

SCIENCE

LETTERS

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Patriot Missile Controversy

A 3 April item in *ScienceScope* (p. 19) reports that the editor of the journal *International Security* and its editorial board would not speak to reporters about the controversy over Theodore Postol's analysis of the performance of the Patriot missile in the Gulf War. We have no such reluctance.

With respect to allegations that the Raytheon Corporation, Patriot's prime contractor, pressured *International Security* not to publish Postol's article, the facts tell the story: we did publish Postol's article, and we stand by our publication of it, as we stand by all our articles in this important field. As a journal that promotes open scholarly discussion of security issues, we are also extremely concerned about any use of the classification system to stifle debate or intimidate scholars.

Ashton B. Carter
Chairman, Editorial Board,
International Security,
Center for Science and International Affairs,
John F. Kennedy School of Government,
79 John F. Kennedy Street,
Harvard University,
Cambridge, MA 02138

Kuwait Oil Well Fires

Richard Stone, in his *Research News* piece (13 Mar., p. 1357) about the results of a risk assessment our group conducted for U.S. citizens working in Kuwait City during the recent oil well fires, gives the impression that the fires created a major increase in cancer risk. Actually, our results point to the opposite conclusion for residents of Kuwait City.

The available evidence indicates that ambient concentrations of carcinogens such as benzene and polycyclic aromatic hydrocarbons were elevated during periods affected by the smoke plumes, but only up to concentrations that are at or below those typical for major urban areas (for example, benzene: 9 milligrams per cubic meter; benzo[a]pyrene: 4 nanograms per cubic meter) (1, 2). In fact, monitoring teams found generally low concentrations of sulfur dioxide and carcinogens in Kuwait City, in spite of initial expectations of a much larger impact (2–4). These concentrations translate into cancer risk estimates for Kuwait City that are typical of U.S. cities.

Our cancer risk estimates for Kuwait City are actually overestimates, because we assumed that exposure would be for a 2-year period; in fact, the fires were extinguished within 10 months. Even with the longer exposure assumption, total cancer risk estimates were no higher than six (possible cases) in 10^6 (exposed individuals), which is within the range of acceptable risk (one in 10^6 to one in 10^5) in many regulatory arenas (5, 6).

Gary L. Ginsberg
Wendy H. Koch
Gale F. Hoffnagle
TRC Environmental Consultants, Inc.,
5 Waterside Crossing,
Windsor, CT 06095

REFERENCES

1. J. J. Shah and H. B. Singh, *Environ. Sci. Technol.* **22**, 1381 (1988).
2. P. Lameloise and G. Thibaut, "Measurement campaign of the Regional Mobile Laboratory for Measurement of Air Quality in Kuwait" (French Monitoring Team Report, Airparif, Paris, 27 May 1991).
3. *J. Air Waste Manage. Assoc.* **41**, 736 (1991).
4. "U.S. Interagency Team interim report: Kuwait oil fires" (report prepared for the U.S. Coast Guard, the Environmental Protection Agency, the Department of Health and Human Services, the National Oceanic and Atmospheric Administration, and the Department of Energy, Washington, DC, 3 April 1991).
5. *Risk Assessment Guidance for Superfund*, Vol. I, *Human Health Evaluation Manual* (Environmental Protection Agency, Washington, DC, 1989).
6. *Guidelines for Assessing Health Risks from Proposed Air Pollution Sources* (Rhode Island Department of Environmental Management, Providence, RI, 1990).

Early Humans in North America

I read with interest the article by Tim Appenzeller (*News & Comment*, 21 Feb., p. 920) regarding the purported evidence presented by Richard MacNeish of early humans in New Mexico, dated as being more than 30,000 years old. I have worked extensively on the taphonomy of cave deposits and believe that MacNeish's findings need comment.

Paleontologists studying the taphonomy of fossil remains from caves know how complicated these deposits can be. Many animals, especially mammalian carnivores and avian predators, have used these caves as dens and roosts, leaving behind an accumulation of bones from their prey. Packrats also cause mixing of plant and animal remains of different ages in these caves when

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.

Steve Emslie

Board of Environmental Studies,
College Eight,
University of California,
Santa Cruz, CA 95064

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).



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.

Lester Levin

Environmental Studies Institute,
Drexel University,
32nd and Chestnut Streets,
Philadelphia, PA 19104

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. J. W. 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.

Thomas C. Mosca III

Route 5,
Box 1143,
Gloucester, VA 23061

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.

Gio Batta Gori

Health Policy Center,
6704 Barr Road, Bethesda, MD 20816

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).



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