At another point, Shannon warned that any cuts in the NIH budget "would have disastrous effects on the programs."

"Do you use that term advisedly?" Flood asked.

"I do, sir, yes," Shannon answered. "I think the number of trained scientists who are coming into the field who will not be supported with these appropriations is very substantial. I think this will have an effect on the plans of new young scientists just beginning their careers; it will divert some of them from careers in the biomedical sciences. . . . I consider this budget as less than a barebones budget."

Shannon explained that though NIH was requesting an increase in funds for training grants, from $134.5 million to $139.6 million, the latter figure, because of increased costs, would actually lead to reduction of 31 training grants. "We had the choice to make, under a lower ceiling, either to reduce research grants or to reduce training in order to encompass both activities under the ceiling. It was our feeling that, if this was a short period of reduced support, we should ride through a period of scarcity by curtailing the training of new scientists." The budgeted funds, he pointed out, would provide for an increase of 422 research grants. ". . . the budget before you reflects, to my mind," Shannon said, "not what is desirable but, within a given ceiling, the best distribution that we can make."

It can be expected that the NIH budget will fare at least as well in the Senate as it did in the House, and, if tradition holds, perhaps the Senate will even add to the House figures. But the President does not have to spend a dime more than he chooses to spend, and with the costs of the Vietnam war skyrocketing beyond the forecasts of just a few months ago, it is doubtful that the White House is hunting for new frontiers in basic biomedical research.—D. S. GREENBERG

Chemical and Biological Weapons: Once Over Lightly on Capitol Hill

Last February more than 5000 scientists signed a petition urging the administration to reexamine and publicly state the government's policies on chemical and biological weapons. So far, their action has drawn no response apart from a perfunctory acknowledgment from White House science adviser Donald Hornig. In a note sent to one of the progenitors of the petition, Hornig simply said in effect "thank you for your interest in national security."

If the administration does not intend to be pressed into debate by the scientific community, however, it has recently been drawn into discussions of CBW on Capitol Hill. The occasion was the appearance last February of Deputy Defense Secretary Cyrus Vance before the subcommittee on disarmament of the Senate Foreign Relations Committee during a general review of U.S. armament and disarmament problems.

Vance's testimony on CBW and the discussion that followed are both rather thin; the treatment is made even more superficial by the facts that the hearings took place in executive session and that the version just released to the public is heavily censored. Nevertheless the hearings did bring out two points worthy of note: First, the administration regards its CBW program chiefly as a "deterrent" to the initiation of CBW attacks by other nations; second, in the event of a nonproliferation treaty or other international agreement limiting the use of nuclear arms, CBW is apt to assume increased importance in U.S. defense programs. In addition, the fact of Congressional interest is itself significant. These hearings marked the first time the question of CBW has surfaced in Congress for many years, and the Foreign Relations Subcommittee was interested enough to commit itself to more extensive hearings in the future, though no date was set.

In the course of his prepared remarks, Vance said:

> I have indicated that we seek international understandings to limit chemical and biological warfare and that we have not used weapons of the sort condemned by the Geneva protocol. I should also point out that we have at the same time maintained an active chemical and biological program. In the last few years we have placed increasing emphasis on defensive concepts and materiel. As long as other nations, such as the Soviet Union, maintain large programs, we believe we must maintain our defensive and retaliatory capability. It is believed by many that President Roosevelt's statement in 1943 which promised "to any perpetrators full and swift retaliation in kind" played a significant role in preventing gas warfare in World War II. Until we achieve effective agreement to eliminate all stockpiles of these weapons, it may be necessary in the future to be in a position to make such statement again in the future.

It is evident from Vance's remarks that the Pentagon has simply incorporated CBW into its overall strategy of deterrence, and has dressed it with history by emphasizing the most "deterrent-like" aspect of Roosevelt's 1943 statement—the threat of retaliation. By those outside the Pentagon, the statement is generally remembered for its gentler side—its promise that the United States would not be the first to use chemical or biological weapons.

Critics have questioned the soundness of the deterrence strategy where CBW is concerned. They argue that the United States already has overwhelming retaliatory capacity in its nuclear arsenal, and they question the necessity of preparing to retaliate *in kind* for a chemical or biological attack.

In addition, the extent to which the Pentagon feels bound to use CBW only in retaliation is not wholly clear. Many critics regard the use of riot-control gases and defoliants in Vietnam as already constituting a first use of CBW although the administration regards it differently. Moreover, the Pentagon has in the past opposed a Congressional resolution restating Roosevelt's "no first use" position. When questioned about this resolution during the hearings by Claiborne Pell (D–R.I.), Vance was unable to recollect it.

The other point on which the hearings focused was the extent to which the budget and program for CBW could be affected by arms-limitation agreements in other areas. The discussion

was something of an "after you, Alphonse" dialogue between Vance and Stuart Symington (D–Mo.), a former Air Force secretary who is a leading advocate of defense preparedness:

Senator Symington: I have always felt, if we made a deal on nuclear weapons, some of these other countries would do their best to develop their chemical and biological warfare capability. . . . What is the amount you spend, have in the budget, for chemical and biological warfare. . . ?

Mr. Vance: . . . For research, development, test, and evalution concerned with chemical and biological warfare there is [deleted] in the 1968 budget . . . and there is [deleted] for procurement, and [deleted] for operations and maintenance, for a total of [deleted].

Senator Symington: . . . We might get caught short unless we develop in this field, especially after we have made a possible nuclear treaty. Is that a fair hypothesis, Mr. Secretary?

Mr. Vance: We think we must have a retaliatory capability and a defensive capability, and those are the ends to which we are devoting both our research and development and our procurement. It is clearly our policy not to initiate the use of lethal chemicals or lethal biologicals.

Senator Symington: But I understand it is a form of deterrence to also have it?

Mr. Vance: It is indeed.

Senator Symington: It would become important, especially if we made a meaningful nonproliferation treaty, would it not?

Mr. Vance: Until we can reach a satisfactory agreement for the elimination of all chemicals and biologicals, I think we must have a retaliatory capability as a deterrent.

Between the deletions and the limitation of discussion, this is not much to go on. Future Senate hearings could obviously go a long distance toward putting on the table more of the facts about U.S. programs and policies for chemical and biological weapons. It is worth noting, however, that—if the line of questioning pursued by Symington is any indication of the tenor of Congressional interest—such hearings could as easily result in the promotion of greater CBW effort as in recommendations for restraint.—ELINOR LANGER

Appointments

Harrison Brown, professor of geochemistry, California Institute of Technology, to joint professor of geochemistry and newly established professorship of science and government at the Institute. . . . **Harold B. Finger**, manager of the Space Nuclear Propulsion Office, NASA, to associate administrator for organization and management, NASA headquarters. . . . **Francis B. Smith**, formerly assistant director of the Langley Research Center, Va., to head of the newly established Office of University Affairs, NASA. . . . **Christopher H. Demos**, clinical research director of E. R. Squibb & Sons, Inc., to medical director of the Squibb Institute for Medical Research. . . . **Clarke Williams**, deputy director of Brookhaven National Laboratory, to research administrator of the new Marine Resources Council on Long Island. . . . **O. Burr Ross**, director of the Oklahoma Agricultural Experiment Station and dean of Agriculture, to vice president for all research at the Oklahoma State University. . . .

Inez M. Hinsvark, dean of the College of Nursing, South Dakota State University, to dean of the University of Wisconsin School of Nursing. . . . **Robert L. Cochrane**, research associate in the department of physiology, University of Pittsburgh School of Medicine, to senior endocrinologist at Eli Lilly Company. . . . **Donald M. Pace**, professor of physiology and director of the Institute for Cellular Research, University of Nebraska, to professor of physiology-pharmacology and director of cellular research, School of Pharmacy, University of the Pacific, Stockton, Calif. . . . **Frans E. Wickman**, professor and curator of the department of mineralogy of the Swedish Museum of Natural History, to professor of geochemistry, Pennsylvania State University. . . . **Joseph D. Novak**, professor in the departments of education and biological sciences, Purdue University, to president of the National Association for Research in Science Teaching. . . . **Dale K. Mecham**, principal chemist in the Cereals Laboratory, USDA Western Utilization Research and Development Division, to president-elect of the American Association of Cereal Chemists. . . . **C. Taylor Whittier**, superintendent of Philadelphia's public schools, to executive director of the Central Atlantic Regional Educational Laboratories, Alexandria, Va. . . . **Roger D. Reid**, director of the biological sciences division and supervisor and coordinator of biological research in the Office of Naval Research, to professor of biology at the University of West Florida. . . . **Charles Feldman**, manager of the Physical Electronics Laboratory at Melpar, Inc., to the staff of the Applied Physics Laboratory, Johns Hopkins University. . . . **Ernst O. Attinger**, research director, Philadelphia's Presbyterian Hospital, to director of biomedical engineering, University of Virginia.

Recent Deaths

Ormond E. Barstow, 87; director, Instrument Systems Research Laboratory, Dow Chemical Company; 21 April.

Elizabeth Brown Chase, 56; professor of zoology, University of Rhode Island; 30 March.

William D. Collins, 91; retired chief, Branch of Water Quality, U.S. Geological Survey and recipient of the Distinguished Service Award; 8 May.

Palmer H. Craig, 66; dean emeritus of the College of Science and Mathematics, Florida Atlantic University, Boca Raton; 7 April.

Edward F. Degering, 68; former head of the radiation chemistry laboratory, U.S. Army Natick Laboratories; 11 May.

Foster L. Gambrell, 66; professor of entomology, New York State Agricultural Experiment Station, Geneva; 27 April.

Paul Hahn, 59; assistant to the director of the National Center for Radiological Health, Public Health Service; 3 May.

J. Donald Henderson, 57; professor of physics, University of North Dakota, on leave to serve as program director, Research Training and Academic Year Study Program, National Science Foundation; 17 April.

J. Warren Horton, 77; technical director emeritus of the U.S. Navy Underwater Sound Laboratory, New Haven, Connecticut; 10 May.

Fritz F. Koczy, 52; professor and chairman of the Division of Physical Sciences, Institute of Marine Sciences, University of Miami; 17 April.

William E. Ladd, 87; professor emeritus of child surgery, Harvard University; 21 April.

Jerome J. Morgan, 86; professor emeritus of chemical engineering, Columbia University; 20 April.

Harry R. Muegel, 71; professor emeritus of botany, University of Cincinnati; 8 April.

C. C. Torrance, 65; professor of mathematics, Naval Postgraduate School; 2 May.

Heinz von Diringshofen, 67; pioneer in flight and space medicine; 5 May.

Nathan Woodruff, 54; scientific adviser to the State Department; 7 May.