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# LETTERS

## Geological Models

As the lead author and the Department of Energy monitor for one of the reports (1) cited by N. Oreskes *et al.* in response to letters (15 Apr., p. 329) about the issue of validation and verification of codes and models (2), we take exception to their representation of our work. The Yucca Mountain Site Characterization Project has long recognized that “validation” in the common sense is not possible for models of long-term geological processes. Thus, we have restricted the use of the term to the verification that codes which embody models accurately implement the mathematical equations that describe the model, without regard to the verity of that model. This can be done.

We use the term “validation” in the sense of provisional acceptance, as E. J. Rykiel Jr. points out in his letter (p. 330). It is certain that there will be debate over who should decide the acceptance criteria, as pointed out by Oreskes *et al.* (Articles, 4 Feb., p. 641), and there certainly has been in the arena which they appear to criticize, that is, the radioactive waste management community. To the extent the public cares to listen, the caveats have been far better presented than Oreskes *et al.* indicate with their selective citation. Warnings about the impossibility of absolute proof are even embodied in the regulations.

As scientists involved in the difficult task of supporting credible policy decisions, we are regularly made aware of the limitations of our models by the scientific community. The statements of Oreskes *et al.* are, we feel, exaggerated.

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## References

1. J. L. Younker *et al.*, “Report of early site suitability evaluation of the potential repository site at Yucca Mountain, Nevada” (SAIC-91/8000, U.S. Department of Energy, Las Vegas, NV, 1992).

## SIDS Research

Ginger Pinholster (News & Comment, 8 Apr., p. 197) suggests that pioneering sudden infant death syndrome (SIDS) research by Alfred Steinschneider may be called into

question because the mother of two SIDS victims is now charged with having murdered her babies. In 1972, Steinschneider described five infants with severe apneic episodes who subsequently died from SIDS (1). He suggested that SIDS may be due to apnea.

These murder charges do not refute Steinschneider’s ideas. SIDS is the most common cause of death in infants between the ages of 1 month and 1 year, yet its cause remains unknown. Leading hypotheses about the cause of SIDS are related to brain-stem dysfunction, especially neurologic control of breathing and sleep-wakefulness. The relation between control of breathing, apnea, and SIDS is currently being investigated, and many studies support an association between SIDS and respiratory dysfunction. Thus, one should not conclude that the “apnea hypothesis of SIDS” is unpopular, has been disproved, or that it is of little scientific interest.

Child abuse exists, and it is a serious pediatric problem. Similarly, SIDS exists, and it is a serious pediatric problem. Occasionally, infants whose deaths were originally attributed to SIDS are found to have died from child abuse. These deaths, and those described in the article, are tragic, but they represent child abuse. That child abuse exists does not decrease the credibility of legitimate scientific inquiry into the cause of true SIDS deaths. Steinschneider’s ideas have inspired 20 years of sustained SIDS research in which the relation between SIDS and apnea has been investigated, and that research continues today.

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## References

1. A. Steinschneider, *Pediatrics* 50, 646 (1972).

## Embargo on Biomaterials

The article “New challenges in biomaterials” (25 Mar., p. 1715) by N. A. Peppas and R. Langer points out significant opportunities for the creation and characterization of biomaterials that are essential com-