

Book Review

Breathing Life into Crystals

Crystals and Life: A Personal Journey

By Cele Abad-Zapatero

La Jolla, CA: International University Line (2002).

290 pp. \$24.50

Although pictures of biological molecules can be taken as works of art, the science that produces them remains obscure to outsiders—even to many fellow scientists. Undaunted, we crystallographers plow on, trying to explain our arcane science to family and friends and to our colleagues. Surely, I think, my metaphor of X-ray diffraction as vision with computer lenses will get the idea across. Brändén and Tooze felt compelled to give a biologist level description in their *Introduction to Protein Structure*. Perutz presented a treatment entitled *Diffraction without Tears* in his 1992 book *Protein Structure: New Approaches to Disease and Therapy*. The urge is inescapable.

For some years now, crystallographers and structural biologists have been entertained with occasional essays from an avocational newsletter columnist, Cele Abad-Zapatero. Now, adding a few new chapters to fill out his story, our author brings his essays together in *Crystals and Life: A Personal Journey* for a cohesive and evocative treatment of biological crystallography. Just as these were not ordinary essays, the book is no ordinary treatise. Cele aspires to communicate the discoveries and wonders of crystallography to the “educated lay person” in a lively, inspirational, and even poetic form. He does so in a most remarkable mix of science and the arts, of pure and applied, and of technical and personal.

The book comprises 27 essays arranged neatly into textbook-like sections: Basic Elements of Crystallography; Symmetry and Properties of Protein Crystals; From Data to Electron Density Maps; Protein Structure, Model Building, and Refinement; New Technologies; and Future Perspectives. But the resemblance to a textbook ends there. The essays themselves are masterfully written excursions of fancy given intriguing titles such as *These Naughty, Naughty X-Rays*; *Can Crystals Cry?*; *The Combs of the Wind: Unweaving the X-Ray Rainbow*; *Only Refined Structures Go to Heaven*; *Cathedrals and Synchrotrons for the 21st Century*; and *The 1.8 Å Structure of Scientific Revolutions*. They are laced with historical anecdotes, references to family and Spain, allusions to music and poetry, personal encounters and tributes, and countless similes and metaphors. They are authoritative, yet have an easy, conversational style. And they are nicely illustrated.

Does this book succeed? It certainly does in providing sheer intellectual delight: what fun to learn about symmetry through the visit by Escher to the Alhambra of Granada. How great to learn about α helices and β sheets as a curious migrant worker (our own Cele) observes a spider's web in a Bordeaux vineyard. It also does in eliciting feelings: one cannot help being moved

by the story of precious Christmas gifts uncovered for the Abad-Manterola children. Who wouldn't be touched by the unvarnished admiration for a mentor pictured in the homage to Rossmann. This is indeed a “personal journey.” Whether it succeeds in educating a general audience needs to be answered by a receptive lay person. My guess is that the concepts of reciprocal space and the phase problem will still elude many, but then again, I should not dismiss lightly the power in a sheet of Love stamps.

Cele Abad-Zapatero is a romantic and a visionary. His keen observations and fabulous cultural repertoire truly do breathe life into crystals. His colorful book will fascinate anyone interested in nature and discovery. More importantly, it is must reading for crystallographers. Armed thereby with Cele's images and analogies, we will each emerge better prepared to communicate the crystallographic story.

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