

launch the next phase of its campaign against nuclear power. Confident that they have succeeded in checking the expansion of nuclear power, the Naderites now plan to "contain existing nuclear commitments" — including the rapid phase-out of the 67 existing nuclear plants, with resulting financial losses to be borne directly by the utility stockholders. This would bankrupt the country's major utilities if successful. Nader has worked with Congressman Bingham, the House sponsor of the Percy Anti-Proliferation Act of 1977, for the bill's domestic

counterpart, the Nuclear Reappraisal Act, which would impose a five-year moratorium on all nuclear power generation pending further governmental assessment of safety, efficiency, and national security. According to one nuclear industry publication, cocky Nader is boasting that "it is very problematic whether there will be a thriving nuclear industry by 1985. There may be fragments and survivors of what once was called the nuclear industry..."

Sakharov:

Political Freedom Depends On Nuclear Development

What follows are excerpts from a statement by Soviet dissident and Nobel Prize winning nuclear physicist Andrei Sakharov, published in the Dec. 19 issue of the West German weekly magazine Der Spiegel. Sakharov's article, titled "Political Freedom Only Possible Through Nuclear Energy," should be closely scrutinized by the AFL-CIO and other organizations which have lionized Sakharov as an anti-Soviet spokesman, but which advocate zero growth and dismantling the nuclear energy industry.

For quite a long time I have been amazed at the stormy demonstrations of thousands of people, at speeches from well-known and unknown politicians, and at every conceivable kind of campaign launched in the Western countries, all aimed at halting the development of nuclear energy and the construction of nuclear power plants and "fast breeders." I also felt somewhat provoked, but I held back from taking any position in public, especially since there was naturally nothing comparable going on in the USSR. Nevertheless, I have gradually come to the conclusion that this question deserves to be addressed directly and that I have some things to say about it.

The reason for this antinuclear attitude probably lies in people's lack of adequate information about complicated technical questions. It's not easy to explain to the layman that a nuclear reactor is not a nuclear bomb, or that a coal- and oil-burning power plant is much more dangerous to public health and the environment than a nuclear power plant with the same capacity, or a "fast breeder."

Only recently have many responsible politicians in the West, along with many leaders of industry and nuclear researchers, somewhat belatedly recognized the necessity to make the basic technical data in this field comprehensible to the broad public.

They have now recognized the importance for extensive scientific-technical information; and in fact this is quite important. A wonderful, well-argued article entitled "The Necessity of Nuclear Energy" has been written by Nobel Prize winner Hans Bethe. He is the

author of many significant theoretical works on nuclear reactions inside stars, quantum electrodynamics, and nuclear physics. The European reader may also be familiar with the name of a physicist now working in Sweden, Frantisek Janouch, who has dealt repeatedly with this question. I fully agree with the arguments of these and of many other competent authors.

The development of nuclear energy has called for greater attention to be paid to questions of safety technology and environmental protection than was called for by the development of such industrial branches as metallurgy and coking, mining, industrial chemicals, coal-fired power plants, modern transportation and agricultural chemicals.

The fundamental difference between nuclear energy and energy from conventional fuels is, first, the extremely high concentration of the nuclear fuel, and second, the small scope of the dangerous waste materials and of the overall process. This simplifies and cheapens the solution of safety and environmental problems in comparison to coal- or oil-generated energy.

At the same time, it is obviously a vital necessity to speed up the expansion of nuclear energy, since it is the only economical substitute for oil in the coming decades. According to most estimates oil will already start getting scarce by the end of this century.

Furthermore, it is not enough to build only "normal" nuclear power plants using the rare isotope of uranium isotope U-235 which is contained in enriched uranium. It is also important to solve the problem of producing fissile material from uranium's basic isotope (U-238) and in the future also from thorium. This gives us, on the one hand, the possibility of economically utilizing ores with a low uranium content, while in the future it will open up the use of thorium reserves which are even more plentiful.

It is well known that the reactors which are based on fast neutrons (the so-called "fast breeders") represent one possible solution to this problem. Good progress has also been made there in regards to safety technology. In the coming years it may become necessary to build industrial reactors on this basis, naturally with the greatest care devoted to safety questions.

As another alternative solution to the problem of increasing the quantity of fissile material I myself proposed a while ago the construction of a large subterranean chamber — I am by no means the originator of this idea — a chamber with a hermetically sealed, heat-proof enclosure, inside of which specially designed miniature nuclear bombs can be exploded periodically. Such explosions could increase fissile material with a high efficiency, since the material's absorption of neutrons from the explosion would change it into uranium or thorium. To be sure, there still remain many serious difficulties in the realization of this idea.

Another technical question widely discussed in the literature is the possibility of theft of the fissionable material from the nuclear power plant or from a chemical metallurgy plant, and its subsequent use in the production of primitive nuclear bombs. As far as the possibility of theft is concerned, I believe that with the aid of appropriate organizational and technical measures its probability can be brought down to a minimum. The plutonium contained in a fuel rod, however, is by no means enough to produce a nuclear device. And in addition to this, no one need envy the thief who decides to steal an irradiated rod out of the nuclear reactor; he will be the first to die from the radiation.

As for the production of a "home-made" nuclear bomb (by small countries), in this matter I — and probably Bethe, too — am bound by an oath of secrecy. But just like him I can assure the reader that it is an extraordinarily difficult thing to do, no less difficult than, for example, the construction of a home-made space rocket. It is very likely that the production of a functioning bomb is rendered even more difficult by the "denaturing" of the plutonium.

The nuclear energy problem has not only technical and economic aspects, but political ones as well. The world's statesman always act on the assumption — and not without reason — that the quality of a country's economic development and its economic sovereignty is one of the major factors determining its political sovereignty as well as its military and diplomatic power and its international influence.

Such an opinion becomes all the more crucial in a world where two different systems face each other. The level of economic strength, however, is in turn determined by the use of oil, gas and coal in the present, and of uranium, thorium, and possibly even deuterium and lithium in the future.

This is why I maintain that the development of nuclear

energy is one of the necessary preconditions for the preservation of economic and political independence in each country, whether it be for a country which has reached a high level of development or for a developing country.

The importance of nuclear energy is especially important for Japan and the Western European countries. If in the future these countries continue to be more or less dependent on deliveries of fuel material from the USSR and the countries in its orbit, then the West will be living under the constant threat that these deliveries may be halted. The consequence of this will be a degrading political dependence. In politics, one concession always motivates the next concession. It is difficult to predict where this will lead to in the end.

In my book *My Country and the World* I have already taken the opportunity to transmit the prediction of one of the most important Soviet officials, which I heard in 1955 when I was still considered "loyal." There was talk of a reorientation of Soviet policy in the Mideast. Nasser was to be supported with the aim of bringing about an oil famine in West Europe. To do this we wanted to have an effective lever at our disposal. The present situation is much more complicated and laden with nuances. But in spite of this there are doubtless some parallels. Inside the USSR there is political interest in utilizing the West's energy difficulties.

Are the current campaigns against the development of nuclear energy being directed from the USSR or other East European countries? I do not know of any credible information concerning this. If it is so, it would certainly take very little to significantly strengthen this campaign, given the broad distribution of antinuclear prejudices and the lack of comprehension of the necessity of nuclear energy.

People must have the opportunity, but also the knowledge and the right to soberly and responsibly weigh the interrelated economic, political, and ecological problems against each other. Problems related to the development of nuclear energy and the alternatives for economic development must be solved without spurious emotions and prejudices. It is not merely a question of comfort, or of maintaining the so-called "quality of life." There is a far more important question — that of economic and political independence, of the preservation of freedom for our children and grandchildren. I am convinced that in the end the correct solution will be found.