mammoth advisory system with its more than 400 committees, some of which meet only once a year, if that. There is a clear feeling that some streamlining is in order. However, Edwards said, "We have absolutely no thought of doing away with peer review." He went on to say that this does not mean that HEW thinks peer review should take the place of good staff work. Commenting that he would like to see the peer review system expanded to cover some of the activities of the Food and Drug Administration (FDA), which he formerly headed, and to the awarding of research contracts, Edwards said that he thinks it important that the contributions of outside reviewers be matched by good staff work.

As the peer review system at NIH works now, it applies primarily to research grants. Most of the significant decisions about rating and funding applications are made by outside consultants—members of scientific study sections or of institute advisory councils. Staff members play a somewhat peripheral role in this process, particularly in comparison to the authority they have over contracts. In other HEW agencies, including FDA, staff members have virtually full authority over both grants and contracts, using the advice of outside reviewers on an ad hoc basis rather than on a regular one, as does NIH.

In spite of Edwards' assurance that "the grant mechanism at NIH will remain essentially unchanged," some biomedical administrators and researchers are not convinced. Certainly, in the abstract, the idea of greater staff control does not appeal to scientists, who

have an inbred distrust of the scientific judgment of men who are not themselves in the laboratory. But it has a certain appeal to government officials, who are looking for administrative efficiency, coordination, and research that bears on targeted projects.

The source of all this concern over peer review is an eight-page document from the OMB that, after a précis of the system as it works at NIH and at the National Institute of Mental Health, lists eight "problems with the peer review system." Among them are the following:

- The process is largely reactive to the initiative, interests, or whims of individual researchers and therefore is not readily compatible with targeted or directed research to achieve specific national objectives.
- The participatory process produces a large clientele group that has a personal interest in the continuation of the process and the increase of appropriations at its disposal.
- The system currently operates largely independently of administrative direction for the allocation of research funds.
- Because it uses subjective measures of judgment, and thereby defines "scientific merit or quality" for itself, the system is not subject to objective measures of assessment.

Efforts to avert any potential OMB moves to significantly change, or even abolish, the system have taken different forms. The council of the Institute of Medicine, National Academy of Sciences, at its May meeting, urged institute president John R. Hogness and academy president Philip Handler to seek a meeting with Weinberger and Edwards. At the meeting, which took place on 21 May, they discussed both the question of greater staff review of grants and the matter of greater peer review of contracts in what has been described as "cordial terms."

On Capitol Hill, plans are under way to introduce legislation that would make peer review a mandatory rather than discretionary process. Speaking to a packed auditorium of NIH employees recently, Senator Edward M. Kennedy (D–Mass.) said he plans to introduce such a bill within days.

—BARBARA J. CULLITON

Oceanography: Albatross of Diplomacy Haunts Seafaring Scientists

If present trends in international negotiations preliminary to the 1974 Law of the Sea Conference continue, the United States ocean science establishment, as well as those in the United Kingdom, the Soviet Union, and other advanced nations, could become ensnared in red tape, slowed down or even, in the words of one expert, "killed" in the next few years.

In their fear of rich, technologically elite countries, some developing countries, during preparatory meetings, are seeking limits on ocean research because they want access to any goodies the scientists might discover as they cruise around the globe taking their measurements and samples. The fear is based on the fact that those nations with an oceanographic capability—the United States, the Soviet Union, and the United Kingdom—also have the power to exploit any resources they might discover. The United States is arguing that everyone should be permitted to do research, and make the results available to everyone else.

Two trends in the negotiations threaten the future of ocean research. One is the trend in developing countries to declare all activities within 200 miles of their coastlines subject to regulation by them. The 200-mile band includes portions of the continental shelf that are of great interest to physical and biological marine science, but it can also include oil, gas, and other wealth-producing sunken treasures. On the old axiom that "science-leads-to-knowledge-leads-to-wealth," these governments prefer to keep the scientists —and all potential exploiters such as foreign oil companies—ignorant of what is off their coasts. Fear of economic exploitation, then, is the powerful motive for curbing ocean research. One prominent scientist, citing the restrictions already enforced by Brazil and some other Latin American countries said, "there isn't any science going on off South America anymore."

The second tendency is a growing consensus that some sort of international organization should be established to oversee activities on the high seas, those waters beyond any national jurisdiction. Such a group could be empowered by the 1974 Law of the Sea Conference to claim royalties from seabed mining of manganese nodules (*Science*, 25 May), for example, or manage other resources. The suggestion has been made that it also license ocean research vessels. William Nierenberg, director of the Scripps Institution of Oceanography, fears international licensing may wreck science. "It's not like peer review. Licenses would be made on the basis of political considerations, on which nation should get any resources they might find . . . you would open up a whole Pandora's box."

The United States has adopted the oceanographic community's advocacy of freedom of research, which they define as the right of research vessels to operate anywhere in the world, whether offshore or on the high seas, so long as the findings are nonproprietary commercially and are unclassified in the military sense. Although this position has the blessing of the International Council of Scientific Unions (ICSU), the National Academy of Sciences (NAS), the National Science Foundation (NSF), and other groups, the scientists' lobby remains rather weak and flimsy. Compared to those of interest groups —oil, mining, defense, fisheries and others—who want to keep their particular planks afloat in the overall U.S. position, arguments that the advance of knowledge will be hindered, or that we will know less about plate tectonics, or the history of the planet, carry relatively little weight. Roger Revelle, a long-term fighter in the cause for international ocean research and director of the Harvard Center for Population Studies says, "The scientists don't have any clout. They don't represent any economic or national security interests. They are a weak group politically and haven't been successful in developing a constituency. So their interests are