

A Brief Tribute to Benoit Mandelbrot

K.R. Sreenivasan

International Centre for Theoretical Physics

Trieste, Italy

I had read Benoit's article on Britain's coastline length sometime in the late 1970's. I was working then on the geometry of interfaces in turbulent flows, so thought that his paper may be relevant to my work. But I moved to Yale soon after and needed some settling-down period, which distracted me somewhat. There was free time at Goettingen where I spent a few months in 1982, so I checked the scaling of the interface length from line intersections and didn't find any fractal behavior. I summarized these negative results in three figures and sent them with a cover letter to Benoit. Copies of the letter and the figures are still with me.

Benoit never replied (more about this later) and I put it down to his refusal to believe my results. So I kept churning things over in my mind and realized that line intersections are not the best tools for examining the problem (for reasons that became clear even later) but planar sections would be better. It took some time to develop the needed expertise and make new measurements. We found reasonable fractal scaling and reported the results in [1]. I sent an advance copy to Benoit as a matter of courtesy.

Benoit obviously read the paper and traced me to Caltech where I was spending a sabbatical. We had an hour-long discussion on the paper. It was in 1985, so I don't remember everything well. But I do remember well that he had very detailed comments and questions---some of them had to do with priority of credit---and it was then I decided that Benoit was truly serious and had real curiosity for things: He was not content just to know their existence; he wanted to know details.

Since then, Benoit and I have had wide-ranging interactions. He has been kind to me on several occasions and I hope that he has found our interaction at least infinitesimally to his advantage. After he moved to Yale, we have spent many hours talking about many things, including science. I have seen him in happy and generous moods---also in moods of dejection and outright disgust. Through these years, if I have to name the constancy about him, it is that he has remained curious about science. He has sat next to graduate students in my lab at the computer terminal, asked them to change parameters of analysis of experimental data to see the results for himself. He has seen experiments when they were in progress and asked, "Do it again, let me see it better." This is quintessential Benoit. I hope he will remain as curious for many years to come.

By the way, about my 1982 letter to Benoit: Some years later, I mentioned it in my talk at the Gordon conference, and said something like, "Benoit may have forgotten about it." Benoit was in the audience. He interrupted me to say, "Not at all, but I didn't respond because the letter raised several profound questions and to answer them would have meant writing a new paper." I believe his response on both counts. I believe that Benoit's memory is phenomenal and that he can recall things whenever he needs them. I believe

that Benoit rarely allows negative results to dampen his creativity. Because he knows he is right. And quite often, he is.

[1] K.R. Sreenivasan and C. Meneveau, “The fractal facets of turbulence,” *J. Fluid Mech.* **173**, 357-386, 1986. In the acknowledgments of the paper, I wrote: “...[thanks] to Benoit Mandelbrot for commenting on the manuscript, and for providing the necessary impetus in the early stages of this work by refusing to believe KRS’s negative conclusions of that time...”