Marijuana dangers: Teen use down

There is no solid proof that marijuana smokers suffer any lasting damage, but the acute, immediate effects justify serious national concern, according to the latest in a decade-long parade of reports on the country's most popular illicit drug. Such public alarms may be having a cumulative impact on teenage behavior, according to a separate but related study, which indicates a continuing decline in marijuana use among students concerned about their physical and psychological health.

The National Academy of Sciences (NAS) report of a 15-month study stresses the short-term effects of marijuana use on mental functioning and behavior, including the motor coordination and eye tracking abilities crucial for driving. The report says further that behavioral and mental deficits may linger long after euphoria has passed. Smoking marijuana also impairs memory, oral communication and learning, continues the report, which suggests that marijuana use is probably both a cause and effect of so-called "amotivational syndrome."

Although the committee acknowledged some evidence that the neurophysiological effects of chronic marijuana use may last a while, it dismissed as unconvincing the data indicating permanent alterations in brain structure. In general, the 22-member panel concluded that the federal investment in marijuana research — especially on long-term consequences — is inadequate considering how widespread marijuana use has become.

Such reports as this may have an effect. According to a recent survey by University of Michigan psychologist Lloyd D. Johnston, fewer high school seniors are using marijuana this year than did last year, continuing a decline that began in 1979. In 1978, one of nine seniors was smoking regularly — at least 20 days a month; by 1981, that number had dropped to one in 14. Overall use had declined slightly as well. Significantly, Johnston and colleagues report, students seem to have moderated their smoking habits because of their health concerns rather than legal or ethical concerns.

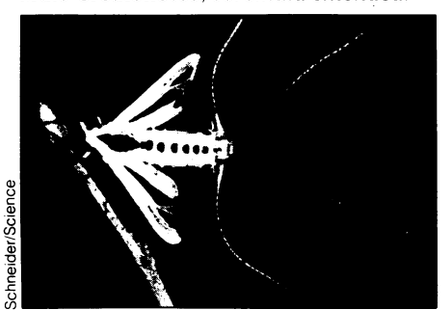
The researchers emphasize that use of marijuana and other illicit substances by American youths today is high, despite the apparent trend toward moderation.

The NAS committee noted that, while the evidence on ill health effects of the herbicide paraquat is inconclusive, continuous exposure to inhaled paraquat is likely to lead to "respiratory insufficiency, disability, and death." The report coincides with a federal decision to permit spraying of domestic marijuana crops with the herbicide. —*W. Herbert*

Plant compounds control moth morphology

There may be no more appropriate application of the adage "you are what you eat" than to the males of two species of Asian moths: In their case, diet could very well be critical to the sexual functioning of the species. These males, in the genus *Creatonotos,* must ingest plant alkaloids to obtain full development of scent organs that appear to be involved in sexual attraction, reports a group of U.S. and German researchers in the March 5 SCIENCE. "This has never been seen before ... it's genuinely novel," Jerrold Meinwald, of Cornell University, told SCIENCE NEWS. Meinwald directed a group of Cornell chemists that teamed up with three German biologists, led by Dietrich Schneider of the Max-Planck-Institut für Verhaltensphysiologie, to study these organs, called coremata. Coremata are retractable tubes, covered with hair, that extend from the insect's abdomen. Some other moths and butterflies have similar structures, used to distribute pheromones, but none are as large as those of *Creatonotos.*

Male Creatonotos, *coremata extended.*



Schneider/Science

Analysis of extracts from the coremata shows that they contain hydroxydanaidal, known to be a sex-attracting pheromone in other species. While it's likely that the odor released by *Creatonotos* will prove to be a sex attractant as well, the scientists stress that the "biological function of the coremata is still undetermined." Other moths that synthesize hydroxydanaidal need to eat plants containing pyrrolizidine alkaloids (PAs) to do so. Research reveals that this is true of *Creatonotos,* too. When larvae were fed a diet deficient in PAs, they grew up with only traces (<5 ng) of the presumed pheromone.

What is more exciting, however, was that moths fed a PA-deficient diet as larvae also failed to develop full-sized coremata. Addition of monocrotaline, a typical pyrrolizidine alkaloid, to the same diet resulted in full development. While dependence of insects on PAs to synthesize defense compounds is well known, the regulation of organ development by a plant compound is "an insect-plant relationship without parallel," conclude the researchers. —*L. Tangley*

Science for poets attacked

The quality of undergraduate science education for non-majors has so declined since the 1960s that colleges are turning out future opinion leaders ill equipped to comprehend their increasingly technological society, according to a recent report of the National Research Council.

Colleges and universities have lowered their science requirements to the "alarming point" where the average non-major now devotes only 7 percent of his or her classroom time to natural sciences — the equivalent of three courses during four years. Students are permitted to choose unsystematically from courses once designed for relevancy, the report says, but the typical science curriculum has become irrelevant and dull. As a result, the report concludes, colleges are graduating future lawmakers, journalists and teachers who do not know even the basic principles of science.

The report includes a series of recommendations aimed to reverse the trend toward scanty and haphazard science education, but most of the proposals call for increased federal spending to provide incentives for excellence in science teaching. Specifically, the report suggests that the National Science Foundation take responsibility for invigorating general science education, a task that would require a substantial boost in funding at a time when the administration is proposing to cut funds for all but graduate-level science education. □

On dumping hazards

The Environmental Protection Agency is attempting to change its regulations for disposal of hazardous wastes containing liquids. A law that went into effect last November 19 required landfill operators to inspect all incoming hazardous wastes, which had been packaged, for the presence of liquids. When liquids were found, absorbants had to be added to sop them up. But landfill operators complained that the procedure was needlessly expensive — especially if no liquids were found — and potentially hazardous; if the wastes proved flammable, opening containers could be risky. So EPA is posing an alternate plan and suspending the Nov. 19 rules for three months while it gets the industry's reactions.

Under the scheme, depending on a landfill's depth, EPA would allow up to 25 percent of a landfill to be devoted to packaged wastes containing liquids. And there would be a presumption that all unopened packages of hazardous wastes contained liquids. However, dumpers would be allowed to open, at their own expense and risk, a container to rectify its liquids problem, and then exempt this waste from its liquids quota. □