



The spark that ignited Nicolaus Copernicus' interest in the positions of heavenly spheres remains a mystery.

ASTRONOMY

Recasting the heavens

Dava Sobel mixes fact and fiction to great effect in her biography of Copernicus, finds **Owen Gingerich**.

Nicolaus Copernicus (1473–1543) was a quintessential unifier. He gathered the planets around a central Sun, thereby inventing the Solar System. The grand challenge facing biographers of Copernicus is that few personal details survive. Was he gregarious? Did he have a girlfriend in his youth? When did he become interested in the stars? Because the historical record answers none of these questions, some authors have resorted to fiction. In *A More Perfect Heaven*, science historian Dava Sobel has it both ways.

The first third of the book is strictly historical. It traces Copernicus's life from his birth in Polish Toruń, to his undergraduate studies in Kraków and graduate work in Italy, and to his career as a legal, medical and administrative officer in the northernmost Catholic diocese of Poland. Sobel makes particularly effective use of the records surviving from when Canon Copernicus was the rent collector for the Frauenburg cathedral chapter's vast land holdings. To fill the narrative, she occasionally quotes from John

“The grand challenge facing biographers of Copernicus is that few personal details survive.”

Banville's novel *Doctor Copernicus* (W. W. Norton, 1976), but always makes clear that those reconstructions are not taken from archival sources. What Sobel achieves is a brilliant chronological account — the best in the literature — laying out the stages of Copernicus's administrative career.

Having reached Copernicus's final years, when publication of his still unfinished manuscript seemed to have stalled, Sobel takes a new tack. She inserts a play in 2 acts and 17 scenes, with 6 characters. Besides Copernicus, there is the ailing and rabidly anti-Lutheran bishop, Johannes Dantiscus. And there is Tiedemann Giese, a more liberal bishop of the adjacent diocese, who is Copernicus's confidant. The play opens with a young mathematics teacher from Lutheran Wittenberg, Georg Joachim Rheticus, literally stumbling in to seek an audience with Copernicus. True to the historical record, Rheticus finally persuades the ageing canon to allow a copy of his manuscript to be taken to Nuremberg for printing. The penultimate scene brings the printed pages of *De Revolutionibus Orbium Coelestium* (*On the Revolutions of the Heavenly Spheres*) to the astronomer's deathbed. In contrast to this reasonably well documented event, the final fictional scene shows Rheticus turning up at Copernicus's funeral, and receiving as a gift the original manuscript.

The invented scenes paint vividly the peril that faced a young Lutheran

➔ NATURE.COM

A museum of Copernicus's instruments: go.nature.com/gz4jnx



A More Perfect Heaven: How Copernicus Revolutionized the Cosmos

DAVA SOBEL
Walker/Bloomsbury:
2011. 288 pp.
\$25/£14.99

homosexuality. Sobel's literary handling of these issues gives a dramatic punch to an otherwise colourless encounter between Copernicus and Rheticus, his only student — an encounter that was crucial to placing the heliocentric cosmology on the world stage.

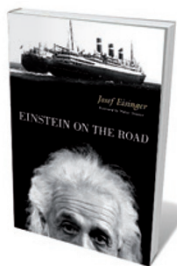
The final third of the book returns to documented history, tracing the aftermath of the 1543 publication of *De Revolutionibus*, which led to the insights of Johannes Kepler and Galileo Galilei, and the eventual acceptance of the Copernican system. The wonderful detail and eloquent writing that Sobel demonstrated in her best-selling *Longitude* and *Galileo's Daughter* carry the reader along here too. Given what she has chosen to include, the book is first rate.

What *A More Perfect Heaven* does not include are questions that have puzzled historians of science for many decades. What triggered Copernicus's interest in the radical heliocentric arrangement? "With a wave of his hand, he had made the Earth a planet and set it spinning," she writes elegantly. There is, however, barely a clue as to what *De Revolutionibus* contains, or how one might use it to calculate positions of the Sun and the planets. Nor is there much about Copernicus as an observer. His manuscript contained only 30 or so new observations, but they are crucial points for establishing the parameters of the planets' orbits, and Copernicus had to wait for years before some of the desired astronomical configurations took place.

A More Perfect Heaven is a charming and accurate book, although it omits much of the technical background in which earlier accounts revelled. Still, this carefully constructed biography leaves space for those of us probing the origins of heliocentrism to defend our speculations. ■

Owen Gingerich is professor emeritus of astronomy and history of science at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, USA.
e-mail: ginger@cfa.harvard.edu

Books in brief



Einstein on the Road

Josef Eisinger PROMETHEUS 270 pp. \$25 (2011)

The 1920s and early 1930s saw Albert Einstein gripped by wanderlust. Prompted by Germany's political upheaval and a curiosity about other cultures — as well as a liking for contemplation on the high seas — the scientific celebrity roved from Japan to Uruguay and from California to Britain, encountering such luminaries as Charlie Chaplin, Niels Bohr, Edwin Hubble and Franklin Delano Roosevelt on the way. Einstein's travelogues form the core of physicist Josef Eisinger's portrait, an account that brings to life the artistic and scientific revolutions that were then in full swing.



The Darwin Economy: Liberty, Competition, and the Common Good

Robert H. Frank PRINCETON UNIVERSITY PRESS 256 pp. \$26.95 (2011)

The premise of economist Adam Smith's 'invisible hand' — a tenet of market economics — is that competitive self-interest shunts benefits to the community. But that is the exception rather than the rule, argues writer Robert H. Frank. Charles Darwin's idea of natural selection is a more accurate reflection of how economic competition works, he says, because individual and species benefits do not always coincide. Highlighting reasons for market failure and the need to cut waste, Frank argues that we can domesticate our wild economy by taxing higher-end spending and harmful industrial emissions.



Fascinating Mathematical People: Interviews and Memoirs

Edited by Donald J. Albers and Gerald L. Alexanderson PRINCETON UNIVERSITY PRESS 352 pp. \$35 (2011)

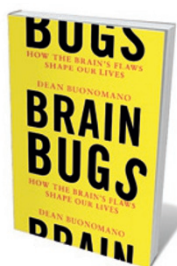
What do a Beatles expert, a professional magician and a Los Angeles dentist have in common? If they're Joseph Gallian, Arthur Benjamin and Leon Bankoff, it's mathematics. The words of these and other researchers, mentors and teachers in the maths community feature in this compilation by educator Donald Albers and mathematician Gerald Alexanderson. There is much to relish in these accounts — not least geometer Thomas Banchoff's friendship with Salvador Dalí, who explored the nexus of atomic science, maths and art late in life.



The Art of Medicine: Over 2,000 Years of Images and Imagination

Julie Anderson, Emm Barnes and Emma Shackleton UNIVERSITY OF CHICAGO PRESS 256 pp. \$50 (2011)

Portrayals of our grapplings with disease pop up throughout history. Medical historian Julie Anderson, with science communicators Emm Barnes and Emma Shackleton, survey a range of works from London's Wellcome Collection that highlight medical practices, including paintings, anatomical drawings, scrolls and digital art. Two millennia of visual exploration from cultures such as ancient Persia and Renaissance Europe provide a stunning overview of how ideas about healing the body and mind have evolved.



Brain Bugs: How the Brain's Flaws Shape Our Lives

Dean Buonomano W. W. NORTON 240 pp. £16.99 (2011)

Neurobiologist Dean Buonomano reframes the brain as a glitch-ridden lump of neural 'wetware' that often gets in the way of well-being. Information saturation in the man-made environment may threaten to overwhelm our brains' capabilities. But by getting to grips with its 'bugs' — including a vulnerability to advertising, gambling, fears, phobias and beliefs, an unreliable memory and a predilection for immediate gratification — we can uncover solutions to strengthen key mental functions, he says.