

natural sciences

Yes, some grass is greener

For years, an uncounted number of backyard experimenters have competed with government scientists to unravel an age-old mystery: Is marijuana from warmer climates really more potent than that from temperate zones, and if so, why? At least a partial answer has now been provided by Ernest Small of Canada's Department of Agriculture and H. D. Beckstead of the Canadian Department of National Health and Welfare, reporting in the Sept. 21 *NATURE*. The grass, they say, is indeed greener on the other side of the tropics.

With instruments considerably more reliable than the amateur scientist's estimate of his own euphoria, the authors tested strains of *Cannabis* from over 50 countries, grown together in Ottawa. By comparing the plants' relative contents of THC (the psychologically active ingredient) and CBD (an inactive ingredient), they found three genetically distinct types of plant. Plants with relatively high THC content generally came from warm areas south of 30° N. Lat. (approximately the latitude of Houston, Texas). Plants with very little THC but a high CBD content come mostly from cooler regions north of that line. A third type of plant, which the authors speculate may be a human-produced hybrid, contained roughly equal amounts of the two test compounds, but in greatly varying potency.

Booms of the finback whale

For over two decades, ocean researchers have monitored the background chatter of sea life with sometimes surprising results, not the least being a best selling recording of the "songs" of the humpback whale. These songs are characterized by melodic, high-pitched chirping sounds and contrast strongly to mysterious, deep-bass booms often detected by remote, underwater acoustic sensing devices. The origin of these booms has never been firmly identified, but the finback whale seems to be one likely source, and the sound-conducting properties of water suggest the intriguing possibility that whales could use such sounds for long-distance communication.

But cetology (the study of whales) can be a frustrating business when it comes to tracking and closely examining the agile, seabound giants, and no direct observation links the bursts of 20-cycle-a-second sounds (near the lower limit of human hearing) to the finbacks. However, in Sept. 28 *NATURE*, E. G. Barham of the U.S. Naval Undersea Center at San Diego has proposed a possible mechanism by which the sounds could be produced. Just as breath blown across the top of a pop bottle produces a sound whose frequency depends on the volume of air above the soda—the resonance chamber—presumably whales would need a certain minimum volume inside their bodies to produce and receive long-wavelength sounds. Barham calculates that the trachea of whales diving to depths between 36 and 63 meters would have just the necessary volume to resonate at about 20 cycles a second, but cautions that his conclusions may be the result of a provocative coincidence.

Dune buggy go home!

A group of zoologists from the University of California, Berkeley, have warned that dune buggies can irreversibly damage fragile desert ecology. In a strong statement against further expansion of off-road-vehicle recreation on national resource lands, the group suggests that such use at least be restricted to the extensive areas already damaged beyond repair.

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behavioral sciences

What makes great goats?

Leaders are born, not made. Or is it the other way around? For centuries in human societies it has been assumed that leaders are born. Therefore, the heritability of kingdoms. In recent years, however, the environmental paradigm (leaders are made) has gained in popularity and the genetic thesis has been somewhat discounted. One possible way of comparing the results of nature vs. nurture is by observing the development of dominance hierarchies in various animal species.

Peter H. and M. S. Klopfer are particularly fond of goats. Working at Duke University's field station for animal behavior studies, they investigated the importance of maternal behavior as it relates to the later appearance of domineering behavior in young goats. Environmental variables such as speed of birth, vigor, weight and sex of kid, access to mother and frequency of nursing were observed. None were found to be adequate indicators of future dominance or leadership. The Klopfers suggest "a genetic rationale for such a model," and conclude in the September-October *AMERICAN SCIENTIST*: "Who would have guessed that the events transpiring at that time would be, at least taken individually, such poor predictors of future status."

Deficiencies in higher education

The Carnegie Commission on Higher Education, in its next-to-last report, cites a variety of deficiencies and biases in the current system of higher education. "It puts too much pressure on too many young people to attend college whether they want to or not. It offers them too few alternative options. It is thus biased too much toward academic subjects alone." Colleges and universities, the report says, receive heavy public funding but unfairly direct their attention at selected populations. For instance, the system is "biased by class, since the middle class is more likely to go to college; by type of job, since college tends to lead to the professions and to the higher-level white-collar occupations; and by age, since younger persons are the more frequent regular college enrollees."

The report, *Toward a Learning Society—Alternative Channels to Life, Work and Service*, supports learning throughout life and says education should be less concerned with a minority of the young and more concerned with a majority of all ages. It calls for expanded training opportunities for a variety of citizens.

Middle age and intelligence

It has been a common assumption that academic ability declines with increasing age. Walter Cunningham of the University of Southern California in Los Angeles has evidence that this assumption may be false. Intelligent teen-agers, he has found, actually tend to be even brighter in middle age.

Cunningham administered a U.S. Army intellectual capability test to 36 men. All of them had taken the same test in 1944. Comparing the results of both sets of tests, Cunningham found that verbal abilities increased significantly. This, he said, tends to be the best indicator of academic success. Hence, an individual might be a better student in middle age than during high school or college years. "There are interesting implications here in regard to adult education," Cunningham said. "The old adage about not being able to teach old dogs new tricks may be wrong. Middle-aged persons should feel optimistic about continuing their education."

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