King of Hearts: The True Story of the Maverick Who Pioneered Open Heart Surgery (review)

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of new diagnostic technologies, for example—he does not systematically review such factors, so that it is difficult to know why "biology matters" more than "society" or "culture." Furthermore, the strength of his claim that we need to return to biology is undermined by contradictions within his own analysis. His assertion that biology matters is based on a review of historically specific medical and scientific knowledge that he himself accepts may be socially shaped, and he notes that the biological changes he describes for the eighteenth and nineteenth centuries must remain speculative (p. 1).

Finally, despite the author's claim to situate the history of rheumatic fever solidly in its social context, the book focuses on medical achievement (or the lack of it) at the expense of those most affected by the disease. While hinting that patients had different priorities from their physicians, English tells us little about how they came to terms with their illness, or how medical knowledge of the disease shaped the patient's experience of it. These are the problems with his attack on social history. English's achievement is to provide the clearest account we have of changing clinical conceptions of rheumatic fever; a valuable history of the clinical management of this disease; and a useful account of the rise and decline of rheumatic fever as a medical phenomenon.

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G. Wayne Miller. *King of Hearts: The True Story of the Maverick Who Pioneered Open Heart Surgery.* New York: Times Books, 2000. xv + 302 pp. Ill. $U.S. 25.00; $Can. 38.00.

It is generally agreed that one of the great medical achievements of this past century was the development of safe open-heart surgery. The distinguished Viennese surgeon Theodore Billroth had stated in 1883 that "a surgeon who tries to suture a heart wound deserves to lose the esteem of his colleagues."[1] Even as recently as 1953, Billroth's admonition seemed to have a ring of truth. John Gibbon of Jefferson Medical College in Philadelphia had worked for almost twenty years to develop a safe, functional heart-lung machine. After one unsuccessful operation in 1953, he successfully corrected an atrial septal defect using his heart-lung machine in a fifteen-year-old girl. Tragically, Gibbon's next four patients did not survive surgery, and he was so despondent that he never again attempted open-heart surgery.

The pervasive feeling among thoracic surgeons and cardiologists in 1953 was that patients surviving open-heart surgery would require support on the heart-

1. Rudolf Nissen, "Billroth and Cardiac Surgery [letter to the editor]," *Lancet,* 1963, *2:* 250–51, quotation on p. 250.

lung machine for at least a week because of the presumed "sick heart syndrome." This, then, was the general feeling in the spring of 1954 when C. Walton Lillehei stunned the medical world with his successful repair of a ventricular septal defect in a three-year-old girl using the girl's parent as a *living* heart-lung machine. With this technique of cross-circulation, Lillehei carried out total correction of ventricular septal defect, tetralogy of Fallot, and atrio-ventricular canal in forty-five infants and young children; remarkably, two-thirds of these patients survived.

G. Wayne Miller does an exceptional job of describing the pioneering groundwork of Gross, Bailey, Harken, Lewis, and Gibbon leading up to Lillehei's monumental achievement. He then carefully details the remarkable successes and extremely discouraging failures that occurred during the fourteen-month period in the mid-1950s when Lillehei was the only surgeon in the world performing open-heart surgery. The era of Lillehei's cross-circulation ended in May 1955 when one of his residents, Dr. Richard DeWall, made a major breakthrough: the development of a safe, simple bubble oxygenator using disposable plastic tubing. The same surgeons who had come to watch Lillehei do cross-circulation returned to Minneapolis in 1955 to watch him repair these complicated defects using DeWall's bubble oxygenator. Most of these surgeons returned to their hospitals with DeWall's oxygenator and commenced their own open-heart programs. Within a very few years there were hundreds of open-heart programs around the world, all utilizing the bubble oxygenator and the new techniques they had first seen at the University of Minnesota Hospital. I had the privilege of participating as an intern on Lillehei's first cross-circulation case and then spending eighteen months in his cardiac research laboratory.

The depth and extent of Miller's research for this very complex story are impressive. He interviewed hundreds of individuals, including patients and their family members, members of Lillehei's surgical and research team, and cardiac surgeons from around the world. Most important, he had extensive discussions with Dr. Lillehei. It is surprising that for a topic as important as the development of open-heart surgery, there has been a paucity of books written for the general public. Miller's is assuredly the best to date. In addition to documenting Lillehei's remarkable achievements, he thoroughly covers the surgical events leading up to cross-circulation. He also describes, in excellent detail, subsequent landmark achievements such as heart transplantation and the development of the cardiac pacemaker.

The title of Miller's book hints that Lillehei, like many other "scientific groundbreakers," had personal traits and frailties that set him apart from mainstream surgeons. The final three chapters are devoted to the legal difficulties related to Lillehei's federal tax returns. His defense during this humiliating tax case was that he was too busy operating and lecturing around the world to keep precise financial records. His trial ended in the spring of 1973 with a guilty verdict and a fine of $50,000 and six months of community service. He regained his reputation, however, and his seventieth birthday was marked by a celebration at which scientific papers were presented by his trainees and other eminent surgeons from around the world; these papers were published as a festschrift

issue of the *Journal of Thoracic and Cardiovascular Surgery* (November 1989), the only time in seventy-five years that this journal devoted an issue to a living surgeon.

Miller does an outstanding job in telling the story not only of Lillehei the surgeon and Lillehei the man, but also of the life-and-death struggles of dozens of pioneering surgeons who were attempting to prove the fallacy of Billroth's statement. In this year 2001, more than one and a half million patients around the world will undergo cardiac surgery with a heart-lung machine. Most cardiac surgeons would agree that the man who made the greatest contribution to this specialty was C. Walton Lillehei.

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Peter J. Whitehouse, Konrad Maurer, and Jesse F. Ballenger, eds. *Concepts of Alzheimer Disease: Biological, Clinical, and Cultural Perspectives.* Baltimore: Johns Hopkins University Press, 2000. xx + 321 pp. Ill. $55.00.

The majority of essays that make up this extremely useful and informative collection are the result of a 1997 symposium held in Alois Alzheimer's birthplace in Marktbreit, Germany. Although parts of this book trace material familiar to specialists in each area examined, the volume as a whole provides a comprehensive overview of Alzheimer disease (AD) that is valuable for generalists as well as for historians of medicine. The book is divided into five sections, each focusing on a different methodological approach to AD. The first examines the cases of Alzheimer's original two patients. Based on recently discovered clinical records and examination of the first patient's brain, Konrad Meyer and his colleagues conclude that the tangles and plaques, with an absence of vascular lesions, make this a model for AD. In contrast Hans-Jurgen Möller and Manuel B. Graeber find that Alzheimer's second patient, Johann F. (1911), reveals "numerous plaques but no neurofibrillary tangles" (p. 44). This history opens the wider historical, clinical, and cultural questions discussed in the chapters that follow: Are there separate categories of AD that can be classified through histology? Should AD be seen as separate from senile dementia? Is the neuropathology and sign/symptom complex associated with senile dementia a separate disease when it occurs in relatively younger patients? Can a common condition of aging be classified as a disease?

The second section reviews the evolution of AD as a clinicopathologic entity. Heiko and Eva Braak's excellent discussion of neurofibrillary changes in AD provides a useful historical overview of the way that neuropathology has been understood in AD. Hans Förstl argues that the correlation between deficits and pathology in AD patients provides "a powerful argument for a spectrum of clinical and anatomical findings between pathology and normalcy," which "does