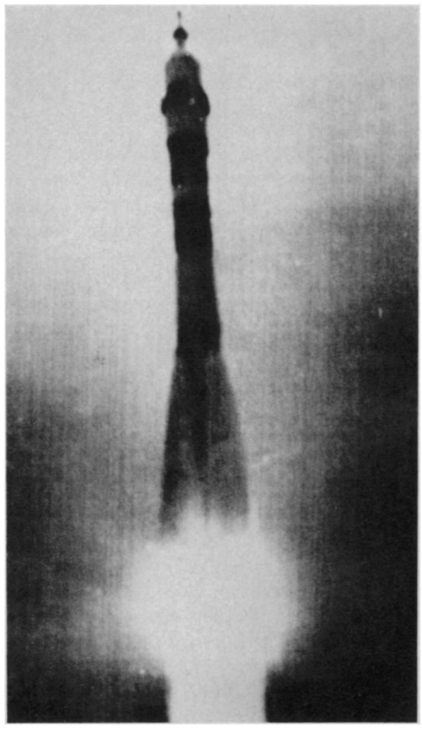
Flight of Soyuz 12: Short but successful

In June of 1971, three Soviet cosmonauts died, apparently from an air leak, as their Soyuz 11 spacecraft returned to earth from orbit. The tragedy stunned the Soviet manned space program, and more than two years of earthbound silence followed. This July, speculation arose that another manned flight was in the offing when space tracking ships moved out to their ocean posts and a delegation of Russian space scientists cut short a visit to the United States and returned home. But still, nothing happened.

Finally, last week, Soyuz 12 was launched.

The mission lasted just 44 minutes less than two days. Soyuz 12 completed 31 orbits of the earth before landing on target Sept. 29 in the Kazakhstan Steppe about 250 miles from its launching site at the Soviet space center at Baikonur. The crew included only two cosmonauts, Air Force Lt. Col. Vasily G. Lazarev and civilian Oleg G. Makarov. Television broadcasts from the spacecraft may have shown why.

Tass, the Soviet news agency, reported only that "the experimental flight is one of the stages in the work of further improving manned spacecraft." But the TV pictures suggested that Soyuz 12 had been modified into a two-man craft to make room for the bulky spacesuits of the crew, presumably a safeguard against the fatal leak of Soyuz 11, which was a shirtsleeve environment even during reentry.



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Soyuz 12 lifts off from Baikonur pad.

Soyuz 12 also reached new orbital heights for the Soviet manned space program when it lifted its flight path to a near circle ranging from 202 to 214 miles above the earth. The mission was a morale booster for officials planning a joint Soviet-American flight for 1975, when a Soyuz is to dock with a U.S. Apollo spacecraft. □

Skylab crew: Weaker, but rapidly readapting

"I feel a little bit weaker now than when I left," said Alan Bean, a week after splashing down in the Pacific with fellow astronauts Jack R. Lousma and Owen K. Garriott, but except for a little tiredness, the crew of Skylab 2 is very well, thank you.

The problem of returning to normal earth gravity after two months of weightlessness has been a key concern of manned space flight researchers. The Skylab astronauts, however, found that they readily adapted to the renewed pull. In fact, said Lousma, it took him only about 24 hours to reaccustom himself to the feeling of his normal weight. (It also took a day, he said, to get himself to stop "floating things around," reacting to objects as though they, too, had no weight.) Within a day or two after splashdown, even the heart rates and blood pressure of the crew had returned to the same levels at which they had been before the flight.

A week after splashdown, the astronauts still tire more easily than normal, possibly a symptom of their losses during the flight of up to 12 percent of their red blood cells and 20 percent of their plasma volume. The effect is fading as their bodies regain moisture and new red cells.

It seems to take longer for the body to adapt to the lack of gravity, in fact, than to reaccustom itself to the presence of it. Lousma says the feelings and reactions of the crew seemed to stabilize after about 25 days in orbit, and medical tests showed that cardiovascular changes leveled off in about 40 days. The fact that they do level off, says Lousma, suggests that plans for longer missions anticipate no serious physiological problems.

The astronauts were a little wobbly when they arrived back on earth, but forward movements, the principal weight shifts in walking, seemed relatively unaffected, according to Bean. "Your lateral balance is kind of funny," he says. "When we lurched, we always seemed to lurch to the side."

Though the astronauts have fared well, Skylab 2's other passengers were not so fortunate. Arabella, sole survivor of the journey's two space spiders, was found dead when her vial was opened on earth, possibly from lack of nourishment, the same cause suspected of causing the death of her cohort, Anita. Four of 54 minnows that returned from the flight were alive at splashdown, but all were dead when they arrived in Houston.

The mission's rich scientific harvest, including 50 percent bonuses in solar and earth resources data, has inspired planners of Skylab 3. Scheduled to last from Nov. 11 to Jan. 6, the mission could be extended until Jan. 19 for longer studies and deep-winter earth resources photography. It could be launched as early as Nov. 6 to enable human-assisted observations of Mercury's passage across the sun on Nov. 10. □

U.S. science: Still big, but signs of decline

What many scientists have long suspected has now been confirmed in the recently published *Science Indicators*, compiled by the National Science Board: While America is still preeminent in most fields of science and technology, the international competitive edge is being eroded away and domestic retrenching has set in. Hardest hit are young, academic researchers. The indicators:

- International position. The proportion of the gross national product and the proportion of the population devoted to R&D has been declining in the United States but increasing in the Soviet Union, West Germany and Japan. Labor productivity in the United States has increased 39 percent in the last decade, but in the same period, labor productivity in Japan climbed 210 percent and in West Germany it rose 86 percent.
- Resources. Total national expenditures for R&D declined six percent from 1968 to 1971, in terms of constant dollars, with R&D falling from 12 percent of the Federal budget in 1965 to 7 percent in 1972. (Almost three quarters of the Federal R&D budget in 1972 went for defense and space exploration.)
- Universities. The number of institutions granting science and engineering degrees rose 18 percent during the 60's, with universities increasing their share of the basic research load from 43 percent in 1960 to 57 percent in 1972. But Federal obligations to such institutions for R&D plants and major equipment fell 75 percent between 1965 and 1971. The Federal retrenchment in the academic sphere coincided with an increase of funds to the Government's own intramural R&D programs, with the largest increase going to the Department of