Department report on minority-group hiring will be made public. "As a matter of policy, we never wash a contractor's dirty linen in public," Moskowitz said, "We need the goods."

If Michigan is a fair example, it is obviously no disaster if governmental recommendations are published; public airing of the problem may lead to faster action and to the realization that outside advice may be useful. "Generally, we're happy with the report," said university administrator Jack H. Hamilton. "We claim no simon purity. We're not that well acquainted with the problem. Mr. Greene works on it full time." In a telephone interview, Walter Greene, the official who conducted the study of the university, said that he didn't attribute the lapses he found at Michigan to conscious discrimination. "They're a little too moral there to purposefully engage in purposeful discrimination," he commented. Rather, Greene said, he thought the lapses were due "to not paying attention and not thinking about it."

Norman R. Scott, Associate Dean of the College of Engineering, who thinks that his college was unfairly singled out in Greene's recommendations, believes that some good may have come out of the review: "Inevitably, there are those at Michigan who feel they went too far, but this pressure has made it possible for people to do things which they might otherwise have been reluctant to do."

It is apparent that some federal officials would be happier if the University of Michigan, which terms itself the "mother of state universities," would educate more Michigan Negroes so that they would not feel like academically "motherless" children in their own state. The same kind of judgment might be made about a variety of universities in other states. Having already displayed some desire to move in the direction of a better integrated university, Michigan's leaders now seem ready to push a little harder to achieve the goal.

The Ann Arbor incidents this year are indicative of the changed conditions under which the nation's universities operate. The growing dependence of universities on federal funds gives an added impetus and importance to the type of federal reviews conducted at Michigan. For better or worse, such federal scrutiny of universities will continue.—BRYCE NELSON

Technology: Academy Panel Sees Need For Enhancing Applied Science

European concern over the so-called technology gap suggests, at a minimum, that the United States must be doing something right in the development and employment of its scientific and technological resources. But however golden the American scene may appear when viewed from across the Atlantic, it is a source of much restlessness among those who are closest to it. Over two decades, an unplanned gusher of federal support, inspired mainly by East-West tensions, helped create a huge and productive national research establishment. Now, because of the financial cost of running this establishment, and the enticing hope that science and technology can be as effectively deployed against "civilian" problems as they were against military problems, more and more attention is being turned toward two separate but closely related policy matters. These concern, on the one hand, the growth and quality of the nation's scientific and technical capabilities and, on the other, the institutional arrangements for using these capabilities to make life safer and more comfortable.

The latest manifestation of these dual concerns is a collection of 17 essays, *Applied Science and Technological Progress,** issued 25 May by the National Academy of Sciences. Written by a panel of the Academy's Committee on Science and Public Policy (COSPUP), the essays were prepared in response to a series of questions posed by the House Committee on Science and Astronautics, as part of its continuing inquiries into the affairs of science and government.†

Confronted with such issues as the criteria that should be employed for supporting applied research, and how the work should be apportioned among government, university, and industrial laboratories, the panelists produced no surprises. As the House Committee stated in a press release describing the report, "The applied research organization of the future will have to be flexible, adaptable and quick on its feet. It must be closely tuned, on the one hand, to public need and business reality and, on the other, to the workings and mechanisms of basic research —if it is to be effective, useful and profitable. This is the picture that emerges from a just completed report . . . ."

G. Evelyn Hutchinson, the Yale ecologist, gracefully raised the warning that one man's prescription for progress may be another man's death warrant, and that before significant changes are altruistically foisted on the environment, a high level of understanding should be obtained as to their ultimate effects. In general, however, his fellow panelists held to the view that the objectives are clear and the problem at hand is to rev up the applied science establishment so that they can be swiftly reached. Nevertheless, mixed in with the formulas for better flexibility, adaptability, and footwork were some curious new outcroppings of thought that merit notice.

For example, two years ago, COSPUP issued what was the forerunner of the present report, a collection of essays titled *Basic Research and National Goals.* In his contribution to that volume, Harvey Brooks, dean of engineering and physics at Harvard, and now chairman of COSPUP, wrote, "Basic research is recognized as one of the characteristic expressions of the highest aspirations of modern man. It bears much the same relation to contemporary civilization that the great

* Copies of the collection are expected to be available for general distribution toward the end of June; they may be obtained without charge by writing to: Committee on Science and Astronautics, House of Representatives, Rayburn Building, Washington, D.C.

† Members of the panel are: Raymond A. Bauer, Hendrik W. Bode, Harvey Brooks, Arthur M. Bueche, Robert A. Charpie, Preston E. Cloud, Jr., Donald N. Frey, Ralph W. Gerard, Harold Gershinowitz, Jacob Goldman, Sterling B. Hendricks, G. Evelyn Hutchinson, Charles N. Kimball, George B. Kistiakowsky, Vincent E. McKelvey, Cyril Stanley Smith, C. Richard Soderberg, C. Guy Suits, Edward Teller, Maurice B. Visscher, and Alvin M. Weinberg.

Molecular Biology: European Laboratory Still In Limbo

Geneva. A European conference on molecular biology held in Geneva in April did not bring establishment of a much-discussed European laboratory measurably closer, but the talks seem to have put relations between the European Molecular Biology Organization (EMBO) and European governments on a friendly footing.

An organization of individuals formed in 1963 to promote European cooperation in biology, EMBO has aspects of an exclusive club, a supranational academy of the biological sciences, and a pressure group for projects dear to the hearts of biology's new breed.

Creation of a regional, multidisciplinary laboratory was one of the objectives of EMBO's founders. It has been evident that paying for such an institution and for other parts of the EMBO program will require the support of governments, and the conference in Geneva was a first formal meeting of EMBO and governmental representatives. The Swiss government convened the meeting, which was held at the headquarters of CERN, the European nuclear research organization. Only CERN member governments were represented. The surroundings were appropriate, since CERN is a presumptive model for a governmentally underwritten EMBO, and CERN officials have taken a fraternal interest in the biologists' cause.

Despite its absence from the agenda, the subject of a European laboratory did come up at the meeting. Not unexpectedly, discussion revealed that scientists generally favor the idea, but most governments are decidedly cool to any immediate action to create a regional laboratory. Governmental representatives did, on the other hand, seem disposed to consider making public funds available to continue and probably to expand EMBO's present activities in providing fellowships and courses. EMBO now administers a program of postdoctoral fellowships financed primarily by the Volkswagen Foundation. This grant runs out next year, and intergovernmental financing of the program is expected to be discussed late this year at a continuation of the recent conference.

The sensation of the meeting occurred, however, when the French offered a site for a laboratory and, the implication was, a building. The offer was unexpected and caused a furor. Some at the meeting apparently questioned French timing and motives; others felt that, in view of the hostility to the laboratory in some quarters, the French initiative may have kept the door from being slammed on the idea.

Governmental opposition seems to stem mainly from a reluctance to see a diversion of funds and a loss of researchers to a regional program. Scientists argue that a major laboratory drawing on regional resources is necessary for continued development of biology in Europe and, incidentally, to counter the lure of the United States for European biologists. Debate on the laboratory has been suspended, but partisans feel that the idea is still very much alive.

Whatever the prospects of the laboratory in the long run, the conversion of EMBO to a government-supported organization will involve some changes in structure and style. EMBO up to now has been a small organization dominated by a group of well-known men who know each other well. EMBO members want to preserve this informality and autonomy to the greatest degree possible, and it will be interesting to see how the give and take will go in the negotiations ahead.

—JOHN WALSH

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artistic and philosophical creations of the Greeks did to theirs, or the great cathedrals did to medieval Europe. In a certain sense, it not only serves the purposes of our society, but *is* one of the purposes of our society." In that essay, Brooks had a great deal more to say about the role and value of basic research in modern society, and the brief quote does not do justice to his formulation. Nevertheless, with the passsage of 2 years, during which a good deal of ferment has taken place over the role and value of basic research, we now find Brooks stating the following:

> After many decades of inadequate attention to basic science, and inadequate recognition for scientists, the United States may have over-reacted. Raising the status of applied science in universities has become a real problem. . . . Historically, a certain snobbery has always existed between pure and applied science, but whereas once the exponents of pure science represented a small and rather ascetic minority who took pride in sacrificing the greater material rewards of applied science for what they thought of as the greater psychological satisfactions of pure science, today both the gaps in material reward and external prestige between basic and applied science have largely disappeared. However, some of the mythology of "we happy few" in basic science has persisted. As pointed out by many observers, the values and attitudes of the academic "subculture" are increasingly becoming the dominant values of the influential segment of society as a whole. . . . The business tycoon of the last generation boasts of his son's achievements as a theoretical physicist or a Sanskrit scholar. . . .

Perhaps too much can be read into this one passage, but when Harvey Brooks even toys with the possibility that emphasis on basic research may, if only inadvertently, produce undesirable side effects, it must be recognized that something new and important is stirring inside the politics of science.

Edward Teller, long a forceful advocate of greater emphasis on applied research, stated in his essay that there are sound reasons for the enthronement of basic research as a superior intellectual activity, but says "the pendulum seems to have swung too far. Together with the greater appreciation of pure science, a tendency to despise applications of science has been introduced. These are considered below the dignity of a real scientist; they are scorned as intellectually irrelevant and as usually having merely economic interest."

On another point, Teller stated, "as one who argued strongly for the creation of the first large-scale secrecy wall around a government project [the wartime atom bomb project] in American history. . . . I wish to recall the very proper, almost universal repugnance with which it was greeted at the time, to express my growing unease with the continuation, spread and acceptance of the practice, and to warn that it is probably making an overall negative contribution to our nation's security; it certainly had an adverse influence on

the badly needed growth of applied science in this country."

Though the essays are all lucidly written and informative, a perusal of the 497 packed pages leaves the impression that, outside of the confession of doubts on the part of some of the one-time ideologues of pure science, there is nothing new being said on the subject at hand. Virtually all of the essayists regularly appear on the conference circuit, and at one time or another, one gets the impression, it has all been said before, and now they are even beginning to repeat each other. The most forceful recommendation, contained in an introduction to the essays, states that "it is important for Congress to listen to the skeptics as well as the enthusiasts, and to ask the enthusiasts to answer the arguments of the skeptics." And the introduction goes on to argue for something called "a multidimensional interaction between scientists, technologists, public servants, and the general public."

What might be appended to this call for debate and interaction is that the public and the Congress have demonstrated a willingness at least to hear anyone who comes along with anything sensible to say on public issues. There is no dearth of outlets for setting forth information and opinion, and, in fact, one of the more endearing qualities of the U.S. Congress is that almost anyone with enough perseverance can find a Member, if not a committee, that will hear him out. But within the scientific community, a kind of tacitly enforced discipline prevails, and once a "leadership" position has been proclaimed, few are willing to stand up and challenge it. Congressional witnesses often grouse in the Cosmos Club, but on Capitol Hill, they become tame. In this connection, it might be recalled that a few years ago, Academy President Frederick Seitz, severely reprimanded Hollis Hedberg, the Princeton geologist, when Hedberg frankly told a congressional committee of his opposition to NSF's plans for the Mohole project. Similarly, when the physicist Eugene Wigner, also of Princeton, sat on a panel reviewing high-energy physics, and appended a minority "commentary" questioning the panel's enthusiasm for high-energy physics, he was regarded to be the skunk at the picnic. As is frequently the case, skeptics are welcome until they sound off.

Since it is getting to be an article of faith that an invidious relationship exists between basic and applied science, it would perhaps be illuminating to subject this question to some sort of systematic exploration. Too many people are reciting from the same hymnbook when they address themselves to this important question. Is it really true that the brightest young men shun applied research in favor of basic research? Is it really true that to a significant extent university science departments derogate applied research? This may be true at a few renowned and highly visible institutions, but is it true at the many universities that actually serve as the training grounds for the bulk of the nation's technologists and engineers? Reliable data on these questions is nowhere to be had, but, meanwhile, Congress is being persuaded that something ails this nation's applied research effort and that basic research deserves at least some of the rap. Maybe it does, but before we start tinkering with anything as delicate, as vulnerable, and as laboriously constructed as the nation's basic research enterprise, it would be desirable to have something better to go on than aged clichés about the conflict between basic and applied research.—D. S. GREENBERG

Appointments

Frederick C. Redlich, chairman of the department of psychiatry, Yale University, to dean of the School of Medicine at the University. . . . **Albert J. Rowell**, reader of geology at the University of Nottingham, England, to professor of geology, University of Kansas, and **W. R. Van Schmus**, first lieutenant, Cambridge Research Center, to assistant professor of geology at the University. . . . **Irwin W. Sizer**, head of the department of biology, Massachusetts Institute of Technology, to dean of the graduate school at M.I.T. . . . **Harry G. Day**, professor and former chairman of chemistry, Indiana University, to associate dean for research and advanced studies at the University. . . .

Walter L. Koltun, special assistant in the office of the vice president and secretary, M.I.T., to a part-time appointment of Institute Secretary for Foundations at M.I.T. . . . **Findlay E. Russell**, director of the Laboratory of Neurological Research, Los Angeles County Hospital, to professor of neurology and pharmacology at the University of Southern California. Operation of the laboratory has been transferred from Loma Linda University to the University of Southern California. . . . **Harry H. Gordon**, associate dean of the Albert Einstein College of Medicine of Yeshiva University, to dean of the College. . . . **Henry Kritzler**, associate professor of biology at Bard College, to professor of oceanography, Florida State University and scientific director of the University's Marine Laboratory. . . . **Arthur E. Hess**, director of Health Insurance, HEW, to deputy commissioner of social security with the Department. . . . **Thomas M. Tierney**, president of Colorado Hospital Service, to director of Health Insurance, HEW. . . .

Robert B. Carlin, head of the department of chemistry, Carnegie Tech, to associate dean of the College of Engineering and Science at Carnegie. . . . **Avrum B. Organick**, assistant coordinator for the Wisconsin Regional Medical Program, to a newly established position of assistant dean for continuing education at Marquette University School of Medicine. . . .

Gustavo S. L. Appeltauer, biophysicist at Instituto de Investigacion de Ciencias Biologicas, Montevideo, Uruguay, to research associate in neurobiology, Division of Physiological Sciences, Kirksville College of Osteopathy and Surgery. . . . **Paul H. Todd, Jr.**, former Michigan congressman, to chief executive officer of Planned Parenthood-World Population. . . .

Louis B. Arnoldi, retired Command Surgeon of the Air Force Logistics Command, to director of occupational medicine for NASA, succeeding **David H. Stoddard**, who has resigned. . . . **Kenneth C. Deemer**, former chairman of the department of mechanics and aerospace at the University of Kansas, to director of a UNESCO program designed to establish a training center for graduate engineers and professors of engineering science and technology. The center will be located at the National Polytechnical Institute in Mexico City. . . . **George S. Trimble, Jr.**, vice president for advanced programs, Martin Co., to director of Advanced Manned Missions Program, Office of Manned Space Flight, NASA. . . . **Joseph C. Sitterson**, chancellor of the University of North Carolina, to the National Advisory Allergy and Infectious Diseases Council. . . . **Elio R. Rotolo**, principal in the Management Services Division of Arthur Young and Company, to president of the American Institute of Industrial Engineers.