

behavioral sciences

Questions about early Americans

When did humans first appear in the Americas? Artifacts suggest a date of at least 25,000 to 32,000 years ago (SN: 1/27/73, p. 55). Now, from Ecuador, comes more substantial evidence. D. M. Davies of University College in London reports that a human skull, vertebrae and some long bones found in the highland terrain west of the Andes are 28,000 years old. Two testing methods, thermoluminescence and carbon-14, have given the same dates for the fossilized bones. The features of the skull—its receding forehead, brain capacity and teeth—"suggest a part neanderthal part *Homo sapiens* origin," says Davies.

How did humans first appear in the Americas? They came across the land bridge that is now the Bering Strait, is the general theory. They came by sea from North Africa, suggests Thor Heyerdahl. A similar theory is that they came from New Guinea, borne on the Pacific currents. Or, asks Davies, was South America a cradle for an early form of *Homo sapiens*, just as Africa and Asia appear to have been?

Toys in the nature-nurture controversy

Theories of the role of environmental stimulation on mental development have suggested that parents should surround infants with a variety of colorful, mobile, noisy toys. "Parents who are purchasing these materials are almost sure to be wasting their money," says David Elkind of the University of Rochester in New York. "This is not to say, of course, that infants should be deprived of mobiles or rattles or other toys to which they are attracted, and which they enjoy. What is important to remember is that the presence of such toys will not make the infant a genius anymore than their absence will make him an imbecile."

In the August AMERICAN JOURNAL OF DISEASES OF CHILDREN, Elkind says that the question of how much heredity contributes to intelligence is unanswerable. But, he explains, "Bright children are likely to stay bright unless, for whatever reason, they engage in activities destructive to mental prowess. Contrariwise, a youngster with average ability can, by dint of hard work, accomplish a good deal. He will never be a genius . . . but he will make the most of what he has." Toys for infants, says Elkind, should be chosen on the basis of their safety and their immediate entertainment value, rather than in terms of their long-range educational benefit.

Another bad trip

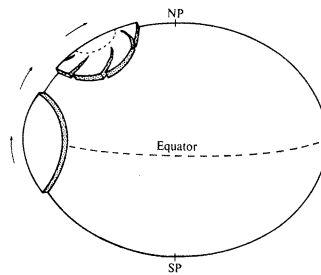
MDA (3,4-methylenedioxyamphetamine) is a mild hallucinogen that has been classified by the Department of Health, Education and Welfare as a Schedule 1 drug. This implies that the drug has a high abuse potential, is without currently accepted medical use in treatment in the United States and lacks accepted safety for use under medical supervision. This classification has managed to dry up street supplies of MDA and force some dealers to substitute other drugs. One drug that has been sold as a substitute is PMA (paramethoxyamphetamine), a substance that has five times the hallucinogenic potency of mescaline.

Since March of this year, according to the Bureau of Narcotics and Dangerous Drugs, PMA has been associated with 10 deaths, one case of temporary blindness and numerous acute overdoses throughout the United States and Canada. Accordingly, the bureau has recommended to HEW that PMA also be banned as illegal under Schedule 1. HEW has concurred and action is being taken.

earth sciences

Mid-plate tectonics

Plate tectonics is perhaps the most unifying theory in geology today, accounting for all sorts of ridges, trenches, fracture zones and other features and processes at the junctions of the plates. Features within the plate boundaries, however, removed from the edges, are less understood. Some geologists believe that mantle plumes, boiling up from below the earth's crust to create "hot spots" near the surface, are one possible cause of events within plates. Other geologists disagree.



Donald L. Turcotte of Cornell University and E. Ronald Oxburgh of the University of Oxford, England, suggest two other mechanisms in the Aug. 10 NATURE.

The crustal plates are basically slightly cupped disks sliding about on a sphere. But the earth is not a perfect sphere—it is oblate, flattened at the poles and bulging at the equator because of its spin. Thus when a plate formed near the equator moves poleward, the resulting flattening—like pushing half an orange peel down on a table—causes stresses that move in toward the center of the disk.

A double source of stress, the geologists believe, is that as the plate material moves away from, say, an ocean ridge toward the center of the plate, it both piles up, or thickens, and gets squeezed inward from the ends. The thickening produces stress from the increasing temperature difference between the top and bottom of the plate. The narrowing is resisted by the wider outer material in the plate trying to keep the inner material stretched to its original width, which produces tension.

Blanketing hurricanes

A chemical blanket spread on the ocean may be a future tool for inhibiting hurricanes by keeping the storms from borrowing the energy contained in evaporating seawater.

Hurricanes are driven by heat energy carried in water vapor that has evaporated upward from the tropical ocean. The blanket, a biodegradable, partially polymerized film a few molecules thick, would provide a physical barrier to evaporation, but perhaps more important, it would minimize evaporation by suppressing small waves and ripples.

"Some investigators," says William D. Mallinger of the National Oceanic and Atmospheric Administration's Office of Weather Modification, "have considered this type of wave suppression as perhaps the major mechanism in evaporation reduction by monolayers (chemical films), in contrast to the evaporation barrier effect of the chemical structure as the major retarding mechanism.

In limited tests in the Gulf Stream about 15 miles east of Miami, the film produced "very striking" wave suppression, with a stable, clearly visible boundary. The energy of waves with frequencies higher than .29 hertz, for example, was only about 54 percent of that of similar waves outside the blanket.

The most effective of the chemical films tested consisted of linoleic acid, polyvinyl alcohol and derivatives of polyvinyl acetate, which could be dispensed to cover an acre of ocean in 20 minutes. One aim of future studies is to make the film long-lasting enough to stay together throughout a hurricane.