

dation really possible? The answer, unfortunately, is no. The Soviet view comes from centuries in the past and goes centuries into the future. They are willing to keep pressure applied and wait. Eventually they expect the will of the United States to weaken and atrophy such that a Soviet takeover would be virtually bloodless. An immediate concession today might be possible from them. But, for the long haul, they are dedicated, and ultimate domination is the only goal they hold.

How can we hold off this juggernaut in our time and in the future? There is only one way that is remotely feasible at this time. Political means are not real and will do nothing but give false hope and vulnerability to the USSR's objectives. We must continue to be so armed and so prepared as to make it prohibitively expensive to the USSR to attempt to dominate the United States by force. We must be able, if needed, to extract such a price from the Soviets for a brute force attempt to overcome the United States that they will not be willing to pay that price, thereby using their willingness to wait as a tool to maintain peace. Anything else is a prelude to destruction.

Therefore, Mr. Lin, your thesis is not valid. It will not work. It would destroy you. We must do our best to be able to protect ourselves in such a fashion that it will not pay the Soviets to play their nuclear-war card.

ROBERT S. FLUM SR
Navy Department
Space and Naval Warfare Systems
Command
Washington, D.C.

8/85

HERBERT LIN REPLIES: Robert Flum feels threatened by the Soviets; I do too. He apparently feels that political accommodation with the Soviets would mean weakening our security. I do not share that belief. Political accommodation need not imply surrender or suicide. Accommodation can also include healthy doubts about the wisdom of perpetual confrontation in a world of nuclear weapons or an acceptance of differences.

I do not know how to reach a political accommodation with the Soviets; it may or may not be possible. But I do know that technology will not eliminate the reasons each side has for buying weapons; if there is hope for survival, it lies not with technology but with politics. If political accommodation is not possible, then in the long run we will all be dead. I prefer not to take such a pessimistic point of view.

In fact, Flum's view of history reinforces my main point. He feels that we were safer in the 1950s. Once again, I share that belief. The last 30 years of

arms build-up have brought us from the relative safety of being threatened by nuclear bombers to the relative danger of being threatened by nuclear missiles. This is progress? Flum has thus illustrated the futility of a perpetual arms build-up: In each generation, we point to the current state of affairs, and wish for yesteryear, when the threats to our security were not so great. When will we learn that buying arms does not buy long-term security, but rather long-term insecurity?

Finally, Flum believes that we must be prepared to make a Soviet attack on the US prohibitively expensive. However, that is not the goal of the President's Strategic Defense Initiative, whose charter states that its ultimate goal is "to eliminate the threat of nuclear ballistic missiles." Today it is SDI itself that gives false hopes that threats to our security can be contained technologically.

As a resident of a coastal city, I do not want to face the choice of dying in a nuclear blast or dying by an explosion-induced tidal wave. Nor do I wish to live in a Soviet-style society in which security measures could largely eliminate the threat of biological weapons or suicide bombs (and incidentally, most of the civil liberties we take for granted).

John von Neumann once pointed out that the area of the Earth remains constant, while the number of weapons increases. Surely this does not describe a stable situation. For the short term, deterrence is unavoidable. But weaponry cannot increase without limit immune to catastrophe. Our only hope over the long run is to reverse the upward spiral of weapons. We should begin now.

HERBERT LIN
Massachusetts Institute of Technology
10/85 Cambridge, Massachusetts

'Refusenik' physicists

I have recently received two open letters from Soviet "refusenik" physicists with the request that I share them with your readers. I present only excerpts. The first is from Nahum Meiman and addressed to Mikhail S. Gorbachev, Secretary of the Communist Party, and the second one is from Armen G. Khachatryan and addressed to A. Aleksandrov, president of the Soviet Academy of Sciences. Both of these scientists believe that appeals from Western colleagues can help them greatly in their present situations. This is also the belief of other refusenik scientists and dissidents and I feel that in cases like these we have to take the wishes of the oppressed as our guide for action.

► Meiman writes:

A few words about myself: I am a professor of mathematics, 74 years old. Since 1975 I have been seeking permission to go to Israel. My only daughter left the Soviet Union in 1976. I am refused permission to go, on the pretext that I had done classified work. More than 30 years ago, at the dawn of the atomic age, before there were even any computers in the Soviet Union, I did certain classified calculations for long-dead Academician Landau in the Institute of Physical Problems of the Academy of Sciences. These calculations were of a very auxiliary nature, and have long ago lost all sensitivity and significance. I transferred to work in another institute in 1955, and as officially certified, never had any further contact with sensitive work. When I applied to go to Israel in 1975, I was compelled to retire on pension.

Two years ago, a tumor appeared on the back of my wife's neck, close to the spinal column. This could be treated only with extremely sophisticated modern equipment and skill in using it. The Soviet Union still has neither the equipment nor the skill to use it. The only thing Soviet medicine could offer was surgery. Now for two years, my wife has had four risky, painful operations, the last one in the Oncological Center three months ago. So much muscle tissue has by now been removed that no further operation is feasible. My wife holds her head up with difficulty, and is in constant pain.

Immediately after the disastrous first operation, in October 1983, my wife received generous invitations to the treatment in oncological clinics in Sweden, France, the United States and Israel.

This inspired my wife and me to go to the national emigration chief, Colonel Kuznetsov, on 4 September and apply to him personally to let my wife go with her mother, brother, son and two grandchildren, leaving me behind. A week later, Colonel Kuznetsov informed me by phone that this was refused. On 18 September he told my wife that she could not leave with other members of her family because she had been married to me too long and her departure would constitute a security risk for the Soviet Union.

This malicious, paranoid nonsense is more than a fatal threat to my wife; it is in fact a danger for the whole world, even for the Soviet Union itself. It is absurd and dishonest in the extreme to

claim that my departure would threaten the safety of the USSR. To claim that my sick wife's departure would be risky is simply dangerous madness. My wife worked only as an English teacher and we married in 1981, a full 26 years after I ceased all contact with classified work. It arouses a dangerous psychological climate of mutual distrust, preventing achievement of vitally important compromises."

► Khachaturyan writes:

I have no alternative other than addressing you [in] an open letter. That decision was caused by the bitterness over improper actions of the Soviet Academy after my family applied for emigration to Israel.

After application for emigration in 1981 I learned that my position in the Academy, where I worked since 1973 as a full Doctor of Physics, immediately changed. I was expelled from three scientific councils: in the Institute of Crystallography, where I work, in the Academy of Sciences and in the Moscow Steel and Alloys Institute, where I was a member for many years. Then I found myself in complete professional isolation. The general atmosphere created around me is such that my colleagues are afraid to work with me. Even to speak with me became a matter of personal courage. My wife is in the same position. So my wife and I have to work together. My director, however, canceled my wife's permit to visit my institute and did not allow her to use the laboratory computer for our work.

My wife and I can no longer attend scientific meetings in the Soviet Union since we applied for emigration. Vice presidents Academicians E. P. Velikhov and Ju. A. Ovchinnikov forbade us to attend any scientific meetings abroad as well, even though all travel expenses were covered by organizers. Velikhov, the Soviet Academy's main "peace advocate," cut me off from scientific cooperation with my American colleagues. Velikhov killed my joint research project with Lawrence Berkeley Laboratory and the department of materials science of the University of California, Berkeley (one of the most successful Soviet-American projects), where I was a visiting professor in the 1976-77 and 1978-79 academic years, when he refused to let me accept invitations to Berkeley for work.

The Presidium of the Soviet Academy took on itself unprecedented functions of unsealing, checking

and confiscating the letters sent to my office by my Western colleagues. For example, the ballots for election of officers of The American Physical Society, in which I participate as a member of the Society, I received from the Presidium of the Soviet Academy four months after the ballots arrived in the USSR and three months after the election. All this time the letter with ballots was kept in the Soviet Academy. Even a telegram from my publisher [at] Pergamon Press, Professor J. W. Christian, FRS, I received enclosed in the letter from the Presidium of the Soviet Academy three weeks later. My protests about it did not produce any effect.

After the hunger strike of my family, which took place in spite of the threats, vice president E. P. Velikhov ordered my dismissal. Only the flow of protests of my colleagues from France, England and USA made him change his intentions. By the way, I can't compel myself to feel gratitude to the leadership of the Academy of Sciences that unlike other scientists-refuseniks I was not fired after I applied for emigration. I am fully aware that the absurd situation when they don't let me work but at the same time pay the salary of the full Doctor of Science during 4½ years is not due to the special attitude to me, but is due to the simple fact that the vice presidents of the Soviet Academy, often traveling in the West, don't want to do anything that might spoil their pleasure from these trips.

Both of these letters speak for themselves. I hope that the readers of this magazine will respond to the appeals of these and other oppressed scientists. You can do this by letting your views be known to Soviet officials, scientific and nonscientific, and in particular by visiting refusenik scientists whenever you travel to the Soviet Union. There will presumably be more opportunities for this as various exchange agreements go into effect. For further information please contact me or the Committee of Concerned Scientists, Suite 608, 330 7th Avenue, New York, NY 10001, telephone 212-695-2560.

JOEL L. LEBOWITZ
Rutgers University

12/85

New Brunswick, New Jersey

Correction

November, page 61—The photograph of Werner Heisenberg was from the AIP Niels Bohr Library. □

MEASURE & CONTROL RESISTANCE & TEMPERATURE LOW SENSOR POWER



LR-400

AC RESISTANCE BRIDGE 4-WIRE AUTO-BALANCE

- 4½ digit display
- 8 ranges .02Ω to 200KΩ
- 1 micro-ohm resolution
- Linearity .025%
- 4½ digit set resistance
- Digital in/out option
- Mutual inductance option
- Squid readout option
- Drives our LR-130 Temperature Controller

LINEAR RESEARCH INC.

5231 CUSHMAN PL. X21
SAN DIEGO, CA 92110

619-299-0719

Circle number 56 on Reader Service Card

physics today

position open

PHYSICS TODAY is looking for a person with an advanced degree in physics, who writes well. Experience is desirable in physics research, writing and editing. Send resume and salary history and requirements together with writing samples to:

Ms T. C. Braun
Personnel Division
American Institute of Physics
335 East 45th Street
New York, NY 10017