About the Cover

The legacy of Benoît Mandelbrot

Benoît Mandelbrot died in 2010, and this issue of the *Notices* and the next contain memorial articles about him. What he is most famous for, in the world at large and also in mathematics, is his exploration of fractal phenomena (in the process coining the now ubiquitous word "fractal"). His computer illustrations of the Mandelbrot set (a term first applied in work of Douady and Hubbard) became extraordinarily popular among a huge range of people not otherwise particularly knowledgeable about complex dynamics. Deservedly so—it is very easy and satisfying to write programs that expose a wide variety of intriguing phenomena which are not even now completely understood on a rigorous level.

Mandelbrot's exact role in the early days of the Mandelbrot set seems a bit murky, and has stimulated some controversy. Accounts by Mandelbrot in *Fractals and Chaos* and the preface by John Hubbard in *The Mandelbrot Set, Theme and Variations* are not in accord. Also, as the Wikipedia article on the Mandelbrot set points out, it was in an article by Brooks and Matelski in *Riemann Surfaces and Related Topics* (edited by Kra and Maskit), in which a computer-drawn picture of it, albeit crude and not very suggestive, first appeared. Did this play a role in subsequent development? In any event, it seems clear that the remarkable detailed pictures produced by Mandelbrot in 1980 with the help of machines at Harvard and the IBM Watson Research Center were ultimately responsible for the set's fame beyond the world of professional mathematicians.

The Mandelbrot set itself is marked in the cover images by black pixels. The shading is explained in the Wikipedia article on it. Simple instructions for coding can be found at

`http://warp.povusers.org/Mandelbrot/`

One great feature of drawing the Mandelbrot set is that zooming in on selected parts, which has spectacular effect, is not necessarily expensive in run-time. This has undoubtedly been significant for its attraction.

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