BEHAVIOR

Boston: From beans to booze

Most Bostonians have long felt it unfair that their town be identified primarily with baked beans. Well, now it seems they will have something more than the bean to kick around. A recent survey shows that the Boston area has about twice as many heavy drinkers and half as many abstainers as the rest of the United States, according to a report in the July JOURNAL OF STUDIES ON ALCOHOL.

Boston's apparently higher alcohol consumption "generally [is] thought to be a function of urbanization, location, and the educational, economic and ethnic characteristics of the population," say researchers Henry Wechsler and Nell Gottlieb of the Medical Foundation, Inc., in Boston and Harold W. Demone, dean of the graduate school of social work at Rutgers University, which publishes the journal.

The study also reports that three times as many men as women are heavy drinkers. This puzzled the researchers, since other recent studies indicate a considerable increase in drinking among U.S. women.

Little difference was documented between blacks and whites, but "drinking was found to be significantly related to social class." Women of lower social class are more than twice as likely as upper class women to be nondrinkers. The differences, though less distinct, are still apparent among men, with more than twice as many lower class men abstaining from booze, compared to their upper class counterparts.

In the same JOURNAL issue, Canadian researchers report that nearly a quarter of all alcohol-related crimes in Hamilton, Ontario in the last two years have involved marital assaults. Lowell Gerson of McMaster University in Ontario says that in 43 percent of all marital assault cases, both the offender and victim had been drinking. Gerson and his colleagues report that the victim alone had been drinking in only 13 percent of such assault cases, while the offender alone had been drinking more than 40 percent of the time.

High anxiety and alpha waves

One of the enigmas of the alpha wave has been its apparent lack of effect in decreasing anxiety. For years alpha has been recognized as a brain wave that, if maintained at a high enough level, facilitates relaxation. So researchers reasoned that boosting alpha through biofeedback would reduce a person's anxiety level. But four years ago, Pennsylvania scientists Martin T. Orne and David A. Paskewitz reported that in a study of 25 college students they could find no such alpha-anxiety link (SN: 11/9/74, p. 294).

Now, however, James V. Hardt and Joe Kamiya of the Langley Porter Neuropsychiatric Institute in San Francisco challenge those 1974 findings. In the July 7 SCIENCE, Hardt and Kamiya report that "alpha changes were tightly linked to anxiety changes, but only in high anxiety subjects (for whom anxiety was reduced in proportion to alpha increases, and was increased in proportion to alpha suppression)."

The Langley Porter team criticized the "methodological problems and unproved assumptions" of Orne and Paskewitz — who they said "did not select high anxiety subjects; in fact they probably eliminated them by excluding subjects with low alpha levels . . . ."

Hardt and Kamiya said that although their "low anxiety" subjects were superior to anxious persons in their ability to enhance and suppress alpha, "their [the low anxiety group] alpha changes were not related to anxiety changes . . . . Our results suggest the possibility that alpha feedback can be used therapeutically, but to obtain therapeutic effects more extended training should be given than that reported in most studies."

BOTANY

The coming botano-chemical boom

Thirty-four species of plants, including wild plants, weeds and exotic ornamentals, rate high in potential for hydrocarbon crops, according to an analysis of almost 300 species by Department of Agriculture scientists at the Northern Regional Research Center in Peoria, Ill. The plants with the greatest promise are pale Indian plantain, guayule (SN: 4/9/77, p. 232), desert milkweed, rabbitbrush and Edison's goldenrod. The ranking considers crop adaptability and yield, whole-plant oil and other hydrocarbon content, protein content and fiber utility. Chemist Russell A. Buchanan predicts that hydrocarbon crops as productive as the rubber tree can be developed from native wild plants. He says that increasing prices and decreasing availability of petroleum may force the United States to rely heavily on plant hydrocarbons for fuel and chemical raw materials.

Plants store their hydrocarbons in fibrous ducts or fiber-walled cells, so separating the hydrocarbons from the plant fibers has been a modern problem akin to sifting the grain from the chaff. Now Buchanan announces he has patented a hydrocarbon-fiber separation process that is practical on an industrial scale. In a pilot plant he has already extracted rubber from goldenrod and pale Indian plantain, and he expects the process to work on other plants containing sufficient amounts of hydrocarbons. Buchanan calls his procedure the mechanical cud process. A machine squeezes and shears plant leaves, stems and roots into a pliable cud of fibers bound by gummy hydrocarbons. Next commercial solvents are used to dissolve the hydrocarbons, which can then be separated from the fibers.

Only some lichens like it hot

Lichens, those primitive partnerships of fungi and algae, have a reputation for being extremely resistant to heat. In an air-dried state, some species can still respire at half the normal rate at temperatures up to 101°C. Hydrated lichen, however, show the same thermal sensitivity as other plant tissue.

The impressive thermal resistance of dried lichens is limited to certain strains, say J. D. MacFarlane and K. A. Kershaw of McMaster University in Hamilton, Ontario. In the Aug. 25 SCIENCE they report that one strain of *Peltigera canina* in the air-dried state shows little change in respiration, photosynthesis or nitrogen fixation at temperatures up to 45°C. However, for another strain of *P. canina,* those activities decay sharply at high temperature. "These differential levels of thermal resistance correlate exactly with the ecology of these populations," MacFarlane and Kershaw say. The heat-sensitive lichen was collected from woodland where the temperature is generally less than 30°C. In contrast, the heat-resistant strain came from an open roadside where lichen tissue temperatures of more than 60°C can be measured.

Foxy paper: A fungal infection

Old books and prints are frequently marred by irregular yellow-brown patches called "foxing." Both fungal infection and chemical reactions have been suspected as the cause. G. G. Meynell and R. J. Newsam report in the Aug. 3 NATURE that microscopy implicates fungal growth in an unfavorable environment. The University of Kent biologists examined foxed paper from 11 books published between 1842 and 1919. They used scanning and transmission electron microscopy and fluorescence microscopy with a stain adapted from dermatology. Only in the foxed areas did Meynell and Newsam observe fungal hyphae weaving around the individual fibers. They suggest that when paper becomes damp, fungal spores germinate and mycelial development begins, but progresses slowly.