LETTERS

Effective International Cooperation

Science appears to have missed the news, but the International Institute for Applied Systems Analysis (IIASA) in Laxenburg just outside Vienna has been shaken by scandal. This is particularly unfortunate since the Institute, splendid with Nobel laureates and conceived in high purpose, is struggling to continue its good works in the teeth of economic crisis. But the incident serves as an object lesson that we in the scientific community will have to address sooner or later or, failing that, the entire structure of international scientific cooperation will fall into a miserable state.

In summary, Arkady Belozerov, a Soviet physicist assigned to IIASA as secretary (a rather high-ranking position at the policy level within the secretariat) was accused of espionage and subsequently resigned last April. This was not the first time that Arkady had been publicly accused of being a KGB agent while serving within the international scientific bureaucracy. A few years ago, a flurry of articles appeared in the Western press—notably in *Stern* and the British news magazine *Now!*—outlining in vague murkiness his alleged intrigues. At that time, Arkady was serving as a scientist in the Fusion Research Section of the International Atomic Energy Agency in Vienna, in a relatively junior position; quite a contrast with his recent exalted status in IIASA.

During Arkady's tenure in Vienna, I got to know him quite well (I was assigned to the Division of Life Sciences for 3 years). He and his wife Laura were among my wife's and my best friends in Vienna, and we shared numerous enjoyable days together. Many of our other friends (German and American, mostly) warned us, in the gossip common to closed communities in alien settings, that Arkady was a relatively high Soviet official and pointed to certain anomalous perks which he enjoyed and which were not commonly given to Eastern scientists: freedom of travel, the opportunity to have his entire family join him in Vienna, close ties with the Russian embassy (which was viewed as a hotbed of spies), and his opportunities to live abroad for extended periods (he received some of his graduate training in Canada). In general, all Soviet appointees were seen as having "responsibilities" beyond those to the Agency—in clear violation of the Agency's charge that no member of the secretariat serve the national interests of his country over those of the member states.

While I was troubled by the allegations against Arkady, our relationship was nonprofessional and personal: we went fishing and picnicking and talked about mountain climbing, Agency politics, and science, all the while avoiding political discussions and current events. Those of my friends who worked with him found him competent, innovative, and industrious. He had a powerful, open personality which many Americans found attractive and which was certainly exhilarating.

I say that I was troubled by the allegations because, if they were true, then Arkady was not merely serving Soviet interests, but was perverting the delicate fabric of the international scientific community. The functions of the Agency are particularly vulnerable to disruption, since they include the safeguard provisions of the nuclear nonproliferation treaty and the technical assistance program in nuclear energy and science. Scientists, no less than journalists, can simply not afford to become suspect as the tools of international intrigue. The cynicism which pervades the international bureaucracies of the United Nations is a result of these known or assumed activities, and this has done great violence to the effectiveness of these agencies in pursuing their missions.

It is impossible to pass judgment on the validity of the allegations against Arkady; there is no due process in the international arena—for either nations or individuals. I am both personally and professionally upset by what has happened. Yet I am compelled to search for some way to repair the damage. Failure to respond can only lead to further diminution of the international scientific apparatus with a concomitant loss of communication—a disaster not only for those in the Third World who need our help but for ourselves as well. We must not forget how costly and difficult it was to open dialog after World War II (or any war) and how important that dialog has been to all of us. And yet, the climate has begun to cloud and occlude those precious channels of communication.

No one can apologize for Soviet behavior: those of us who have served in the international scientific bureaucracy know the intransigence of Russian policy, the difficulty of obtaining the participation of important Soviet scientists at many conferences, and the uncertainty as to whether or not these scientists will attend meetings to which they have been committed. Nor can we excuse the appalling mistreatment of our colleagues as punishment for their political beliefs and activities.

Yet we must be wary about what is happening here. On the one hand, the international community tacitly accepts duplicity until a fuss is made—usually as a result of the simultaneous appearance of articles in several publications. Clearly the press is being manipulated by sources which choose their time, format, and place for disclosure. And if you read these published allegations carefully, the details are usually confusing or trivial—hardly the stuff of high intrigue and mortal danger. It is an altogether repelling spectacle.

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NSF and Science Education

Bill G. Aldridge's editorial on the National Science Foundation's (NSF) other mission (3 Apr., p. 9) should be noted by all scientists. It is a pity that NSF will be forced soon to eliminate all or most of its science education programs, which are beginning to show some remarkable dividends. As one who has worked on NSF research grants and appreciates its science education programs, I find it hard to understand the Office of Management and Budget's drastic cuts.

For example, I have benefited immensely from the Chautauqua-type short courses especially designed for science faculty from 2-year and 4-year colleges. There is often no other way of updating one's knowledge of the rapid developments taking place in many branches of science. These courses give faculty the opportunity to meet and discuss recent advances and trends with authorities in many scientific fields. It is also an excellent opportunity to make contacts with colleagues working in different branches of the same field. A remarkable aspect of the program is the intermixing of faculty from different disciplines which gives new insights and perspectives. I have participated in four of these programs in the past 10 years and have learned much about some branches of science that I could not have learned from reading journals or attending scientific meetings. No other scientific endeavor funded by the government pays so much dividend on capital investment. The elimination of the program would also have some long-range effects on science education. The

community colleges and 4-year colleges will bear more and more responsibility in the coming years for science education because of inflation and prohibitive tuition costs at larger universities. If this trend is to continue, we will need more, not less, of Chautauqua-type programs to help the faculty in these colleges keep in touch with different branches of science.

The cuts proposed by the Office of Management and Budget for all science education programs are "jellybeans" compared to the waste in so many other federal programs. I hope that the scientific community, especially those working in small colleges, will band together and lobby for the restoration of the cuts.

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Chlorinated Drinking Water

The Environmental Protection Agency (EPA), the Council on Environmental Quality (CEQ), and now Thomas H. Maugh II (Research News, 13 Feb., p. 694) suggest that we face an imminent danger of cancer from chloroform in our drinking water. Before we are forced to spend tens of billions of dollars for its removal, someone should ask whether these estimates of risk are based on reason or on Environmentalist theology.

It is reported to be possible to produce cancer in rats and mice with carefully selected doses of chloroform, but apparently not without severe liver or kidney damage. On this basis, it is fair to consider that chloroform might be a human carcinogen. It is not appropriate to conclude that it is such and to refuse to consider evidence to the contrary. Quite a lot has been learned about the physiological effects of chloroform since it was discovered 150 years ago or first used as a human anesthetic 134 years ago. I have not reviewed the original literature, but the available reference sources indicate that: (i) attempts to produce cancer in experimental animals other than rodents have been unsuccessful; (ii) its use as an anesthetic has been abandoned largely because newer agents offer a lower risk of cardiac failure; and (iii) occupational exposure limits have been reduced several times because of concern for liver damage and related effects. These human exposures have been in the range of 0.1 to 10 grams *per day*. The exposure expected from drinking water is 0.1 to 10 grams *per lifetime*. Unless a very large