BEHAVIOR

Blind drunk

It's no secret that alcohol is involved in a great many automobile accidents, up to 50 percent by some estimates. Many factors are involved (for instance, alcohol affects muscle and motor activity and tends to degrade decision-making ability), but another major reason that drinking and driving don't mix may be that alcohol has serious effects on human vision. This conclusion comes from optometrist Anthony J. Adams and his colleagues at the University of California in Berkeley and in San Francisco and at the Pacific Medical Center in San Francisco. Their investigations show that drinking, even in moderation, causes temporary but important changes in identifying and tracking moving objects, recovering from glare and distinguishing between some color hues.

After even one drink, test subjects had 10 to 20 percent greater difficulty in identifying moving objects, with recovery taking up to six hours. The faster the object moved, the more difficulty the intoxicated person had in focusing on the image. Moderate doses of alcohol were also found to decrease a person's ability to see fine details after they had been exposed to bright lights. Glare recovery under normal conditions takes 20 seconds. After a few drinks, it took 30 to 50 percent longer. During glare recovery, according to Adams, a person is in a period of relative blindness. The fact that drivers are intermittently exposed to the bright light from other cars and to the high glare from light scattered on the windshield may help explain why alcohol is so frequently linked to traffic accidents.

Learning and synapse density

Physical evidence of the process of learning has been tentatively identified in rats. Richard Altschuler of the University of Minnesota has found that rats placed in a stimulating environment show almost a doubling in the density of the connections between neurons in the hippocampus.

One group of rats was housed in a special learning-enriched environment, a large cage with two levels containing a small maze, a swing, mirrors with bells, an exercise wheel and other similar devices. Another group was kept in a normal laboratory cage without extra learning opportunities. After 80 days, Altschuler examined brain tissue from both groups of animals. He specifically examined the synapses, the connections between neurons. He explains: "Changes in the number or size, or both (the density), as a result of learning, would then be a significant step in determining the anatomical basis for learning and memory." Examination showed that the increased learning group had a synaptic density of 1.97 percent compared with 1.04 percent for the control group. Altschuler emphasizes that further clarification is needed, but his study does suggest that an increase in synaptic density may be associated with learning.

High school drug use

Despite changing attitudes toward and increasing use of marijuana, the great majority of young people in the United States continue to disapprove of the use of other illicit drugs, according to a survey of 17,000 high school students conducted by the University of Michigan's Institute for Social Research. This, however, does not mean that only a small number of young people are involved. "Quite the contrary," say the researchers. "By the time they left high school, nearly 60 percent of this year's seniors had used some illicit drug at least once; one in three had used an illicit drug other than marijuana—such as amphetamines, psychedelics, cocaine or narcotics—and more than one in five had gone beyond experimenting with one of the more serious drugs."

PHYSICAL SCIENCES

Do galaxies spit quasars?

Several astronomers now say there is evidence that some galaxies can swallow other galaxies. Halton C. Arp of the Hale Observatories proposes that sometimes galaxies can spit other galaxies out—and, what is more to the point, quasars. This is one way of solving some of the outstanding problems about the redshifts in the quasars' light. If the redshifts are caused by velocities connected solely to the expansion of the universe, quasars are, as a class, the most distant bodies known, and that requires them to have an energy output that becomes difficult to explain. If quasars are ejecta from galaxies, then part of the redshift can be attributed to what might be called the muzzle velocity of ejection. They are thus nearer than otherwise supposed and the energy problems are not so severe.

If galaxies emit littler galaxies and quasars, and the quasars come last, Arp writes in the Dec. 1 ASTROPHYSICAL JOURNAL LETTERS, then one should find instances of a large, low-redshift galaxy, a smaller higher-redshift galaxy and a high-redshift quasar lying near each other in the sky. Arp reports finding a number of such examples.

In the present paper he puts particular emphasis on one trio, the spiral galaxy NGC 5297, the smaller companion galaxy NGC 5296 and a blue compact object that turned out, on spectroscopic examination, to be a quasar. He likes this example particularly well because, even though the quasar's redshift is much higher than those of the galaxies, long-exposure plates show a luminous extension from NGC 5296 toward the quasar.

Another extreme ultraviolet dwarf

The science of extreme ultraviolet astronomy, observing celestial radiations in the spectral range where ultraviolet light shades over toward X-rays, began with equipment on the Apollo-Soyuz mission, which discovered the source HZ 43. Now the group of observers involved, Bruce Margon, Michael Lampton, Stuart Bowyer, Robert Stern and Francesco Parese of the University of California at Berkeley report in the Dec. 1 ASTROPHYSICAL JOURNAL LETTERS that the Apollo-Soyuz data yield evidence of a second source.

This source appears to be a white dwarf star in the constellation Cetus called Feige 24. Feige 24 is a member of a binary system; its companion is a star of the spectral class dMe.

According to a straightforward interpretation of the EUV, spectrum Feige 24 is extremely hot, with a temperature in excess of 90,000° K. A study of optical observations of Feige 24 and comparison with theoretical models of white-dwarf atmospheres by Albert V. Holm of the University of Wisconsin at Madison (published in the same journal) yields a temperature estimate between 55,000° and 90,000° K and supports the identification of Feige 24 as the EUV source.

The EUV estimates of the temperatures of both HZ 43 and Feige 24 are at or above the upper limits of estimates of white dwarf temperatures from theory and other observations. Detailed corrections to the models used in interpretation may lower the temperature estimates somewhat but it seems that there are now two known examples of unusually hot white dwarfs. This is a start on the answer to the question raised by HZ 43: Is there an entire class of such ultrahot white dwarfs?

Leap year ends with leap second

The International Time Bureau decided that another leap second was required last year. It started at precisely 23:59:60 Universal Coordinated Time on Dec. 31, and was the last second of 1976. It ended with 00:00:00 on Jan. 1, the beginning of the first second of 1977.