erode the force of the agreement. Administration officials, on the other hand, have threatened not to participate in the treaty at all if the Senate ratifies it with an amendment that tear gas and herbicides are included.

America's failure to ratify the treaty, now agreed to by 96 other countries, has been a regular issue in the debate, during the past few years, over chemical and biological warfare. While declaring a ban on U.S. stockpiling of biological weapons in 1969, President Nixon announced he would resubmit the Geneva protocol for Senate approval. But 10 months later, in the actual message seeking the advice and consent of the Senate, Secretary of State William P. Rogers said, "It is the United States' understanding of the protocol that it does not prohibit the use in war of riot control agents and chemical herbicides. Smoke, flame, and napalm are also not covered by the protocol."

At issue is a section of the treaty that prohibits "asphyxiating, poisonous, or other gases and . . . all analogous liquids, materials, or devices." The Administration's interpretation of that statement is shared by few other countries. On 16 December 1969, the United Nations' General Assembly approved by a vote of 80 to 3, with 26 abstentions, a resolution declaring that the use of any chemicals in war is contrary to the protocol. Only Portugal, which has used gas and herbicides in its war against guerrillas in Angola, and Australia, which has used them in Vietnam, joined the United States in opposing the measure.

Even though the hearings before Fulbright's committee may not lead to ratification of the treaty, they did provide one of the rare public discussions of America's policies of chemical and biological warfare. During testimony at the hearings, Rogers announced that all programs of crop destruction in Vietnam would be terminated, and that defoliation by herbicides would be "phased out." During the phase out, Rogers said, defoliation will be limited to "remote, unpopulated areas" with "no spraying from fixed-wing aircraft."

American forces will continue, however, to use tear gas at a "level to be determined by relevant military and economic considerations."

G. Warren Nutter, an Assistant Secretary of Defense, told the committee that the Administration "has shown profound concern over the problem of developing a sound national policy on chemical and biological warfare and related research." This sound policy, according to Nutter, now includes a renunciation of any use of biological weapons, including toxins. The United States, however, will maintain large stocks of chemical weapons of all types. Rogers requested that, in addition to the total exclusion of herbicides and tear gas, the Senate attach a formal amendment to the Geneva protocol reserving the right of the United States to retaliate with chemical weapons if attacked with either chemical or biological weapons.

Thus, the American government has proclaimed that it will not be the first to use "lethal" or "incapacitating" chemicals, but all other chemicals are to be considered "legitimate" weapons. Neither the Administration nor its critics contend that tear gas should be

Handler Dissents on NSF Budget

While the Administration's proposed 1972 budget for the National Science Foundation (NSF) has encountered general if not ardent approval in the scientific community, Philip Handler, president of the National Academy of Sciences (NAS) and former chairman of the National Science Board (NSB), has voiced objections to shifts in the budget that will emphasize applied research while subtracting funds for graduate science traineeships and fellowships.

In testimony before the House subcommittee on science, research, and development, Handler warned that the current budget request "starts down the trail of complete elimination of NSF training and fellowship programs." Two programs have been eliminated outright: first-year graduate traineeships, and the Secondary Science Training Program for high school students.

While the budget has grown considerably, Handler noted, most of the increment will go for picking up programs that have been dropped by other agencies. The rest, he said, is being funneled into the new applied research program, Research Applied to National Needs (RANN), whose budget is being doubled to $81 million. The year-old program (formerly known as Interdisciplinary Research Relevant to Problems of Our Society, or IRPOS) was inaugurated amid misgivings on the part of the NSB, said Handler. He said he still regards RANN as "experimental," noted that it has not yet produced any significant contributions to the solution of national problems, and reiterated his fears that too much emphasis on applied research might turn NSF into a "job shop."

Handler emphasized that he was speaking only as NAS president and not for the NSB, of which he is still a member. Apparently, he is a minority voice on the board. Its current chairman, Herbert Carter, said the proposed budget was endorsed by the board and that he regards the RANN program as extremely important for helping universities set up new interdisciplinary curriculum units.

While the proposed NSF budget of $622 million means an increase of $116 million over last year, the new money does not represent a substantial increase for any NSF programs except RANN. Most of the money—$74 million—will be used to pay for programs transferred from other agencies, chiefly the Department of Defense (DOD), and for picking up projects which mission-oriented agencies like DOD and the Atomic Energy Commission have had to drop for budgetary reasons.

Handler's budget complaints reflect the conflict that has bubbled up from time to time between him and the Administration over concepts of science funding (*Science*, 25 December 1970). Handler believes that cutbacks in graduate student support reflect a lack of faith in the future of the economy, and he is fearful that too much applied research will erode the country's basic research capability. The Administration, on the other hand, would prefer to hold the line on student support until the employment picture brightens, and is eager to encourage the conversion of technology to more socially useful ends.—C.H.