



An engraving from 1705 showing a lamb-to-human blood transfusion.

MEDICINE

Blood feud

A history of early transfusions mixes experiment and ethics with Anglo-French rivalry, finds **W. F. Bynum**.

Modern blood transfusion is a wondrous mix of science and technology. It hinges on Karl Landsteiner's discovery in 1901 of the major human blood groups, which earned him a Nobel prize. He was also involved in the elucidation of the rhesus factor, important for understanding blood incompatibilities. Before Landsteiner, transfusion was a

lottery at best, and fatal at worst.

In the decades before Landsteiner, a few intrepid physicians occasionally resorted to transfusion, especially in obstetric cases in which the woman's loss of blood could be treated with a donation from her husband. It was always touch and go. But at least these physicians were performing human-to-human transfusion. Two centuries earlier,

animals, usually lambs, were used as donors.

In *Blood Work*, medical historian Holly Tucker looks at the beginnings of transfusion in the seventeenth century. Adding material from her own archival research to the standard historical account, she fleshes out the start of physiological experimentation and examines historical attitudes to blood.

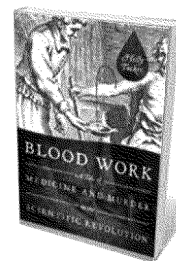
The result is a page-turning insight into early scientific attitudes and disputes over priority.

In the 1660s, she explains, the fellows of the newly established Royal Society of London began to transfer blood from one animal to another. This was part of investigations into the heart, blood, circulation and respiration, following William Harvey's seminal description of the circulatory system in 1628. The British group included Christopher Wren, Robert Hooke, Robert Boyle and Richard Lower, and their experiments were communicated throughout Europe by the secretary of the Royal Society, Henry Oldenburg, and published in the society's *Philosophical Transactions*.

Meanwhile, the French Academy of Sciences opposed transfusion, so the main innovator in France was a marginal but ambitious physician, Jean-Baptiste Denis. He, too, began with animal-to-animal work, but quickly moved on to transferring blood between animals and humans. At stake was more than whether foreign blood was curative — people believed that the characteristics of the chosen animal might alter human personality.

The docile lamb was the donor species most often used, with its religious overtones (Agnus Dei, or Lamb of God). "The blood is the life," the Bible tells us, and seventeenth-century natural philosophers endowed that phrase with its full theological significance. Consequently, these were not simply experiments of curiosity; they were aimed at uncovering deeper meanings. That said, one of Denis's early subjects, a butcher, apparently took away his exsanguinated donor to roast.

The early human transfusion patients in both countries were generally treated for what was perceived to be lunacy or other psychiatric disabilities. The first English subject was an eccentric clergyman who liked to converse in Latin. He survived an infusion of about a third of a litre of lamb's blood.



Blood Work: A Tale of Medicine and Murder in the Scientific Revolution

HOLLY TUCKER
W. W. Norton: 2011.
304 pp. \$25.95

NATURE.COM
For a retrospective review of Fernel's *Physiologia*:
go.nature.com/83sfed

Although it did not cure his language preference, he was less agitated afterwards. So the procedure was thought to hold enough promise to be repeated a couple of weeks later.

Hopes were dashed when Denis transfused an agitated servant, Antoine Mauroy, with some calf's blood. The first two transfusions seemed to calm him. A third, insisted on by Mauroy's wife, was abandoned when the patient had a series of seizures. The next morning, Mauroy was dead, and was taken away for burial before Denis could perform an autopsy. The case came to trial, and although Denis was exonerated, Mauroy's wife was implicated in poisoning her husband. The results of her trial are lost, but a year later the French parliament prohibited transfusion of blood into humans. The English also lost heart until human-to-human transfusions were gingerly begun in the 1820s.

Tucker makes a reasonable (if circumstantial) case that one of Denis's medical opponents, Henri-Martin de la Martinière, supplied Madame Mauroy with poison to dispose of her violent husband, also putting paid to Denis's ambitions. De la Martinière was a colourful surgeon with a dark past involving pirates; he wrote vitriolic pamphlets against Denis and transfusion.

Tucker uses the competition between the French and English scientific societies as a window onto international rivalries during the scientific revolution. Claims over priority were at stake — being the first to successfully carry out a procedure mattered a great deal. In Paris, there was the additional tension between the Academy of Sciences, sanctioned by King Louis XIV, and the private groups that it effectively replaced. The fact that the French and English were at war during the 1660s adds spice to the story, as do London's 1665 plague outbreak and the Great Fire in 1666, which disrupted the early meetings of the Royal Society.

Tucker seeks to expose the passions and the pain behind physiological experimentation. Her narrative reads like a novel, marred only by occasional errors of fact and lapses into sensationalism. *Blood Work* is a powerful reconstruction of what has often been relegated to a minor episode within early modern science and medicine. ■

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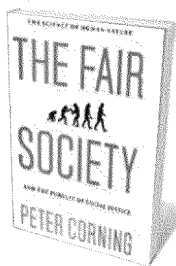
Books in brief



In The Plex: How Google Thinks, Works, and Shapes Our Lives

Steven Levy SIMON & SCHUSTER 432 pp. \$26 (2011)

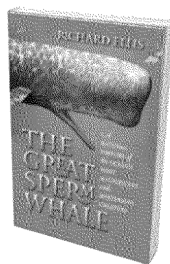
Expanding beyond its early dominance of the search-engine market, Google has shifted gears many times since it began as a small start-up firm in Silicon Valley, California. Yet the company clings to its image as a creative hub. Technology writer Steven Levy gives an upbeat account of life inside the Googleplex campus, where hand-picked workers are able to devote up to 20% of their time to self-generated projects. He explores the next frontiers for the company, such as cloud computing and social networks, and examines its controversial decision to enter China.



The Fair Society: The Science of Human Nature and the Pursuit of Social Justice

Peter Corning UNIVERSITY OF CHICAGO PRESS 256 pp. \$27.50 (2011)

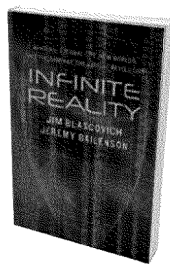
Evolution is often reduced to the survival of the fittest, yet that does not mean we should trample on others to get ahead. We have an innate sense of fairness, argues complex-systems biologist Peter Corning in his book, which draws on our evolutionary history and the science of human nature. For the benefit and well-being of all, he proposes that society should adjust its political and economic priorities toward fairness. We should adopt a new 'biosocial' contract, which promotes the principles of equality, equity and reciprocity.



The Great Spermin Whale: A Natural History of the Ocean's Most Magnificent and Mysterious Creature

Richard Ellis UNIVERSITY PRESS OF KANSAS 432 pp. \$34.95 (2011)

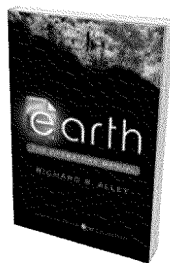
Just as the sperm whale inspired Herman Melville's 1851 book *Moby Dick*, it has long fascinated writer Richard Ellis. Here he devotes a whole volume to the giant creature, which he notes has stalked the chapters of his other books on marine life, from giant squid to tuna. Using his own elegant illustrations, Ellis discusses the sperm whale's evolution and biology, its migrations, diet and breeding. He also considers its impact on myths about sea monsters, and the whaling that has decimated its numbers over two centuries.



Infinite Reality: Avatars, Eternal Life, New Worlds, and the Dawn of the Virtual Revolution

Jim Blascovich and Jeremy Bailenson WILLIAM MORROW 304 pp. \$27.99 (2011)

Online environments are becoming ever more convincing and pervasive. Psychologists Jim Blascovich and Jeremy Bailenson ask how our brains cope with virtual reality. Describing the emerging technologies and what they say about us, the authors point out how our interactions are mostly driven by age-old impulses to search for new experiences and deeper perspectives on ourselves. They argue that in that sense, virtual reality is just an extension of humanity.



Earth: The Operators' Manual

Richard B. Alley W. W. NORTON 479 pp. \$27.95 (2011)

In a book to accompany a PBS documentary, climate scientist Richard Alley charts our expansive need for energy sources and the damage that fossil fuels are wreaking on our planet. Setting out the scientific facts clearly for the layperson rather than pushing particular solutions, he explains how we have come to be dependent on coal, oil and gas; points out the impact of greenhouse-gas emissions; and details the choices that will eventually have to be made over alternative forms of energy production.