

Community-based drug abuse

The movement toward deinstitutionalizing psychiatric patients is viewed generally as a positive one, allowing persons who might otherwise have been confined in hospitals for years to live and work in the community while receiving therapy at special mental health centers or outpatient clinics. One negative aspect of this, however, appears to be the increased availability of antipsychotic drugs, which are now being taken home by outpatients rather than confined within hospital walls.

A study of patients admitted to Massachusetts General Hospital between 1962 and 1975 reveals that in 56 admissions — 7 percent of all overdose patients — “an antipsychotic drug was among the agents ingested,” report Marcia Divoll Allen, David J. Greenblatt and Barbara J. Noel of the hospital’s clinical pharmacology unit.

“Our review of 56 cases involving self-poisoning with an antipsychotic agent clearly indicates that intentional overdose with these drugs commonly produces serious complications,” the researchers report in the February *AMERICAN JOURNAL OF PSYCHIATRY*. “More than half the patients developed severe CNS [central nervous system] depression and complications such as respiratory failure, hypotension, tachycardia and other cardiac arrhythmias. . . .” No deaths were reported among these cases, but the scientists emphasize the potential dangerousness of antipsychotic drugs if overdosed and “recommend that patients who have taken excessive quantities of major tranquilizers [in the past] . . . should receive intensive monitoring care.”

Barbiturates and cancer

The ever-spreading list of possible cancer-related substances may have a new addition: barbiturates. Researchers at the University of Notre Dame report that the drugs — used primarily as sedatives and sleeping pills — do not *cause* cancer but appear to promote the growth and spread of existing tumors.

Latest study results from Notre Dame’s Lobund Laboratory show that sodium barbiturate and phenobarbital promote intestinal cancer and, in the case of phenobarbital, liver cancer as well. Previous research indicated that the two substances accelerated the growth of breast and prostate tumors in laboratory rats and speeded their rate of spread throughout the body.

“Phenobarbital is a dangerous drug,” says Morris Pollard, who conducted the study with P.H. Luckert. “While phenobarbital does not cause cancer, it promotes cancers already formed, causing more and larger tumors to develop” in animals.

In the study, those rats given sodium barbiturate in their drinking water developed an average of nearly twice as many tumors as those given drug-free water. In a control group of rats who did not have tumors to begin with, none developed any cancer, the researchers reported in the October, 1979 *JOURNAL OF THE NATIONAL CANCER INSTITUTE*.

High school pot use declines

For the first time in more than a decade, marijuana use among U.S. high school students appears to be falling off, according to a study by the University of Michigan’s Institute for Social Research. In a sample survey of 17,000 seniors in 130 public and private high schools around the country, psychologists Lloyd Johnston, Jerald Bachman and Patrick O’Malley note that from 1975 through 1978, regular marijuana use has risen from 6 percent to 11 percent. In 1979, however, this increase abruptly halted — a change the researchers attribute to increased public awareness of the potential hazards of daily or near-daily use.

The study is reported in two new books published by the National Institute on Drug Abuse.

Phobos: From crater to tides to grooves

One of the most distinctive features of the larger Martian satellite Phobos is a collection of prominent grooves extending across its surface. Discovered in photos taken by the Viking spacecraft, the grooves are several kilometers long, typically 100 to 200 meters wide and from 20 to as many as 90 meters deep. The distribution of the grooves has suggested to some researchers that their formation may have been associated with the huge impact that produced a crater named Stickney (nearly half as wide as Phobos itself); other scientists have linked the markings with tidal stresses caused by gravitational interactions between Phobos and Mars. Now Stuart Weidenschilling of the Planetary Science Institute in Tucson, Ariz., has proposed that both processes were possibly involved. Tidal stresses may have been the energy source, he reports in *NATURE* (282:697), but they only became strong enough after the impact that caused Stickney altered the satellite’s rotation rate.

First of all, Weidenschilling says, the grooves appear to have formed slightly after Stickney rather than at the same time. The material ejected by the Stickney impact, tossed into orbit around Mars and then redeposited on Phobos as the satellite came around in its orbit, would have blanketed the surface to a depth of about 20 meters. Yet in many of the grooves, shallower features still remain exposed to view, suggesting that they were formed or renewed after the bulk of Stickney ejecta had settled.

Secondly, although Phobos is now in synchronous rotation around Mars (with the same side always toward the planet) and could have been in the same condition before the impact, the powerful blow (one estimate is 10^{26} ergs) could have temporarily disturbed that balance, or at least triggered a large-scale wobble. The changing orientation of Phobos in the gravitational field of Mars would have subjected its interior to periodically varying stresses, which could have caused faulting along planes of maximum shear stress, producing the systems of grooves. Sure enough, Weidenschilling says, the grooves seem neither radial nor concentric to Stickney itself, but rather appear to define three sets of planes (one parallel to the equatorial plane, one perpendicular to the satellite’s longest axis and a third between those two).

Additionally, calculations by other researchers suggest that the time required for Phobos to recapture the material ejected from Stickney would have been as little as 100 years, while the satellite would have been wobbling (or otherwise out of synchronous rotation) for 10,000 to a million years. This would have allowed plenty of time, Weidenschilling maintains, for the grooves to have formed even after there was no more ejecta waiting in the orbit of Phobos to cover them up.

The lack of similar grooves on Deimos, he says, could be due simply to the lack of a sufficient impact, but even if there were such a blow, Deimos’s greater distance from Mars would have subjected it to weaker tidal stresses as it shuddered in response.

More messages through space

By the year 2000, as much as one-fourth of all long-distance voice communications traffic and half of all data and video traffic may be carried by satellite, according to two studies carried out for the National Aeronautics and Space Administration. The studies, conducted by U.S. Telephone and Telegraph Corp. (part of IT&T) and by Western Union Corp., indicate that such growth will be part of an overall 500 percent increase in demand for telecommunications services. The present 4-to-6-gigahertz and 11-to-14-GHz satellite bands will have become completely saturated by the early 1990s, the studies show. NASA is now developing technology for the 20-to-30-GHz band, which has not yet been in routine use in the United States.