

each other without becoming bound into un-ionized matter. He finds the whole thing rather reminiscent of a scaled-down version of a supernova.

The spectral complications and the hypothesis deductible from them, the nova-like appearance of the brightness curve and the absence of certain spectral features, expected of an ordinary nova, fortuitously seem to coincide with a theoretical calculation done by S.G. Starrfield of Arizona State University, J.W. Truran of the University of Illinois, Gallagher, W.M. Sparks of the Goddard Space Flight Center, P. Strittmatter of the University of Arizona and H.M. Van Horn of the University of Rochester. This model was calculated by ignoring the existence of an important part of traditional nova theory, the presence of a binary companion star.

According to the traditional nova

theory, a nova is a white dwarf star bound in a binary system with a more or less ordinary star. The white dwarf's gravity draws matter from the companion, and this infalling matter creates an energy instability that leads to the nova explosion. If the companion is ignored, Truran told the meeting, the light curve and other features come out like Nova Cygni 1975. If the companion is put into the calculation, theory comes out like a typical nova. So they suspect that the noncompanion calculation represents Nova Cygni 1975's situation. Truran says it could either be a binary nova, in which for some reason accretion of matter from the companion had long ago ceased, or it could be an example of an entirely new kind of nova, a free-standing star that accreted material from interstellar space to trigger its outburst. □

Marijuana: Cultural and clinical studies

Contradictions abound. Studies have shown that marijuana causes or does not cause any number of serious physical, psychological and social problems. Two of the most serious charges are that marijuana reduces motivation and lowers testosterone levels. Two multidisciplinary studies, one undertaken in Jamaica and one just completed in Costa Rica, may go a long way toward answering these charges and resolving some of the long-standing contradictions that surround marijuana and its use. Both studies were discussed last week in San Francisco at the annual meeting of the American Anthropological Association.

In 1969, the National Institute of Mental Health pinpointed some of the deficiencies leading to contradictory results in marijuana studies and decided that a different approach was needed. A long-term, multidisciplinary study of more than 2,000 Jamaicans was planned. Anthropologists Vera Rubin of the Research Institute for the Study of Man in New York and Lambros Comitas of Teachers College at Columbia University undertook the study in conjunction with the University of the West Indies.

The cultural studies in Jamaica showed that the drug is used by up to 75 percent of the working-class population. Women and children often take it as tea or as a tonic. Males most often smoke it mixed with tobacco. The quality of the drug they use is about four times stronger than that usually found in the United States. The major reason cited by men for marijuana use is, "It makes me feel to work." They smoke the drug before and during work and claim that it helps them concentrate, feel better and work harder. Energy output as well as thoughts about the job at hand did increase after drug intake. The men smoked about seven joints a day.

In Jamaica, marijuana was not found to be related to the use of harder drugs

(though few were available or affordable), was found to be related to less alcohol use and was not related to crime (except arrests for using marijuana). Some psychological dependency was noted in smokers when asked to give up the drug during the clinical studies.

For the clinical part of the study, 30 male *ganja* or marijuana smokers were matched with 30 nonsmokers and given thorough physical examinations during a six-day hospital stay. Few adverse effects were found. Physical dependence, chromosome damage, brain damage and psychosis were not found to be related to marijuana use. Functional hypoxia (reduced delivery of oxygen to the tissues) was noted but appeared to be related to tobacco use rather than to the *ganja*.

Ganja in Jamaica: A Medical Anthropological Study of Chronic Marijuana Use (Mouton & Co., The Hague) was published in book form early this year, but the study has been under considerable attack since its results first began to come out three years ago. It was attacked especially because it did not confirm the then popular theory that marijuana produced an amotivational syndrome. A number of researchers and politicians continue to claim that marijuana will produce a generation of semizombies.

Both Rubin and Comitas have defended the validity of their work, but their best defense now comes from the just-completed Costa Rican study. Paul L. Doughty, William E. Carter, Wilmer J. Coggins, William R. True and John B. Page of the University of Florida released the preliminary results of their study at the anthropology meeting. The Costa Rican study, the largest controlled study yet of chronic marijuana users, was partially modeled on the Jamaican study. It confirms many of the Jamaican findings.

From a larger sample than was used in the cultural studies, a clinical sample of

41 pairs (users and nonusers) was selected and matched for age, education, marital status, tobacco and alcohol use and occupation. Up to 15 percent of the working-class males in San Jose use marijuana, averaging about 10 cigarettes a day. Most began using the drug at about age 14 as a social experience after leaving home and beginning to make their own living.

Physical examinations showed some differences between users and nonusers. Users averaged about seven pounds less in body weight and tended to have bloodshot eyes. Visual functioning, sleep and EEG studies have not been completed, but one controversial question may have been cleared up. The researchers were careful to test serum testosterone levels and could find no difference between users and nonusers. This point was emphasized by Coggins who said there was not even a trend toward a difference.

Both the Jamaican and Costa Rican studies suggest that the effects of marijuana are highly dependent on cultural expectations. But since such expectations (as well as research results) tend to be contradictory in the United States, perhaps, as Vera Rubin says, "We will have to learn about the use of marijuana from other societies." □

DAD's in the drink

A pair of U.S. satellites known as the Dual Air Density (DAD) Explorers, sent aloft on Dec. 5 to study the composition and density of earth's atmosphere at different altitudes, ended up in the water instead when their rocket malfunctioned and dumped them into the South Pacific. The two instrumented probes—a 30-inch rigid sphere and a 12-foot balloon—weighed less than 80 pounds each, making their masses low enough to respond to slight changes in atmospheric drag, thus yielding sensitive density measurements. Early analysis of the telemetry data from the hapless flight suggests that the Scout rocket's fourth stage never ignited, leaving the dead weight to pull the \$5 million double payload down to its demise. □

NOTE TO READERS

Following our practice of the last two years, the final two issues of 1975 will be combined into one double-sized issue of SCIENCE NEWS. The year-end issue is scheduled to contain a report to readers on results of the reader survey we conducted this year. It will also carry a review of the top stories of 1975, organized by scientific fields, plus the semi-annual index and our regular news and feature columns. The special year-end issue will be dated Dec. 20/27 and will be mailed Dec. 24.

—The Editor