

## Fractures, Fractals and Foreign Physics

Fractals have been a fashionable topic in physics since the early 1980s, as remarked in the news story "Are Fractures Fractal or Quakes Chaotic?" (November, page 17). However, the connection to fracture processes was made much earlier than the story implies. Benoit B. Mandelbrot made the first approaches.<sup>1</sup> We, along with various colleagues, then made a rather comprehensive survey of the relation between crack growth in brittle materials and other fractal-generating growth models, such as diffusion-limited aggregation and dielectric breakdown.<sup>2</sup> Our first article was entitled "The Fractal Nature of Fracture." The answer to the question "Are fractures fractal?" is a qualified yes, in many cases. Research in the same direction has been pursued independently by other authors,<sup>3</sup> and the topic has induced lively debate in many scientific meetings. Even the question of self-organized criticality has been addressed in this context. There is also a wealth of experimental evidence accumulated subsequent to this work.<sup>4</sup>

One should perhaps remark that the news story concentrates on earthquakes, which, for all their social relevance, represent only an aspect of fracture processes. The ambitious title left room for a more comprehensive review.

A book reviewer in the same issue (page 82) remarks repeatedly that most of the experimental data in the book (on high- $T_c$  superconductors) are of US origin. The members of the US physics community do a much better job of communicating their findings than others elsewhere, and this difference seems to be widening. We hope, however, that recognition in physics will depend on publicity efforts as little as possible, for the sake of scientific progress.

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November's Search and Discovery story "Are Fractures Fractal or Quakes Chaotic?" omitted mention of the elegant renormalization-group analysis of critical behavior in this class of models by R. F. Smalley, D. L. Turcotte and S. A. Solla (*Journal of Geophysical Research* **90**, 1894, 1985).

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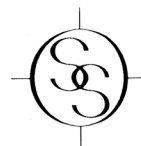
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