ranks of the teaching staff; 9 would be chosen by the junior teachers; 12, by the students, and the remainder, by the various other groups that are employed by, or associated with, the medical school. These 67, in turn, would elect a governing body of 7. Membership in this group, however, would be limited to the teaching and research staff, a provision which led one reform-minded, middle-ranking researcher to comment, "The colonels were strong enough to take it away from the generals, but the privates didn't get very much."

The process of consultation on the proposed reforms is an elaborate one, and currently it is in the stage of referral back to the constituent groups whose representatives sit on the Conseil. So far, approval has been voted by all the groups that have considered the matter, with one exception: the teaching staff. Meeting in closed session on 16 March, it deliberated at length but decided to go no further than simply acknowledging receipt of the recommendations and describing them as a good point of departure for further negotiations; this means, of course, that some of the senior professors are gagging at the prospect of power being dispersed to the lower ranks. In particular, it appears, they do not like the idea of limiting the number of activities that a man may head; nor do they like the idea of having their representation in the legislative body limited to 25. Furthermore, objections were raised to students having any vote at all. And, finally, there were those who opposed the idea that anyone interested in the various medical activities that are now being reviewed by special reform committees should have an opportunity to make his views known to these committees. At the end of their meeting, the teaching staff agreed to meet again in 2 weeks to reconsider the proposals.

At this point it is apparent that the old ways are no longer viable, but they do constitute a defense in depth that remains formidable. Thus, middle-ranking teachers and researchers, though in the vanguard of the reform movement, tend to see less evil in the chair system as they get closer to becoming occupants. In this sense they are not unlike the congressman who said that, when first elected, he was opposed to the seniority system, but that the longer he remained in office, the more merit he saw in it. A visitor is repeatedly told that it is impossible to overestimate the role tradition plays in determining academic affairs. It is also repeatedly pointed out that the proposed changes are far from radical. "They are not at all revolutionary," one researcher remarked. "It is just that they are long overdue. What is revolutionary is that people are at last talking about change."

The students, it was noted by one staff member, have been quiet over the past few months. "Yes," another remarked, "they have been altogether too inactive. We're going to need them again if the reforms do not go through."—D. S. GREENBERG

ABM: Scientists Are Important in Building Senate Opposition

"In opposing the ABM, the scientific community has come into its own as a political force," asserts a leading aide to the Senate Foreign Relations Committee; "this is science's most golden, glorious hour."

Whether or not one agrees with the interpretation that opposition to the anti-ballistic missile (ABM) system marks a "glorious hour," it is apparent that scientists have played a significant part in convincing many congressmen that they should vote against ABM deployment when it comes to a vote in the next few weeks. At present, opposition to ABM seems much more pronounced in the Senate than in the House. Many Senate observers are convinced that the Senate will vote against ABM deployment by a fairly narrow margin, unless the international situation changes greatly or unless President Nixon adopts more persuasive arguments.

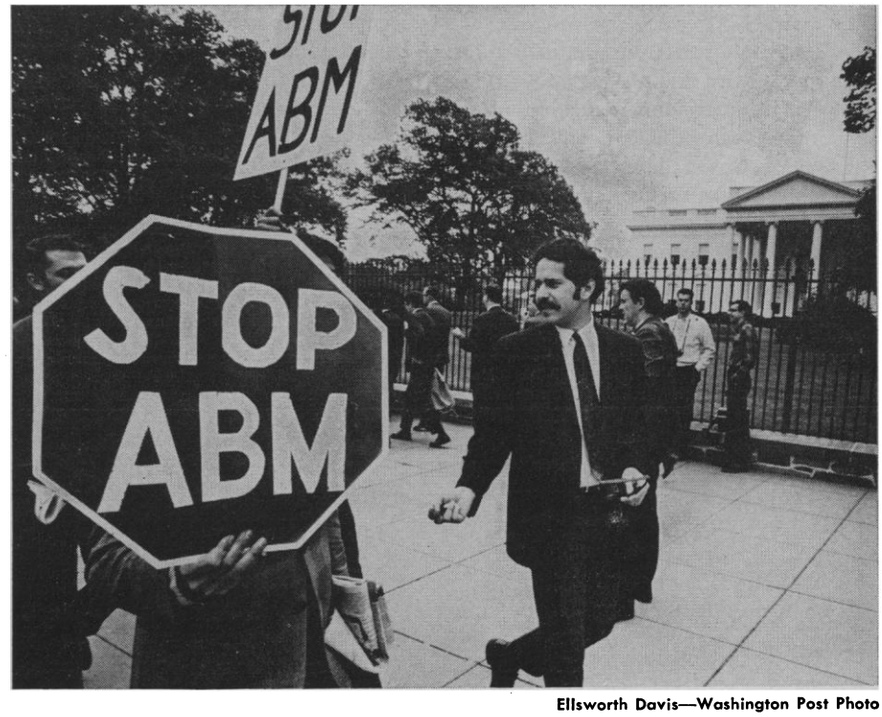
A somewhat dramatic demonstration of opposition to ABM deployment among the scientists was held on 30 April when about 100 physicists in Washington for the American Physical Society (APS) meeting staged a 1.7-mile anti-ABM protest march from their hotel to the White House. There they were joined by more than 100 less physically active activists, who had made the journey by bus. The physicists, most of whom were university teachers, marched in front of the White House for a few minutes, while some of the leaders chanted "Stop ABM, stop ABM." For many of the marchers, including organizers Tom Kirk of Harvard and David Nygren of Columbia, the march was their first political action. Several of the participants said that, in their knowledge, it was the first political march ever conducted by a group of scientists. Five members of the group went to meet with Presidential science adviser Lee A. DuBridge to present a petition signed by 1100 physicists urging that plans to deploy the Safeguard ABM system be withdrawn. DuBridge told the group that he would present the petition to Nixon.

The walk to the White House was an outgrowth of the activities of Scientists for Social and Political Action, a 500-member group formed at the February meeting of the APS in New York. During last week's Washington meeting of the APS, delegations from Scientists for Social and Political Action met with senators or senators' aides in 63 senatorial offices to deliver anti-ABM petitions signed by 1100 physicists. The groups also conveyed the results of a poll of 1216 physicists taken on 29 April at the APS meeting. In this poll, 21 percent of the physicists supported Safeguard ABM, 76 percent opposed it, and 3 percent had no opinion. The poll was taken after more than 2000 physicists jammed a hotel ballroom to hear Eugene P. Wigner of Princeton and Donald C. Brennan of the Hudson Institute argue for ABM deployment, and Hans A. Bethe of Cornell and George W. Rathjens of M.I.T. argue against it.

The purpose of the march on the White House was not so much to persuade the government to delay ABM as to demonstrate to the public that many scientists were ABM opponents. The march was carried out in an emi-

nently respectable manner; the parade leaders stopped dutifully at each traffic light, and they had been careful to obtain a parade permit for their political promenade. Several of the protesters were busily scribbling down equations and eagerly discussing their work in physics while they marched. The only hostile reaction this reporter heard came from a woman of about 60, who sputtered "Talk about a nutty bunch of kooks" as the physicists strolled by the Mayflower Hotel.

But a marching physicist is not necessarily a weapons expert, and, to this observer, it seems that the more significant influence of scientists against ABM deployment has been taking place in the committee rooms and the offices of Capitol Hill. Among the scientists who have been persuasive on Capitol Hill are professors from M.I.T.—former Presidential science advisers James R. Killian, Jr., and Jerome B. Wiesner, and Rathjens, Jack Ruina, and Bernard T. Feld—George B. Kistiakowsky of Harvard; Hans A. Bethe of Cornell; W. K. H. Panofsky and Jeremy Stone of Stanford; Herbert York of the University of California, San Diego; and Ralph Lapp of Washington, D.C.



Ellsworth Davis—Washington Post Photo

Physicists picket in front of the White House on 30 April to protest President Nixon's plan to deploy an ABM system.

Council for a Livable World

One of the groups which helped get scientists and senators together to discuss ABM is the Council for a Livable World, an arms-control organization founded by physicist Leo Szilard, which is supported by contributions from scientists. The Council has been working since 1964 to inform the Senate of the reasons for opposing ABM deployment, but for the past 18 months it has made opposition to ABM almost a full-time lobbying occupation.

The Council has sponsored various dinners and seminars to acquaint senators with arguments against ABM. Philip A. Hart (D–Mich.), one of the leaders of the anti-ABM forces, has hosted several of these meetings, including a well-attended February lunch at which Rathjens spoke. Commenting on this meeting, Hart told *Science* that "a good indication that Senators were anxious to get this scientific assistance came at a luncheon and briefing on the ABM. More than 20 Senators remained for more than 2 hours listening to scientists talk about the project, which must be something of a record for that many Senators staying for that length of time in one place."

Not only have scientists talked to senators in groups and in private, they have also done research and written speeches for senators and have provided technical and political arguments and questions for use in jousting with the Defense Department. John Holum, an aide to Senator George S. McGovern (D–S.D.), thinks that "scientists have played a massive role. They're the biggest reason why we're so close to stopping ABM," Holum said. Muriel Ferris, an assistant to Senator Hart, commented, "We never really had a source of non-Pentagon information on ABM until scientists came forward to help us."

ABM Supporters Less Active

Although the scientist supporters of the ABM seem to have been much less active than the opponents, congressmen who favor ABM deployment, such as Senator John Tower (R–Texas), believe that scientists are playing a highly important role in the debate by providing the relevant technical information. ABM supporter Edward Teller visited Tower's office recently for a talk on this subject, but Teller seems to be one of the few scientist proponents who is actually visiting congressmen. On the other side, Senate ABM opponent Stuart Symington (D–Mo.) says that scientists have done a good deal to persuade senators to change their minds on ABM deployment. Senators also believe that scientists played a part in stirring up opposition to ABM in states where deployment preparations had begun—Massachusetts, Illinois, Washington, and Michigan.

Although scientists expressed their reservations about ABM in letters and telegrams to Congress last year, they were not brought much into the public debate until this session of Congress. In a closed Senate debate last autumn (*Science*, 20 December), Senator J. William Fulbright (D–Ark.) criticized Senator Richard B. Russell (D–Ga.) for not calling in outside scientists to testify on the ABM before the Armed Services Committee. After the Senate Foreign Relations Committee held widely publicized ABM hearings this year, the Senate Armed Services Committee finally agreed to the request for outside scientific evaluation and held public ABM hearings which featured both scientific supporters and opponents of the ABM system. These hearings, held on 22 and 23 April, were important in giving new respectability to the ABM opponents and in giving clear evidence that at least a half dozen members of the 18-man Armed Services Committee (which was once thought to be a monolithic source of ABM support) had grave

reservations about deployment. One of the ABM opponents who made the greatest impression on the committee members was Panofsky who argued that "it is almost unimaginable that our deterrence can be endangered by 1975 through a Soviet first strike capability; therefore a case for urgency for deploying ABM to protect our retaliatory forces cannot be made."

In the past, senators have obediently accepted the evaluations of Defense Department officials and scientists. Now, outside scientists are providing the information and ideas that Congress needs in order to evaluate and criticize the ABM deployment. The support of these scientists and weapons experts has emboldened senators to tackle the Defense Department in a way that they have previously hesitated to do. Whether or not the opponents are actually able to stop the Safeguard ABM, scientists and senators are likely to be pleased enough by the success of their newfound working relationship to extend their examination to other Administration requests for the development and deployment of new weapons systems.—BRYCE NELSON

House Panel Kind to NSF Budget but Trims Some Programs

The National Science Foundation has emerged relatively unharmed from the first authorization hearings ever held on the agency's annual budget. Last week the House Subcommittee on Science, Research, and Development, chaired by Representative Emilio Q. Daddario (D–Conn.), announced that it had cut NSF's budget request for fiscal year 1970 by some $9 million, or less than 2 percent of the amount requested. In the opinion of Leland J. Haworth, NSF director, "the overall reduction in funds is not severe." In fact, Haworth told *Science*: "We are pleased with the success of the authorization hearings and feel that Mr. Daddario and his subcommittee have considered our proposals with sympathy and understanding." But NSF officials could not become euphoric over this initial success, for their budget faces still tougher hurdles ahead.

The Daddario subcommittee's biggest single cut—totaling $4 million—was imposed on virtually the only significant new program in what NSF officials have otherwise described as "pretty much a standstill budget." NSF had sought $10 million to support interdisciplinary academic groups in the performance of research, both basic and applied, on problems relevant to society, but the subcommittee chopped this down to $6 million, a cut of 40 percent. Ironically, the interdisciplinary program was devised, in part, to carry out the congressional mandate in last year's NSF reorganization act, which specifically authorized NSF to support both the social sciences and applied research. The interdisciplinary program also marks an important departure from past NSF timidity over supporting research in touchy areas. As Philip Handler, chairman of NSF's National Science Board, told the subcommittee:

"When the Science Foundation first began to think in terms of the possible mode of support of the social sciences, it erected for itself a set of taboos. The Science Foundation wasn't sure of itself, it didn't feel strong, it wasn't sure it could defend [itself against] the wrath that might fall upon it for breaking such taboos. Subjects like sex, religion, ethnic voting behavior, anything that had an air of controversy about it, if the results were uncomfortable, were just simply excluded from consideration. . . . But I think we have crossed that bridge now. . . . We like to support the social sciences as vigorously as the people in the field have the talent to permit."

Despite NSF's newfound courage and seeming desire to comply with congressional wishes, the subcommittee concluded that NSF's interdisciplinary program was too ambitious. The subcommittee's action does not seem to reflect any bias against the social sciences, though at least one key member, Representative James G. Fulton (R–Pa.), has stated that NSF should stick to supporting the natural sciences and keep out of such touchy problems as "integration of the schools." Rather, the subcommittee seems to have concluded that neither NSF nor the universities could effectively use $10 million on such research in the coming fiscal year. As Daddario told NSF officials: "They [the universities] are groping; you are groping; and you are kind of groping together."

NSF officials profess to be happy that the subcommittee approved the concept of the program and do not seem overly concerned about the size of the cut. As Haworth expressed it: "We are pleased that the proposed new program for interdisciplinary research has been endorsed for significant funding."

The Daddario subcommittee imposed two other major cuts on NSF by requiring that two "big science" construction projects be deferred. The subcommittee declined to authorize $3.3 million to resurface the radiotelescope at Arecibo, Puerto Rico, which is in the process of being transferred from Pentagon funding to the NSF. Some subcommittee members were concerned that the Pentagon, as a result of its own budget problem, is "palming off" too many research projects on NSF, but the subcommittee's action seems to have been motivated primarily by a desire to have the next NSF director establish priorities for large-scale astronomy projects. The subcommittee also declined to authorize $2 million to build a new oceanographic research vessel. In both cases, Haworth said he was "disappointed" at the subcommittee's action.

The NSF budget still has several more hurdles to clear. Authorization hearings were scheduled to start in the Senate this week, and the appropriations committees in both the House and the Senate must still be heard from. Last year Congress cut an amazing $100 million from NSF's budget request of $500 million. This year NSF has again requested $500 million in new appropriations, and Foundation officials are keeping their fingers crossed that Congress will treat the request more kindly. However, it seems likely that Congress, no matter how kindly it handles NSF appropriations, will again impose a spending ceiling on the Administration, an action which caused considerable grief among NSF grantees last year.—PHILIP M. BOFFEY