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## Salyut 3: Busy and comfortable

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"The Salyut so readily answers the controls," radioed cosmonaut Yuri Artyukhin, "that at times it seems that it responds not only to the steering buttons, but to our wishes." Entering their second week aboard the Salyut 3 space station, Artyukhin and space veteran Pavel Popovich seemed, according to official Soviet accounts, to be both comfortable and busy.

The cosmonauts gave themselves and each other a variety of biomedical tests—lung efficiency, cardiovascular changes, sense of balance—but subjectively appeared to have adapted to weightlessness by the third or fourth day of the mission. With Popovich's pulse appearing "almost as an ideal, direct line on the chart," according to Tass, the Soviet news agency.

The mission was almost cut short at one point, when unexpected solar activity raised worries on the ground about possible radiation hazards to the crew. Some Soviet physicists "believed it was an extraordinary situation," reported Tass, "and even suggested that the flight program be curtailed." Officials decided to continue the flight,

however, commenting that the danger would have been greater if the station had been in a polar or lunar orbit. Tass further cited data from Cosmos satellites showing that in orbits below about 250 miles, the radiation exposure is three to four times lower than in deep space.

The most important part of the flight for U.S. officials was the ascent to orbit and docking (SN: 7/13/74, p. 22), which will need to work smoothly next summer when an Apollo spacecraft couples with a Soyuz like the one that carried Popovich and Artyukhin into orbit. Soviet reports, however, made little mention of the planned rendezvous, stressing science instead.

There are no announced Soviet plans for long-duration missions similar to Skylab, which remained aloft for more than six months and sustained three separate crews, but one of the items on the Salyut 3 agenda was the testing of several water-recycling devices aimed at "expanding the resources of space." The cosmonauts also photographed the daytime and twilight horizons of the earth and moon as an aid to future improvements in onboard navigation techniques, the lack of which have prompted U.S. officials to comment on the lack of sophistication in the control systems of Soviet spacecraft. □

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## Looking with lasers into insect ears

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Investigating the mechanics of hearing in live animals has been a difficult task for researchers because the inner ear structures are small and difficult to reach. Recently a team of Cornell physicists and neuro-bioengineers, while attempting to study frequency selection in crickets, devised an optical technique for measurement of mechanical vibrations of the eardrum which does not interfere with the motion of the membrane. The inventors—Watt W. Webb, Paul R. Dragsten, John A. Paton and Robert R. Capranica—describe their equipment and procedure in the July 5 *SCIENCE*.

The procedure involves the focusing of a helium-neon laser beam on the eardrum and analyzing the small shifts in frequency in the scattered light bounced back from the membrane onto a photomultiplier. The frequency shifts in the light are extremely small but can be observed by comparing them to unshifted light (reference beam) from a laser produced simultaneously with the scattered beam. The difference between the two frequencies is detected in much the same way that one hears a "beat" note when two sounds of slightly different frequencies are played together. The strength of the "optical beat note" in-

dicates how much the eardrum vibrates. The equipment can measure vibration amplitudes as small as four ten-trillionths of an inch or one-tenth the diameter of a hydrogen atom on a surface as small as 10 square microns. The technique has been successfully used, Webb says, in measuring the mechanical response of eardrums in crickets.

The researchers hope that their studies will help to shed light on the mechanism of human hearing. The ear of man is probably unsurpassed in distinguishing tones of slightly different pitch and widely different quality. Hearing in man has acquired an importance second only to vision.

"We believe that it [the technique] is suitable for investigation of the movement of structure within the inner ear, such as the basilar and tectorial membranes in the cochlea, and for studies of mechanical excitation of sensory hair cells," the researchers report in *SCIENCE*. (Hair cells within the inner ear are sensitive to different vibration patterns.) "It could also prove valuable for use on nonbiological mechanical systems at the submicroscopic scale. . . . Since nothing contacts the vibrating structure, the technique does not perturb normal movement." □

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## Test-tube babies: Now a reality?

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A feat that science fiction writers have been predicting for many years and that many members of the public have feared now appears to be a reality. One baby in England and two in Western Europe have been conceived during the past 18 months in test tubes from ova removed from the would-be mother and then placed back in her womb to develop to birth.

Certainly a totally successful test-tube achievement has been expected by scientists for some time now since previous efforts were partially successful (SN: 9/15/73, p. 168). The peculiar thing about these apparent achievements is that no one will claim having done them. They were leaked to the press by Douglas Bevis, professor of obstetrics and gynecology at Leeds University in England. But Bevis would not admit to having done them himself and now refuses to talk to the press about them. Aside from alarming the public in this titillating way, Bevis has also upset scientists dedicated to test-tube fertilization research, such as Patrick Steptoe of Oldham in Lancashire. "I am astounded that Professor Bevis would have made this statement," Steptoe declared. "As far as I know, no one in this country or anywhere else has yet succeeded in this technique."

The most crucial question, of course, is whether the offspring of the technique are normal. Bevis reports that they are. He admits, however, that the technique "is potentially dangerous for the child, and a lot can go wrong." If the technique is ever worked out so that it is relatively safe, it will probably help women who cannot bear children because of blocked oviducts. □

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## Health care and do-little Government

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There has been pathetically little progress in Government health care programs during this past year. This message emerged rather surreptitiously from last week's White House conference on health for science writers. The lack of decisive action is not surprising in view of preoccupation with Watergate and impeachment possibilities.

At last year's conference, for example, Caspar W. Weinberger, secretary of Health, Education and Welfare, announced the formation of a national blood policy. The policy was to do away with the scandalous waste in blood collection and to stop paying