Facile Optimism

While I sympathize with the sentiments expressed by Philip H. Abelson in his editorial "Enough of pessimism" (9 Jan., p. 29), I cannot help feeling that uninformed optimism confronts us today with much more serious dangers than the pessimism which he deplores. In discussions of any of the serious problems which we are facing (exhaustions of resources, deterioration of the environment, and so forth) it is all too common to meet with the argument, "Oh well, man's ingenuity has always found an answer in the past, so it is to be expected that solutions to all of these problems will be found in the future." Such blind confidence tends to minimize the urgency of meeting emergencies which may arise before long-range solutions are found. This reinforces the unfortunate reluctance of politicians to give the public bad news and to ask for sacrifices which might be necessary if the seriousness of crises is to be investigated. What we need in place of the paralyzing pessimism described by Abelson is not the facile optimism of our advertising agencies but inspiring leaders who are not afraid to describe the dimensions of the dangers with which we must deal and who are willing to outline the manners in which they will be overcome, even if such programs call for unpopular measures.

HERBERT MORAWETZ
Department of Chemistry,
Polytechnic Institute of New York,
Brooklyn 11201

Unsolvable Problems in Mathematics

Most of mathematics can be formalized by means of systems of axiomatic set theory, such as that of Zermelo-Fraenkel (ZF), with specific axioms and rules of inference. Statements in the formalism of ZF set theory may be either "provable" (from its axioms, using only its allowed rules), "disprovable," or "undecidable" (neither provable nor disprovable).

It has been suggested by Lynn Steen (Research News, 18 July 1975, p. 209) that some famous unsettled conjectures, such as Fermat's last theorem, Goldbach's conjecture, and the four-coloring of planar maps, may fall into "the purgatory of perpetual undecidability." The axiom of choice and the continuum hypothesis are known to be undecidable in ZF set theory, provided that theory is consistent (no contradiction can be proved in it). It is indeed possible that some of the above three conjectures are also undecidable in ZF