the shooting down of the South Korean passenger plane [on 1 September]," says Morse. "They were worried about the world political climate—even more now than they had been when Afghanistan was invaded. They weren't eager to talk about specific incidents, but they did voice their feelings about the need to continue scientific links, particularly now that both the US and USSR have virtually reduced exchanges to zero. They expressed concern about increasing impediments to scientific communications between both countries."

Zabusky has similar impressions. "There was an uneasy attitude that collaboration in science between our countries was in a deep freeze," he observes. "So, at Kiev there was a concerted effort to warm East–West relations in science." Besides delivering his paper, he participated in the opening and closing sessions. Zabusky hails the conference as "first-rate, especially in the theoretical realms of fluid dynamics, plasma physics and atmospheric physics. But there is little computational work going on in the Soviet Union in those fields—unlike the West. Compared with what our scientists have to work with, Soviet computers are still in a primitive stage."

Back in Moscow, he, his wife, Charlotte, and daughter, Stacia, were asked to dinner by Eugene Lifschitz, a collaborator of Lev Landau. But on 1 November, the day of the dinner, Lifschitz called to say they could not meet. This was Zabusky's first inkling that all was not well. The next day the US Embassy informed him he was being expelled.

Why did it happen? "Did they need me as an example?" Zabusky asks. "I don't really know. Things are not the same in the Soviet Union. Even some of the best and most trusted scientists are forbidden to travel to the West. I don't think this has anything to do with science. It has to do with politics."

Political messages. Zabusky's expulsion, observes a State Department official, "sends a message to Western scientists to 'behave yourselves' in the Soviet Union." If any message is directed to refuseniks, he says, "it is that the campaign for greater discipline is intensifying in all walks of life under Yuri V. Andropov. It's hard to believe that refuseniks need any reminder of that, however, considering the harrassment and repression they continue to endure."

The picture that emerges from the Zabusky case is a Soviet policy toward science that is a mixture of bureaucratic rigidity, distrust of scientists and fears of non-conformist behavior of any sort. Frank Press, president of the National Academy of Sciences, has spoken forcefully on the current state of US–USSR scientific relations. Testifying at a Congressional hearing on scientific affairs and international security on 2 August, he acknowledged that "Our scientific contacts are withering. The causes are manifold, including the concern of our own government about technology transfer; a further desire by government to restrict cultural, educational and scientific contacts as a means of punishing the Soviets for their actions in Afghanistan and Poland; the continuing secretive nature of Soviet society and the bureaucratic impediments imposed by the Soviet government; the politicization of the Soviet process for selection of exchange scientists; and, finally, the abhorrence on our part of the abrogation of human rights of Soviet scientists. Each of these impediments can alone seriously endanger the sensitive thread of communication that exists today between our scientific communities." —IG

Physicists sign appeal for nuclear freeze

By late November 15 000 physicists in 44 countries had signed the following appeal for a nuclear freeze:

> We call for an agreement to halt the testing, production and deployment of nuclear weapons and nuclear weapons delivery systems. Meanwhile, no further nuclear weapons or delivery systems should be deployed anywhere.

Over half of the living winners of the Nobel prize in physics were among the signers.

In mid-November groups of physicists presented the call to representatives of national governments and to international organizations. The presentations, like the circulation of the call, were conducted without any formal organization. On 18 November Philip W. Anderson (Princeton University), James W. Cronin (University of Chicago) and Robert Serber (Columbia University) met with Javier Pérez de Cuéllar, Secretary General of the United Nations, to present the call. (Sheldon Glashow of Harvard University was prevented by illness from participating.) Pérez de Cuéllar gave the group a sympathetic reception, according to Serber, and welcomed the appeal. He assured the physicists that he shares their goals and is doing all he can to bring about disarmament, Serber told us.

Presentations were also made to officials of the governments of Finland, France, Italy, Japan (to the prime minister), Spain and West Germany, according to Rolf Hagedorn (CERN), one of the initiators of the petition. He told us that receptions for the most part were polite but negative.

In the US, signers made attempts to present the petition to President Ronald Reagan, Vice President George Bush, the Office of Science and Technology Policy, House majority leader Thomas P. O'Neill (D-Mass.), and Senate majority leader Howard Baker (R-Tenn.), without any success at this writing. Hagedorn did not know of any attempts to present the call in the USSR, where over 750 physicists signed the statement.

The idea for the call arose during a conversation at CERN in the summer of 1982. Daniele Amati (CERN), Nina Byers (UCLA), Rolf Hagedorn (CERN), Jack Steinberger (CERN), Victor Weisskopf (MIT) and Christophe Wetterich (CERN) discussed what they could do about the nuclear arms race. They wrote the appeal and sent it to 120 well-known physicists asking for their endorsements. Almost 80 re-

Petition presented at UN. From left: Jan Martinsen (UN under-secretary-general for disarmament affairs), Philip Anderson (Princeton), Javier Pérez de Cuéllar (UN secretary-general), Robert Serber (Columbia), Sidney Katz (coordinator of the presentation from the Center for Defense Information) and James Cronin (University of Chicago).

sponded positively. The organizers then found collaborators in many countries and, in the spring of 1983, sent out copies of the call with over 80 signatures of prominent physicists. From that time the gathering of signatures has proceeded—and still proceeds—informally, as physicists pass it on to each other.

In a covering letter circulated with the petition, the organizers state that the nuclear arms race is accelerating. The increased precision of missiles may invite first-strike use and launch on warning; new tactical nuclear weapons may lower nuclear thresholds. The letter continues to explain that the appeal has been circulated among physicists because it arose in a discussion among physicists. It was felt that an appeal from physicists all over the world, across political and national boundaries, might be a constructive contribution to efforts to curb the arms race. The organizers also felt it was appropriate for physicists to present an appeal because physicists have been instrumental in the invention of nuclear weapons and are still directly involved with their production and development. —DG

Cambridge nixes ban on nuclear-weapons activity

On 8 November voters in Cambridge, Massachusetts, defeated an ordinance that would have made work on nuclear weapons within the city illegal. Forty percent of the voters approved the measure; 60% opposed it. About two-thirds of the 45 000 Cambridge voters took part. The Cambridge referendum was one of many that have taken place, according to Nuclear Free America, a national clearinghouse and resource center in Baltimore. A spokesman for the organization, Max Obuscewski, told us that voters or city councils in 31 communities have designated themselves "nuclear-free zones," areas where nuclear-weapons activity is opposed or prohibited. Most of the measures passed have been simply statements of opposition. In ten communities, however, the measures are legally binding, Obuscewski said; in those cases, ordinances have been passed or bylaws have been added to city charters. Only in Cambridge would the measure have threatened to disrupt current weapons-related activities.

The chief target of the ordinance was Draper Laboratory, which designs guidance systems for the Trident II and MX missiles. Draper employs about 1800 people full-time, 180 of whom live in Cambridge, according to Joseph O'Connor, Draper vice-president for administration. It receives about $120 million a year in DOD contracts.

Pollsters whom Draper hired early in the summer found voters two-to-one in favor of the ordinance. The shift against it occurred after Draper organized Citizens Against Research Bans to oppose the ordinance. CARB in turn hired two public-relations consultants. They rallied support from many faculty members at MIT and Harvard and conducted a campaign that cost over $400 000, according to Ernest May, head of CARB and professor of history at Harvard. CARB received funds from military contractors in and outside of Massachusetts, including Raytheon, Northrop and Lockheed, May told us, and Hughes Aircraft, General Electric, and Sperry Corporation of New York, according to the legal counsel of the Massachusetts Office of Campaign and Political Finance, where political contributions are on public record. The Mobilization for Survival, which conducted the campaign for the ordinance, reports spending $23 000 on the campaign.

The proposed ordinance would have made criminal "research, development, evaluation, production, maintenance, storage, transportation, disposal of nuclear weapons or their components" after a two-year period in which nuclear weapons activity could be converted to other work. The ordinance would have urged the city of Cambridge to redirect resources previously used for nuclear weapons towards health care and new jobs.

May told us that the ordinance would have made illegal a great range of activity, including research and even teaching about arms control as well as the production of computer software that, among diverse applications, is used in the guidance systems of nuclear-armed aircraft. He also said the ordinance would have violated the First Amendment.

Richard Schreuer, an organizer for the ordinance at Mobilization for Survival, said the ban would not have affected basic research or arms control research because a clause excluded "basic research, the primary purpose of which is not to work toward the development of nuclear weapons." He added that the ordinance would have only affected developing nuclear weapons, not thinking or speaking about them, which the First Amendment does protect.

Schreuer told us that it was likely that another campaign for a nuclear-free Cambridge will be waged in 1985, the next time the measure can appear on the ballot in Cambridge. Meanwhile, efforts for ordinances as well as non-binding resolutions are being organized in 40 other communities, according to Nuclear Free America. On 15 November a policy ordinance in Madison, Wisconsin, was approved by the city council 14 to 7. The ordinance, which does not affect any current activity, will put into effect a zoning prohibition against the production of nuclear weapons and components "expressly intended to contribute to the operation, guidance or delivery of a nuclear weapon." It also prohibits the storage of high-level nuclear waste and makes it city policy to oppose high-level radioactive waste shipments through Madison. That makes Madison, with a population of 170 000, the most populous nuclear-free zone. Another contest that is sure to generate a lot of controversy will take place in Santa Monica, California, home of the Rand Corporation, next November. —DG

Society of Rheologists elects Landel as vice president

Robert F. Landel took office as the new vice president of the Society of Rheology at the Society's October meeting.

Landel, after a two-year term as vice president, is to succeed the new president, William R. Schowalter, professor of chemical engineering at Princeton University.

Landel received a BA (1950) and an MA (1951) at the University of Buffalo and a PhD in physical chemistry at the University of Wisconsin (1954). He has worked at the Jet Propulsion Laboratory of Caltech since 1955, until 1959 as senior research engineer, from 1961 to 1975 as a manager of the polymer research section. Since 1981 he has been a senior research scientist and, since 1983, deputy manager for materials, engineering technology section. His research has concerned dynamic mechanical properties of polymers, aging and lifetime of polymers, and large deformation and rupture of elastomers.

In the same election, two new members were elected to the executive committee: Adi Eisenberg of McGill University and Montgomery T. Shaw of the University of Connecticut. Secretary John R. Collier, treasurer Edward A. Collins and editor Raymond R. Myers were all reelected. □

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