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SPACE MEDICINE BRANCH REPORT

A Report on the Nelson Congressional Delegation to the U.S.S.R.

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In October, 1985, a group of United States congressmen, headed by Rep. Bill Nelson (D, FL) of the House Subcommittee on Space Science, journeyed to the Soviet Union to open discussions about mutual U.S.-U.S.S.R. cooperation in space. Accompanying the congressmen were Gen. Tom Stafford and Deke Slayton, two of the astronauts from the 1975 Apollo-Soyuz joint venture into space—visible symbols of past cooperation; Tom Paine, Director of the President's Commission on Space; and Jess Moore, Shuttle Program Director for NASA.

High on the list of Rep. Nelson's priorities was his interest in the Soviet space biomedical program. Nelson is scheduled to do a number of experiments in the biomedical area while in space on Shuttle flight 61-C. He was aware that biomedical research has been an important area of mutual cooperation with the Soviet space program for many years.

Perhaps because it was the 10th anniversary of the Apollo-Soyuz mission (or the Soyuz-Apollo mission as it is known in the Soviet Union), or perhaps because Tom and Deke were along, or perhaps just because the timing of the trip was right (pre-Summit) and there was a point to be made, our reception and entire visit were warm and open and the delegation was able to see parts of the Soviet space program that have not been routinely open to Western visitors.

MISSION CONTROL

The highlight of the visit was a trip to the Soviet Mission Control Center actively involved in the current Salyut mission (which only recently was terminated due to the illness of one of the cosmonauts). Except for the larger size, the Soviet Mission Control Center looked very similar to our own. While at the Mission Control Center, we were able to talk on the air-to-ground radio to the three Soviet Cosmonauts: Vladimir Vasyutin, Viktor Savinykh, and Alexander Volkov who, at that time, reported they were in excellent health.

INSTITUTE OF BIOORGANIC CHEMISTRY

This facility was added to our itinerary and was definitely the most modern of the research facilities we were shown. The equipment was "state-of-the-art" and was mostly U.S.A.- or German-made. The design of the facility was in the form of a double-helix, which is probably a good indication of the type of research being done there. According to the director (Ochel'nikov) the Institute has the capability for large-scale production of single-cell proteins and ongoing programs in genetic engineering. He mentioned interferon as one compound that was actively being developed at the facility. In combination with a zero-G continuous flow apparatus seen at the Institute, this suggests that the Soviet program is very actively exploiting the capabilities of the space environment for drug manufacture.

INSTITUTE OF BIOMEDICAL PROBLEMS

The manpower and variety of the space medical research we saw were impressive. Almost all of the Soviet scientists we met were interested in sharing information on their research with us. Much of the actual equipment appeared to be old, but it was impressive to see what was being done with it! An area of particular interest was the work being done on the effects of long-term group isolation. At the time of our visit, there were three male subjects who had been living in the closed environment for almost 7 months. The researchers reported that the "record" for a group was a year! The individuals in this setting were continuously biomedically monitored, as well as voice recorded and videotaped. Soviet researchers report that they have not done any of the group isolation work with mixed-sex groups, or even all-female groups. Another intense research effort appeared to be in the area of growing higher plants in the space environment.

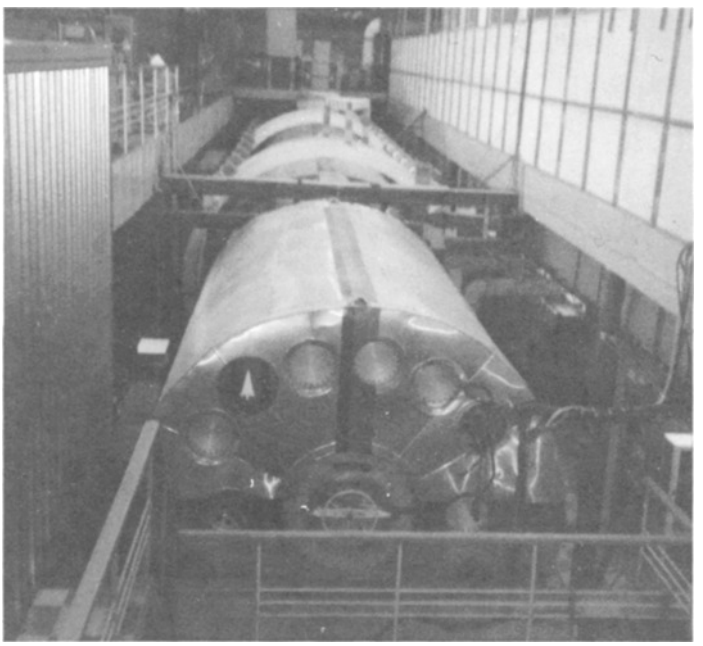
We were able to see the landing recovery tents and the medical equipment available to flight surgeons for Soyuz landing recovery. Extensive trauma treatment facilities and surgical capability were available. We also visited the " biomedical mission control" at the Institute, where the extensive exercise required of the cosmonauts on the long-duration missions is monitored. We saw a downlink of one of the three cosmonauts exercising on the treadmill. The usual exercise protocol is 2 hours per day, per cosmonaut with 3 days of exercise and 1 day of rest. EKG is downlinked real-time. Equipment appeared to be available for upper body exercise onboard the Salyut.

I spoke for some time with Dr. Oleg Gazenko, the Director of the Institute of Biomedical Problems, about a variety of topics in space medicine. He told me, for example, that Soviet data on calcium loss during long-term flights shows no plateau (up to 234 days) but that the maximum calcium loss in cosmonauts has been only 10–12%. He expressed a strong interest toward continuing the exchange of scientific information that had occurred for many years in the medical area.

STAR CITY

Overall, this cosmonaut training center appeared to be an attractive and quiet place to live. There were several large apartment buildings where the cosmonauts and their families live. It appeared to be a totally closed environment with all necessities of life located at the Center. We saw the 1-G Soyuz and Salyut trainers from the inside and observed several cosmonauts in the underwater weightless environment training facility (very similar to NASA's WET-F). In the museum at the Center, there was a replica of Yuri Gagarin's study as it was at the time of his death—a place where current cosmonauts can go to meditate.

Overall, the message the delegation received was fairly consistent. All the scientists were interested in future joint ventures in space. A last-minute meeting with President Gromyko also confirmed this interest, but we were led to believe that cooperation would be limited unless and until the United States drops its "Star Wars" program. Reflecting on this position now that the Summit is over, it remains to be seen how actively the U.S. and the U.S.S R. will pursue the joint ventures proposed by the delegation. The proposals included two Mars scenarios (a joint unmanned mission in the 1990's and a joint manned mission around the turn of the century) and a suggestion to "swap" crews and have a Soviet cosmonaut fly on the Shuttle and an American astronaut fly on the Salyut. The Soviets have indicated that they plan to launch a new Salyut facility sometime in the next year.



Group Isolation Study Chamber at the Institute of Biomedical Problems, Moscow, U.S.S.R.

Biomedical "Mission Control" at the Institute of Biomedical Problems, Moscow, U.S.S.R. On the foreground monitor, Salyut-7 Cosmonaut 8 is on treadmill in the Salyut craft.

Little-known medical airlift run by Federal Bureau of Prisons

The Federal Bureau of Prisons, part of the U.S. Department of Justice, operates a three-part medical airlift system to transfer patients/prisoners between its 45 federal correctional institutions (FCIs). Two of these—the Medical Center for Federal Prisoners, Springfield, MO, and the new medical center at FCI Rochester, MN—have extensive facilities. Three other medical facilities are also approved for medical treatment—FCI Terminal Island, CA, FCI Butner, NC, and FCI Lexington, KY.

According to CDR John M. Kutch, Jr., USPHS, Chief of Health Plans and Operations for the Bureau, the medical airlift system has three prongs—the U.S. Marshals Service, which operates a Beech Craft Queen Air and flies prisoners and ambulatory patients; air charter/air ambulance transfer; and commercial airline transfer. Whatever transfer method is used, the patient/prisoner must be accompanied by medical personnel and by a guard or guards.

In 1984, 1,752 prisoner/patients were admitted to the medical facilities. Of these, the vast majority—1,320—were transported by the Marshals Service, which makes no per-patient charge. Instead, the Bureau of Prisons pays half of the yearly cost of the Service. In 1984 that 50% obligation came to $1,250,000. The cost involved in using air charter/air ambulance services was $448,610 in 1984, and in using commercial airline transfers was $24,095. These costs include overtime and per diem for escorting medical staff and guards.

Dr. Kutch says: "Because medical staff members work within the overall correctional model of a prison organization, they are often influenced by countervailing pressures. Health care delivery must not be compromised; however, the security of inmate custody must not be compromised either.

"At the current time, the Federal Bureau of Prisons Medical Airlift System, using U.S. Marshals aircraft on a regular basis, charter aircraft as needed, and commercial airlines when appropriate, is considered to be the most feasible and cost-effective organizational arrangement within the parameters of medical need and security requirements."

FAA extends rules on shoulder belts

Shoulder harnesses, now required only on the front seats of airplanes with less than 10 seats, must be installed on all seats in new planes, under a new rule adopted by the Federal Aviation Administration.

The new rule, which also requires the pilot-in-command of such planes to brief passengers on shoulder harness operation, will apply to all planes sold here, whether manufactured in the U. S. or not.

FAA has also established 11 new Airport Radar Service Areas in the U. S. All planes flying in these areas will be required to report by radio to the air traffic control facility.

The new measure is seen as a safety enhancement to prevent the risk of collision at busy airports where some aircraft are not now required to be under air traffic control.

Ohio women honor Lauretta Schimmoler

The late Lauretta Schimmoler, who formed the first group of flight nurses in the U.S. and eventually got the Army to recognize the need for specialized flight nurses, was honored recently with induction into the Ohio Women's Hall of Fame—the first to be inducted posthumously. The ceremony was held Nov. 14 in Columbus.

A native of Ohio, Miss Schimmoler was cited as the "first woman to establish and manage an airport....one of the first members of the 99s....recognized a need for air nursing personnel and formed the Emergency Flight Corps, later renamed the Aerial Nurse Corps of America....brought to life the concept of flight nursing."

Miss Schimmoler died in 1981.

Lt. Col. M. D. Grinevich, USAF(Ret.), Southern Pines, NC, attended the ceremonies. She had been a member of Miss Schimmoler's Aerial Nurse Corps of America and one of the original eight Army flight nurses. In 1966, Miss Schimmoler was made an Honorary Flight Nurse in the USAF by Lt. Gen. Richard L. Bohanan, now retired but then USAF Surgeon General. But she had already been given the gold wings of a flight nurse—gold wings Lt. Col. Grinevich had taken off her own uniform. (They were later returned to Lt. Col. Grinevich who has since donated them for display in the "Women's Corridor" at the Pentagon).