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project at the Idaho National Engineering Laboratory (INEL) can be arranged by political pork-barreling, thereby circumventing scientific peer review. Questions of the Idaho laboratory as a site to develop the new cancer treatment facility have been raised and are genuine concerns of medical doctors. Radiation oncologists, experts in cancer medicine, and medical scientists are skeptical about INEL as a suitable site for a sophisticated cancer treatment facility that would conduct studies of cancer patients with brain tumors and melanomas. The remote location and lack of a suitable medical environment or supporting medical expertise makes it unlikely that INEL would be qualified for the conduct of a quality-controlled clinical trial of a new form of cancer therapy. Such scientific studies require first-class radiation and neutron therapy specialists, medical physicists, and neurosurgeons, as well as excellent supporting scientific and medical staff. The environment in which to conduct the study also requires proximity to a major tertiary medical center with highly qualified, skilled, and experi-

enced radiation oncologists, neurosurgeons, diagnostic radiologists, medical physicists, neuro-oncologists, and radiobiologists to direct and conduct the clinical trials on human patients. We and other radiation and neuro-oncologists would have considerable reservations about referring patients to INEL to receive a new and experimental form of cancer therapy. Those of us in the peer community who are knowledgeable about this field concur with Robert G. A. Zamenhof that the methods and strategy being used to obtain funding for the Idaho project and the type of pressures being exerted to force Congress to provide funding are not ethical.

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### Invention of the Autoanalyzer

Barbara J. Culliton (News & Comment, 2 Mar., p. 1026) states that Edwin (Jack) C. Whitehead "made a fortune inventing scientific equipment such as the autoanalyzer for blood." Actually, the autoanalyzer was invented by a biochemist, Leonard T. Skeggs. Skeggs described his invention to me in the early 1950s. He said that prototype versions were working beautifully and that he was dickering with the Technicon Co. (headed by Whitehead) to manufacture and market the device. In short order, the machine had revolutionized blood chemical analysis in clinical laboratories worldwide. Not only could far fewer technicians turn out many more determinations in much shorter times, but results were also more dependable. I suspect that among the countless users of the autoanalyzer, few know who invented it.

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### Unscrambling an Egg

While I agree with Leonard Hayflick's assertion (Letters, 15 June, p. 1281) that an egg can be unscrambled by feeding it to a hen, I do not agree that the process violates the Second Law of Thermodynamics. If the hen is regarded as a thermodynamically open system, the decrease of entropy involved in organizing a new egg is more than compensated by the hen's concurrent production of entropy-rich wastes. Thus, the inviolability of the Second Law is preserved.

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I'm afraid that Hayflick has not found a way of violating the Second Law of Thermodynamics. Feeding only one scrambled egg to a hen will not produce a new unscrambled egg—even a hen is not that efficient. If he uses a three-egg omelet, containing the original shells, it might work; but that only confirms the Law.

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### Smokers: Black and White

Concerning Health and Human Services secretary Louis Sullivan's appropriate condemnation of R. J. Reynolds' marketing approach (Briefings, 2 Feb., p. 530), *Science* says, "Blacks smoke more than whites." Not

so. While proportionately more black men than white men report themselves as current smokers, they also report that they smoke substantially less than whites. For example, in 1965 black smokers, both men and women, reported that they smoked 25% fewer cigarettes per day than whites (1). [When looking at lung cancer rates, it is appropriate to look at smoking behavior 20 years earlier because of the roughly 20-year latent period. (2)] The proportion of adult current smokers is roughly equal in black and white women, as are the lung cancer mortality rates, despite the fact that black women smoke much less. In 1970, black male smokers smoked about 70% as much as white male smokers, and black men began smoking at slightly older ages (3).

After we took into account 1965 smoking prevalence (current percent of smokers), the proportion of smokers who have quit, the proportion of those who have never smoked, and the amounts smoked by smokers, we found (4) that, for 1984 mortality data, the residual lung cancer death rates remaining after smoking was accounted for were, per 100,000, as shown below.

Race	Males	Females
White	9.3	5.8
Black	15.5	6.8

These residual rates place nonsmoking attributable lung cancers (NSALC) among the three or four most common cancers (in terms of mortality) in the United States. While cigarette smoking is by far the most important cause of preventable cancer deaths, other causes of lung cancer still need to be looked for. Sterling and Weinkam (3) have suggested closer examinations of industrial exposures and the urban environment. In view of the sex and race differences we found in NSALC, this looks like a good idea.

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#### REFERENCES AND NOTES

1. *Health, United States 1979* (Department of Health, Education and Welfare, Washington, DC, 1980), pp. 170-171. To estimate numbers smoked it assumed that under 15 cigarettes per day equals 10, 15 to 24 equals 20, greater than 25 equals 40.
2. L. R. Peace, *The Statistician* 34, 371 (1985).
3. T. D. Sterling and J. T. Weinkam, *Am. J. Ind. Med.* 15, 319 (1989).
4. M. A. Schneiderman, D. L. Davis, D. K. Wagener, *Am. Med. Assn.* 261, 2635 (1989).

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