The Pope's Science Advisers

Members of the Pontifical Academy of Sciences talk to world leaders about the consequences of nuclear war

Pope John Paul II greets P.A.M. Dirac (center) and Victor Weisskopf.

The world's only international academy of sciences has its headquarters in Rome, in Vatican City. The little-known but illustrious Pontifical Academy of Sciences gives science advice to the Pope. Most of its 70 members are non-Catholics; the academy includes 26 Nobel laureates. Victor Weisskopf, an MIT physicist who has been a member of the academy for 5 years, says, "The only explanation I have for the obscurity of the academy is that the Vatican is very bad about publicity."

In the past few years, however, there were several occasions in which news of the academy and its advice has surfaced. This is because Pope John Paul II, according to several academy members, has an active interest in science. But, says Alexander Rich, an MIT biologist and academy member, it is also due to the influence of Carlos Chagas, a distinguished Brazilian neurophysiologist who is the current president of the academy. "The Pontifical Academy has become an activist academy under Chagas. He is warm, compassionate and engaging. He is respected by the academy members and gets on well with the Pope," Rich remarks.

At present, one of the academy's more newsworthy activities is its stance on nuclear war. In the spring of 1980, Pope John Paul set up a permanent study group within the academy to consider the consequences of nuclear war. The committee reported its conclusions on the medical consequences in October of 1981 and, impressed by what the group had to say, the Pope wrote personal letters to Ronald Reagan, Leonid Brezhnev, Margaret Thatcher, and François Mitterrand, asking them to receive delegates from the academy who would discuss this subject. The four world leaders agreed. On 14 December, Reagan was visited by Weisskopf, David Baltimore of MIT, Marshall Nirenberg of the National Institutes of Health, and Howard Hiatt of the Harvard School of Public Health. (Hiatt, who is not an academy member, is well known in the scientific community for his attempts to publicize the medical consequences of nuclear war.) The other world leaders spoke to academy delegates that same week.

Although the meeting with Reagan got some press coverage, Weisskopf was not much impressed. "Reagan did not even ask us to sit down," he remarks.

Pope John Paul also made use of the academy's advice on 1 January 1980. (New Year's Day is a day of prayers for world peace in the Catholic church.) The Pope quoted directly from a statement by the academy study group, describing the sort of terror and destruction that might be expected if nuclear weapons were used. But the academy stayed in the background. A *New York Times* story on the Pope's speech said, "Vatican officials said they could not name the authors of the scientific report on which [the Pope's] information is based."

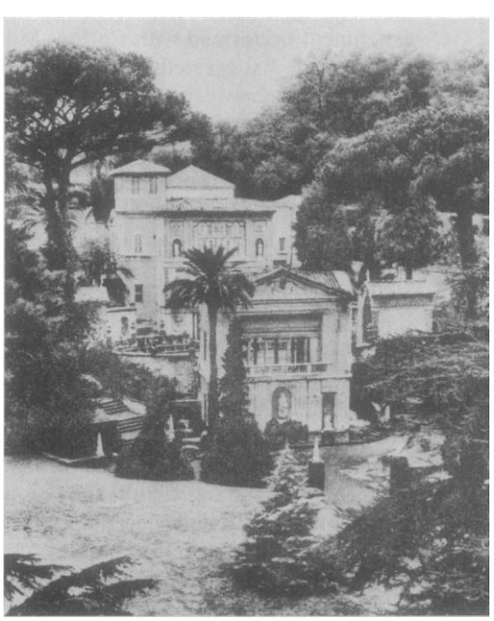
On 10 November 1979, the Pontifical Academy of Sciences held a meeting in Rome to honor Albert Einstein on the occasion of his centennial. According to Weisskopf, the Pope expressly asked the academy to organize the meeting and said he wanted to be its chairman. At the meeting, Pope John Paul gave a speech lauding scientific research and praising the academy, saying that the existence of the academy "is a visible sign which shows to people without any form of racial or religious discrimination, the profound harmony which can exist between the truths of science and the truths of faith." The talks given at that meeting were published in the 14 March 1980 issue of *Science* (page 1159).

But, in the past, the proceedings of the academy have gone unnoticed. The academy itself originated from the Academy of the Lincei, which was founded in 1603 and restored by Pope Pius IX in 1847. This academy became the Pontifical Academy of Sciences in 1936 under Pope Pius XI. In 1936, there were 70 cardinals, and it was decided that there would be one scientist in the academy for every cardinal. The scientists would give the Pope advice on scientific matters just as the cardinals give the Pope advice on spiritual matters.

Scientists are elected into the academy for life in what academy member Rich describes as an impressive ceremony. "It is a very formal ceremony and we are given a heavy gold necklace and a gold pin," Rich says. When he gets letters from Rome, Rich notes, they are addressed to "His Excellency" and when he enters Vatican City, the guards salute him.

Rich also notes the high caliber of scientists who have been academy members and he points to a list he made of physicists who have been elected to the academy. The list reads like a roster of the great names in early 20th century physics, including such luminaries as Niels and Aage Bohr, Sir James Chadwick, Louis DeBroglie, Peter Debye, Paul Dirac, Otto Hahn, Werner Heisenberg, Gerhard Herzberg, Robert Millikan, Max Planck, Ernest Rutherford, Erwin Schrodinger, and Max VonLaue.

Until John Paul became Pope, however, the academy was largely inactive. Paul VI, Weisskopf recalls, did little



The Pontifical Academy of Sciences meets in this villa in the Vatican.

0036-8075/82/0226-1076$01.00/0

more than shake hands with the new members. The academy carried out its customary business of having scientific meetings in Rome every 2 years and the proceedings of these meetings were published by the Vatican Press, but the scientists were mainly speaking to themselves. In contrast, says Weisskopf, "This Pope [John Paul] showed a great interest in us from the beginning. He came to the academy and gave a speech in the summer of 1979 in which he expressed a special interest in science."

Weisskopf remarks that he has had a great deal of contact with Pope John Paul and thinks highly of him. "The Pope is a real intellectual, very widely read. I'm very much impressed by his intelligence," Weisskopf says. The Pope currently is continuing to seek out advice from the academy on nuclear war and has also expressed an interest in recombinant DNA technology and parasitic diseases.—GINA KOLATA

Budget Tailors Education to Reagan Pattern

Critics charge that paring federal role would break commitment to assuring access to higher education

As a presidential candidate, Ronald Reagan made it clear he thought that the federal role in education should be sharply reduced. The budget President Reagan sent to Congress on 8 February amply illustrates what he had in mind.

In education, the new budget calls for cuts of about 20 percent overall. Aid for students in higher education would be reduced by a third compared to the current academic year. The budget also spells out the Administration's plan for breaking up the Department of Education (ED). Demotion of ED from Cabinet status was a Reagan campaign promise.

By comparison with education, federal R & D spending was accorded generous treatment (*Science*, 19 February, p. 944). However, the general effect of the education cuts on individuals and institutions, if they are accepted by Congress, seems likely at least indirectly to put a drag on science and technology. And the plan to make graduate students ineligible for government-guaranteed loans at interest below market rates could, in the words of Senator Claiborne Pell (D–R.I.), "have a devastating effect on graduate education."

Pell, ranking minority member of the Senate education subcommittee, said in a speech on 10 February that if the Reagan cuts go through, "thousands and thousands of students will face a crisis of the first order," and said he foresaw a "tragedy of national proportions."

Spokesmen for higher education organizations have reacted strongly to what they see as sharp change in educational policy. J. W. Peltason, president of the American Council on Education (ACE), said of the cuts, "It means that this administration is advocating the abandonment of a bipartisan, 25-year-old commitment that college will not be denied to any person because of the financial condition of his or her family."

The Administration rationale for its budget proposal was expressed in a statement on the budget by Secretary of Education Terrel Bell:

"Over the years, Federal intervention in education has become increasingly intrusive, has imposed unnecessary administrative and paperwork burdens on recipients of Federal grants, and has supported too large a bureaucracy for the limited role the Federal Government should play. We intend to reverse that trend, and to return decisions about how and what to teach back where they belong—to teachers, parents, State and local officials and educational institutions."

The big question, of course, is whether Congress will go along with the Administration requests for budget cuts and reorganization. Bell himself acknowledged at a budget briefing that the proposal to dismantle ED funds faced strong opposition in Congress, but said legislation to effect the change would soon be sent to Capitol Hill. And misgivings about Administration budget policy have been voiced not only by Pell and other Democrats, but by Republicans like Senator Robert Stafford of Vermont, chairman of the Senate education, arts, and humanities subcommittee. In a speech to college officials delivered after the budget was released Stafford raised the issue of the "federal commitment to access," and asked "do we return to a situation in which higher education is available to a privileged few?" The impression in Congress is that the Administration faces tough sledding in gaining further deep cuts in education. But in view both of the Administration's past successes in winning budget battles and the prospect of a highly unpredictable legislative climate this year the education lobby is girding for a hard campaign.

Overall, the Administration is requesting $8.8 billion for education, down from $12.9 billion in fiscal year (FY) 1981 and $11.2 billion in the current year. The figures represent current dollars and do not reflect the effects of inflation.

In the higher education sector, student aid programs aimed at low-income students would be cut to $1.8 billion in FY 1983 compared to $3.5 billion in FY 1981. Eligibility rules for direct grants would be changed so that students from families with incomes over $14,000 a year would be cut out, affecting more than a million students in the largest of the student aid programs.

Also targeted for trimming is the guaranteed student loan (GSL) program that has helped many middle-income families meet rising college costs since family income limitations were relaxed during the Carter Administration. Under the Reagan budget proposals, the Administration would halt the growth of the highly popular and rapidly expanding program by requesting $2.5 billion for it for FY 1983, some $267 million lower than provided for the current year. To be eligible middle-income families would have to pass what in effect is a stiff need test. Other changes would include requiring borrowers to pay market interest rates starting 2 years after leaving college, making the loans substantially more costly.

Graduate students who are now eligible for GSL's would be denied them entirely. They could qualify for so-called Auxiliary Loans to Assist Students (ALAS), an ironically apt acronym since the loans carry a 14 percent interest rate compared to the 9 percent for GSL's and have repayment terms that would be difficult for most graduate students to meet. According to an ACE analysis of the budget, some 600,000 graduate students, over half of those enrolled, depend on GSL's to finance their studies.

0036-8075/82/0226-1077$01.00/0