

Soviet space station is occupied again

The much-trafficked Salyut 6 space station, visited by numerous cosmonaut crews since the Soviet Union sent it into orbit in September of 1977, was boarded again last week. Cosmonauts Valery Ryumin and Leonid Popov were launched April 9 aboard their Soyuz 35 spacecraft and docked with the station the following day. Already docked at the facility's other end and awaiting the crew's arrival was the unmanned Progress 8 "freighter" capsule, which had been sent up late in March with a load of fuel and supplies to be transferred over by the cosmonauts.

Popov, a ten-year veteran of the cosmonaut program, was nonetheless making his first spaceflight. Ryumin, however, has spent more time in space than any other human being except cosmonaut Vladimir Lyakhov, together with whom he set a record of 175 days in orbit last year, virtually all of it aboard Salyut 6. The Soyuz 35 launching also makes Ryumin the only spaceman — either cosmonaut or astronaut — to take part in back-to-back space missions. The planned duration of the latest endeavor was not announced, but observers speculated that it could well include another record attempt, or at least a Soviet presence in space while the summer Olympic Games are taking place on Soviet ground.

The crew's work schedule began with a number of repair checks and inspections of Salyut 6, which had been unoccupied since last August. Plans also included medical and biological tests, earth-resources studies and other activities, presumably including some astronomical observations. □

Aluminum-senility link remade

Aluminum, one of the most abundant elements in the earth's crust, and an element not known to have any biological function, was implicated as a cause of senility in the 1970s by a team of Canadian researchers. A group of British investigators failed to confirm those findings, but now two U.S. scientists have managed to at least buttress the original results by taking a somewhat different approach.

Donald R. Crapper of the University of Toronto and his colleagues studied brain samples from eight healthy persons and from 16 senile ones. Four times as much aluminum was found in the neurons of senile brains as in the neurons of healthy brains, and the aluminum was especially prevalent in areas of the senile brains that were rich in neurofibrillary tangles. Such tangles are one of the major characteristics of senility (SN: 10/1/77, p. 219). Crapper

and his colleagues, however, performed their aluminum assays with atomic absorption spectroscopy, which tends to destroy the elements it analyzes. The scientists who failed to confirm the findings of Crapper and his team were headed by J.R. McDermott of Newcastle General Hospital, Newcastle upon Tyne, England. They used the same method. But Daniel P. Perl of the University of Vermont College of Medicine in Burlington and Arnold R. Brody of the National Institute of Environmental Health Science in Research Triangle Park, N.C., decided to use a more sensitive analytical method — scanning electron microscopy in conjunction with X-ray spectrometry — to examine aluminum levels in the hippocampi of both senile and normal, aged brains. The hippocampus of the senile brain is known to be especially rich in neurofibrillary tangles.

Using this method, Perl and Brody report in the April 18 SCIENCE that they were

able to detect a lot of aluminum in neurons containing neurofibrillary tangles in both senile hippocampi and in normal, aged hippocampi, but virtually no aluminum in normal neurons from either senile hippocampi or normal, aged hippocampi. While their study was not identical to that of Crapper and co-workers, Perl and Brody concluded that it does substantiate the findings of the former — that aluminum is somehow implicated in senility.

In addition to being naturally abundant in the environment, aluminum has also been introduced into our lives through various industrial products — airplanes, buses, trucks, windows, roofing, foil, cooking utensils and others. Patients with two neurological diseases other than senility have also been found to possess abnormally high levels of aluminum in their brains — those with Down's syndrome and those who have undergone long-term kidney dialysis. □

A tale of two toners

It is the best of times and the worst of times for Xerox Corp. — at least in regard to the possible existence of a carcinogen in their copy toner. It is the best of times, says company Vice President Horace Becker, because a suspected carcinogen, nitropyrene, has been virtually eliminated from Xerox copy toner, or chemical darkener. But it is the worst of times for Xerox, according to University of Texas researchers, because nitropyrene probably is not the culprit in the potential cancer hazard of long-term exposure to toners. Moreover, says the Galveston team, Xerox officials may have acted irresponsibly by not reporting toner test results "they probably have had for years."

Becker says Xerox Corp.'s involvement in the copy chemical controversy began a year ago when a Swedish researcher informed the company that carbon black — aggregates of carbon particles used in copy toner — tests "positively" in the Ames test. The test measures a chemical's mutagenicity — ability to change genetic material. A "positive" result indicates that the chemical should be further tested as a potential carcinogen.

Although "it's a long way from the Ames test to cancer," says Becker, Xerox officials engaged in a considerable "amount of detective work" to isolate the suspect chemical in carbon black. Finally, the contaminant nitropyrene was identified and company officials worked with their carbon black supplier to reduce nitropyrene to about 0.1 parts per million.

Meanwhile, Marvin Legator and colleagues at the University of Texas also were testing copy toner. The researchers' toner curiosity had been piqued when they noticed Xerox repeatedly sending toxicologists to their university's annual genetic toxicology course. So Legator and co-workers performed the Ames test on a

batch of toner, and then conducted a "transformation assay," which measures whether a chemical will "transform" mouse embryo cells into a cancerous state. Legator's toner tested "positively" in both experiments.

The Texas researchers and the Xerox Corp. each presented research results at the March Environmental Mutagen Society meeting. Legator says Xerox did not publicly present any of its data until his group decided to report its findings at the mutagen society meeting. Becker counters, "We didn't wait for Texas to trigger anything; we even submitted a paper [on the toner research] to SCIENCE magazine before we heard about Legator. . . . We haven't shoved anything under the rug."

Interestingly, Becker says Xerox officials submitted the paper to SCIENCE on March 4; Legator says the booklet of mutagen society meeting "preprints," including an abstract on the toner research at Texas, arrived in the mail about Feb. 22. Legator guesses that a Xerox official's discovery of the Texas abstract among the meeting preprints prompted Xerox not only to speak at the meeting, but also to submit a paper to SCIENCE. "I know damn well that, given the scope of work Xerox had performed, they had this information for years and it only came to light because we decided to present our data," Legator says.

The Environmental Protection Agency is expected to release in several weeks an evaluation of Xerox Corp. actions in this toner tale, says EPA spokesman Frank Kover. Lost in the controversy, however, is the fact that Legator's team was not testing a Xerox toner. In fact, says Legator, their Texas toner supplier assured them that the substance is not contaminated with nitropyrene. Since the toner still tests positively in the Ames and transformation tests, Legator says the potential cancer