BIOMEDICINE

Prenatal alcohol and drug tolerance

Heavy, perhaps even moderate, consumption of alcohol during pregnancy can endanger unborn children with problems ranging from low birth weight to mental retardation (SN: 12/13/80, p. 373). Now there is evidence, at least from animal studies, that heavy prenatal exposure to alcohol can also produce long-term tolerance to alcohol and sometimes even tolerance to some drugs.

Ernest L. Abel, Renee Bush and Barbara A. Dintcheff of the Research Institute on Alcoholism in Buffalo gave 15 pregnant rats 3 grams of alcohol per kilogram of body weight (comparable to five to six drinks in human terms) twice daily throughout gestation. Ten control rats got sucrose solutions throughout pregnancy. Pups to which the pregnant rats had given birth were then given, from the age of six to 10 months, not only alcohol but a variety of drugs and were assessed for their tolerance to these compounds.

As Abel and his colleagues report in the June 26 SCIENCE, both male and female pups exposed prenatally to alcohol showed significantly more tolerance to alcohol than did the pups not so exposed. What's more, the female pups exposed prenatally to alcohol also showed significantly more tolerance to the drugs pentobarbital and diazepam than female pups not exposed to alcohol but did not show such a reaction to chlorpromazine, morphine and d-amphetamine.

GI endoscopy: When it's useful

Does upper gastrointestinal endoscopy—looking at the upper GI tract with an instrument called a flexible fiberoptic endoscope — really help in the diagnosis and treatment of upper GI disorders such as stomach ulcers, upper GI cancer, gastritis and duodenitis? The question is not a trivial one. Half a million such procedures are performed in the United States each year for total annual physician charges of about $122 million.

The answer, according to a study recently released by the Congressional Office of Technology Assessment, is that upper GI endoscopy does aid in the diagnosis of such diseases, but that it adds little to their treatment or to recovery, primarily because of the lack of effective treatments for such disorders.

Prostacyclin and migraines

Abnormal blood flow, nerve receptors and enkephalins (natural pain-relieving chemicals in the brain) appear to be involved in causing migraine headaches (SN: 10/11/80, p. 237). Now a fourth cause has been indicted — hormone-like substances called prostaglandins.

One kind of prostaglandin — prostacyclin — appears to be made in blood vessel walls and to dilate blood vessels, and R. C. Peatfield, M. J. Gawel and F. Clifford Rose of the Princess Margaret Migraine Clinic in London tested whether prostacyclin might be involved in the causation of migraines. They infused prostacyclin into eight migraine patients as well as into another eight patients suffering from cluster headaches and into three persons suffering from neither migraines nor cluster headaches.

As they reported in Washington at the recent annual meeting of the American Association for the Study of Headache, the prostacyclin infusions triggered headaches not only in the migraine patients but in the cluster headache patients and in the persons normally not suffering from migraines or cluster headaches. However, the headaches experienced by the subjects were somewhat different from the typical migraine. So prostacyclin is probably not a single cause of migraine, the researchers conclude, but it may very well act in concert with other factors in bringing on a migraine.

EARTH SCIENCES

Better geobarometers

Did the Himalayan mountains arise from a smooth overlapping of continents or from an accordian-like crash? Using what they call "the first accurate geobarometers," University of Chicago geochemists have gathered data that support the first theory, that parts of several continents were once buried under an entire thickness — 15 or more miles — of the earth's crust.

Geobarometers, thermodynamic formulas that relate the composition of rock minerals to the pressure at which the rock crystallized, have been used in the past to help classify the origins of rock formations, but formulas developed by Robert Newton and Ole J. Kleppa allow geochemists to more finely tune their approximations of how and under what conditions the rocks were created. "The previous geobarometers were too crude to put any relatively narrow pressure limits on these rocks," explains Newton.

By studying the thermodynamic properties of minerals found in ancient rocks called granulites, Newton and Perkins report that rocks from the oldest areas of Europe, Asia, North America and Australia were once subjected to pressures of about 120,000 pounds per square inch — 8,000 times the pressure of earth's atmosphere. Such pressures correspond to those found at the base of today's earth crust and suggest that today's surface granulites were once 20 miles deeper. Continental overlapping or "crustal doubling" best explains the phenomenon, Newton says. The buoyancy of the earth's crust compared with that of the underlying mantle allows the double crust to stand high, making it more susceptible to erosion. As the edge of the continent that formed the top layer erodes away, the ancient bottom layer is left exposed.

As the researchers continue to measure the thermodynamic properties of a wider spectrum of minerals, they hope to develop geobarometers that can be used in regions where granulites are not found.

'Significant' U. S. quakes double in 1980

Twice as many significant earthquakes rocked the United States in 1980 as in 1979, in keeping with a worldwide trend in increased temblors. Despite a sharp rise in the number of quake-related deaths internationally, however, no one has died in a U. S. earthquake since 1975, according to the U. S. Geological Survey.

"Significant earthquakes" register at least 6.5 on the Richter scale, or cause casualties or considerable damage, according to Survey definition. The strongest such quake in the United States last year reached a magnitude of 7.4 on Nov. 8 off the coast of northern California. It injured five persons.

A quake hotline to beat the shakes

Lest citizens of New York lie awake at night wondering what to do if a major earthquake strikes, the folks who should know suggest dialing (415) 858-0323.

Nestled against California's San Andreas fault — a crack in the earth whose twitch crumbled San Francisco in 1906 — Stanford University students staff a 24-hour earthquake hotline.

For $4.50, callers can order a "basic earthquake preparedness packet," which includes a booklet on protecting life and property from earthquake damage, and advice to parents and preparedness games for children. Red Cross information on first aid, and material on water storage and formation of neighborhood cooperatives for quake safety are also included. Staffers also research individual questions on quake preparedness.

Long distance inquiries can be addressed to Earthquake Preparedness, P. O. Box 5847, Stanford, Calif. 94305.