J. KING-HOLMES/SPL

BIOGRAPHY

From grasshopper to grand old man

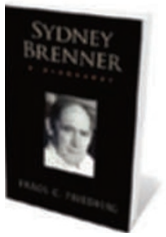
Jonathan Hodgkin enjoys a life story of Sydney Brenner, one of the fathers of molecular biology.

Molecular biologist Sydney Brenner has always exceeded expectations. At the age of 83, after more than 60 years in research, he continues to inspire, provoke and entertain. Brenner, who published his memoir *My Life in Science* (BiomedCentral) in 2001, is now the subject of a biography by biologist Errol Friedberg. *Sydney Brenner: A Biography* is a dutiful and admiring account of an unconventional life, enormous scientific contributions and a fascinating personality.

Brenner grew up a cobbler's son in South Africa. Having published his first scientific paper on histochemistry at the age of 18, he qualified with a medical degree in 1951 from the University of the Witwatersrand, Johannesburg, and moved to the University of Oxford, UK, to pursue a DPhil in bacterial and bacteriophage genetics. On a visit to the University of Cambridge's Cavendish Laboratory in 1953, he saw James Watson and Francis Crick explain their revelatory DNA model. Recognizing Brenner's extraordinary talent, Crick recruited him three years later as one of the founding members of what became the UK Medical Research Council's prestigious Laboratory of Molecular Biology (LMB) in Cambridge. The two scientists shared an office for 20 years.

Over the next decade, Brenner made a series of fundamental contributions to molecular biology, including the concept of messenger RNA, the theory of mutagenesis and the nature of the genetic code and its decipherment. In the 1960s, Brenner began the project for which he is best known — the use of the nematode worm *Caenorhabditis elegans* as a model system for investigating development and neurobiology. This work won him a share of the Nobel Prize in Physiology or Medicine in 2002, with his disciples Robert Horvitz and John Sulston.

Today, *C. elegans* is a stellar model organism that still attracts new researchers and garners Nobel prizes. But Brenner rapidly moved on, pushing the development of gene cloning technology and contributing to ethical debates about genetic engineering. As one of the conveners of the historic 1975 conference at Asilomar in California, he provided rational arguments against the purported dangers of recombinant DNA and stressed the value of biological containment as a form of insurance against these hypothetical risks.



Sydney Brenner: A Biography
ERROL C. FRIEDBERG
Cold Spring Harbor Laboratory Press: 2010. 334 pp. $39

In 1979, Brenner accepted an appointment to become director of the LMB — a decision he describes as the biggest mistake of his life. Whereas the original chairman, Max Perutz, had largely succeeded in balancing the conflicting demands of a group of scientific prima donnas, the irreverent and abrasive Brenner was more impatient with human and administrative issues. He also inherited a difficult situation: financial and scientific tensions arose between the Medical Research Council and its flagship laboratory, and various personal tensions rattled within the LMB itself.

Brenner's directorship ended prematurely in 1986. He then decamped to the separate Molecular Genetics Unit run by the Medical Research Council, where he tried to set up a large-scale programme for sequencing human complementary DNA — the protein-coding part of the human genome. More successfully, he launched a project to sequence the ultra-compact genome of the pufferfish, *Fugu rubripes*. This arguably became the most cost-effective of all the large genome projects in terms of useful information for money spent.

After reaching the formal UK retirement age of 65 in 1992, Brenner moved much of his research activity to various sites in California. He became increasingly peripatetic, flying between the far-flung outposts of the Brenner research protectorate. Time spent ruminating in the stratosphere has its compensations: he claims that travelling first class is a good way to get first-class thoughts.

In the past decade, Brenner's status as an

international scientific guru and his love of new projects have seen him act as an adviser to three major scientific ventures: Singapore's Biopolis, the Okinawa Institute of Science and Technology in Japan and the Howard Hughes Medical Institute's Janelia Farm campus in Virginia. These projects all seek to do adventurous interdisciplinary research and have budgets large enough to attract talented scientists.

Brenner never stops talking, thinking and making jokes, on every subject. This makes him exciting, if not easy, to be around, especially for the thin-skinned. Brenner's style is not to everyone's taste, as Friedberg shows with a heated exchange of letters between Brenner and another scientist about an unnamed junior researcher. There are also perils in his being such a scientific grasshopper — his transient fancies have sometimes sent hapless students off on doomed projects. Brenner's most productive partnership was with Crick, who could pick out the jewels from the endless stream of wild thoughts, witticisms, projects and experiments.

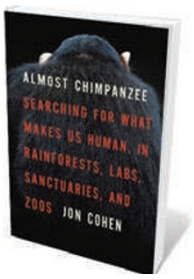
Friedman makes a few errors in science, dates and names; he also gives a misleading impression of how Brenner and his projects were seen initially. The *C. elegans* work was viewed with scepticism, nationally and internationally, despite its power to entrance young scientists — myself included. Friedman skates over some other contentious episodes and failures in Brenner's career. For example, his close friendship with Victor Rothschild, another charismatic polymath, is described without mention of Brenner's consequent endorsement of the 1971 Rothschild Report, which was a misbegotten attempt to impose contract research on UK science. Some successes are also omitted, such as his recent work on elephant shark DNA, which has revealed ancient features of the vertebrate genome — and echoes his first research animal, the South African elephant shrew.

"Brenner never stops talking, thinking and making jokes, on every subject. This makes him exciting, if not easy, to be around."

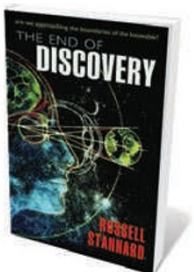
No biography could contain all of Brenner's provocative, funny and acute remarks. But enough are included, and the photographs do justice to Brenner's wild eyebrows and penetrating gaze. Friedberg wisely quotes others, notably fellow Nobel-prizewinner François Jacob, to provide the most vivid descriptions of his extraordinary subject. ■

Jonathan Hodgkin *is a professor of genetics in the Department of Biochemistry, University of Oxford, South Parks Road, Oxford OX1 3QU, UK.*
e-mail: jonathan.hodgkin@bioch.ox.ac.uk

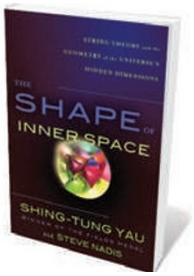
Books in brief



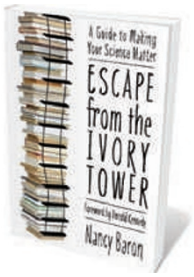
Almost Chimpanzee: Searching for What Makes Us Human, in Rainforests, Labs, Sanctuaries, and Zoos
Jon Cohen TIMES BOOKS *384 pp. $27.50 (2010)*
Science journalist Jon Cohen explores the ties between humans and our ape cousins. He visits labs, forests and zoos to give a frank and captivating account of the evolutionary parting of ways of the two species. Cohen argues that differences between apes and humans, rather than similarities, offer the most scope for discovery. Using the chimpanzee genome as his starting point, he asks why humans have bigger brains, walk upright on two limbs and have unusual immune systems, mating habits and longevity.



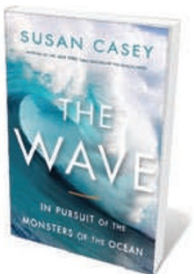
The End of Discovery: Are We Approaching the Boundaries of the Knowable?
Russell Stannard OXFORD UNIVERSITY PRESS *224 pp. £14.99 (2010)*
Scientific progress has a limit, according to physicist and broadcaster Russell Stannard. Some barriers are practical: it is impossible to build a particle accelerator the size of our Galaxy to reach the high energies he contends are needed to test string theory. Other fundamental problems — such as understanding consciousness or the Big Bang — are, he feels, inherently intractable. Stannard suggests we are living in a special age of scientific discovery that, like all good things, must come to an end.



The Shape of Inner Space: String Theory and the Geometry of the Universe's Hidden Dimensions
Shing-Tung Yau and Steve Nadis BASIC BOOKS *400 pp. £20 (2010)*
Physicists investigate one cosmos, but mathematicians can explore all possible worlds. So marvels Fields medallist Shing-Tung Yau in his memoir, co-authored by science writer Steve Nadis. Relating how he solved a major theoretical problem in string theory in the 1970s, Yau explains how the geometries of the vibrating multidimensional strings that may characterize the Universe have implications across physics. In pursuing these hidden geometries, Yau says that he seeks only mathematical beauty and truth.



Escape from the Ivory Tower: A Guide to Making Your Science Matter
Nancy Baron ISLAND PRESS *272 pp. $27.50 (2010)*
Communications trainer Nancy Baron offers practical advice for scientists on how to deal with politicians and journalists across all types of media. Drawing on her background in biology and journalism, Baron has used her workshops to transform many nervous scientists into spokespeople who are confident in front of a camera. When sticking up for their science, researchers should try to convey solutions to problems and embrace criticism, she suggests. She also describes how to survive in the aftermath of publicity.



The Wave: In Pursuit of the Rogues, Freaks and Giants of the Ocean
Susan Casey RANDOM HOUSE *352 pp. $27.95 (2010)*
Rogue waves large enough to scupper ships were once the stuff of seafaring myth, but are now settled in fact. Journalist Susan Casey illuminates the work of scientists who study tsunamis and giant ocean waves, noting that the physics of these freak swells is far from solved. Casey also follows surfer Laird Hamilton, who has pioneered techniques for riding extreme waves. She reminds us of their immense power and potential for energy production.