Behavior

Drinking to forget

Among the many myths surrounding alcohol use is that the brokenhearted drink to forget their misery, but according to a government scientist, that strategy doesn't work. While drinkers are likely to forget the drinking experience itself, alcohol fails to dislodge memories that were stored prior to drinking. Psychologist Elizabeth Parker of the National Institute on Alcohol Abuse and Alcoholism conducted a series of experiments with college students, testing their memories while sober and after increasing doses of alcohol, and she found that the amount of alcohol in the bloodstream is an excellent predictor of memory loss. Even two or three drinks caused memory loss, and the more the subjects drank, the less they remembered. But what they failed to remember were new experiences; even though the alcohol did not diminish comprehension and they thought they were taking in new information, the students failed to form new memories while under the influence of alcohol. But memory retrieval was not affected; the old memories remained intact and accessible—during and after drinking.

Another myth about alcohol use, according to Parker, is that the sober mental performance of social drinkers is unimpaired. She studied more than 100 middle class men, questioning them about their drinking habits and testing their sober intellectual performance on a variety of tests. What she found was that frequent drinking does not seem to interfere with mental efficiency —as long as only small amounts of alcohol are taken at a time. But subjects who drank occasionally but heavily did show deficits in their ability to work with abstraction. The absolute amount of alcohol that one drinks may in the long run be less important than the amount one drinks on a given evening, Parker concludes.

Coping with dreams

One of the most reliable biological indicators of serious depression is disturbed sleep. Specifically, depressives tend to move very quickly into dream sleep, and the quality of that sleep is more intense (as measured by eye movement) than is normal dreaming. Sleep researchers do not know, however, just what psychological function — if any — these sleep abnormalities serve. One possibility, according to psychologist Rosalind D. Cartwright of the Rush-Presbyterian-St. Luke's Medical Center in Chicago, is that dream sleep provides a time for integrating emotionally significant events with existing memories; if the events are too powerful to be accommodated during normal periods of dream sleep, the brain compensates. Just as the hard-of-hearing adapt by leaning forward in conversation, Cartwright suggests in the February Archives of General Psychiatry, the emotionally vulnerable might rely more heavily on dreaming to deal with difficult information.

In order to test this hypothesis, Cartwright monitored the sleep of 30 women who were going through divorce or separation. The subjects were also tested for signs of depression and for a single personality trait: women who thought of themselves primarily as wife were called traditional; those who had varied roles, liberated. Cartwright predicted that the more traditional women would have more trouble dealing with the emotions surrounding marital breakup, and indeed she found that these women were more depressed and that their dream sleep was more abnormal — regardless of who instigated the divorce. When Cartwright re-tested a sample of subjects one and two years later, she found that, while an improvement in mood was generally accompanied by a return to normal sleep, that was not the case for the most severely depressed. Even as these women seemed to improve outwardly, their sleep remained disturbed, suggesting either that they were not as well as they were acting, or that they had a personality trait that made them more vulnerable to future depression.

Physical Sciences

Organic superconductors: A new family

Superconductivity is the complete loss of electrical resistance exhibited by certain materials when they are chilled to temperatures very near absolute zero. For about 70 years the phenomenon had been observed only in metals. In 1980 superconductivity in organic materials, compounds of tetra methyltetraselenafulvalene (TMTSeF), was reported for the first time. Now, in the Jan. 24 Physical Review Letters, a second family of organic superconductors is reported, compounds of *bis*(ethylenedithiolo)tetrathiafulvalene (BEDT-TTF).

S. S. P. Parkin and six others of the IBM Research Laboratory in San Jose, Calif., report that they found superconductivity in the rhenium oxide salt $(BEDT\text{-}TTF)_4(ReO_4)_2$ at temperatures around 2 kelvins and pressures above 4,000 times atmospheric pressure. The requirement of high pressure to produce superconductivity is characteristic of organic superconductors.

One advantage of the new family, Parkin and co-workers point out, is that, unlike the TMTSeF family, the BEDT-TTF family exhibits a variety of structural phases. Studying these, researchers might find a correlation between superconductivity and a particular structural type. That might help explain why organics become superconducting.

Four-way-stretch universe denied

The cosmic background radiation, the flux of radio waves that represents a blackbody at a temperature of 3 kelvins and pervades the universe, is regarded as a relict of the big bang that can tell us much about the history and present state of the universe. One question put to it is whether the universe is isotropic, the same in all directions. There have been suggestions of a basic anisotropy, but a report at the recent meeting in New York of the American Physical Society now denies them.

The existence of a *dipole* anisotropy seems well established. This can be interpreted as due to a motion of our galaxy toward the constellation Virgo superimposed on the expansion of the universe.

There have also been two reports of a *quadrupole* anisotropy (SN: 1/26/80, p. 54; 4/18/81, p. 254). Quadrupole means warmer in both directions along a given line and cooler in directions at right angles to that line. Such a phenomenon cannot be attributed to motion on our part. It must have to do with the structure of the universe.

However, observations made from balloons flown in both the northern and southern hemispheres by Philip M. Lubin of Princeton University and the Lawrence Berkeley Laboratory and Gerald L. Epstein and George F. Smoot of LBL have failed to find evidence of the quadrupole anisotropy. The two previous observations were made at frequencies where interference from the disk of our galaxy complicates the data, while this measurement was done in a band that is free from such interference. Lubin, Epstein and Smoot suggest that the other groups were seeing interference from the galaxy.

Lifetime of the tau particle

The class of elementary particles called leptons includes only six members: the electron, the muon, the tau and a kind of neutrino associated with each of the first three. According to theory it is important that the electron, the muon and the tau form a sequence in which the electron is the basic member and the other two are more and more massive versions of it. John Yelton of the Stanford Linear Accelerator Center, reporting for the group of physicists involved in the experiment Mark II, told the New York meeting of the American Physical Society that Mark II's best measurement of the tau lifetime is about 3.31×10^{-13} seconds, right on the theoretical prediction based on the assumption of such a sequence.