they build their nests and middens from materials found within and outside the cave (*1*). Moreover, because the sedimentation rate in these caves often varies (*2*), it is not unusual to find fossils and artifacts of different ages on the surface of the cave floor. In the Grand Canyon, I have found bones of extinct vertebrates that were dated as being more than 20,000 years old on the surface of caves near artifacts that date from 1,000 to 4,000 years ago (*2*).

Sometimes the age of bones found in caves has been mistakenly associated with that of archeological artifacts. For example, condors were once thought to have occurred in Texas during the Holocene because their bones were found in a cave near artifacts dated as being up to 3000 years old (*3*). Subsequent radiocarbon analysis of the condor remains indicated that they were much older (*2*). Archeologists must be cautious about these apparent associations when determining the age of human occupation. The charcoal dated at 29,000 years ago by MacNeish could have been mixed from other levels in the cave, or humans in the Holocene could have burned sticks from ancient packrat middens. Unless MacNeish finds human remains or artifacts that can be dated directly by radiocarbon analysis, his claim of an ancient arrival for humans in North America appears unfounded.

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REFERENCES

1. J. L. Betancourt, T. R. Van Devender, P. S. Martin, Eds., *Packrat Middens* (Univ. of Arizona Press, Tucson, 1990).
2. S. D. Emslie, *Science* **237**, 768 (1987); *Nat. Geogr. Res.* **3**, 511 (1987); *ibid.* **4**, 128 (1988).
3. A. Wetmore and H. Friedmann, *Condor* **35**, 37 (1933).

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Cigarettes and Addiction

Thomas C. Shelling, in his article addressing the addictive aspects of smoking (24 Jan., p. 430), states that cigarettes produce no impairment of any faculty and expresses no personal concern that his airline pilot may smoke.

The absence of impairment may be true with respect to the addictive components, but where there's tobacco smoke, there is invariably carbon monoxide (CO). The National Institute of Occupational Safety and Health (NIOSH) reports that a typical CO concentration in cigarette tobacco smoke of 4% produces a carboxy-hemoglobin (COHb) concentration of 5.9% in the blood of a pack-a-day smoker (*1*). The concentration of COHb in the blood of cigarette smokers will range from 3 to 10%, whereas nonsmokers have an average concentration of less than 1% (*2*, *3*).

The resultant oxygen deficiency in the blood produced by an incremental increase in the COHb concentration of as little as 3% was demonstrated by McFarland *et al.* almost 50 years ago to have an adverse effect on light sensitivity, or the visual threshold (*3*). More recent behavioral studies have suggested that COHb concentrations below 5% may alter the results of time discrimination, visual vigilance, choice response tests, visual evoked responses, and visual discrimination thresholds (*1*). Limitations affecting vision, timing, decision-making, and coordination are attributable to increased blood COHb concentrations (*4*).

Whether the reported behavioral effects from inhaled CO actually impair the flying ability of a airline pilot smoker may be less easily demonstrated, but a claim of no impairment of faculty from cigarette smoking does not seem justified.

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REFERENCES

1. *NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards. Occupational Health Guideline for Carbon Monoxide* [DHHS (NIOSH) Publ. 81-123, National Institute for Occupational Safety and Health, Washington, DC, 1981].
2. *Environmental Tobacco Smoke in the Workplace, Lung Cancer and Other Health Effects* [DHHS (NIOSH) Publ. No. 91-108, Current Intelligence Bull. 54, National Institute for Occupational Safety and Health, Cincinnati, OH, 1991].
3. R. A. McFarland, *Human Factors in Air Transportation* (McGraw-Hill, New York, 1953); R. A. McFarland, F. JW. Roughton, M. H. Halperin, J. I. Niven, *Aviat. Med.* **15**, 381 (1944).
4. *Controlling the Smoking Epidemic, Report of the WHO Expert Committee on Smoking Control* (Technical Report Ser. 636, World Health Organization, Geneva, 1979).

Schelling's statement that cigarettes cause "no loss of visual acuity" contradicts what I learned in my training as a pilot. Smoking, as Schelling acknowledges, introduces carbon monoxide into the blood. Night vision is reduced by the inhalation of carbon monoxide in cigarette smoke (*1*). Carbon monoxide is also thought to reduce peripheral vision. These effects increase with altitude, and airliners are typically pressurized to a "cabin altitude" of about 8000 feet.

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REFERENCES

1. *Federal Aviation Regulations/Airman's Information Manual, AIM* (Aviation Supplies & Academics, Renton, WA, 1991), p. 290.

Schelling's article about addiction and cigarettes presents puzzling contradictions. It seems difficult to reconcile stating that cigarettes are highly addictive while also saying that 50 million people, or "half the men who ever smoked in this country have quit, and nearly half the women," and that they have done so on a voluntary basis, in a climate of ready and legal availability of cigarettes. Evidence shows that many continue to smoke, not because cigarettes are addictive, but because the rewards are immediate and tangible while possible negative consequences are remote, uncertain, and hard to visualize.

With the fitting analogy of cigarettes and chocolate, Schelling also implies that a more precise definition of "addiction" is in order, lest we find ourselves "addicted" to most things we do. To compare nicotine with crack would seem an assault on common sense, especially when many scientists and the U.K. Scientific Committee on Smoking and Health agree that nicotine is probably harmless at the doses experienced by smokers (*1*). And given that nicotine is responsible for most of the desired effects of smoking, Schelling rightly laments the obtuse U.S. policy against exploring new cigarettes that may deliver less smoke and more nicotine.

Smoking may indeed be a legitimate target, but when public health policy ignores reality and common sense, it becomes a brazen political tool. Today this tendency is pervasive. It extends beyond smoking to the cavils of infinitesimal exposures to putative carcinogens, raising troubling questions about the limits of paternalism (*2*) and of puritanical presumption.

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REFERENCES

1. *Fourth Report of the Independent Scientific Committee on Smoking and Health* (Her Majesty's Stationery Office, London, 1988).
2. H. M. Leichter, *Free to be Foolish: Politics and Health Promotion in the United States and Great Britain* (Princeton Univ. Press, Princeton, NJ, 1991).

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Consolidation at Yale

In Richard Stone's News & Comment article "Yale plan draws faculty fire" (24 Jan., p. 398), my comments regarding consolidation were meant to describe the consolidation of resources that will be essential in the

coming decade. First and foremost Yale is committed to excellence in all disciplines including science and engineering. We are grappling with the difficult questions that all institutions are now facing including the issue of whether to emphasize breadth or depth in a time of diminishing resources. Yale's effort to find solutions that would avoid freezing faculty salaries or appointments and across-the-board cuts are currently under intense scrutiny by the faculty, as Stone indicates, and also by the administration and the Yale trustees. No final decisions have yet been made regarding Yale's approach to these compelling problems, and the impact of these decisions on our colleagues and on the quality of our programs at Yale is of central concern.

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Corrections and Clarifications

In the "Women in Science" special section (13 Mar.), Rhonda Hughes, chairperson of mathematics at Bryn Mawr College, was quoted correctly in the article "Profile of a field: Mathematics: Heroism is still the norm" (p. 1382) as saying that graduate school in math constitutes a "minefield" for women. The next sentence said that some of the "land mines concealed under the surface include a lack of encouragement from faculty members, sexual advances of mentors—and a suspicion on the part of male colleagues that women can succeed only by sleeping with male mathematicians." Those specifics came from interviews with a number of female mathematicians, not from Hughes, and the sentence should have said so.

In the "Data points" on page 1376 of the "Women in Science" special section (13 Mar.), the table that ranks institutions of higher education had an incorrect title and caption. The title should have been "Where female Ph.D.'s received their baccalaureate degrees," and the caption should have reflected that fact.

In Ivan Amato's 17 April article "Chemists vie to make a better taxol" (Research News, p. 311), Walter E. Goldstein of the ESCAgenetics Corporation in San Carlos, California, was incorrectly named "Arthur Goldstein."

In Ivan Amato's 17 April article "The ascent of odorless chemistry" (Research News, p. 306), Roald Hoffmann's name (p. 308) was incorrectly spelled.