

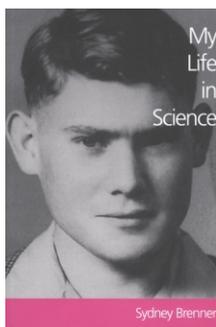
## My Life in Science

by Sydney Brenner

BioMed Central Limited, 2001.

\$22.10 pbk (191 pages)

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I first met Sydney Brenner at a Symposium in the USA at the beginning of the 1950s. Short and broad of back, this character seldom went unnoticed. His squarish head, his blue eyes beneath blond brows, enormous, hirsute, shaggy, he resembled certain Dutch portraits – a real Franz Hals! But behind his slightly sarcastic manner and even devilish aspect, his smile revealed a child's face. Born in South Africa, he had settled in Cambridge University's Laboratory of Molecular Biology, already home of Fred Sanger, Max Perutz, John Kendrew and Francis Crick. A beautiful string of prima donnas into which Sydney fitted perfectly.

As soon as he appeared on the scene, Sydney took part in almost every advance in molecular biology. He was involved in the establishment of colinearity between gene and protein, in the demonstrations of the triplet nature of the genetic code, in the discovery of messenger RNA. And when he decided to switch from bacteria to metazoa, he 'invented' the nematode, a small worm of which he analysed both genetics and anatomy. As quick with his mind as with his hands, he was interested in everything. In addition, he had a good sense of humour, which could sometimes turn to nasty wittiness.

Scientists' autobiographies are a special kind of literature, for scientists can rarely bring themselves to discuss personal matters. They describe an orderly train of concepts and experiments that they have carefully purified from all affective and irrational dross. They get rid of any personal scent, any human smell. Very few scientists – Jim Watson, Max Perutz – dare to write a piece on life that is not restricted to work. Scientists spend most of their life in puzzlement and doubt. Yet they describe their work as a straightforward achievement, a victorious march from darkness to light. In reality, they

hesitate, stumble, feel their way, question themselves constantly. They go from hope to disappointment, from exaltation to melancholy, always wondering whether they will emerge from the dark. Scientists write mainly for their fellow scientists and, above all, for historians of science. Historians of science, however, mistrust scientists' autobiographies. They know that two scientists telling the same piece of history will not tell exactly the same story.

Like many of his colleagues, Sydney Brenner has written his 'scientific life'. He dissects and recalls with great care his major achievements and the steps he took to get to them. What I find most revealing in his account is the less scientific part; that is, the beginning of his life and the way he came to science. It is the story of a young Jewish boy, the son of Lithuanian emigrants who lived in a small town of South Africa. It is of the hard time he endured at school, where his small size attracted a lot of teasing and rough play. He said of himself, 'I grew up to be a professional coward. I would agree to anything not to get bullied'. But the exceptional talents of this small boy were soon recognized. He decided to become a scientist, and the beginning of the book describes how this remarkable boy became one of the most successful biologists of the century. The book is clearly and simply written. It is difficult to resist the fantastic drive and the intelligence of its leading figure.

*François Jacob*

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## Time, History and Belief in Aztec and Colonial Mexico

by Ross Hassig

University of Texas Press, Austin, 2001.

US\$ 18.95 pbk (xviii + 220 pages)

Scientific discoveries and innovations in the ancient world have frequently occurred in the service of religion. Historians and archaeologists have shown that, from China to Peru, early breakthroughs in mathematics, astronomy, engineering and other fields were initially put to use for ceremonial rather than utilitarian purposes. One major intellectual achievement of the ancient peoples of Mesoamerica (the Mayas, Olmecs, Aztecs and

other groups living in what is now Mexico and northern Central America) was the development of a series of calendars. Although some were ritual almanacs with little connection to the real world, other calendars were wonders of early empirical science. The Mesoamericans calculated the length of the solar year and the cycles of the moon, Venus and other planets with great accuracy. Scholars in the 19th and 20th centuries deciphered the workings of these calendars and showed how they were used to track rituals and cosmic time. In this book, ethnohistorian Ross Hassig argues that scholarly emphasis on the ritual aspects of the Aztec calendar and conceptions of time has obscured a more utilitarian function: imperial rulers manipulated the calendar for political purposes.

The Aztec year count, which recorded historical events, is the most significant calendar for Hassig's argument. Each year is designated by a number (between one and thirteen) paired with one of four symbols (rabbit, reed, flint-knife and house). He describes the relationship of this 52-year cycle to other major Aztec calendars (the 260-day ritual cycle and the 365-day annual calendar) and compares it to the Maya long-count (a continuous, non-repeating, count of days). The Aztec year count starts again every 52 years, an event celebrated by the New Fire ceremony. Whereas past interpretations have stressed the cyclical nature of the year count (any given year – for example, 2-reed – recurs every 52 years), Hassig emphasizes its linear dimension. Aztec pictorial histories (for example, section one of the *Codex Mendoza*) depict the year signs laid out in linear fashion, often running for hundreds of years. However, Hassig views the New Fire ceremony more as a device that linked successive 52-year periods into a chain than as a ritual of cyclical completion, the traditional interpretation.

Each city-state dynasty in central Mexico maintained its own 52-year count to record the deeds of its rulers, and individual calendars were not necessarily synchronized. Hassig argues that as the Aztec kings forged their tributary empire they deliberately manipulated the year count for political purposes. They moved the New Fire celebration from its traditional date of 1-rabbit to 2-reed and forced their subjects to adopt a common year count and annual calendar, presumably to coordinate imperial tribute payment. The change in date of the New Fire ceremony is well documented but the timing and reasons for the switch have been much debated. Hassig states his views on

this and other unresolved issues in Aztec calendrics and history, such as whether the Aztecs had leap years to synchronize their calendar with the solar year (he argues that they did, and proposes a novel mechanism) and whether individual city-state calendars were coordinated (he says that they were not until forced to do so by the empire).

Hassig's revisionist program includes both theoretical and empirical elements. Most studies of Mesoamerican calendars and history adhere to a theoretical approach that Hassig calls 'ideology-as-action' that is, religion and ideology determine behavior, and calendrical scholarship should focus on the internal workings of calendars and their symbolic aspects. Hassig proposes an alternative approach based on political economy, 'ideology-as-idiom,' in which religion and ideology justify, but do not determine, behavior. Studies of calendars should focus on their social and political uses, not their symbolism. Hassig argues that this approach has not been applied to studies of Aztec calendars and conceptions of time and history, and that the notion of linear – as opposed to cyclical – history has been 'ignored' by scholars. Contrary to this assertion, however, art historian Elizabeth Boone has published detailed analyses of the linear nature of Aztec historical thought (in her 2000 book, *Stories in Red and Black*<sup>1</sup>, and in articles back to 1992).

As a materialist I am in wholehearted agreement with Hassig's overall goals and approach. This type of revisionist history, in which political explanations are applied to phenomena previously interpreted in particularistic and ideological terms, is welcome. Nevertheless, I am uncomfortable with many of Hassig's specific arguments, largely because I am unable to assess their strengths and weaknesses. In part this is owing to his style of scholarship. Hassig identifies an important and unresolved issue, summarizes what the primary historical sources say, discusses the pros and cons of alternative interpretations of the data, and then states his preference. His exposition sounds logical and convincing but because he does not cite the relevant secondary literature, one would never know that a given topic (e.g., leap years and calendar synchronization) is the subject of considerable published scholarship and debate among specialists, many of whom draw on data and methods not presented by Hassig. Michel Graulich and Anthony Aveni, for example, have made fundamental contributions to the topics covered by Hassig, but he does not cite the relevant publications.

This failure does not make Hassig's arguments wrong, but the reader is prevented from evaluating them within the context of contemporary scholarship.

I am also disappointed by Hassig's treatment of archaeological data. He presents incorrect dates (which support his interpretations) for several key buildings, including the New Fire temple on Mount Huixachtécatl and the twin-temple pyramids of Tenayuca and Teopanzolco. Contrary to Hassig's assertions, these latter temples are dated quite firmly to the Early Aztec period (several centuries before the Aztec empire) and thus cannot possibly have had the imperial significance attributed to them by his model.

*Time, History and Belief in Aztec and Colonial Mexico* is an intriguing study with a fresh theoretical approach and many promising interpretations of Aztec history, time and calendars. However, to be assessed properly, Hassig's interpretations must be debated within the community of scholars working on these issues so that the strength of his arguments can be evaluated.

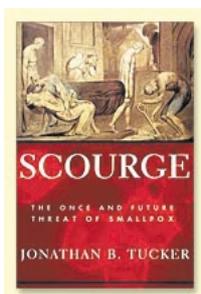
Michael E. Smith

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- 1 Boone, E. (2000) *Stories in Red and Black*, University of Texas Press

### Scourge: The Once and Future Threat of Smallpox

by Jonathan B. Tucker  
Atlantic Monthly Press, 2001



The smallpox vaccine I received as a child left a small scar on my upper left biceps. Eventually, the scar faded away. So did my immunity to smallpox. Therein lies a serious problem.

Routine vaccinations against the smallpox virus ended two decades ago. The horrible disease had been eradicated worldwide, so why continue to vaccinate people? Today, there are 6 billion people on Earth, and all of us are susceptible to the smallpox virus. The natural disease is gone, but the virus lives on, locked away in freezers in the U.S.

and Russia. What if it got out? What if someone let it out?

Jonathan Tucker, director of the Chemical and Biological Weapons Nonproliferation Program at the Monterey Institute of International Studies in California, lays out the entwined history of smallpox and humanity in his latest book, *Scourge: The Once and Future Threat of Smallpox*. He recounts the battle to eliminate every single case of smallpox infection on earth, and the uncertain future of that vicious virus. By the time readers finish this book, they will likely be as worried as Tucker is. Smallpox is the viral sword of Damocles hanging over all our heads.

Some diseases are simple nuisances. Others are slow and insidious. Smallpox is acutely apocalyptic. The virus is highly contagious and highly lethal. Those it fails to kill outright are left disfigured or blind. And the bodies of the dead are as infectious as the dying. Centuries ago, this massive (for a virus), dumbbell-shaped microbe cut a genocidal swath through the New World when the conquistadors landed. Between 1492 and 1800, writes Tucker, the estimated native population of the Americas plunged from 72 million to 600,000. The Native Americans had never been exposed to smallpox or measles or, later, to the yellow fever virus that arrived with African slaves. Primitive firearms and cheap whiskey may have helped Europeans to enter the Americas, but smallpox broke down the door.

The accidental discovery of a primitive form of smallpox vaccination (called variolation) in the late 18th century gave people a glimmer of hope that the disease could someday be controlled. Widespread vaccination began in the 19th century, and compulsory vaccination programs in the 20th century rid the Western world of regular outbreaks and deaths. In 1958, then Soviet deputy minister of health Viktor Zhdanov made the first formal proposal to eradicate smallpox. It was a reasonable plan. There were only a few remaining endemic countries, but smallpox-free countries were still spending time and money to vaccinate their citizens and guard their borders against infected travelers.

D.A. Henderson, a physician in the U.S. Public Health Service, was handed the assignment. 'Suppose I refuse?' he asked his boss. His only choices were to resign or move to Geneva, Switzerland, and run the Smallpox Eradication Unit. Fortunately, he chose Geneva.

*Scourge* is good history because it can be read as the history of one man and the forces