BOOKS & ARTS

A man of magnitude

Charles Richter developed the scale for measuring earthquakes.

Richter's Scale: Measure of an Earthquake, Measure of a Man
by Susan Elizabeth Hough
Princeton University Press: 2007. 336 pp. $27.95, £17.95

Gregory C. Beroza

The cover of *Richter's Scale* by Susan Hough features an early photograph of Charles Richter looking like a grown-up Harry Potter. Like much of the rest of this biography, it reveals an unfamiliar side of the scientist famous for developing the first magnitude scale for earthquakes in 1935.

Until now, younger seismologists have known of Richter's life primarily by word of mouth. This has led to a rather uneven treatment. For example, I have been told many times that Richter was an avid nudist, but I was unaware that he was an alumnus of the Stanford University physics department. As Hough's biography repeatedly makes clear, there is much more to this intensely private and extremely complicated man.

Hough, a seismologist at the United States Geological Survey in Pasadena, California, brings a distinctly scientific approach to her writing, systematically presenting the data, learning what she can from it, and stating the uncertainties and non-uniqueness in her interpretations. Her data include Richter's personal and professional papers from the archives at the California Institute of Technology, his poetry (he was a dedicated writer of verse) and interviews with those who knew him.

The book chronicles the many difficulties in his family life, which at times are so tortuous that they are hard to follow. It also covers his many idiosyncrasies and indiscretions. In exploring the latter, Hough extrapolates somewhat to infer both Richter's intentions and his actions. This leads her onto shaky ground, and at times feels uncomfortably invasive, but she is careful to express both her reasoning and the uncertainty in her interpretations. She speculates that much of Richter's behaviour could be explained by Asperger's syndrome, a form of autism — a diagnosis that was not available during his lifetime.

The biography shines brightest in its treatment of scientific matters. It may come as some surprise that, among seismologists, there is a notion that Richter is more famous than he ought to be. Why and how do scientists become famous? In the case of seismology, earthquakes provide opportunities for scientists to speak to a wide audience. Richter clearly took advantage of this platform to promote an awareness of earthquake hazards. However, there can be a fine line between public outreach and self-promotion. *Richter's Scale* explores these issues, which transcend any single discipline, and sets the record straight in Richter's case.

CALTECH SEISMOLOGICAL LAB.

Charles Richter and the measurement of quakes: a portrait of the young seismologist in his 'Harry Potter' days.

Conventional wisdom holds that credit for developing the magnitude scale ought to rest equally with Richter and Beno Gutenberg, a colleague of Richter's at Caltech who is recognized as one of the giants of seismology. Hough persuasively argues that credit for developing the first earthquake magnitude scale rightly belongs to Richter. She also conveys a sense of what an undertaking it must have been to establish an earthquake magnitude scale given technological limitations of the 1930s. The development of subsequent magnitude scales that can be applied more generally, and their interpretation in terms of the energy released in earthquakes, was clearly a collaborative effort, with Gutenberg taking the lead role. The unfortunate practice of referring to all magnitude scales as 'the Richter scale' contributes to the perceived slight of Gutenberg.

Magnitude scales are not the be-all and end-all of seismology. What about Richter's wider contributions? Here too, Hough makes a case that he has been underappreciated. Richter was a full partner in the systematic studies of wave propagation and global earthquake activity that led, in addition to journal publications, to Gutenberg and Richter's seminal *Seismicity of the Earth and Associated Phenomena* (Princeton University Press, 1954). Richter also wrote his own landmark textbook, *Elementary Seismology* (Freeman, 1958). An understanding of the relative frequency of large and small earthquakes and the implications for earthquake risk are first expressed in Richter's original paper on magnitude in the *Seismological Society of America Bulletin* in 1935, but it was nearly a decade before he and Gutenberg quantified this observation and published their result.

Hough's book concludes with a draft of the speech Richter planned to give at his retirement. The speech serves as a metaphor for his hidden life, covering a wide range of topics in science, the arts, history and philosophy. Its seismological aspects are preoccupied with seismic risk reduction, an activity Richter championed in the latter part of his career. His comments are clearly, if somewhat bluntly, stated. He never delivered the speech, however, owing to his discomfort at the way his retirement party played out, so most of his colleagues remained unaware of the scope of his thoughts and interests. *Richter's Scale* will change this. It reveals Richter to be an individual with more than his share of flaws, but also as an iconoclastic scientist worthy of his fame and of our admiration. ■

Gregory C. Beroza is in the Department of Geophysics, Stanford University, Stanford, California 94305, USA.