engineered policy, drafted and passed through the concerted efforts of a specific subset of physicians, the elite Regulars” of the Medical Society of West Virginia (156). Mohr also challenges the interpretation that medical licensing was a response to the growing complexity of scientific medicine. Because scientific medicine did not produce tangible therapeutic results until the 1930s, the push for medical licensing is also a consequence of economic and political factors, not strictly scientific ones. Finally, Mohr shows that the Supreme Court upheld a version of medical licensing that relied on the quality of a physician’s education as the only measure of competence, a system that led to the growth of a massive and costly medical malpractice system.

Mohr’s sources—newspapers, medical society records, personal papers, and legal documents—show clearly that the controversy surrounding medical licensing in West Virginia was more than a “local and specific . . . feud” of “idiosyncratic individuals.” *Licensed to Practice* is the story about a struggle “over nothing less than the future status of the medical profession in the United States,” a “battle” that “forced the nation’s Supreme Court to rule on how the relatively recent Fourteenth Amendment would impact occupational and professional regulation by the states” (155). Mohr’s effective blending of engaging narrative with cogent historical analysis makes this book a useful resource for historians of medicine, legal historians, as well as those interested in social history. But the book is also appealing to medical, legal, and regulatory professionals seeking a historical perspective on medical licensing, its impact on practice, and the implementation of public health in the United States. Mohr’s important contribution is sure to stimulate interest in this often overlooked but significantly important episode in American medicolegal and regulatory history.

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Don B. Olsen. *True Valor: Barney Clark and the Utah Artificial Heart.* Salt Lake City, University of Utah Press, 2015. 432 pp., illus. \$44.95 (cloth).

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Tough to argue that it did not take courage for patient, Barney Clark, to agree to be implanted with an experimental mechanical heart in 1982. He lived a remarkable 112 days with the artificial heart after his own diseased heart was removed. But Clark’s clinical experience was rocky, and he never left hospital. He battled seizures, respiratory problems, a broken heart valve, confusion, and clear mobility limitations due to

being tethered to a 418-pound, “big blue” power console. The media reported the case in great detail, rooting for Clark’s recovery and framing him as a hero for being the first permanently implanted artificial-heart patient. It was a significant case for its technological achievement as well as for the subsequent debate surrounding the issues of human experimentation, informed consent, patient autonomy, quality of life, and more.

Scholars Renee Fox, Judith Swazey, Barton Bernstein, Baron Lerner, and others have all weighed in on the meaning of this case, while the historical participants have largely restricted their analyses to the scientific literature. Comments over conference cocktails by many artificial-heart scientists imply that much has been missed or simply misunderstood about “what really happened” by those outside the field. This is what makes *True Valor* such an enticing read since it is written by artificial-heart researcher and veterinarian Don B. Olsen, who participated in Clark’s surgery and whose career spanned forty years with the Utah artificial-heart program.

Olsen tells a tale of “pioneering science,” drawing from University of Utah records as well as his own personal papers, to narrate a story of research perseverance, overcoming challenges, and the advancement of a life-saving technology. Throughout the five parts of this book, Olsen foregrounds the courage of two men: the selfless patient Barney Clark and the determined artificial-heart researcher Dr. Willem Kolff. Part 1 of the book is a short eighteen-page teaser, presenting snippets of the media attention, the experimental device, the patient, and the medical team on the eve of the historic surgery. Parts 2 and 3 narrate Kolff’s and Clark’s stories, respectively, leading up to the 1982 operation. In part 2, Olsen describes, with great admiration, Kolff’s determination and tireless efforts to secure research funding, to solidify university support, to attract talented researchers, and, by way of his leadership, to advance the field of artificial organs. Readers will learn that in Kolff’s lab, multiple heart devices were designed and abandoned, that there was much trial-and-error in the research process, and that constant problems of funding, space, equipment, and animals threatened the Utah program. Olsen writes about the tensions and clashes in the laboratory, much of it due to Kolff’s controlling, dictator ways, such as his hiring of Robert Jarvik over the objections of Olsen. In part 3, Olsen tells “Barney’s story,” describing Clark’s childhood, marriage, family, and World War II service. This section highlights Clark as an educated, active, professional, and family man, allowing the reader a view of Clark’s life before he became incapacitated with heart failure, and emphasizes those characteristics that, according to Olsen, served Clark well during the implant experience.

Part 4 addresses some of the challenges with animal research as well as the internal university tensions with the public regulatory agencies during the development of the Utah heart. Kolff hired Olsen to keep his research animals alive longer, which the veterinarian did. Olsen improved overall lab conditions for animal health, initiated a program of rotating “calf-sitters,” implemented closer pre- and postsurgery monitoring of the animals, and conducted full autopsies to identify device versus animal management problems. For Olsen, animal care was more manageable than several other

aspects of artificial-heart research. He rants about intrusive bureaucratic measures and aggressive business ventures that threatened the development of the Utah heart. The University of Utah Medical Center's Institutional Review Board (IRB) was one such hurdle, but it was Washington bureaucrats—the U.S. Food and Drug Administration (FDA) and the National Heart, Lung and Blood Institute (NHLBI)—which proved to be the toughest obstacle of all, according to Olsen. The animosity between Olsen and Jarvik escalated greatly when Jarvik took over the fledgling company of Kolff Associates, Inc., pursued a new business plan, and ultimately squeezed Kolff out. There is a missed opportunity here for a discussion on the business of device innovation, specifically the high risk and volatility of funding associated with the development of artificial hearts.

In part 5, Olsen describes the December 1982 operation, the patient's ensuing complications, and the continued artificial-heart work after the death of Barney Clark. There were no more permanent heart implants in Utah after Clark. The cardiac surgeon William DeVries performed three more Utah heart implants at Humana Hospital in Louisville, Kentucky, but Olsen was not involved. (There is an error on page 345; Jack Burcham, not Murray Hayden, died ten days after his implant.) In Utah, Olsen remained committed to developing the technology, confident that the device would be used clinically again despite harsh criticism. From the proceedings of the "After Barney Clark" assessment conference, Olsen cites large chunks of the published critical views with which he only minimally engages. Olsen states that many of the critics "pursued self-created controversies," that medical writer Gideon Gil's "doomsday predictions" were incorrect, and that historian Barton Bernstein "minimized the impact of the Clark impact" (347, 346, 356). Surely, the Utah research team could see some validity to the criticisms presented, but Olsen does not weigh in. Does Olsen see this conference as the reason why there was no second implant in Utah, or was it something else?

Overall, Olsen argues that the Utah group made significant contributions to the development of artificial hearts leading up to, and after, the well-known Barney Clark case. In reading this book, the reader gains one insider's view of this event, with tantalizing nuggets of personality clashes and research trial-and-error moments. Anyone interested in animal testing of experimental devices, early clinical cases, research team conflicts, or debated roles of IRBs and federal involvement in device innovation will find the Barney Clark case to be an interesting read. For Olsen, the Barney Clark case contributed to heart-failure treatment what "Orville and Wilbur Wright's first feeble flights at Kitty Hawk made to aviation" (395). Certainly, a milestone event in the development of artificial hearts, the Barney Clark case was a high-profile excursion on the way to an alluring but quite controversial destination.

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