intentions, as well as relieve some international anxiety, by simply abandoning its plans to construct a large-scale antiballistic missile system. The only safe alternative, according to Weisskopf and Bethe, is to build the system jointly with the Soviet Union. But this is obviously more of a debating point than a realistic solution. Such a joint effort would be tantamount to mutual disarmament, which surely could be achieved more easily and less expensively in other ways. Major General Lamberson refuses even to discuss the prospect of sharing military secrets with the Soviets. Fred Ikle, the undersecretary of defense for policy, says that "we have had [previous] exchanges and cooperative ventures in the space area. If I were to structure the priorities of areas where we would cooperate, I do not think I would put space on top. . . . I would pick other areas—health, agriculture, and so on."

Three months ago, Soviet premier Yuri Andropov proposed that U.S. and Soviet "scientists, specialists in the field," conduct talks on the implications of large-scale missile defenses. Recently, the Administration rebuffed the offer. "Our position is that discussions could be mutually beneficial, that we are not opposed to talking about the issues," says a State Department spokeswoman. "But we believe that we should hold such discussions within the framework of the ongoing strategic arms reduction talks or the standing U.S.–Soviet consultative committee. These are not merely scientific subjects." President Reagan, at a press conference on 29 March, said that "I have to tell you I haven't given . . . any thought" to joint development of a missile defense. "That's something to think about and look at." Reagan's other remarks that day indicate that he favors independent U.S. research, followed by an offer to share the technology, or a directive to the Soviets that they "do away" with all of their offensive missiles, and the United States will do likewise.

The aggressive and provocative U.S. effort to develop a foolproof missile defense, and to defeat any Soviet missile defense, creates several quandaries for defense policy-makers in Washington. First, it suggests that the equilibrium publicly sought by the Administration is unlikely to be achieved. An impregnable defense in combination with an invulnerable offense—which the Pentagon openly seeks—may well give the United States a real first-strike capability. Second, it points up the fallacy of the last move in weapons invention. When Colonel Richard Rene, the ASMS program director, is asked to predict the final outcome of the U.S.–Soviet countermeasure competition, he answers by noting that "there is no such thing as a static situation for offense or defense." It seems likely that, even if both sides simultaneously deployed workable missile defenses, Rene and his counterpart in the Soviet Union will be hard at work devising mechanisms to ruin the other's defense and alter the strategic balance.

—R. JEFFREY SMITH

The Kyshtym Mystery (contd.)

The mystery of how a large area of the Soviet Urals became contaminated with radioactivity in the 1950's continues to perplex Western analysts. The latest suggestion, put forward in a report by a researcher at Vanderbilt University, is that the contamination probably resulted from a combination of many releases of radioactive waste from a nuclear weapons complex and a major explosion that occurred in 1958 in a fuel reprocessing plant.

The contamination was first brought to public attention by Zhores Medvedev, an exiled Soviet geneticist now living in England. In a 1976 article published by *New Scientist*, Medvedev wrote that a vast region near plutonium production facilities at Kyshtym had been contaminated by radioactive fallout. He reported that the fallout came from an explosion caused by heat buildup in buried wastes.

Medvedev's account was immediately denounced by several prominent members of the nuclear establishment who contended that no accident or contamination had occurred. Medvedev then conducted a painstaking search through published Soviet literature and demonstrated convincingly that the area around Kyshtym has been contaminated. Researchers at Oak Ridge National Laboratory and Los Alamos National Laboratory have independently reached the same conclusion. There is, however, considerable disagreement about the source and extent of the contamination.

Because large numbers of people living in the region were potentially exposed to radiation, Frank Parker, an environmental scientist at Vanderbilt University combed through Soviet medical literature for references to events at Kyshtym. He drew a complete blank. In a report to the Department of Energy, which funded his study, Parker noted, however, that the lack of references is not surprising because research on accident victims would have been classified.

During the course of his research, Parker interviewed several Soviet émigrés and came across one who had worked at the Kyshtym complex in the 1950's. The émigré was a construction engineer who was in charge of building a reprocessing plant at the complex. According to Parker, his description of the plant matched completely the specifications of the Purex plant at Richland, Washington. The Soviets had evidently copied a top secret U.S. weapons plant pipe-for-pipe. The Soviet engineer said that there had been many mishaps at Kyshtym that resulted in extensive contamination of the Techa River and its surroundings. The contamination was so severe that some 10,000 people had to be removed from the area. In addition, the engineer told Parker that some 6 months after he left Kyshtym, there was an accident in the reprocessing plant he had built.

This account meshes with the conclusions of others who have studied the Kyshtym mystery. John Trabalka, a researcher at Oak Ridge, for example, says "the most recent evaluation on our part is that more than one event" contributed to the contamination. He said he now believes that radioactivity was released into the environment in a series of spills, but there is also strong evidence, particularly from eyewitness accounts, of "at least one major accident." An explosion in a reprocessing plant is a plausible explanation for the major accident.

Parker says he is disappointed that Soviet studies of the medical consequences of exposure to the contamination have not turned up in the open literature. Only two other large exposed populations—those in Hiroshima and Nagasaki—have been studied, he points out, and the Kyshtym victims could provide a valuable source of information on the biological effects of low-level radiation.—COLIN NORMAN