Editorial & Letters

EDITORIAL

In Celebration of AAAS

Concern for man himself and his fate must always form the chief interest of all technical endeavors ... in order that the creations of our mind shall be a blessing and not a curse to mankind.

–Albert Einstein

The reader of *Science* regularly encounters researchers from all walks of life in these pages. But he or she does not often read these researchers' personal views about science, much less the views of artists, politicians, religious leaders, and science fiction writers. Beginning with this issue (see page 812), *Science* is publishing a series of essays that explores the relationship among science, scientists, and the wider society. Over the next 9 months a rich assortment of viewpoints will be aired, forming a provocative, often contradictory, and consistently entertaining mosaic that illustrates just how deeply embedded in our culture science has become.

The inspiration for this series is the 150th anniversary of the American Association for the Advancement of Science. The original objectives of the Association, agreed to on 20 September 1848 in the Academy of Natural Sciences in Philadelphia by 461 charter members, were "by periodical and migratory meetings, to promote intercourse between those who are cultivating science in different parts of the United States; to give a stronger and more general impulse, and a more systematic direction to scientific research in our country; and to procure for the labors of scientific men, increased facilities and wider usefulness."

These objectives remain in place today and are met by a wide range of activities, including the ongoing program of AAAS meetings and the relationship with the journal *Science*, which AAAS has been linked with since 1900 and has owned since 1944. In addition, just as scientific progress has accelerated over the past century and a half, so the objectives of the Association have widened. Thus, the Committee on Science, Engineering, and Public Policy, established in 1973, took the lead in bringing science to political decision-makers, and in 1977, a new objective "to foster scientific freedom and responsibility" was introduced to help define the rights and obligations of scientists. These changes presaged a major current focus for the Association, namely promotion of the public understanding of science. Through the Directorate for Education and Human Resources, AAAS is involved in activities as diverse as science radio shows for children, joint projects with black church groups, media fellowships for science and engineering students, and Women in Science programs. Most recently, the realization that public understanding of science must be matched by scientists' understanding of the public led the Association to initiate a "conversation with the community" (see www.sciencemag.org/feature/data/aaasforum.shl/) to identify the key issues facing science and society, and meaningful ways to address them.

It is thus in keeping with the spirit of the organization that we have chosen to celebrate 150 years of the AAAS by exploring how the advancement of science—for better or worse—influences the nature of society. While this is not a direct tribute to the rich history of the Association (a retrospective analysis will be provided by a three-volume history to be published later this year), it does provide testament to the intellectual ferment that is an integral part of AAAS. The organizing committee consists entirely of *Science* staff, and, in keeping with the editorial policy of the journal, the series has been put together with complete editorial independence.

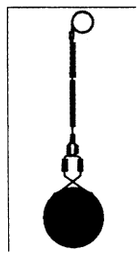
The essayists represent a broad mix. Many of them are scientists who have thought deeply and feel strongly about science's place in society. But we have striven to include the creative insights of a wide range of nonscientists too—members of the business community, teachers, journalists, philosophers, critics, and schoolchildren. In providing such diverse perspectives, it becomes impossible to give a truly comprehensive picture, and we apologize for the inevitable omissions. However, we are confident that the series will provide a vivid illustration of how the scientific endeavor is perceived today.

150th Anniversary Essay Committee*

**Richard B. Gallagher (Chair), Christine Gilbert, Barbara Jasny, Andrew Lawler, Elizabeth Pennisi, Linda R. Rowan, and Julia Uppenbrink*

LETTERS

Envisioning the future



Physicists hold forth on the frontiers of their fields—fractality and muon colliders (right). The genetics of how insulin signaling and longevity are related in a nematode are explored. And ending polio immunization is discussed by scientists considering international policy.

Is Nature Fractal?

David Avnir *et al.* (*Science*'s Compass, 2 Jan., p. 39) report on the high proportion of hasty claims of fractality in *Physical Review* journals and end by saying that "[t]his is the fractal geometry of nature." When assessing a field, other authors might not dwell so much on the statistics of implied and possible failures, but on the variety and quality of the best work. In the case of fractal geometry, it is outstanding.

As I have stressed (*1*, p. 3), fractals *are not* a panacea; they *are not* everywhere. But many investigations in numerous fields started with few decades of experimental data and later moved to many. For example, the fractality of metal fractures was reported (*1*, p. 461) over a few decades, and this produced the first appropriate measurement of roughness. E. Bouchaud has now confirmed fractality over five decades (*2*). In another example [references and discussion in (*1*), chapter 8], in 1963, Berger and I postulated the fractality of transmission errors on the basis of data ranging from seven to nine decades. Even in finance, my new multifractal model (*3*) covers data ranging from three to four decades. In a multitude of other instances, repeated analysis, based on abundant data and distinct methods, yields the same result, or a well-understood theory explains why upper and lower cutoffs are both unavoidable, or both.

Those examples do not exhaust the usefulness of *careful* fractal modeling. Many claims that are questioned by Avnir *et al.* are best understood as unfortunate side effects of enthusiasm, imperfectly controlled by refereeing, for a new tool that was (incorrectly) perceived as simple.

Since 1983, Avnir has published ex-