NIH Budget

Barbara J. Culliton's article "OMB raid on NIH budget called 'outrageous' " (News and Comment, 1 Mar., p. 1016) describes the devious method by which the Office of Management and Budget is attempting to thwart the will of the Congress. Unfortunately, that article does not mention the action that the 100 members of the House of Representatives are taking to reverse this usurpation of power by the Administration.

On 6 February 1985, I introduced House Joint Resolution 136. That resolution would have the force of law if enacted. It requires that the appropriations be used as intended by Congress, to fully fund 6500 new and competing research awards by the National Institutes of Health in fiscal year 1985. Since then, over 100 of my colleagues in the House have joined me to cosponsor this legislation, and the number continues to grow every day.

Two fundamental principles are at issue here: the national commitment to maintaining the world's preeminent biomedical research institutions and the prerogative of the Congress to ensure that the laws it writes are properly administered. Shortsighted attempts at budgetary savings by cutting our investment in better understanding the mechanisms of disease can only result in increased costs in the long run, both financial costs and human costs. The Congress has resolved that this will not be allowed.

HENRY A. WAXMAN
Subcommittee on Health
and the Environment, Committee
on Energy and Commerce,
U.S. House of Representatives,
Washington, D.C. 20515

Geophagical Clay: Medicinal Effects

I would like to make the following comments relating to the report "Nigerian geophagical clay: A traditional antidiarrheal pharmaceutical" by Donald E. Vermeer and Ray E. Ferrell, Jr. (8 Feb., p. 634).

During the Middle Ages, Moslem physicians and pharmacologists became quite familiar with different kinds of clay and the practice of geophagy, mainly through the Arabic translations of the works of Dioscorides and Galen. In various medical and pharmacological works by Moslem physicians and pharmacologists, one finds that medicinal benefits were attributed to more than 45 varieties of clay (*1, 2*). The Persian physician Rhazes (865–925) (*3*), in his book *On the Beneficial Effects of Clay Tablets*, mentioned the clay tablets of Nishabur (a city in the northeastern state of Khorasan in Iran). Several other Moslem physicians, pharmacologists, and historians also mentioned the clay tablets of Nishābur. Antinausea and antivomiting effects were attributed to these clay tablets, which were said to combat the ill effects of greasy and sweet foods and to contract the stomach. The Nishabur clay tablets are no longer available or used. However, an Iranian physician relates that, before World War II, a soldier in a village in Khorasan used and recommended certain locally prepared clay tablets and that when these tablets were chemically analyzed in Tehran, they were found to have a high content of ingredients present in commonly used antacids (*1*).

A. M. BEHBEHANI
Department of Pathology and
Oncology, University of Kansas,
College of Health Sciences and
Hospital, Kansas City 66103

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Experiment and Theory

William A. Goddard III's recent review (Articles, 22 Feb., p. 917) of the saga of the singlet-triplet gap in CH_2, which begins with the first experimental estimate (*1*) of 2.5 kcal/mol, tells a story of how the "indirect" experimental values and the theoretical values tended to converge over the years and are now in essential agreement that the correct figure is about 8 to 10 kcal/mol. I believe the theoreticians are on the right track but are probably still a factor of 2 high. Our initial estimate of 2.5 kcal/mol had an error bar of about ±100 percent. The elegant "direct" experimental value of 19.4 kcal/mol found by Lineberger and his colleagues (*2*) has now been shown to be seriously in error because of "hot band" effects, as pointed out by Goddard. The two most recent experimental values were *upper limits* of 6.3 ± 0.8 kcal/mol (*3*) (not mentioned by Goddard) and 8.1 ± 0.8 kcal/mol, hardly outside the range of the early value, which was, after all, an order of magnitude less than then current guesses of 1 electron volt. The theoretical estimates, it seems, have done most of the converging—downward from greater than 20 kcal/mol. One cannot dismiss the chemical data on which the early low estimates were based. I think, in due course, the theoretical people will get it right at about 5 kcal/mole.

JAMES R. MCNESBY
Department of Chemistry, University
of Maryland, College Park 20742

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McNesby has no basis for complaint. I cited his work only because it was the first. The same (indirect photochemical) methods used by McNesby and his colleagues (*1*) to obtain $\Delta E_{\mathrm{ST}} = 2.5$ kcal were used by Carr *et al.* (*2*) to obtain 1 to 2 kcal and by Simons and his co-workers (*3*) to obtain 10 ± 3 kcal. These photochemical methods were refined by later workers (particularly important were improvements in the theoretical analysis, critical in extracting an experimental singlet-triplet splitting from the data), leading finally to a value of 8.7 ± 0.8 kcal (*4*).

The most direct study of ΔE_{ST} is the spectroscopic analysis by McKellar *et al.* (*5*), which leads to $\Delta E_{\mathrm{ST}} = 9.05 \pm 0.06$ kcal. The recent Lineberger photoionization study eliminating hot bands (*6*) yields 9.0 ± 1. kcal, while the molecular beam study by Hayden *et al.* finds 8.5 ± 0.8 kcal (*7*). All these studies are quite direct and can be trusted within the limits suggested by the error bars.

The intent of my comments about the early work was not to depreciate the contributions by McNesby, but rather to give credit to him as the earliest to make an estimate and to provide the reader with some feeling for uncertainties prevalent back in the early days (the 1970's).

WILLIAM A. GODDARD III
Division of Chemistry and Chemical
Engineering, Chemical Laboratories,
California Institute of Technology,
Pasadena 91125

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