flights, the agency is also assessing the inventory of spare parts it will need to support various flight rates.

Finally, NASA has addressed the larger issues of management:

■ *Safety organization.* On 8 July, Fletcher created the new post of Associate Administrator for Safety, Reliability, and Quality Assurance. The head of this office, George A. Rodney, will oversee these three functions in all NASA activities, including the shuttle program, and will report directly to Fletcher.

■ *Shuttle program management.* On 25 June, astronaut Robert Crippen was placed in charge of a fact-finding group that will assess the shuttle management structure. The group will report by 15 August; among other things, it will address such issues as internal communications within the shuttle organization and the proper role of astronauts in NASA management.

Meanwhile, although the Rogers Commission did not explicitly ask it, Fletcher has deputized General Sam Phillips, who served as general manager of the Apollo program, to do a top-to-bottom review of management throughout the agency. Phillips' influence is being felt already, although his final report is not due until the end of the year. It was at his suggestion, for example, that the space station program was recently reorganized to centralize authority at headquarters instead of diffusing it through the research centers.

Although neither the members nor the staff of the Rogers Commission have commented on the NASA response, it is clear that NASA's efforts to date are only a beginning. "[The implementation report] is an interesting snapshot of where they are right now," says John Pike, space policy analyst for the Federation of American Scientists, "But they've got a long way to go." Indeed, it remains to be seen just how far NASA is willing to go to reform itself. On the other hand, NASA officials do seem determined to do whatever they have to do to get their agency back on track. "We're certainly going to reexamine our management thoroughly," says NASA general manager Phillip Culbertson. "And I suspect we *will* make some fundamental changes." ■

M. Mitchell Waldrop

Soviets Presented Plans For Chernobyl Study

Robert Gale is to be president of a new Armand Hammer foundation that will sponsor studies of Chernobyl victims

On 18 July, Robert Peter Gale, a bone marrow transplant specialist from the University of California at Los Angeles, and Armand Hammer, head of Occidental Petroleum, flew to Moscow on Hammer's private plane to present to the Soviets a plan for international cooperation in following Soviet victims of the Chernobyl accident. The idea is for scientists from several nations to work with the Soviets under the auspices of the newly established Armand Hammer Center for Advanced Studies in Nuclear Energy and Health. Hammer will be chairman of the center and Gale will be president.

Gale's most recent achievements contrast with certain difficulties he has had with the National Institutes of Health. Gale, head of the bone marrow transplantation unit at UCLA from 1977 until 1983, was reprimanded by the NIH in 1985 for violations of policies pertaining to research on human subjects.

Back in 1979, Gale treated a small number of cancer patients with bone marrow transplants based on what many UCLA staff members judged to be experimental protocols. However, Gale failed to obtain permission from the university's Human Subjects Protection Committee; nor did he get from his patients the kind of informed consent that is required for experimental therapy.

According to an NIH official who participated in the investigation of Gale's work, the issue in question was whether Gale, as a patient's physician, had the authority to decide when an experimental therapy became "standard" or "best available" treatment and therefore not subject to research guidelines, or whether that authority rests exclusively with the Human Subjects Protection Committee.

An NIH report on its investigation states that allegations against Gale first came to the NIH's attention through a newspaper report in 1981. When asked by the NIH committee about the allegations, Gale responded that only one, or at most two, of eight patients in question were being treated under NIH-funded protocols and that the treatment was not research and therefore not subject to review by the Human Subjects Protection Committee. "All or most of the patients were simply receiving 'best therapy,' " he wrote to the NIH investigating committee.

It also was alleged that three patients with leukemia were treated with experimental immunotherapy without the approval of the human subjects committee. Gale's reply was that he was not the principal investigator for this project and that any violations that occurred were not his responsibility.

The NIH report, which contains Gale's denials of wrongdoing, was not completed until 1985, when NIH director James B. Wyngaarden concurred in a decision to reprimand the UCLA doctor.

In his letter to Gale, Wyngaarden does, however, note circumstances that must be considered in rendering judgment, even though they do not excuse Gale's actions. Among them are these: "The UCLA human subject protection policies, administrative procedures, and practices operative during the period in which the infractions occurred were at the time imprecise," and "no evidence has been produced which indicates that human subjects were injured as a result of your noncompliance."

Wyngaarden then wrote in his letter that, "In view of the above considerations, NIH has not restricted your participation as a funded investigator or scientific advisor. I wish to emphasize, however, that we view the violations documented in OPRR's [Office for Protection from Research Risks] report as very serious."

In addition, NIH has instructed UCLA to "conduct an audit of randomly selected research records of patients for whom Dr. Gale had an ongoing responsibility." The audit must "assess compliance with institutional human subject protection policies." Furthermore, Wyngaarden wrote to UCLA, "until March 1, 1988, any institution with which Dr. Gale is or may become affiliated

and where he is conducting Department of Health and Human Services funded human subjects research" must report in writing to NIH's Office for Protection from Research Risks, documenting Gale's compliance with HHS policies for the protection of human subjects. Finally, "Until March 1, 1988, before Dr. Gale is appointed to any NIH committee whose functions include recommendations or decisions regarding research involving human subjects, appointing officials shall be provided with copies [of the NIH reports of its investigation and its decisions]."

Gale's 18 July trip to the Soviet Union was the culmination for him of nearly 3 months of frantic activity, sponsored and funded by Hammer. When the accident at Chernobyl occurred, the Soviets declined official offers of aid from the U.S. government but accepted Hammer's offer to send Gale and three other physicians to treat the most severely injured Soviets with bone marrow transplants (*Science*, 4 July, p. 19). Gale's team performed seven bone marrow transplants and three fetal liver transplants; seven of these patients are still alive.

While in the Soviet Union, on 6 June, Gale signed a memorandum with Andrei Vorobiev, who is chief of the Central Institute for Advanced Medical Studies and a member of the U.S.S.R. Academy of Medical Sciences. In the memorandum, Gale and Vorobiev agreed to international cooperation in following the 100,000 to 200,000 Soviets who were exposed to potentially dangerous levels of radiation from the Chernobyl accident. Although U.S. government officials and the National Academy of Sciences also suggested to the Soviets that an international effort to follow Chernobyl victims be established, they received no reply (*Science*, 11 July, p. 147). The only signal the Soviets sent was the memorandum that Vorobiev signed with Gale.

In order to formulate a proposal to take to the Soviets, Gale organized a private meeting of 20 scientists from seven nations. Meeting on 8 July at Occidental Petroleum's Los Angeles headquarters, the scientists included Vincent DeVita, director of the National Cancer Institute; Edward Rall, deputy director of intramural research at the NIH; Itsuzo Shigematsu, chairman of the Radiation Effects Research Foundation in Japan; Edward Pochin of the National Radiation Protection Board of England; and Bo Lindell of the National Institute for Radiation Protection in Sweden. The meeting participants, reports Occidental Petroleum, have expertise in a variety of disciplines, including radiation biology, nuclear physics, genetics, and oncology.

The proposal is that the new Armand Hammer foundation fund studies of cancers and birth defects that may arise in Soviet victims of Chernobyl and that the foundation sponsor basic research and exchanges between scientists from the Soviet Union and other countries.

A press release put out by Occidental Petroleum on 18 July perhaps best expresses Gale and Hammer's views of their accomplishments. It says, "Obviously, there are far reaching implications to the Gale-Hammer initiative. Perhaps, occasionally, private citizens can accomplish what governments cannot. And as a result, if this effort succeeds, Messrs. Reagan and Gorbachev may include agreements on international cooperation in peaceful uses of atomic energy on a future summit agenda. Perhaps more good than was imagined will come from Chernobyl." ■ GINA KOLATA

Keeping the AIDS Virus Out of Blood Supply

More accurate blood tests are needed, according to an NIH consensus panel

SCIENTISTS and blood bank specialists have made great progress in freeing the nation's blood supply from contamination by the AIDS virus, but the system is not 100% perfect. Can the risk of getting AIDS through donated blood be reduced even further? "You know, there's a practical solution to that if someone would just announce it," said Ronald Reagan in a recent interview with the *Los Angeles Times*. "Why don't healthy and well people give blood for themselves?" the President asked. "And it can then be kept in case they ever need a transfusion. They can get a transfusion of their own blood and they don't have to gamble. . . . "

Participants in a recent National Institutes of Health consensus conference on the impact of testing donated blood for antibodies to the AIDS virus* concur with the President if a person is facing elective surgery in the near future. "There is uniform agreement that autologous [your own] blood is the safest form of transfusion therapy. Blood banks and blood centers should make this option available to all qualified patients, simplify the donation process to the extent possible, and inform physicians and patients about the advantages and mechanics of this approach," according to the consensus statement.

Thomas Chalmers, *NIH consensus panel head.*

In contrast to the benefits of autologous blood for immediate use, storage of your own blood for unanticipated future needs is "logistically impractical," says Amoz Chernoff of NIH, who spoke at the conference. Thus, the overall impact of autologous donations on transfusion medicine will be minor, leading conferees to assess other methods for improving the safety of the nation's blood supply.

AIDS was first diagnosed as a specific disease entity in 1981. By 1983, health officials realized that AIDS could be transmitted through infected blood, and in the spring of 1985, the first commercial kits to test blood for antibodies to the AIDS virus were available. Since that time, virtually all blood collecting agencies and blood banks

*NIH Consensus Development Conference on the "Impact of Routine HTLV-III Antibody Testing on Public Health," 7 to 9 July 1986.