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## Letters

### Bedtime behavior

Yawning research ("Are we boring you?"  
SN: 12/5/87, p.360; Letters, 1/9/88, p.19)  
sounds like an excuse to have a good time at  
someone else's expense. It should be obvious  
that yawning is genetic behavior for social  
animals. It's an animal's way of telling the  
pack, "Hey, I want to sleep." Without yawning  
to synchronize sleep patterns in a group of  
individuals, one or more of them would keep  
the others awake. Animals that don't sleep  
don't survive, which brings us to us.

I suspect that Dr. Provine will find that  
after-sleep yawning occurs much less often  
than does before-sleep yawning. Morning  
yawning is no doubt the before-language way  
of saying, "I'll get up if you'll get up."

*William T. Holmes  
Poway, Calif.*

### Collaboration yes, construction no

"The Road to Magnetic Fusion?" (SN:  
11/7/87, p.294) accurately presented the ra-

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Cover: Rabbits, rats and mice have long been used by scientists to determine the relative toxicity of chemical compounds, from cosmetics to food additives to industrial solvents. Pending acceptance by government regulators, test tube alternatives may reduce the number of animals required for such tests.



## Departments

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tionale for internationalizing the U.S. magnetic fusion program and discussed congressional concerns about the unprecedented level of international collaboration that would be required for the joint construction of the International Thermonuclear Experimental Reactor (ITER).

I would, however, like to correct one key error in the article. While the outcome of the quadripartite meeting in Vienna on October 18 and 19 was truly significant, it was never intended to reach "agreement . . . for construction of the next large step . . ." The quadripartite group agreed that each delegation would recommend to its authorities participation in a major ITER conceptual design and validating R&D activity over the next three years. I believe this agreement represents a major step in international scientific collaboration. It is intended to provide all of the information needed for subsequent decisions on international construction of a facility which may be the key to ensuring an adequate supply of energy for the entire planet.

To put the ITER activity in context, I would

like to point out that the current fusion programs are already engaged in extensive international cooperation. All fusion programs are working to strengthen the coordination of national planning efforts to ensure best use of the resources available worldwide for fusion research.

*John F. Clarke  
Associate Director for Fusion Energy  
Department of Energy  
Washington, D.C.*

## Calculus solutions

In "Calculus Reform: Catching the Wave?" (SN: 11/14/87, p. 317), the author points out that about 90 percent of the typical problems in an undergraduate calculus text can be done using some of the current electronic calculator-computers. The point of the exercises, however, is not the answer, but the method used to find the answer. The student would learn nothing from such computer solutions, just as he or she would learn little

*Letters continued on p. 45*

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