pointed only that important detailed agreements have been overshadowed by political battles on nonenvironmental issues." Carlos Calero Rodrigues, one of the Brazilian delegates, said, "Yes, we are satisfied with the results. We didn't expect too much, but we approve the recommendations—they are good." Even Commoner admitted that the conference had performed "a valuable, even if limited, service to mankind." With another conference promised, or threatened, for 1977, the caravan seems to be well under way.

—NIGEL HAWKES

National Institute of Education: New Direction for Education R & D

A section creating a National Institute of Education (NIE) evoked only minor notice when the House of Representatives on 8 June passed and sent to the President the controversy-ridden education authorization bill (*Science*, 26 May). But, with a lot of luck and good management, the new NIE could have as beneficial a long-term effect on the quality of American education as anything in the legislation.

The education bill still awaits the President's signature and the level of financing will depend on the outcome of the appropriations process. It seems a good bet, however, that NIE will emerge substantially in the form and with the funding now contemplated, since the bill has the support of the Administration and bipartisan backing in Congress.

It is lucky that this sort of consensus exists, because NIE is meant to give new direction to education R & D which, in retrospect, is perhaps the least inspiring chapter in the annals of federal research.

The models for NIE are the National Science Foundation (NSF) and the National Institutes of Health (NIH), particularly the latter. But the mission of NIE is at this point both broader and less clearly defined than the missions of NSF and NIH. The new NIE is charged with fostering basic and applied research, development, and demonstration projects and with carrying out effective dissemination of useful results. Its charter evidently extends from preschool education through higher education. The breadth of its commission and the variety of tasks set for it are sources of misgivings to some of NIE's partisans.

The NIE idea dates back at least as far as a National Academy of Sciences–National Research Council report in 1958, but the proximate cause of the institute's emergence was its mention in President Nixon's message on education reform on 3 March 1970. Its presence there can be traced directly to Daniel Patrick Moynihan, then adviser on social legislation in the White House. The idea picked up legislative momentum when Representative John Brademas (D–Ind.), chairman of the House Education and Labor Committee's select subcommittee on education, introduced what in effect was an Administration bill. A second bill, H.R. 33, was introduced last January with Education and Labor Committee chairman Carl D. Perkins (D–Ky.) and Representative Albert H. Quie (R–Minn.), the committee's ranking Republican on education matters, joining Brademas as cosponsors. The NIE idea was amplified through a Rand Corporation "preliminary plan" commissioned by the Administration and through hearings before the Brademas subcommittee last winter and spring. The tenor of testimony in the hearings was of support for the idea tempered by references to past and probable future difficulties. The NIE proposal won favorable action in both the House and the Senate and was incorporated into the conglomerate education bill (S. 659) enacted this month.

The restraint on enthusiasm noted in the hearings and among some legislators seems fully justified by the history of federal education R & D. Research on problems connected with education has been going on in a university setting since the end of the last century, but for much of the time the bulk of the work was done in the context of graduate study by people preparing for active careers as teachers and administrators. The results were analogous to what would probably have happened if biomedical research during the same period had been carried out part time by general practitioners and hospital administrators.

The scientific base for education research has until recently been extremely narrow. Psychology was the principal discipline drawn on for education R & D, and education psychology has been far from the most prestigious branch of the discipline.

Federal funds for education R & D did not become available in substantial amounts until after World War II, although some impact was made on education by wartime research, for example, in instruction techniques and materials for the military. The Cooperative Research Act of 1954 authorized the Office of Education (OE) to make contracts and cooperative arrangements with institutions of higher education for studies on educational problems. Some $35 million was to be spent on the program during the next decade, but significantly OE was not permitted to give research grants. As an agency administering research programs, OE displayed some decided shortcomings. Historically, OE had dealt with public schools, elementary and secondary. OE bureaucrats tended to be "school people" without much acuity as research administrators. Furthermore, OE was conditioned to avoid any semblance of "federal intervention," so it was safer simply to react to research applications sent in rather than to set research priorities and to award contracts where those priorities were most likely to be achieved. The pattern was for small projects to be rather evenly distributed—to keep Congress happy—among institutions with which the bureaucrats had ties and which often had lackluster research traditions. The result, for the most part, was trivial research results.

A significant change in the kinds of people engaged in education R & D, broadly defined, occurred in the period after Sputnik. Effort centered on the reform of elementary and secondary school curricula, particularly in mathematics, sciences, and languages. Sponsorship by NSF and private foundations of the curriculum reform efforts provided the R & D model, but the

crucial feature was the involvement of university scholars, especially mathematicians, physical scientists, and life scientists, in the programs. The point was that it became respectable, and more, for university scholars to engage in education R & D. At about this same time, interest in educational uses of new technology—language laboratories, teaching machines, educational television, computerized instruction—was increasing and drawing new kinds of people into education R & D. In addition, a growth of activity in research in child development and problems of cognition were attracting numbers of behavioral and life scientists—experimental psychologists, physiologists, anthropologists—into what could be legitimately regarded as basic research in education.

The next major impetus came in the middle 1960's from Great Society social legislation. It had become increasingly evident that simply pumping more money into poor rural and inner city schools would not overcome the effects of deprivation. The major rationale of the Elementary and Secondary School Act of 1965 was that it provided a guarantee of significant federal support for school districts with concentrations of children from low income families. To meet the needs of educationally deprived children, the Office of Economic Opportunity launched the Head Start program for preschool children. Head Start, however badly needed, was a crash program with a narrow intellectual basis and no time for pilot projects. Started by OEO and later shifted to the Department of Health, Education, and Welfare, Head Start never really recovered from its ad hoc origins.

The need for more and better R & D was recognized in the Elementary and Secondary School Act's education research and training section, which provided more money for research and for financing graduate education and postdoctoral work in education research. To help break the patterns of the past, the bill also called for the creation of regional centers for research in education. The hope of the proponents of the new regional research labs, as they came to be called, was that they would be detached from the established education-research institutions and provide the locus for new kinds of interdisciplinary research in education that would involve people in the arts, as well as sciences, who had previously been little represented in education R & D.

By most accounts, the regional labs have been a mixed failure. Two or three of the score of labs seem to have fulfilled the original hopes; the rest, by and large, are said to have been captured by the education establishment and to be producing unimpressive results.

This recitation of dismal events is, of course, not the whole story of education research. In fairness it must be noted that education R & D is meagerly financed in relation to the size of the educational enterprise. An estimated $200 million a year is spent on education R & D, while annual expenditures on education are near $70 billion. Health expenditures run at something over $60 billion a year, but R & D costs in the health sector are put at about $2.5 billion. When the even greater proportion of investment in

Briefing

Wakelin to Leave: New Council Rumored

Several straws currently in the wind indicate that the Nixon Administration has new plans for science. One is the not-yet-official departure from government of James H. Wakelin, Assistant Secretary of Commerce for Science and Technology. Although his letter of resignation had not been sent to the White House, Wakelin confirmed in a telephone conversation last week that he would leave Commerce by August because, he said, he has "other things" he would like to do. Other knowledgeable sources, however, have described Wakelin's leaving as "precipitous"; his boss, the new Secretary of Commerce Peter G. Peterson, is said to have "his own ideas" about science and technology.

With Wakelin's departure, two key science jobs in Commerce are vacant, the other being that of Lewis S. Branscomb, who resigned last month as director of the National Bureau of Standards. Wakelin is said to have been heading up the search for Branscomb's successor. Now, Peterson will have a free hand to choose his two science lieutenants, and in doing so, to shape the main features of the Commerce Department's growing role in science.

Another indication with import for the future is the increased consideration now being given in Administration circles to the establishment, after the elections and assuming (as they do) that Nixon will win, of a prestigious council of science and technology advisers.

The three or four member council would supposedly do for science and technology what the Council of Economic Advisers does for economics: providing the White House with top level, highly visible advice which can counterbalance the strategems of the federal agencies.

As for its effect on the status quo, while such a group would bolster the relatively weak hand of the President's science adviser, it would probably use the Office of Science and Technology (OST) as its staff—thus lowering OST's visibility—and perhaps make obsolete the President's Science Advisory Committee (PSAC).

According to knowledgeable sources, this proposal, which has been in the files for years, has now become "very much alive."

Not only alive, but kicking, however, is the issue of what the proposal implies for PSAC. The prestigious PSAC jobs have long been coveted in the scientific community, but PSAC's orintation toward university science and basic research is a far cry from the Administration's bias toward applied science and industrial participation. There seems to be little question that PSAC's influence has declined in recent years. Three vacancies now exist on PSAC, and the last appointments were made in March 1970, before the present science adviser took office. No on in the Office of Science and Technology could be reached last week for comment, perhaps because it is likely that the White House science apparatus will be in for big changes, even if Nixon wins in November.—D.S.

R & D in the defense budget—roughly 10 percent—is considered, it is clear that education is not a research-intensive enterprise. Furthermore, much good education research literally moulders in the files because—as it was put in the hearings—the "transportation system" for education R & D is defective.

Correction of this problem of putting research into use is one thing NIE must manage if it is to close the circle of research, development, and utilization. Considering the slow responses of the system, the last stage in innovation could prove to be the biggest challenge for NIE.

The relationship of NIE to OE and to other agencies is, of course, an essential question. The NIE legislation calls for a major restructuring of the education section of HEW. The bill follows the Rand study in making NIE a separate agency equal to OE. The NIE is to have a director appointed by the President and confirmed by the Senate who will occupy the same grade level as the Commissioner of Education.

A 15-member advisory council is to give the agency advice on matters of general policy and review the state of education R & D. Advisory councils are standard equipment for agencies created by social legislation and unfortunately are often peopled with those who are simply thought to be deserving of one of the minor honors an Administration can bestow.

Chances that a research agency will succeed are improved if research administrators can deal with potential investigators on a basis approaching professional parity. Federal programs in education research have been generally underpowered in terms of management. The OE research branch, for example, in recent years has had four people in civil service supergrade posts —with salaries in the upper 20's and the 30's—compared with 50 such positions in NSF and 90 in NIH. The new bill calls for a big boost in the number of supergraders.

The size of NIE's budget will have an obvious effect on the scope and character of its operations. The Rand report calls for a $155-million budget in fiscal year 1973 and over $1.1 billion by 1982. Congressional sources expect that the Administration will seek the target figure for 1973, but it should be noted that perhaps $90 million of that represents funding for programs which will be transferred to NIE and presumably will be continued, at least in the short run. The expectation is that NIE will put most of its resources into extramural projects but run a small intramural program.

In recent years, OE has to some degree overcome its inhibitions about funding large projects involving some elements of risk or controversy. The much-discussed children's television series "Sesame Street" cost about $8 million and its "Electric Company" successor series considerably more. The ambitious National Assessment Program is expected to cost about $40 million over a decade. So with this precedent and the permissive legal language defining the functions of NIE, the new management will have considerable freedom to set priorities for the institute.

What Congress apparently would like would be a mix—more "Sesame Street" successes at one end of the spectrum, more adventurous basic research at the other end. Brademas hinted broadly at what he hoped for in NIE leadership in a speech at a meeting of the American Educational Research Association in 1971. "It seems to me," he said, "to be most important that the initial staff of the NIE be of the highest scientific caliber, and must represent not only all that is best in the educational research of the recent past but also those fields in which new contributions to learning about learning might be found.

"In fact, I can easily foresee in the membership of the American Educational Research Association many more anthropologists, political scientists, communications engineers, cyberneticists, and neurophysiologists than you may have now."

With its limited resources and facing truly formidable problems, NIE cannot reasonably be expected immediately to engender the science of education that John Dewey hoped for. But the new institute should manage to put more good science into education R & D.

—JOHN WALSH

Columbia Loses Ewing to Texas

Texan largesse and the lure of home have deprived Columbia University of the head of its Lamont-Doherty Geological Observatory, one of the world's leading geophysical institutions. Maurice Ewing, director of the observatory since he helped found it in 1949, is to create another oceanographic institute from scratch for the University of Texas.

Ewing, a native of Texas, may not exactly have put the oceans on the map, but he has devised many of the modern instruments for studying them, charted the Mid-Atlantic ridge, discovered the Hudson River's offshore canyon, and laid bare many other unexpected features of sea floor topography and history. In inviting Ewing to Texas, the university regents last week voted $1.5 million for a preliminary building and over the next 5 years intend to provide "whatever is necessary for him to build up a fine institute." The institute will be part of the university's marine biomedical center at Galveston.

Under Ewing's direction over the last quarter-century, Lamont has grown to support a staff of 500 and two oceangoing research vessels on a budget of $10 million. Ewing says his reasons for leaving are the limited opportunities for expansion at Columbia, either in buildings or faculty positions, and the fact that he is approaching Columbia's retirement age. Some of Ewing's colleagues may follow him to Galveston, where there is an initial establishment for 30 scientists. But there is no mass exodus in the offing; Ewing said last week he was offended by incorrect reports that he would be taking with him 30 of Lamont's scientists and the *Robert D. Conrad*, a Lamont research vessel owned by the Navy.

Truman G. Blocker, president of the University of Texas Medical Branch at Galveston, says Ewing's name was first suggested by a committee studying the expansion of the university's marine science faculty. "When we found out that he was a Texan, we went right after him," Blocker says. The university's desire to build up its marine science activities is not unconnected with the continental shelf off the Texan coast and its oil-laden salt domes, which, in fact, were discovered by Ewing.—N.W.