

# BEHAVIOR

## Follow-up on drug use

Studies of drug use always run counter to popular beliefs, says Lloyd Johnston of the Institute for Social Research at the University of Michigan at Ann Arbor. He and Patrick O'Malley have been conducting a study of the drug experiences of 1,600 young men for more than eight years—from the start of high school until five years after graduation. "The findings we reported in 1970," says Johnston, "did not reinforce public opinion; drug use turned out to be far less prevalent among young people than was commonly believed. . . . Before graduating from high school in 1969, less than a quarter of this age cohort had used any illicit drug, and about half of those using had merely experimented once or twice, usually with marijuana. Now the common belief seems to be that the problem of young people using illicit drugs has subsided considerably. In fact, however, our data indicate that substantial proportions and absolute numbers of young people are involved with drugs to some degree."

The ISR study indicates, for instance, that in the 12 months prior to June 1974, more than half of all 23-year-old males in the United States smoked some marijuana. More than one-fifth made some use of amphetamines without a prescription, and the proportions for barbiturates, cocaine and psychedelics were all greater than one-tenth during that year. The number who had tried these drugs at some time during their lives is even higher: 62 percent for marijuana; 32 percent for amphetamines; 19 percent for barbiturates; 22 percent for psychedelics, and more than 6 percent for heroin.

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The street drug program of the University of the Pacific in Stockton, Calif., analyzes the content of illicit drugs sent in by drug abuse clinics and physicians. The number and type of samples sent in indicates changes in the drug scene. Their most recent data suggest a "tremendous" increase in the availability of cocaine and "rather large" increases in heroin, hashish and mescaline.

## High in the sky

Flying high may be fun, but flying a plane while high on marijuana is something else. Even studies that have found marijuana to be relatively harmless have cautioned against driving a car while high on the drug. Flying a plane while high is a much more serious problem because marijuana is known to affect precisely those areas of perception and coordination most used by pilots. Even so, according to research reported at the recent meeting of the American Psychiatric Association in Anaheim, Calif., some pilots have been known to fly aircraft while high on marijuana.

David S. Janowsky, working at the University of California at San Diego, studied seven professional and three private, male pilots who were social users of marijuana. Flight simulation tests were given before and after smoking. All subjects showed a significant increase in pilot errors related to heading, altitude and deviation from pattern when tested 30 minutes after smoking. Performance did not return to normal until four hours after the drug was taken. "The deficiencies noted in pilot performance probably reflect marijuana's ability to affect memory, skill, concentration, time and orientation in three-dimensional space as well as the performance of multiple complex tasks," said Janowsky. "At times," he said, "subjects exhibited a complete loss of orientation with respect to navigational fix, resulting in grossly unpredictable flight performances." They seemed to concentrate on some variables to the exclusion of others. The pilots did report, however, that flying was a much more challenging task while high.

# SPACE SCIENCES

## A nice, sunny spot for a power plant

The SMS-1 weather satellite, superstar of the GATE tropical meteorology experiment last summer, is about to take on a very different sort of job, together with its SMS-2 sibling: locating ideal spots for large solar power generating stations.

H. W. Hiser, H. V. Senn and S. S. Lee, of the University of Miami's Clean Energy Research Institute, are embarking on a two-year project for the National Aeronautics and Space Administration to pinpoint areas of the United States where the sunshine "crop" is best for producing commercial quantities of electricity. The SMS satellites (now known as GOES) are stationed over fixed points on the earth's surface, so that they can provide continuous observations of changes in cloud cover while gathering other relevant data, such as variations in the planet's surface reflectivity.

Data from the satellites will be processed into a grid with four-mile squares, then analyzed to determine the places that receive the maximum amounts and best daily and annual distribution of sunshine. "We are looking for midday sunshine, worth more for solar power than early morning or evening sunshine," says Hiser. "We already know that a place receiving sunshine half the year, with the other half-year cloudy, is not practical."

Besides the satellites, a number of existing ground stations will be used for additional data, with results combined into detailed maps of insolation (incoming thermal energy from the sun) received throughout the contiguous United States.

It is also possible, Hiser says, that the insolation maps may have agricultural applications, revealing, for example, why some areas seem to produce a better yield from a given crop.

## Space trek ends: A new home for ATS-6

Following an orbital trek of more than 80,000 kilometers, the multipurpose ATS-6 satellite has reached its home for the next year, hovering over Lake Victoria in East Africa, in time to handle communications for the Apollo-Soyuz rendezvous mission and to relay television programs to rural villages for the government of India.

The versatile probe has developed a problem—a malfunction in the circuitry of one of the three "momentum wheels" that control its stabilization in three axes—but officials at NASA's Goddard Space Flight Center have worked out a solution, which they say should see the satellite through its Indian service as well as four or five years back in its original station just west of the Galapagos Islands. The solution calls for augmenting the two healthy momentum wheels with occasional bursts from the gas jets that were provided as a backup stabilization system. This is expected to use gas sparingly enough to allow several years of controllability, provided nothing else breaks down.

ATS-6 was moved from its previous position by lowering it slightly from its 35,900-kilometer geosynchronous altitude, so that it would move eastward relative to the surface of the earth. Once in its new position, it was simply instructed to climb back up to the height at which it would be moving at the same speed as the earth's surface below.

## Moon-ranging super-laser is operational

The 1.5-billion-watt super-laser at the University of Hawaii's Institute for Astronomy, which is aimed through a 16-inch telescope to make such measurements as the distance of the moon to within a few inches, has become operational after a year of testing and modifications. Located atop 10,000-foot Mt. Haleakala on the island of Maui, the device is computer-aimed at reflector panels left on the lunar surface by Apollo astronauts. It was developed by GTE Sylvania, Inc.