

Ice islands in the Andes

Laguna Colorada, high in the central Andes of southwestern Bolivia, is inaccessible to most visitors, and the mineral-encrusted islands in its middle are even more so. The main visitors are Quechua Indians who, undaunted by the deep mud underlying the lake's shallow, salty waters, come to the islands to harvest flamingo eggs. Until recently, no one noticed that the islands are made of ice. The massive ice features made of fresh water are up to 1.5 kilometers long, and protrude as much as seven meters above the water surface.

Steve Hurlbert of San Diego State University in California and Cecily C.Y. Chang of the United States Geological Survey in Menlo Park, Calif., discovered that the islands were made of ice. They suggest that the islands formed when fresh water in the pores of the lake sediments froze, developing a lense of ice below the surface of the sediments. In much the way that ice heaves up river banks and concrete pavements during harsh winters, Hurlbert says the islands gradually rose out of the water. The researchers describe their findings in the April 20 *SCIENCE*. They report that they also found 10 freshwater ice islands in several dozen other saltwater lakes they explored in the isolated drainage basins in the high, broad area that separates the eastern and western ranges of the mountains.

Such islands have never been observed before, Hurlbert says, adding that their watery makeup is not apparent, mostly because they are covered with an aragonite or calcite crust, 10 to 40 centimeters thick. But at some places, the margins are melting rapidly, displaying clearly the ice and the islands' structures. All of the islands are less than 6,000 years old, and some have formed within the last few years, the authors report. However, all of them are in jeopardy because rapid melting indicates that geothermal heat is radiating through the lake floors. They write, "The most spectacular ones, such as those at Laguna Colorada, will probably not persist for more than a decade or two."

December 1983: The coldest month

Now that winter's chill has ended for most of the United States, statisticians for the National Climatic Data Center in Asheville, N.C., report that December 1983 really was as bone-crunchingly cold as it seemed. Until that month, January held the monopoly on the "coldest month" designation — all 10 of the coldest months for the lower 48 states since 1895 were Januaries. The monthly national average temperature for December was 26.2°F, placing December 1983 seventh among the 10 coldest months on record.

Great Salt Lake highest in 105 years

Surface elevation of the Great Salt Lake is at its highest level since 1879, the United States Geological Survey reports. The water level in mid-April was 4,207.75 feet above sea level (SN: 3/17/84, p. 172), compared to the May 1, 1879 level of 4,208.10 feet. The lake still is 2.8 feet below the all-time recorded high that occurred in June 1876. Between March 15 and April 16, 1984, the lake rose .85 feet, matching the record increase that took place from Dec. 1, 1983 to Jan. 1, 1984.

Exotic animals in Gulf of Mexico

The scientists aboard the research submarine *Alvin* were not looking for exotic marine life on the floor of the Gulf of Mexico, so the recent discovery of giant clams and other animals familiar from the Pacific was all the more exciting. It is not yet clear whether the Gulf communities, like their Pacific counterparts, also rely on hydrogen sulfide as a basic food and energy source. However, the water around the Gulf communities is much cooler than that near the Pacific hydrothermal vents.

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Compensation for low level radiation

The Colorado Industrial Commission in Denver has awarded the widow of a Rocky Flats Nuclear Weapons Plant employee \$40,000 in a workers' compensation case. The commission ruled that Leroy Krumback's colon cancer resulted from his chronic low level exposure to radiation. Federal occupational limits allow external radiation exposures of up to 5 rems per year, and Krumback's 15-year cumulative total was estimated to have been 45 rems. The case, which had included an appeal to the state supreme court over the expert witnesses used, is believed to involve the lowest radiation exposure for which workers' compensation has been awarded.

The commission's finding that radiation caused Krumback's cancer was based primarily on the testimony of British radiation epidemiologist Alice Stewart. (She was not one of the expert witnesses disputed in the appeal.) Stewart testified that based on data developed from one of her analyses of mortality among workers at a nuclear weapons plant in Hanford, Wash. — an analysis (SN: 1/20/79, p. 44) she had performed along with British colleague George Kneale and University of Pittsburgh epidemiologist Thomas Mancuso — older workers are more susceptible to radiation injury. A rule of thumb developed from this still-controversial "cracked-plate theory" holds that for every 8 years after the age of 40, radiation potency increases by a factor of 2.7. Since much of Krumback's measured exposure occurred in his later years, Stewart testified that his "effective dose" was probably closer to 220 rems, not the recorded 45.

Observations on precollege education

A new study examining the likelihood that federal programs to aid science and math education will bring about needed reforms makes some provocative assessments. For instance, there is no evidence "that training programs to upgrade existing [certified] mathematics and science teachers will produce results in terms of improved student achievement," the General Accounting Office study finds. To shore up this observation, it notes that "general research in the 1970s failed to show any consistent relationship between the extent of teachers' knowledge and subsequent student learning."

A more valuable approach to upgrading educational achievement, the study suggests, would be to fill teaching vacancies in science and math by retraining teachers from other fields. The report notes that surveys have shown a drop between 1971 and 1981 of 64 percent for math-education graduates and 33 percent for science-education graduates. More serious, "about half of recent bachelor degree graduates who are teaching science and mathematics are not certified or eligible for certification in the field they are currently teaching," it says. Finally, the study notes that data do not exist to quantify nationally — or more importantly, by state — what the shortfall of certified teachers in these fields is, nor whether those who have been certified are now out-of-date in their subject areas.

News briefs

- A U.S. District Court judge in New York has ruled that scientific researchers are entitled to the same "limited federal common-law privilege" to withhold research notes from grand juries that journalists enjoy. The case involved sociology graduate student Mario Brajuha, whose journal on a restaurant where he had worked — and part of a doctoral project — was subpoenaed by a grand jury investigating suspected arson at the restaurant.
- Less than 6 percent of all new jobs created by 1995 will be in high technology fields, according to a study by Stanford University's Russell Rumberger and Henry Levin. In fact, the demand for janitors (779,000) will be 14 times that for computer-service technicians, they have estimated.

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