Whatever one thinks of the merits and strength of the Air Quality Act of 1967, it is apparent that the nation is moving toward setting standards to define the acceptable limit of pollutants in the air. In the past, enforcement efforts of the air-pollution division of the Public Health Service have been directed more toward individual polluters and individual situations. The Air Quality Act of 1967 will require a much more systematic approach, both by the Public Health Service and by the various state and regional officials.

Although Administration officials praise the Air Quality Act of 1967 as a major step forward, there is worry behind the scenes about the effectiveness of abatement programs in the next few years. The new regulations are complex and time-consuming, and there is some doubt about the willingness of the authorities in many states to move on setting pollution standards. Meanwhile, the nation's air pollution is growing worse. In his House testimony last August, Secretary Gardner said, "It is now clear that the problem will not yield to anything less than a full-scale concerted attack by both the private and the public sectors."

The widespread acclaim given to the Air Quality Act of 1967 proves one thing: there are few federal politicians who believe that they can afford to oppose control of air pollution. However, the willingness to learn the details of these complicated pollution problems and to battle for substantial new federal powers for abatement are quite different matters. This year, neither the White House nor the Congress as a whole showed itself willing to devote anything like a significant part of its time and resources to working for a highly stringent air-pollution control measure. The nation is acquiring the technological capacity to abate its air pollution; so far, it has not felt the problem urgent enough to mount a full-scale effort to do so.—BRYCE NELSON

Money for NSF: The Odyssey of a Research Agency's Budget

The following is the political odyssey of a science budget. It is worth following in some detail—from the National Science Foundation, to the White House, to Congress, to Cambridge, Massachusetts, and back to Congress—for the ups and downs of this budget tell a good deal about the contemporary politics of science.

In the annual budget proposals that the President sent to Congress last January, NSF was listed for $526 million—an increase of $46 million over the then-current budget. Why was the figure set at $526 million? The answer lies in the administration's response to congressional practice and preference, rather than in any carefully formulated research policy or master plan. Those who run NSF felt they could profitably spend a good deal more, especially for project research, institutional development, and laboratory equipment. But the congressional committees that handle NSF funds have never accepted the poor-mouth talk that witnesses from the scientific community frequently present. Thus, in 1963, when President Kennedy's science advisers persuaded him to attempt to jump the NSF budget from $322 million to $589 million, Congress balked, and NSF emerged with no more than a $31-million increase. Since then, NSF, with the firm guidance of the Bureau of the Budget, has framed its growth plans in the 10-percent range, and this practice, of course, has been reinforced by the general financial restrictions emanating from the Vietnam war. So, it was $526 million that the President sought for NSF in the budget for fiscal 1968.

In mid-March the budget came up for consideration before the 11-member House Appropriations subcommittee on Independent Offices and Department of Housing and Urban Development, chaired by Joe L. Evins (D–Tenn.). Traditionally, this subcommittee has been a crucial checkpoint in NSF's budgetary affairs, for the full Appropriations Committee rarely dissents from the findings of its subcommittees, and the full House almost invariably goes along with the Appropriations Committee. Added to this is the fact that the Senate generally votes out a bit more money than the House does, which, in effect, means that the House subcommittee sets the minimum for the budget.

NSF was present in full force, with Director Leland J. Haworth accompanied by 26 staff members, plus Philip Handler, chairman of the National Science Board, and three other board members. Since Evins's subcommittee handles the budgets of 21 federal agencies (for a total of about $15 billion), including NASA, the Veterans Administration, and the Department of Housing and Urban Development, it might be thought that NSF would not figure large in its considerations. But the House takes seriously its constitutional mandate to originate money bills, and the appropriations subcommittees, which are the chief instruments for fulfilling this mandate, are, on the whole, the most industrious of congressional committees. The NSF hearing went on for 2 days, and the testimony that resulted, along with some prepared papers, added up to a printed record that covers 298 pages. By and large, the proceedings were harmonious. And now and then there even were moments when the members' seeming enthusiasm for science in general and NSF in particular somewhat overwhelmed the NSF representatives.

At one point Representative Louis C. Wyman (R–N.H.) said to Handler, "Well, Doctor, would it be fair, or reasonably accurate . . . if you were looking for a description of the National Science Foundation's ultimate role, it would be the CIA of intellectual progress in America?"

Replied Handler: "Can't we just be the National Science Foundation?"

"I didn't intend that facetiously," Wyman said. "You are the catalytic agency in which you try to bring together, and help and assist the best brains and the best qualified young people to have the opportunity through the money you have made available to you to produce the best good, and learning about the common cause and

effect on the human race on earth. . . ."

Later, Chairman Evins, in a dialogue with Haworth, expressed his understanding of the route to scientific progress. "The way to get results," Evins stated, "is to keep the pressures on. Wasn't it Edison who said that he tested bulbs 149 times and the 150th time he got a breakthrough? It was perseverance and the Foundation persevering will continue to make great strides forward."

When the returns came in from the House, NSF found that it had not fared too badly. It, of course, did not receive the full $526 million. But the House subcommittee voted for $495 million, which, when combined with some $21 million of unspent appropriations originally destined for the now-defunct Mohole Project, would bring NSF up to $516 million. On the basis of past performance, it was reasonable to expect that the Senate would top the House figure by several millions; then, in conference, the two chambers would split the difference, and NSF would emerge with its budget either intact, or very close to it—which is no common event today in Washington.

The scene now switched to the Senate, where, for all the virtues of that body, the appropriations process is not pursued with the same diligence that prevails in the House. The reason lies not so much in the constitutional division of labor as in the human division of labor. With its 100 members, the Senate operates a committee structure that is virtually identical to a House setup that draws upon 435 members. Thus, while House members rarely receive more than one major committee assignment, it is not uncommon for a Senator to be assigned to from two to four major committees. In short, Senators, if they are so inclined, can find reasons to be a lot busier than Representatives, and such was the case on 7 June when the NSF contingent appeared before the Senate's counterpart of Evins's subcommittee to testify in behalf of the budget. Though 17 Senators hold appointments to the Independent Offices and Department of Housing and Urban Development appropriations subcommittee of the U.S. Senate, only two were listed as present when the proceedings, which lasted a day, were called to order. These were Chairman Warren G. Magnuson (D–Wash.) and Gordon Allott of Colorado, the ranking Republican on the subcommittee. And Magnuson left at once, bound for another committee meeting, with the result that Allott, as the only Senator present, presided throughout most of the hearing. Toward the end, Magnuson returned and took over; Allott stayed on for a few minutes, and then left the remainder of the proceedings to Chairman Magnuson. (It is fairly unusual for a member of the minority party to preside over a hearing, but Allott and Magnuson are old and friendly colleagues, and party labels rarely figure in their relationship.)

Now, the relationship between the National Science Foundation and Senator Gordon Allott is far from casual. In the annual NSF hearings, which normally draw a better senatorial turnout than was the case this year, Allott has always been one of the most active and inquisitive members of the subcommittee. Just why this should be so is not readily apparent, but, for some reason, NSF has engaged the interest of Senator Allott. And it was in pur-

POINTS OF VIEW

John Kenneth Galbraith, in The New Industrial State, *published by the Houghton Mifflin Company.*

. . . Both the educational and scientific estate and the intellectual community are handicapped by the belief that their role is professionally passive—that it is to feel and think but not to act. Righteousness, as well as convenience, defends this passivity. Politics is not the business of the intellectual or the artist. Nor of the educator nor of the scientist. Theirs is the purer domain of the spirit and the mind. This can only be sullied by concern for practical affairs. In the last milli-second before the ultimate nuclear fusion, a scientist will be heard to observe that the issue of nuclear control and military security is really one for politicians and their military and diplomatic advisers. And as the last horizon is lost behind the smoke, gas, neon lights and detritus of the industrial civilization, men of self-confessed artistic sensitivity will be heard to observe that, unfortunately, none of this is the business of the true artist. In fact, no intellectual, no artist, no educator, no scientist can allow himself the convenience of doubting his responsibility. For the goals that are now important there are no other saviors. In a scientifically exacting world scientists must assume responsibility for the consequences of science and technology. For custody of the aesthetic dimension of life there is no substitute for the artist. The individual member of the educational and scientific estate may wish to avoid responsibility; but he cannot justify it by the claim of higher commitment.

* * * * * *

Secretary of State Dean Rusk, from the transcript of his news conference, 12 October 1967.

It is not true that I have any generic attitude toward all those people who call themselves or are called intellectuals. . . . I do recall, once in a while—perhaps you will forgive me for this—as friends used to say of Einstein—that he was a genius in mathematical physics, an amateur in music, and a baby in politics.

Now I think that an idea stands or falls on its own merits and the fact that a man knows everything there is to know about enzymes doesn't mean that he knows very much about Vietnam or how to organize a peace or the life and death of nations.

So I have great respect for intellectuals, but I don't feel that I'm intimidated by them.

(*Laughter*)

suit of this interest, several years ago, that he locked onto Project Mohole, which, though it might well have fallen of its own weight, was no doubt accelerated toward its unhappy conclusion by Allott's incessant hammering at faulty cost estimates and curiosity-provoking contract procedures. In the case of Mohole and other NSF activities, Allott has projected himself as a paternalistic friend of NSF, striving to protect the Foundation from its own follies. His performance lends itself to various interpretations, but there is no doubt that the Senator's carping has been accompanied by longstanding support for continued—but not too rapid—growth of the Foundation.

With Allott presiding, the hearing was mainly a condensed replay of the House version, but now and then the Senator got off a few bean balls at the very noncombative witnesses from NSF. "Looking at the District of Columbia," he said, "it seems to me that about every scientific society that has an office in Washington has managed to latch onto a research program of some kind."

To which Haworth opaquely replied, "I think in general, Mr. Chairman, they are not research programs but other types. To some extent, they are studies."

Allott then turned to NSF's procedures for evaluating grant applications. "How much of a turnover do you have on your panels? I am afraid of it getting bureaucratic and ingrown." Haworth replied that there is "a good deal of turnover." (He later supplied, for the record, 17 closely printed pages listing the names and terms of NSF consultants.)

"Well," said the Senator, "I recently had a gentleman in my office who had some of these [grant proposals] referred to him . . . and he says some of the proposals that passed him made him sick. Not being a scientific person, I cannot pass upon the merits of this. But there are enough people who talk to me each year that I think it is worthwhile calling your attention to the fact that there is, and not just among people who are disappointed applicants, some considerable disillusionment . . . that this whole area ought to be looked at and studied to be assured it has not just gotten ingrown. . . . I have always had it put up to me, 'I must talk to you in confidence,' which indicates that they are afraid of the reaction if their true thoughts were known, the reaction in the National Science Foundation might have adverse effects upon their own situation or their institutions which they represent."

SENATE APPROPRIATIONS: Senator Gordon Allott (R–Colorado), right, with Senator Warren G. Magnuson (D–Washington), at a recent hearing.

Replied Haworth: "Well, Mr. Chairman, I am surprised they feel the reaction in the Foundation would be this way. I can understand why, if they have these feelings, they would be a little fearsome of their colleagues."

Handler followed this with a detailed explanation and defense of NSF's granting procedures, and the hearing passed on to other matters.

At the end of August the Senate subcommittee reported its decision: $459 million, which was $36 million below the House bill; with the $21 million available from Mohole, NSF, in the Senate version, would end up with exactly the budget it had received last year. The financial decision of the Senate committee was also accompanied by a statement that left NSF somewhat mystified—to wit: "In view of the proliferation of basic research in pure science now conducted by private industry as well as the Government, the committee requests that the Foundation submit to the committee for consideration with the 1969 budget a report surveying all significant efforts in pure science, private and public." Later it was revealed that the author of this provision was Senator Jacob K. Javits (R–N.Y.), a newcomer to the subcommittee. Though not present at the hearings, he had sat in on the "markup" of the bill, and had concluded from the discussion that it would be desirable to have a survey of what's going on in science. As for Chairman Magnuson, who is often referred to as "father" of the Act that established NSF in 1950, he has not displayed any special interest in the Foundation since then. During the brief time he spent at the hearings this year, most of his questions concerned NSF's Sea Grant Program, which is a matter of some great interest to the State of

Atoms for Peace: Russian Declines Award

I. I. Rabi

B. L. Goldschmidt

W. B. Lewis

Vasily S. Emelyanov [UN]

Three recipients of the Atoms for Peace Award were publicly announced on 11 October; on the following day, the New York *Times* revealed that a fourth, a Soviet scientist, had also been selected to share in the $90,000 award, but had declined as a protest against American policy in Vietnam. Those receiving the award are: Isidor I. Rabi, Nobel laureate of 1944 and Higgins professor of physics emeritus, Columbia University; Bertrand L. Goldschmidt, director of foreign relations and of programs, French Commissariat on Atomic Energy; and W. Bennett Lewis, senior vice president, science, Atomic Energy of Canada, Ltd. The Russian physicist who refused to accept the award is Vasily S. Emelyanov, head of the Soviet Administration for the Peaceful Uses of Atomic Energy.

The award was to have honored four men who had been leaders in their country's participation in the International Atomic Energy Agency. (Britain's role had been recognized earlier when the award was presented in 1961 to the late Sir John Cockcroft.) The award, a memorial to Henry Ford and his son, Edsel, was established in 1955, when the Ford Motor Company Fund donated $1 million to support the presentation of ten annual Atoms for Peace Awards. It is granted "solely on the basis of merit of the contribution, wherever found in the world and without regard for nationality or politics." Not an annual award, it has only been presented seven times since its founding, and no award has been given since 1963.

Emelyanov has for many years led the Soviet delegation to meetings of the IAEA and has had extensive dealings with leaders of Western atomic energy agencies in efforts to promote international cooperation in peaceful uses of the atom.—G.M.P.

Washington. According to a staff assistant who is close to members of the subcommittee, Allott took the position that, since he had presided over most of the hearings, his views merited serious consideration. It was Allott's view, according to this report, that NSF had failed to make a persuasive case for the budget increase that it sought. Magnuson deferred to Allott, and the rest of the committee went along with the chairman and the ranking minority member.

Since, over the past 16 years, NSF's budgetary travails have never been deemed worthy of a serious floor fight aimed at upsetting the verdict of the appropriations committees of either chamber, the Senate figure carried with it some painful implications for the Foundation. The House, though generally more conservative than the Senate, had voted out a larger budget. When the two came to confer on a final figure, the likelihood was that the House conferees would take the position, that, if the traditionally big spenders were content with $459 million, why should the House hold to the figure of $495 million? Under these circumstances, it was not at all unlikely that both houses would swiftly agree on the lower figure.

Such were the prospects early in September when the Senate scheduled 18 September for floor action on the $10.4-billion money bill that included the NSF appropriation.

However, NSF was soon to be the object of a series of maneuvers that, though commonplace in the politics of nonscience affairs, were actually quite extraordinary for the politically aloof Foundation. A few days before the bill came to the floor, Edward Wenk, Jr., executive secretary of the National Council on Marine Resources and Engineering Development, encountered Senator Fred Harris (D–Okla.), who chairs the Senate subcommittee on Government Research. Harris, whose subcommittee has no jurisdiction over financial matters, was aware of the action taken by Magnuson's subcom-

mittee, but, in the hurly-burly of congressional affairs, had done no more than take note of it. Wenk mentioned that NSF was in difficult shape financially and would be seriously affected by a budget cut or even a static budget. Meanwhile, at least one person close to the Foundation phoned Jerome B. Wiesner, provost of M.I.T. and White House science adviser under Kennedy. A call was also made to Mary Bunting, president of Radcliffe College, who formerly served as a member of the Atomic Energy Commission. Subsequently there were conversations with the office of Senator Edward Kennedy (D–Mass.).

On 18 September, when the bill that included funds for NSF came up on the floor of the Senate, Harris introduced an amendment, jointly sponsored by Teddy Kennedy, to raise the NSF budget from the $459 million voted by Magnuson's subcommittee to $505 million. With the $21 million available from the Mohole project, he stated, the NSF budget would reach the $526 million that was provided for in the President's budget.

Harris, who last year was berating the old-line administrators of federal research funds for what he regarded as a failure to spread the wealth (*Science*, 5 August 1966), is a shrewd, industrious, and ambitious young man, and it is not likely that his political horizons end with a Senate seat from Oklahoma. If this be so, it is also unlikely that he sees any point in skirmishing with the power that resides in Cambridge, Massachusetts, for there was Harris advising his Senate colleagues that the "Massachusetts Institute of Technology was first a great institution of excellence in research and education and, then, received Federal funds. It did not first receive Federal funds and then become an excellent institution." But the present system, he went on to point out, reinforces the position of those, such as M.I.T., that got in on the ground floor of federal support. If the members want to build up the colleges and universities in their states, the only realistic method, he continued, is to provide development funds in addition to the support that is necessary to continue programs at the already first-rate centers. And the way to do this, he concluded, is to give NSF the money requested for it in the President's budget. Teddy Kennedy followed with a short statement, and then he inserted in the *Congressional Record* a state-by-state, institution-by-institution list of who is getting how much from NSF.

On 20 September, Harris and Kennedy, backed by ample staff support from inside and outside the Senate and a flock of telephone calls from Cambridge to members of the Senate, resumed the fight. Harris, leaning on the Academy-spawned argument that basic research needs a 15-percent annual increase simply to stand still, warned that research and institutional development would be seriously impaired if the budget was not restored. Frank Lausche (D–Ohio) turned the debate aside for a moment with a contention that Ohio was being shortchanged on its share of research and development funds. "The Texas share . . . was nearly twice that of Ohio. My question is, Why?" he demanded.

Ralph Yarborough (D–Texas) replied that Texas not only deserved all it got, it actually merited more.

When the debate got back on the track, Allott defended his record as a supporter of NSF and went on to explain why he thought the budget reported out by the committee would actually benefit the Foundation. "There is no question," he said, "that this entire Mohole situation has done a lot of harm to the program within the Foundation and that, in my opinion, they need time to recoup themselves. There is no question about the good that they can do."

Magnuson, who normally would be defending the budget voted out by the subcommittee he chairs, remained silent, which suggests that he was not ill-disposed to the effort to salvage the budget. When the vote was taken, it was 63 to 25, with 12 not voting, for raising the Senate figure to $505 million.

The final chapter on the NSF budget for 1968 is yet to be written, since the two houses have not completed conferring on their differences. And the budget-cutting fervor now raging in the capitol might easily result in a reversal of the Senate action. But the proceedings to date suggest several possibilities. First, that NSF, which is not too well known in Congress, is coming to be recognized as an agency for dealing with what is well known—the financial difficulties of academic institutions throughout the country. Second, that NSF has a large and influential constituency throughout the country, but heretofore has generally failed to enlist its assistance. And third, that while Lyndon Johnson is not too keen on Cambridge, it remains a powerhouse of science politics.

What all this means for the future of NSF is not too certain. A number of Senators have indicated that they went along with Harris and Kennedy in the expectation that more of NSF's largesse would be dispatched to institutions in their states. If this was their motivation, it might well be recognized that they weren't voting money for science for the sake of science; rather, they were responding to the argument that the Thanksgiving turkey needs to be fattened up.—D. S. GREENBERG

APPOINTMENTS

J. Osborn Fuller, dean of the Arts and Sciences College, Ohio State University, to president, Fairleigh Dickinson University. He succeeds **Peter Sammartino** who will become chancellor of the university. . . . **Howard J. Samuels**, vice president of the Mobil Chemical Corporation, to under secretary of Commerce. . . . **Franklin P. Kilpatrick**, senior staff member, Brookings Institution, to dean of the college of graduate studies, University of Delaware. . . . **D. J. Guzzetta**, senior vice president and provost of the University of Akron, to president, Marian College, Indianapolis. . . . **Thomas E. Broce**, director of development, Duke University, to vice president, Southern Methodist University. . . . **W. Dean Warren**, chairman of the department of surgery, University of Miami, to dean of the School of Medicine at the university. He succeeds **Hayden C. Nicholson**, who will retain hs position of university vice president for medical affairs. . . . **Walter W. Horn**, professor of art; **Michel M. Loeve**, professor of mathematics and statistics; and **Gunther S. Stent**, professor of molecular biology and bacteriology; all of the University of California, Berkeley, to the newly created positions of professor of arts and science. . . . **Wim van Eekeren**, director of facilities development, New York State Narcotic Addiction Control Commission, to director of the commission.

Erratum: In the article "Dams and wild rivers . . ." (13 October, p. 235), the last sentence in the first paragraph of the second column should read ". . . electricity needs . . . could be met through the development of other available dam sites and of thermal plants. . . . "