not in itself show that religious prophets are fallible. My point was that, in recognizing that even Einstein was not infallible, we physicists set a good example. While it doesn't prove anything, our example may have some beneficial moral influence. As to whether this sort of remark belongs in an article about Einstein, it seems to me that part of the justification of pure scientific research lies in the impact it has on the culture of our times. Anyway, some of us unpaid contributors to PHYSICS TODAY take our compensation in the opportunity that publication gives us to express our personal views on one thing or another.

To answer Roger Newton, the difficulty that I find with quantum mechanics is that its rules tell us how to use the wavefunction to calculate the probabilities of various values of dynamical variables, but the apparatus that we use to measure these variables—and we ourselves—are described by a wavefunction that evolves deterministically. So there is a missing element in quantum mechanics: a demonstration that the deterministic evolution of the wavefunction of the apparatus and observer leads to the usual probabilistic rules.

Did Robert Brown study the motion of ink particles, and did they carry a significant electric charge, as Bob Eisenberg says? I thought that Brown chiefly studied pollen grains and dust particles, but whatever they were, I suppose the particles may have been charged, and if so, then the effect of electric forces on Brownian motion should be examined.

I may be missing the point of Robert Becker's remarks, but I have never understood what is so important physically about the possibility of torsion in differential geometry. The difference between an affine connection with torsion and the usual torsion-free Christoffel symbol is just a tensor, and of course general relativity in itself does not constrain the tensors that might be added to any dynamical theory. What difference does it make whether one says that a theory has torsion, or that the affine connection is the Christoffel symbol but happens to be accompanied in the equations of the theory by a certain tensor? The first alternative may offer the opportunity of a different geometrical interpretation of the theory, but it is still the same theory.

Steven Weinberg
(weinberg@physics.utexas.edu)
University of Texas at Austin

Unintended Impact of Author Impact Factor

The letters in the March 2005 issue of PHYSICS TODAY (page 12) in response to Mohamed Gad-el-Hak's Opinion piece (March 2004, page 61) on citation rates and impact factors show how important these criteria have become for hiring, tenure, and promotion, and suggest some models that may result in undesirable, unintended consequences. In particular, the suggestion by Loc Vu-Quoc that multiple-author publications be divided in some fashion according to the number of authors might result in having nervous faculty members delete students and important support staff as coauthors and relegate them to acknowledgments.

The notion that all coauthors are equally responsible for content is not valid in many fields; in solid-state physics, crystal growers, with or without PhD degrees, are not technicians but highly skilled collaborators of equal standing, and students may often play a more important role in that field than in theoretical physics. When I was at Bell Labs (1966–72), no one thought that Howard Guggenheim or Joe Remeika should be responsible for the detailed theoretical analyses of data on their superb crystals, but it would have been unethical not to list them as coauthors; they had grown the world's best specimens of new materials.

The law of unintended consequences has many examples in life; one such story, albeit apocryphal, is that of rat extermination in Singapore. According to the anecdote, a bounty of, say, a few cents was offered for each dead rat turned in to the authorities. Within days numerous rats were delivered, and the numbers dropped quickly as the extermination neared completion. Surprisingly, however, after two weeks the numbers suddenly shot up. Young boys were breeding rats! In a similar vein, if the formulas Vu-Quoc proposes were implemented, we might see a sudden explosion in the number of short, single-author publications by untenured faculty members. Probably these would have about the same value as the rats in Singapore.

We must be careful what we recommend.

James F. Scott
(jsco99@esc.cam.ac.uk)
Cambridge University
Cambridge, UK

Vu-Quoc replies: James Scott describes a knee-jerk reaction of short-sighted authors who focus on getting more credit for a single paper but lose sight of the bigger picture.

Ethical guidelines such as those of the American Chemical Society[1] clearly state that "the coauthors of a paper should be all those persons who have made significant scientific contributions to the work." Most authors would follow these guidelines and share the credit—and sometimes the blame—for the work.[2,3]

Many journals already require each author of a paper to state his or her contribution.[4] Coauthors are sometimes listed for ethically questionable reasons.[5] Inflated authorship, like inflated grades, devalues authentic authorship, does not contribute to good education, and misleads potential employers. The author impact factor (AIF) is a statistical average over a collection of papers. Its unintended consequence is to promote effective and genuine collaboration, good collaborative work, and adherence to the ethical guidelines for authors.[1]

Instead of such narrow issues as, for example, trying to get more credit for a paper, the AIF concept, with its robustness against database errors, addresses much more broadly the challenges of ranking the publication impact (reputation) of heterogeneous groups of researchers—for example, for use in the ranking of doctoral programs.

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Loc Vu-Quoc
(vql@ufl.edu)
University of Florida
Gainesville ■