earth sciences

Australia under ice

During the late Paleozoic (230 million to 300 million years ago), a large part of Australia was covered by glaciers. John C. Crowell of the University of California at Santa Barbara and Lawrence A. Frakes of Florida State University have examined the record of this glaciation and interpreted it in terms of ancient climate and the configuration and geography of Gondwanaland.

Glaciers dotted the eastern mountains about 300 million years ago, and later on continental ice sheets covered much of the southern half of the continent, they write in the September GEOLOGICAL SOCIETY OF AMERICA BULLETIN. A depression that probably connected the ancient Pacific and Tethys Oceans curved across the continent along the glacial margin.

The spread northward of the continental ice sheets corresponds with a rapid shift in latitude previously inferred from magnetic data. Continental glaciers apparently grew when Gondwanaland moved near the South Pole and the nearby early Pacific provided abundant moisture.

Old Faithful strain gauge

Old Faithful geyser isn't entirely faithful; the interval between its eruptions varies slightly, and this variation, according to John S. Rinehart of the National Oceanic and Atmospheric Administration, reflects variations in tectonic stress in the earth around the geyser's underground plumbing.

The NOAA physicist has found a correlation between earthquake activity and the eruption patterns for three well-known geysers—Old Faithful and Riverside in Yellowstone National Park and Old Faithful of California at Calistoga, Calif. Rinehart found that two to four years before every major earthquake within 60 miles of Old Faithful the interval between eruptions began to decrease, reaching a minimum near the time of the quake and rising again afterward.

In 1956, for example, the geyser's period began decreasing rapidly until August 1959, the time of the 7.1-magnitude Hebgen Lake earthquake centered 28 miles away.

Barbados: A giant landslide

The island of Barbados has a complex geology and an anomalous location—on top of the Barbados Ridge—that have long confused geologists. S. N. Daviess of the Gulf Mineral Resources Co. suggests that the island and ridge are the results of a gigantic submarine sediment slide.

Daviess proposes in the September GEOLOGICAL SOCIETY OF AMERICA BULLETIN that during the Eocene (36 million to 58 million years ago) the westward-drifting Atlantic plate began to underthrust the Caribbean plate, causing the sediments that had been deposited on the eastern margin of the Caribbean plate to slide eastward. The entire mass then submerged until periodic uplift again raised it in the Pleistocene, about a million years ago.

Other such slides are known to exist, says Daviess, but this one, measuring about 250 kilometers in width and having a thickness of more than 4.5 kilometers, is one of the largest.

behavioral sciences

The nation of the retired

Estimates say there will be about 25 million United States citizens over 65 by the year 2000. The Pepsi generation will have to move over and make room for the nation of the retired as lower birth rates, longer life expectancy and early retirement combine to produce an ever-growing population of elder citizens.

This situation justifies a national commitment to meeting the needs, solving the problems and improving the quality of life for our older citizens, says psychologist James E. Birren, director of the University of Southern California Gerontology Center in Los Angeles. "Training needs in this field are substantial," he said. "They range from educating research scientists to studying highly specialized neuro-physiological processes of aging to training community workers who provide recreational services to the elderly." Birren's paper will be considered in December by delegates to the White House Conference on Aging.

Behavior therapy for epileptics

Scientists have known for years that certain environmental stimuli such as bells or flashing lights could bring on seizures of Grand Mal epilepsy. Now researchers claim that environmental stimuli can control epilepsy.

Last month at the annual meeting of the Association for the Advancement of Behavior Therapy Roger Richardson and Harbans Lal of the University of Rhode Island and Yani Karkalas of the Rhode Island Medical Center reported success in behaviorally controlling epilepsy. One patient was told she would be transferred to an attractive ward and given special privileges as soon as she recovered. Her seizure symptoms dropped from 10 to 20 per week to zero and follow-up studies revealed only one seizure-related symptom in a five-month period. Another patient's symptoms dropped from 12 to 2 per week after she was told she could see a male friend on the hospital grounds if she did not have seizures.

"We are not claiming a cure for Grand Mal epilepsy," says Richardson, "but we have demonstrated that even severe epileptic symptoms may be controlled by manipulation of the patient's environment."

Methadone withdrawal

Methadone maintenance for heroin addicts is on the increase but the unfamiliarity of many physicians with its effects has led to concern that severe physical problems will result if the user stops treatment abruptly. Therefore most methadone centers advocate prolonged withdrawal. But this is not necessary, say Marvin H. Lipkowitz, Daniel W. Schwartz and Robert J. Lazarus of the State Uniiversity of New York Downstate Medical Center.

In the Sept. 27 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION they report on four cases in which methadone users were forced into sudden withdrawal. In all cases treatment stopped when the men were arrested. The rapid detoxification produced severe symptoms of generalized pain and insomnia that required little more than bedtime sedation. "The findings in these cases do not support the common belief that sudden methadone withdrawal is invariably dangerous," the researchers conclude.