far as the theory of evolution is concerned, it does not even matter in the given context whether it is right or wrong. The only thing that matters is that it belongs in a science curriculum by virtue of being a *scientific theory*, which, by definition, is one concerned with presenting explanations of nature *without taking recourse to God and the supernatural.* On the other hand, comprehensive coverage of any scientific theory should include a discussion of its limitations—phenomena that it does not satisfactorily explain—because that is the best stimulus for advancing science. As Richard Feynman put it in his famous television interview on 25 January 1983 in the Public Broadcasting Service's series *Nova*: "The thing that doesn't fit is the thing that's the most interesting, the part that doesn't go according to what you expected."

Indeed, the evolution issue is not about science at all; it is about subordination of science to an ideology. What is important is not whether a Kansas-type decision could have taken place in one school board, one state, or even "a couple dozen states," as Tim Miller observes in Kumagai's story, but that it did take place at all in a country like the US at the end of the 20th century! The crucial question, frightening as it is, is the following: Could the Kansas decision be just a symptom of a deeper rot, as was the banning of genetics and cybernetics in the USSR in the 1950s, or the political defamation of relativity in Germany in the 1930s?

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PT Fails to Measure Up to SI Standards (but Only by Inches)

I was surprised by Stephen Benka's use of what he calls "the dreaded English system of units" in his January editorial (page 10). If it is dreaded, then we should definitely avoid it. Life is too short for us to live in dread.

Most of PHYSICS TODAY's readers have a scientific background, so we can assume that we all know what a meter is and approximately what thickness is represented by, say, 4 mm. Therefore, using the "dreaded system" is certainly not necessary for the sake of our scientific community.

Given that some of the magazine's readers do not have a scientific background, surely it is the community's responsibility—and, I think, PHYSICS TODAY's duty—to demonstrate correct practice and use of the units of measure that constitute the International System of Units, or Système International d'Unités (SI). According to the Gaithersburg, Maryland–based National Institute of Standards and Technology, SI has long been "the language universally used in science [and] the dominant language of international commerce and trade" and is "the preferred system of weights for United States trade and commerce." [1] That view is also taken by the Sèvres, France–based Bureau International des Poids et Mesures, which declares that its task is "to ensure world-wide uniformity of measurements and their traceability to the International System of Units." [2] And both views, in turn, are reflected in the three metrology-related articles included in PHYSICS TODAY's August 1999 "Buyers' Guide" supplement.

My perspective here is that of an individual who works at Canada's Institute for National Measurement Standards (see http://www.nrc.ca/inms/ for an overview of the institute's activities). However, the above comments are just my personal opinion.

References

1. Quoted on NIST's Web site, http://physics.nist.gov/cuu/Reference/contents.html.
2. Quoted on BIPM's Web site, http://www.bipm.fr/.

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Info Recurs, Going Back to Zermelo, Loschmidt Paradoxes

As a geophysicist interested in stochastic processes, I found George M. Zaslavsky's "Chaotic Dynamics and the Origin of Statistical Laws" (PHYSICS TODAY, August 1999, page 39) very stimulating. It surprised me, however, that in his discussion of Ernst Zermelo's paradox of recurrence and Josef Loschmidt's paradox of reversibility, Zaslavsky does not include any references to either Marian von Smoluchowski's or Subrahmanyan Chandrasekhar's contributions to resolving these paradoxes.[1,2] It seems to me that Chandrasekhar's conclusion—an almost literal translation of von Smoluchowski's earlier one—that "a process appears irreversible (or reversible) according as whether the initial state is characterized by a long (or short) average time of recurrence compared to the times during which the system is under observation" [2] would only add to Zaslavsky's argument. Incidentally, Chandrasekhar, clearly perturbed by the protracted lack of recognition accorded to von Smoluchowski, also commented that "the absence of references, particularly to Smoluchowski, is to be deplored since no one has contributed so much as Smoluchowski to a real clarification of the fundamental issues involved [in the laws of thermodynamics]." [2]

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2. S. Chandrasekhar, Rev. Mod. Phys. **15**, 1 (1943); reprinted in N. Wax, ed., *Selected Papers on Noise and Stochastic Processes*, Dover, New York (1954), p. 3.

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ZASLAVSKY REPLIES: To my knowledge, the first detailed explanation of the Zermelo and Loschmidt paradoxes should be attributed to Paul and Tatiana Ehrenfest[1] (an English-language translation of their paper is given in reference 3 of my article[2]). Unfortunately, space limitations prevented me from including in the article all of the other interesting and important references. So I think that Remko Uijlenhoet's comment is likely to be useful to your readers. Also, more discussions of the paradoxes, especially in relation to systems with chaotic dynamics, can be found in my 1984 book (reference 7 in my article).[3]

References

1. P. Ehrenfest, T. Ehrenfest, in *Enzyklopädie der Mathematischen Wissenschaften*, B. G. Teubner, Leipzig (1912), vol. 14 (6), p. 213.
2. P. Ehrenfest, T. Ehrenfest, *The Conceptual Foundations of the Statistical Approach to Mechanics*, Cornell U. P., Ithaca, N. Y. (1959).
3. G. M. Zaslavsky, *Chaos in Dynamic Systems*, Harwood, N. Y. (1984).

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