environmental sciences

Recreational access to private land decreases

Private landowners are becoming less willing to share their land with hunters and other recreational users, according to a study by the New York Cooperative Wildlife Research Unit of Cornell University. The survey shows that 42 percent of private lands in New York are now posted—an increase of two-thirds in the last 10 years. Landowners surveyed cited increasing "bad experiences" with recreational users as their reason for prohibiting trespassing. Of these, 56 percent said the bad experience was with hunters, 26 percent with snowmobilers, 7 percent with fishermen and 11 percent with others. The owners also cited property damage and fear of personal danger, with hunters again most often blamed. The study concludes that recreationists should try to establish better relationships with owners by always contacting them before entering their property and by leaving the land undisturbed.

A spray deodorant for industry?

One of the most irritating forms of pollution is stench. Anyone who has lived downwind from a stockyard or a chemical factory knows the problem all too well, but on a hot summer day, even clean neighborhoods can develop an impressive stink from rotting garbage and animal droppings. Malodor is also the least understood pollution. Unlike human response to light or sound, olfaction cannot be electronically measured. An odor may be repugnant when concentrated but quite pleasant when dilute; indole, for example, has a highly repulsive fecal odor alone, but diluted it gives chocolate candies their "kick." Individual response is subjective—one man's fragrance may be another man's fetor.

Particularly puzzling is the way smells mix. A combination of odors may not only be more pleasant than either one alone, but also less intense. Engineers are now trying to use this mysterious property to make industrial smells less objectionable, as described by Oscar B. Lauren in POLLUTION ENGINEERING. After trying various combinations of smells on a panel of sniffers, an industry mixes a "modifier gas" with its effluents to reduce their noxiousness. Such modification has its proper place in odor abatement, Lauren says, but he warns against possible misuse by disguising potentially harmful toxic vapors.

Saving Taro-sugi

Nowhere is environmentalism more intermingled with a deep appreciation of beauty and a mystical reverence for nature than in Japan. Intimations of the spirit of nature permeate Japanese philosophy and art, reaching a climax of elegant simplicity in the scant 17-syllable haiku poems of the seventeenth-century poet Basho. How natural then that the residents of Nikko should affectionately name a favorite tree at nearby Toshogu Shrine Taro-sugi-san—(roughly) Honorable John Cedar. And when the National Highway Authority announced plans to cut down the five-century-old conifer to widen the road to the shrine, nationwide opposition mounted from such diverse sources as Shinto priests, traditional environmentalists, journalists and scholars. More than five years of litigation followed, culminating last month in a stern ruling by the Tokyo High Court that the authority had "made light" of cultural values and that the threatened tree should stand. "You can build a road if you have time and money," explained one priest, "but a part of one's cultural heritage can never be brought back once it is destroyed." Basho would be pleased.

physical sciences

Blackbody and the shape of the universe

Numerous observations have shown that the universe appears to be pervaded by a background flux of electromagnetic waves that represent a blackbody at a temperature of 2.7 degrees K. Most cosmologists take this background as a relic of the original "big bang" that started the universe.

On the whole this radiation is isotropic, the same in all directions, but some theories predict a minute anisotropy. If such an anisotropy is present, it could tell us some things about the shape of our universe. In the June 1 ASTROPHYSICAL JOURNAL LETTERS (just received) R. L. Carpenter of California State University and Samuel Gulkis and T. Sato of the Jet Propulsion Laboratory report on a search for such anisotropy.

The observations were made with the 210-foot antenna at JPL's station in Goldstone, Calif. They show that if there is an anisotropy, the ratio of the variation to the base temperature can be no more than 7.15×10^{-4}. This leads to some cosmological conclusions: We live in a highly closed Friedmann universe. (A Friedmann universe is one that shows contraction or expansion and contains real matter distributed isotropically and homogeneously.) Or the scalar-tensor theory of gravity is correct, and we live in either an open or closed universe depending on when the galaxies were formed. Or the background radiation has been smoothed out since the time when atoms appeared, and we cannot tell which type of universe we have.

Two more negatives on gravity waves

It is four years since Joseph Weber of the University of Maryland announced his belief that he had observed gravitational radiation (SN: 6/21/69, p. 593). In that time a few dozen experimenters have tried to verify the observation. So far none has.

Two more negative results have appeared in recent weeks: one by James L. Levine and Richard L. Garwin of IBM in the July 16 PHYSICAL REVIEW LETTERS; the other by J. A. Tyson of Bell Laboratories in the July 30 PHYSICAL REVIEW LETTERS.

Gravitational radiation is supposed to be detected by vibrations that it causes as it passes through large aluminum cylinders. Weber has been detecting bursts of such vibrations at rates of up to several times a day. Levine and Garwin and Tyson used detectors that they claim are more sensitive than Weber's and found nothing, Tyson in three months of operation, Levine and Garwin in nine days. The conclusions are that either Weber has been observing something other than gravitational radiation, or gravitational radiation he observed in 1969 was not present in 1973.

Anomalous heat capacity of water

According to a report in the July 27 SCIENCE by D. H. Rasmussen and A. P. MacKenzie of the Cryobiology Research Institute in Madison, Wis., and C. A. Angell and J. C. Tucker of Purdue University, water that has been supercooled at constant pressure without freezing shows an anomalous and unexpected rise in heat capacity below minus 20 degrees C. This could be important for models of the structure of water, now a highly controversial topic, since it seems to indicate some cooperation between molecules, and structure models would have to account for that cooperation. It could also have meteorological effects since it bears on both the amount of heat contained in supercooled clouds and the amount of heat they could take from objects passing through them.