stop using water in the cargo tanks of tankers for washing and ballasting; (ii) require deck and engine officers and pilots of tankers to demonstrate their competency on simulators; (iii) provide charterers, insurers, and authorities with their accident and oil spill records; (iv) convert part of the cargo tanks on existing tankers into segregated ballast tanks; and (v) construct double hulls on future new tankers, with the space between the hulls sufficient for all segregated ballast requirements.

Unilateral action by the United States is required. Our actions will quickly become adopted by other maritime nations. These proposed changes would add less than 1 cent to the cost of gasoline. They would result in oil tankers becoming "beautiful."

ARTHUR MCKENZIE
Tanker Advisory Center, Inc.,
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Physicists Postpone Visit to Soviet Union

Under the aegis of the Joint Coordinating Committee on Research on Fundamental Properties of Matter (JCC-FPM) established under the Nixon-Brezhnev agreements and involving the U.S. Department of Energy and the U.S.S.R. State Committee on the Peaceful Uses of Atomic Energy, we had planned, as a formal U.S. delegation, to visit nuclear research institutes in Moscow, Dubna, Leningrad, Kiev, Kharkov, Tashkent, Alma Ata, and Novosibirsk during the period 24 May through 7 June 1978. This delegation was the formal counterpart of a Soviet one that visited a number of U.S. nuclear research institutions roughly a year ago.

Collaborative activities under the JCC-FPM have thus far been heavily concentrated in particle physics with productive cooperative utilization of facilities at Fermilab and Novosibirsk. It had been our hope—and that of the JCC-FPM—that through the personal contacts established during our visits, and through our better understanding of the research programs under way in the Soviet institutions visited, it would be possible to broaden these collaborative activities substantially to include a number of areas of nuclear science.

In view of recent developments in the Soviet Union and discussions among ourselves, however, we have found it necessary to postpone our visit. We have forwarded the following letter to the directors of the institutions that had been on our planned itinerary explaining this decision.

We believe our colleagues in the U.S. scientific community will be interested in our decision and the reasons for it.

As you have already learned through formal channels of the Joint Coordinating Committee on Research on Fundamental Properties of Matter (JCC-FPM), and the message from Dr. Kane to Professor Chuvilo dated May 22, 1978, we have decided to postpone our visit to your Institute.

We want to tell you why we have made this decision.

Our planned visits under JCC-FPM sponsorship have reflected our very strong belief in the importance of communication throughout the scientific—and particularly the physics—communities, and our belief that the activities already achieved under the JCC-FPM have made major contributions to scientific cooperation between our countries and to better understanding between our peoples. It has been—and is—our hope that such activities can be extended to new areas of science and to greater cooperation in those areas in which programs already exist.

We are sure that you will agree that one of the most important conditions for the advancement of any science—and again physics in particular—is freedom of communication among scientists. The exchange of ideas as well as the sharing of responsibilities is well known to be fruitful while compartmentalization is, in the end, sterile and unproductive.

It is for this reason that we are happy to have the opportunity to plan for our visits to Soviet institutions, such as your own, as a formal part of the JCC-FPM activity and as a counterpart of the productive visit paid to a number of U.S. nuclear research institutions by a Soviet nuclear science group during the past year. We have envisioned that cooperation between our two scientific communities would be mutually very valuable and we have been anxious to assist in its development.

It is, therefore, with the greatest regret that we have postponed the planned visits.

Cooperative ventures, however, as we are certain you will agree, can flourish only in an atmosphere of good will. It is a fact—an unfortunate fact, but nevertheless a fact—that the atmosphere of good will has eroded as a result of events in your country with the consequence that individual American physicists have progressively become more reluctant to become involved in joint programs involving our two countries.

It must be emphasized that American physicists have a very high regard for Soviet scientists and for Soviet science. It is a fact, however, that American physicists are reacting against a pattern of actions on the part of your government, which they view as repressive, exemplified most recently by the Orlov case. This reaction has now reached an intensity such that we, as individual members of the U.S. nuclear science community, have decided that it would not be possible, at this time, for us to achieve our goal of fostering greater communication and cooperation between our scientists and institutions and yours. It is our judgement that the concern of the American scientists who would be most valuable for participation in joint programs in nuclear science is so strong that little purpose would be served by our visit at this time.

In postponing our visit, it is of course our strong hope that, in future, circumstances will

change such that we can again take up and build upon the strong bonds of collaboration and understanding already forged in JCC-FPM activities. Critical to this change is the rebuilding of the necessary open and free atmosphere.

Let us assure you that it is with the deepest regret that we find it necessary to take this action. We had much looked forward to meeting you, to visiting your Institute, and to exploring areas of possible future collaboration. And we look forward to a future time when such activities can be resumed as an important part of the truly international fabric of our science.

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Solar Energy in 2000

I must comment on Luther J. Carter's article of 12 May (News and Comment, p. 627), in which he discusses the recent solar energy report by the Council on Environmental Quality (CEQ). I feel I was quoted in that article in a manner that did not reflect my intended meaning. Frankly, I think the CEQ estimate that 25 percent of America's energy will be provided by solar technology in the year 2000 is probably optimistic. Although it may seem curious, I use the nuclear industry as a rule of thumb. This amounts to comparing a complex industry (nuclear) with what in most cases is a much simpler one (solar). However there are factors that tend to cancel the nuclear industry's increased complexity, such as the strong contributions from the weapons and naval reactor programs and the unquestioning support of congresses and presidents during the 1950's and 1960's. Thus a well-supported, successful program was able to supply about 10 percent of the nation's electrical energy (2.5 percent of total energy) approximately 20 years after commercial demonstration, and 30 years after the beginning of the R & D program. Because solar energy is not limited to just the electricity market, I feel it can supply from 5 to 10 percent of the nation's energy by 2000.