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meaning. Ordinarily this causes no confusion, because if the exclamation point appears as a factorial sign at the end of an equation that does not end a sentence, then the text that follows will begin with a lower-case letter; conversely if the equation culminates a thought so exciting as to require an exclamation point, this will be signaled by the next word's starting with an upper-case letter. Ambiguity might result if that word were a proper noun, but even then it should almost always be clear from the syntax whether or not it heralds the start of a new sentence.

If, however, we allow the punctuation mark "!"—commonly used to indicate shocked disbelief—then we are in deep trouble, as the following specimen reveals:

Would you believe somebody who maintained that

$$24 = 4! \quad (1)$$

Either way you read it, the sentence has definitely ended. Yet the answer can be "Absolutely!" or "Definitely not!" The solution is simple. We must ban "!" and express our shocked surprise only by "?!"—a small price to pay if it helps revive the noble art of scientific writing. Could anyone possibly disagree?!

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4/90

Publicity's Place in Science

Robert Jones (September 1989, page 142) writes: "Newspapers and press conferences are no way to disseminate scientific results. They are a way of seeking publicity, plain and simple, and need to be discouraged." This coin has two sides and is not, as it might appear on the surface, a simple and straightforward issue. By virtue of the computer revolution and other forces, we are entering a period where small high-technology companies are engaging more and more in basic, fundamental studies of interest to pure as well as applied science. Some of us are paying out of our own pockets to do basic research in our own private facilities, for reasons such as protecting intellectual properties. (I have been doing this, as a matter of public record, for over a quarter of a century.) In recent years non-PhD engineers have won Nobel Prizes, and this trend can only continue.

If I were Jones, I would not be concerned with the construction of homemade hydrogen bombs so much as with the ethical and moral standards of the academic community.

Referees should be named and required to identify themselves; otherwise, we may soon be unable to publish a paper without a lawsuit. In view of the number of professors and others who are operating various businesses on the side, there always exists the potential for a conflict of interest.

Our nation needs the contribution of self-funded individuals, as well as small high-tech startups, if it is to survive. With regard to prepublication public relations, shareholders also have certain rights. PR hastens commercialization by attracting money, talent and joint venture partners. (Thomas Edison, incidentally, was the master at getting funding this way.) Publicity can also speed development, by inducing other people doing similar work to "come out in the open." And while public announcements should not circumvent the normal review process, releasing one's findings after a paper has been in a journal's hands for several months can sometimes move that process along.

News conferences and press releases, like most things in life, have their place. Ultimately, therefore, the bottom line is the *truth* and strength of the documentation for the claims being made. All of us, as individuals or organizations, have the right to survive, and publicity in the media is often the only way out.

MINAS ENSANIAN
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9/89

Learning Compelled Is Learning Repelled

I agree with James F. Jackson (January, page 112) that physical scientists could stand to have a better image in the eye of the typical high school student. However, I think Jackson should reconsider his statement "'Skills' are not as important as knowledge." Forcing scientific knowledge on students tends to turn them off, rendering them antiscientific; only the very few will become scientifically literate or want to pursue scientific careers when taught this way. I question whether it is wise to spend more money on compulsory science education after decades of poor results.

Morris Shamos addresses the issue of achieving scientific literacy in America and offers alternatives in an excellent and thought-provoking article entitled "The Lesson Every Child Need Not Learn" (*The Sciences*, July-August 1988, page 14).

SHANE D. MAYOR
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2/90