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Richard A. Gabriel, *Between Flesh and Steel: A History of Military Medicine from the Middle Ages to the War in Afghanistan*. Washington: Potomac Books, 2013. Pp. ix, 301. ISBN 978-1-61234-420-1.

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The prolific popular historian Richard Gabriel has written another ambitious book¹ on an extraordinarily complex topic, this time synthesizing histories of medicine, military medicine, human biology, civil-military relations, military organizations, weapons technology, and military tactics. The purview of *Between Flesh and Steel* extends to Europe, North America, and Meiji-era Japan. Chapter 1 surveys the evolution of the weapons of warfare, discussing how technological change altered the conduct of war. The next six chapters provide discussions of developments in military medicine over five centuries. The eighth and final chapter proffers some concluding “Thoughts on War.”

Gabriel begins with the following paradox: as weapons have become more lethal, the mortality rate of warfare has decreased. He describes the evolution of weapons from the invention of gunpowder to nuclear fission, with the ensuing political and military implications. Missing, however, is any discussion of something as fundamental as wound ballistics. The reader is left with the impression that there is no difference between injuries caused by a musket ball, a Minié ball, and a high-velocity bullet; in fact, they inflict very different wounds in terms of both soft tissue damage and bone fragmentation.

Having set up his paradox, Gabriel next musters relevant information to make sense of the trends he identifies. As the co-author of a comprehensive review of the history of wound care,² I understand the range of approaches available to historians of military medicine. Should one proceed according to chronology, particular wars, the changing states of medical knowledge and practice (use of the tourniquet, aseptic technique, antibiotics, etc.) or military technology (firearms, automatic weapons, high explosives, etc.) or perhaps James Lind’s³ concept of “generations” of warfare?

Gabriel plumps for chronology, breaking his topic into century increments. But history does not flow in neat 100-year packets; the consequence here is that a disjointed narrative often obscures major trends. Amputation, for example, receives attention in the discussion of the seventeenth and nineteenth centuries, but not the eighteenth; it recurs in passing in the twentieth-century chapter in regard to vascular surgery, which drastically reduced amputations during Korean and Vietnam Wars, then gets no mention in the context of the twenty-first-century wars in Afghanistan and Iraq. Only the most diligent reader will grasp the changes and their implications of this particular procedure over the centuries.

The following excerpt gives a sense of the scope of Gabriel’s study:

Although a number of fundamental medical discoveries had been made in the previous [sixteenth] century, the application of this knowledge to military surgery was marginal at best. Wound surgery remained essentially unchanged from the Renaissance. The doctrine of necessary suppuration, long in vogue and buttressed by the still prevalent belief that gunshot wounds were inherently poisonous, led to the practice of attempting to remove the bullets with probes and extractors and increased the chances of infection. Standard surgical practice was not to close the wound but to widen it, allowing the wound to become infected and drain. Surgeons often placed bits of leather and cloth in a minor wound to bring on infection. Draining infected wounds did

1. A companion volume to his *Man and Wound in the Ancient World: A History of Military Medicine from Sumer to the Fall of Constantinople* (Washington: Potomac Books, 2011). It is similar in subject and scope to his *History of Military Medicine*, vol. 2: *From the Renaissance through Modern Times* (NY: Greenwood Pr, 1992), co-authored with Karen S. Metz.

2. M.M. Manring, Alan Hawk, Jason Calhoun, and Romney Andersen, “Treatment of War Wounds: A Historical Review,” *Clinical Orthopaedics and Related Research* 467 (2009) 2168–91.

3. *An Essay on Diseases Incidental to Europeans in Hot Climates* (London 1768).

not become standard practice until Dominique Larrey, the surgeon in chief of the Napoleonic Armies, helped establish it in the nineteenth century. (74)

But this analysis is problematic: dilation or spreading of a wound was performed to find and extract a bullet or an arrowhead. While removing a projectile and associated debris from a wound was sound practice, seventeenth-century surgeons had no concept of aseptic technique and the danger of wound contamination; they did not so much as wash their hands before surgery. They believed suppuration to be a natural part of the healing process, but, lacking any notion of infection, could not intentionally induce it in their patients. Gabriel correctly states that infection killed a majority of wounded patients in the period, but does not point out the limited antiseptic properties of the wine used to irrigate wounds or poultices containing honey and turpentine.

By the nature of this book, Gabriel must work with a broad brush; this leads to imprecision and outright errors. For example, the author praises the Prussian Army officer Janus Abraham Gehema (1647–1715) for critiquing contemporary military medical care as useless, dangerous, and barbaric, then observes that “in the Spirit of the day, however, he was ignored” (73). The problem, however, was not the “Spirit of the day,” but the fact that Gehema wrote not in Latin, but in German, a language unfamiliar to the learned classes of Europe in his day. Jonathan Letterman (1824–72), Medical Director of the Army of the Potomac during the Civil War, did not, as Gabriel claims, build his ambulance corps around the Ambulance Volante devised by Dominique Larrey (1766–1842) (169). Surgeons actually accompanied Larrey’s ambulances and performed operations on the battlefield before transport to a hospital; by contrast, Letterman’s ambulances, staffed only by enlisted hospital stewards and litter bearers, transported the wounded to hospitals where they then received their surgical treatment.

Though it conveys the gist of evolutionary patterns in the history of military medicine and is based on extensive research, lack of attention to detail vitiates the book’s usefulness as a reference tool. It is, finally, an ambitious attempt that sadly falls short.