

be connected, but both are being studied by investigating boards. The Delta and Atlas-Centaur are to be used for almost all of NASA's launchings until the space shuttle begins its operational missions in 1979 or 1980. Of 21 launches currently scheduled for 1978, for example, 12 are assigned to Deltas, 6 more to Atlas-Centaur and only 3 to the smaller Atlas F.

Of more immediate concern is the launch of the double-payload International Sun-Earth Explorer mission (one satellite each from NASA and ESA), which has been scheduled to take off on Oct. 19 aboard a Delta. The next Atlas-Centaur launch, another Intelsat IV-A, has been targeted for Nov. 10. With its two key rockets under investigation, however, NASA may find its schedule slipping, even if the time only goes to be sure that nothing is chronically wrong.

A similar case of successive malfunctions took place in 1968-69, when three payloads were lost in less than 12 months—all using the supposedly "old reliable" Delta. Yet investigations showed apparently unrelated causes rather than any common thread, "a case," said one engineer, "of statistics catching up with us." □

Sixth Salyut space station launched

Salyut 6, latest in the Soviet Union's series of space stations, was fired into an earth-circling orbit on Sept. 29, with indications that a crew of cosmonauts would soon go aloft to occupy it. The previous station, Salyut 5, was destroyed during atmospheric reentry on Aug. 8, ending a nearly 14-month lifetime during which it was manned by two different crews and unsuccessfully approached by a third.

"We are preparing astronauts now to work on board the orbiting stations," said veteran cosmonaut Vladimir A. Shatalov on Oct. 3, "and a launching will follow soon . . ." In addition, besides the Oct. 4 20th anniversary of Sputnik 1, there is the coming 60th anniversary of the Russian Revolution, with both events being likely candidates for Soviet commemoration in space.

Shatalov's use of "stations," in the plural, could be a reference to Salyut 6 and others to come, or it could be merely a broad usage describing the Salyut and the spacecraft that would carry the crew to meet it. Salyut 5 was said by Soviet officials to carry at least two docking ports, so that an additional spacecraft could be sent up to resupply the station, but this capability was not used. Multiple dockings, however, are one way to assemble large, modular structures in space, and both the U.S. and Soviet space programs include studies of such possibilities. It has thus been speculated that there might be an attempt to join two Salyuts together in orbit, thus creating a large station, presumably with a crew of at least four people. □

Gene-splicing bills suffer setback

It was three steps back last week for recombinant DNA legislation. Both in the House and in the Senate the DNA bills ran into unexpected delays and opposition. However, deadlines for possible enactment this year have long since passed. The continuing work on these bills now aims for settlement in the next Congressional session.

Sen. Edward M. Kennedy (D-Mass.) withdrew support for his own bill, which has already passed the Senate Human Resources Committee. "I am concerned about the fluctuating scientific data and the emotional atmosphere of the debate," Kennedy told a meeting of medical writers. Kennedy proposes instead compromise legislation to extend the current National Institutes of Health guidelines for one year to all parties conducting recombinant DNA research and to establish a national recombinant DNA study commission to recommend, after nine months, whether permanent legislation is necessary.

Kennedy cited new work by Stanley Cohen of Stanford University as challenging the belief that recombinant DNA research can produce novel organisms. "Dr. Cohen believes that by using this technique [recombinant DNA], scientists can only duplicate what nature can already do," Kennedy says.

Recent experiments by Cohen and Shing Chang demonstrate that within bacteria small, independent rings of DNA (plasmids) can be snipped and resealed by the same enzymes that scientists use to engineer plasmids outside the cells. Fragments of DNA either from bacteria or mouse mitochondria were clipped from or inserted into plasmids within bacteria. "It seems reasonable to speculate from our findings that restriction endonucleases [the enzymes that cut DNA at specific sites] may play a major role in the natural evolution of plasmid, and perhaps chromosomal, genomes," the researchers conclude in a paper to be published in an upcoming issue of the PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

Cohen's results may provide Kennedy with a graceful retreat from his strong position on recombinant DNA control, although they are not decisive on the question of hazard, some scientists suggest. Cohen's experiments do not conclusively establish that such genetic recombination occurs in nature. For example, the bacterial cells in the experiments are treated with calcium chloride so that the plasmids may enter. The work does not address incorporation into plant and animal cells, nor does it answer the objection that products of genetic recombination may be hazardous, even if recombination occurs in nature.

In a separate action, the Senate Committee on Commerce, Science and Transportation announced that it will hold hearings next month to examine

the effect of the proposed legislation on the conduct of basic research and the freedom of scientific inquiry. Committee Chairman Sen. Warren G. Magnuson (D-Wash.) says the bills "appear to go considerably beyond previous legislative attempts to control the use of potentially hazardous materials."

In the House last week, commerce committee Chairman Rep. Harley O. Staggers (D-W.Va.) blocked a vote on the bill proposed by Rep. Paul G. Rogers (D-Fla.) and approved by the Health and the Environment Subcommittee. The commerce committee will consider the recombinant DNA bill again this week. □

The right brain: Surviving retardation

As the mysteries of the left and right hemispheres of the brain begin to unravel, it is apparent that although the halves function autonomously in many ways, they may also support, complement and even inhibit each other. Both the autonomous and inhibitive aspects of hemispheres were strikingly portrayed in two studies presented recently at the annual meeting of the American Psychological Association.

In one study, University of Houston researchers report that some youngsters classified as retarded in the left brain functions of speech, writing, logic and mathematics, are normal and above average in the right brain-controlled processes of creativity. In the other study, University of Connecticut psychologists find that persons with left brain damage frequently are more expressive and non-verbally communicative than either persons with right brain damage or non-damaged individuals. The researchers suggest that in many "normal" people the left hemisphere may actually inhibit the right side's facility for "spontaneous nonverbal expression."

The Houston research, conducted by Patricia L. Musick, set out to examine the possibility—which had been implied in several previous studies—that persons who are considered retarded by the usual language- and mathematically-oriented criteria may not be retarded in their right brain functions. "It has been assumed that children with retarded mental development would follow the same stages of growth [in creative development] as the typical child, but at a much slower pace," says Musick.

The psychologist chose a sample of eight 3- to 9-year-olds, ranging from moderately to profoundly retarded. The drawing and painting ability of each was evaluated during one semester by specialists in "creativity for the handicapped." During the next semester, each of the specialists worked with one of the eight children in a program designed to

help the youngsters develop to more advanced creativity levels, if possible.

At the end of the second semester, three judges evaluated the children on the basis of videotape recordings of their behavior, and on the basis of six measures of creative behavior: advances in symbol or schema; control of the art medium; composition; sophistication of concept; verbal description of the artwork, and overall stages, as designated in a formal model.

Of the four moderately retarded children tested during the seven-month period, Musick found that the development of two of them was equal to that of normal children. While this may have constituted a surprising success in itself, Musick further found that the remaining two youngsters had "remarkable development—beyond their chronological age." Of the three profoundly retarded children (one youngster was dropped from the study because of chronic illness), one showed normal creative development and another showed "remarkable development, placing him close to his chronological age." The third profoundly retarded youngster exhibited no creative development.

In the Connecticut study, researchers Ross Buck and Robert J. Duffy tested 37 male patients in a Veterans Administration hospital. One group had left hemisphere damage, another group had right hemisphere damage and a third control group had "no history or medical

evidence of neurological damage." Each of the men was shown a dozen slides, three in each of four categories—"familiar people," "scenic," "unpleasant," and "unusual." The men were videotaped and their reactions evaluated by eight observers, who were asked to judge, from the subjects' nonverbal responses to the slides, which type of slide was being viewed, and the patients' levels of expressiveness.

The left brain-damaged patients were considerably more accurate in relaying the type of picture to which they were responding than those with damaged right hemispheres, and were slightly more accurate than normal subjects, Buck and Duffy report. In addition, the left-damaged were rated as being significantly more expressive than either the right-damaged or normal groups.

While the researchers predicted that left-damaged subjects would be more expressive than right-damaged ones, the superiority over normal controls "was not expected," they say. "One possible explanation is that the left cerebral hemisphere may normally exert an inhibitory influence over some other part of the brain (perhaps the right hemisphere) that is responsible for spontaneous nonverbal expression.

"Damage to the left hemisphere, in this view, would free the right hemisphere from inhibition and allow for greater nonverbal expression," they suggest. □



Cosmos-flown Drosophila exposed to zero gravity appear normal, but exhibit reduced mating and exploratory behavior.

While the Soviets charged no rent for the premium space, they did make other exacting requirements. The experiments had to be self-contained and require no power, and they had to fit in a small volume of space. Otherwise, the Soviets "were extremely cooperative in all dealings," and the technicians who processed the U.S. experiments at the north central Asia recovery site (after recovery on Aug. 22) were "top notch," according to Kenneth Souza, manager of the U.S. studies who escorted the samples from Moscow back to the West Coast.

The consensus of U.S. researchers that the project was successful is reiterated by Russian scientists who collaborated on four of the seven studies. Next month a U.S.-Soviet meeting will convene in California to discuss future joint biospace efforts. Notes Harold P. Klein, director of life sciences at Ames, "It is possible they might want to fly on the shuttle." □

Biosputnik hauls Yankee rats, fruit flies

As Apollo 11 was returning to earth after its historic moon mission, astronaut Edwin E. Aldrin began "seeing things"—blips of light the size of pinpoints that seemed to appear from nowhere, and passed as quickly as they came. At a later debriefing, researchers realized that Aldrin's eyes had been penetrated by "cosmic rays"—heavy, high-energy nuclei stripped of their electron shells. While most cosmic rays never reach the earth (but instead are absorbed or scattered by the atmosphere), NASA officials were concerned that future space travelers, unprotected from the radiation, might suffer eye damage.

Subsequent tests showed that the rays did little or no short-term harm, but space scientists are still concerned with the effects the beams might have on humans making extended space crossings. And there are other unanswered questions that may have profound implications for the future of human travel in outer space: Why do bones stop growing and muscles tend to atrophy during space travel? And what effects does zero gravity have on sexual capability and aging?

American biologists got a golden opportunity to further explore these questions recently when the Soviet Union launched Cosmos 936 from the cosmodrome 500 miles north of Moscow on Aug. 3. The Vostok-launched, unman-

ned payload carried with it seven experiments designed by scientists at NASA's Ames Research Center, West Coast universities and Veterans Administration hospitals around the country. Thirty Wistar rats, time-honored medical surrogates for humans, and 1,000 fruit flies, whose short life cycles provide information on aging and genetics, orbited the earth for 18.5 days along with experiments from France, the Soviet Union and six Eastern-bloc countries.

The U.S. studies were designed to shed light on how persons in less-than-perfect physical condition might fare in outer space. The robust U.S. astronauts have mentioned only slight nausea, and tests have indicated minor calcium loss in prior manned flights. But these "minor problems" may, like irregular vibrations in a new car, prove troublesome in older or less fit human models. If it were not for the Soviet biospace program, U.S. workers would have had to wait for space shuttle operations in the 1980s to continue biological research that has been virtually in limbo since the Skylab missions in the early 1970s. With Cosmos 936 and the earlier Cosmos 782 in 1975, however, not only have U.S. scientists been able to continue crucial research, they have done it for less than \$1 million—a fraction of the cost to mount a flight.

Soviet UFO due to secret launch

A spectacular, starlike ball of light sighted over Petrozavodsk in the northwestern Soviet Union Sept. 20, "spreading over it like a jellyfish" and showering down shafts of light, was identified last week by American analysts as the launch contrails of the Cosmos-955 spy satellite.

The sighting of the strange phenomenon, also seen over Finland, was widely reported by the Soviet news agency Tass and by news agencies around the world. "A huge star suddenly flashed out of a dark sky, sending shafts of light impulses to earth," Tass reported. "This star was moving slowly toward Petrozavodsk and spreading over it like a jellyfish. It stopped and hovered over the city, sending out numerous thin light rays like a downpour of rain." No explanation was offered in the news reports.

But the phenomenon turns out to have been due to a predawn launch from a top secret military space center north of Moscow. Although the base, the Plesetsk Cosmodrome, has been known to Western observers since shortly after it became operational in 1966, Moscow has