

Soviet announcement of a completed breeder-reactor plant at Shevchenko on the Caspian Sea influenced the timing of his announcement. He said it came when it did because agreement on the owner-operator had finally been achieved the day before. Furthermore Schlesinger said the Russian plant is fueled with uranium and thus is not really a breeder. If it were fueled with plutonium, he conceded, it could be a breeder. However, the Soviets have not done that as yet.

The AEC is proceeding with breeder-reactor development in spite of protests and calls for caution. Those who are dubious about breeders see a number of dangers: First they ask whether such a reactor could explode if some accident caused all the fuel to run together. The AEC denies the possibility, but the relevant facts (how much plutonium it takes to explode, how much is in a reactor core, how the design of the core will protect against accidents) are all highly classified secrets.

The second question concerns thermal pollution. Reactors produce a great deal of heat, and they are usually cooled

with ambient water from nearby streams. Schlesinger said thermal pollution from the demonstration plant should not be a serious problem.

A third caution concerns contamination of the environment with plutonium. Plutonium is not only radioactive; it is also biochemically highly toxic. The AEC insists that its safety precautions will prevent this danger.

A suit against the AEC by the Scientists' Institute for Public Information over the environmental questions regarding breeder reactors (SN: 10/16/71, p. 260) is still pending in the courts. Meanwhile the Commonwealth of Pennsylvania has asked the AEC to forbid construction of a conventional uranium-reactor plant on a site 12 miles from Philadelphia alleging that the location is too close to the city. If the AEC accedes to this request, other attempts to push reactors away from cities are likely to follow. In many minds breeder reactors are even more frightening than uranium ones, and states and municipalities may intervene even more vigorously to prevent them from being sited nearby. □

Mouse cancer viruses shed light on human cancer

Attempts to link a virus with human cancer promise to be every bit as competitive in 1972 as in 1971. In recent months several research groups claimed finding a virus or virus-like particle in human cancer tissue. Whether any of them had a real human cancer virus, though, was vigorously protested and is being checked (SN: 12/11/71, p. 388).

Meanwhile other scientists have been taking different tacks to implicate a virus in human cancer. One of the latest efforts comes from five researchers at the Columbia University College of Physicians and Surgeons—Sol Spiegelman, Richard Axel, Donald Kufe, Rudiger Hehlmann and Jeffrey Schlom. They have hybridized, or chemically crossed, in the laboratory several mouse tumor virus RNA's with several human tumor virus RNA's. In brief, they are the first to demonstrate similarities of genetic information between a tumor virus and human cancer cells.

As the New York City team reports in the Jan. 14 *SCIENCE*, Jan. 7 *NATURE* and in an article in the *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES* that will be published toward the end of February, 67 percent of 29 cell samples from human breast cancer tissue contained RNA that would chemically interact with mouse breast cancer virus RNA. Ninety percent of the RNA from white blood cells from 27 leukemia patients interacted with mouse leukemia virus, but not with mouse breast cancer virus. There was also a strong chemical cross between mouse leukemia virus material and human sarcoma tu-

mor cell material. And most strikingly, there were no correlations between mouse cancer virus material and material from normal human cells, or between the cancer tissues and other viruses.

The demonstration of chemical interaction between tumor viruses and human cancer cells strongly suggests that some chemical information has been exchanged, in the test tube, between the viruses and the cells. In fact, such exchanges at the intimate molecular level within the cell are good reason to suspect that viruses may possibly be involved in the formation of human cancer. Yet the Columbia team is the first to admit that a lot of questions still need to be answered before such hasty conclusions can be made. For example, it has still not been shown that RNA tumor viruses incorporate their genetic information into host cell DNA, or that such a transfer makes the host cell turn into a cancer cell. And even such a demonstration would not prove that a tumor virus made to interact chemically with a human cancer cell under artificial laboratory conditions would necessarily turn normal human cells into cancer cells. A virus might not be implicated at all. On the other hand a chemically related virus might be the villain. "Whatever these results may ultimately mean for the viral origin of human cancer," the Columbia researchers conclude, "they do suggest a remarkable similarity in the specific virus-related information found in corresponding tumors of mice and men." □

Nader study of Academy: A progress report

Don't look for that Ralph Nader-sponsored study of the National Academy of Sciences until later this year. The study was originally scheduled for completion this month, but Philip M. Boffey, the former reporter for *SCIENCE* who is in charge of the investigation (SN: 4/10/71, p. 247), needs more time to complete the task to his satisfaction. "I think the study is going quite well and that it will be fairly substantial," he says. "It's just physically taking me longer than expected." The Nader organization has verbally given him an extension of their original agreement, on somewhat modified terms; it's all very informal.

Boffey has completed the bulk of his reporting effort. He has studied numerous reports and documents and conducted extensive interviews with NAS members and staff, with officials in agencies that contract for Academy studies and with others. But he is not yet ready to write a finished version of the report. "I still have 8, 10 or 12 phone calls to make on any given topic."

He says the NAS has been "reasonably cooperative." As would be expected, those in the Academy hierarchy have been "formal and correct." He says they haven't gone out of their way to volunteer information but they haven't been antagonistic. □

Crews for Skylab

This week NASA announced the names of the nine astronauts who will live and do research in the earth-orbiting laboratory, Skylab. Each crew has two pilots and one scientist, causing some internal criticism that two scientist-astronauts were not named to each crew. Skylab, similar to the Soviet's Salyut (SN: 4/24/71, p. 278), is to examine man's ability to function in weightlessness for long periods of time. Its success is regarded as vital to the shuttle and to the manned program.

On the first crew, to be launched about May 1, 1973, will be pilots Charles Conrad and Paul Weitz and surgeon Joseph P. Kerwin. These men will stay in the laboratory for 28 days. The second crew will be sent up in late July and will stay twice as long: 56 days. They are pilots Alan Bean and Jack R. Lousma and electrical engineer Owen K. Garriott. The third and last shift, with pilots Gerald Carr and William Pogue and engineer-physicist Edward Gibson, will be launched about Oct. 27, 1973, and will also stay for 56 days. Skylab itself is scheduled for launch a day before the first crew goes up, April 30, 1973. □