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LESSONS FROM HISTORY

The Foundations of Wilderness Medicine: Some Historical Features

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The surgeons of the navies of the early days of western civilization – Greece, Rome, and the Italian city-states – were most likely the first practitioners of recognizable wilderness medicine. The teachings of Hippocrates and Galen ruled over the practice of medicine in Europe for centuries, but the steady evolution of understanding of the nature and causes of disease was starting to provide a useful foundation upon which to build by the turn of the 19th century. By 1800, nonetheless, the gap between medical theory and knowledge and the real ability to provide effective therapy was still enormous. However, the discovery of anesthesia in the 1840s and Joseph Lister's elucidation and application of the principles of asepsis in 1865 were major steps forward in the history of medicine. Many other improvements in civilian medical care relevant to wilderness medicine, though, have come about as a direct result of military medicine having to determine how to best keep people alive and well, often in very trying combat-related circumstances. The advancement of wilderness medicine has been closely connected to military exploration/operations throughout history, and not surprisingly, this remains in many ways as true today as it was a thousand years ago.

Key words: history, military medicine, infectious disease, wilderness medicine

Introduction

Readers of this article will have a fairly clear and common idea what they consider to be wilderness medicine as it has been known at least since the emergence of the Wilderness Medical Society in the 1980s. Many of us have come to consider wilderness medicine as healthcare that is practiced in the backcountry away from established medical facilities, front country care practiced under conditions of environmental (and other) duress such as the catastrophe—so recently front and center in our consciousness—produced by massive earthquake damage in Haiti, or healthcare provided anywhere (front country or backcountry) in which the physiologic insult has been primarily inflicted by environmental conditions.

However, let us consider what might have qualified as "wilderness medicine" in past centuries: namely, the healthcare that was performed beyond the boundaries of the existing civilized medical infrastructure. Certainly what passed as "civilized medical infrastructure" in ancient Greece or the Roman Empire might appear somewhat rough-hewn, to say the least, through the medical eyes of today. But of course history is most accurately and fairly judged in the context of its contemporary setting—to avoid the classic (and often revisionist) "apples and oranges" comparison of then vs now. As such, I would identify the surgeons of the navies of the early days of western civilization—Greece, Rome, and the Italian city-states—as the first practitioners of recognizable wilderness medicine. In fact, the advancement of wilderness medicine has been closely connected to military explorations and operations throughout history, and, not surprisingly, this remains in many ways as true today as it was a thousand years ago.

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Nautical Beginnings

Medicine Under Sail, Zachary Friedenberg's history on the subject,[1] is an often-overlooked aspect of the early history of medicine beyond the support of existing "civilized" medical infrastructure. Homer even used the *Iliad,* book 4,[2] to make reference to a medical naval incident in the Trojan wars. When Menelaus was wounded by a Trojan bowman, the fleet surgeon,

Machaon (son of Aesculapius, god of medicine) was called to treat the wound:

> Without delay he drew
> the arrow from the fairly fitted belt.
> The barbs were bent in drawing.
> Then he loosed the plate—the armorer's work—and carefully
> O'er looked the wound where fell the bitter shaft.
> Cleansed it from blood, and sprinkled over it
> with skill the soothing balsam of yore which
> the friendly Chiron to his father gave.

By the 11th century, barber-surgeons had taken on the tasks of naval surgery in the Mediterranean navies and came to be known as barbariers in Italy. The practice soon spread to English ships because of frequent contact through trade. Thomas Woodall (1569–1643) perhaps deserves the title of "Father of Marine Medicine,"[1] for he was ahead of his time with his observations of scurvy and views on the treatment of wounds, fractures, and amputations. Incidentally, Woodall's prescient understanding of scurvy was not taken seriously until the late 18th century. Even after James Lind's 1753 publication of *A Treatise on the Scurvy,*[3] many still remained unconvinced for decades.

Woodall had studied the classical works of Galen and other physicians of that era, but unlike many of his day, he trusted the strength of his convictions. Woodall's long period of practical experience, astute observation, and cautious judgment had taught him that the theories of oracles such as Galen often offered little in the way of useful medical knowledge. As an example, Woodall came to divide all wounds into 3 categories as stated in his 1655 book *The Surgeon's Mate*[4]: 1) puncture wounds and lacerations; 2) gunshot wounds; and 3) bone fractures. His treatment recommendations certainly have a modern ring about them: ". . . remove unnatural things forced into the wound . . . which should be done with the least pain to the patient and avoiding arteries, nerves, and veins." The "unnatural things" to which he referred might include wood splinters from spars and masts, fragments from cannon fire, etc. In the case of removal being too difficult or painful—anesthesia being nothing but a pipe dream in this era—Woodall recommended "tarry if you may, while nature helps." His suggestions of ligating specific vessels contributing to excessive bleeding and placing dressings soaked in wine over wounds (the alcohol acting as an antiseptic) was a significant departure from the usual treatment of the day—cauterization with hot oil and the searing iron!

When limb wounds were severe, Woodall was not in a rush to amputate, which was, needless to say, prevailing custom in that era and for several hundred years afterward. Woodall reasoned that specific criteria should be assessed when considering amputation: one half or more of the limb being dismembered, the presence of a chronic suppurating wound, the patient's life was at immediate risk, or the remaining portion of the limb was not serviceable. His concepts were generally far more conservative (and reasonable) than those of military surgeons as much as 200 years later in, for instance, the American Civil War (when immediate amputation of any limb with a gunshot wound was the customary practice). In fact, Woodall's conservative principles might not seem unreasonable to a modern trauma surgeon or a physician providing care for a trauma patient in a harsh or remote environment.

Perhaps not surprisingly, it was a senior nonmedical officer in the British Navy, Admiral Horatio Nelson (of Trafalgar fame), who brought about a revolution in "medicine under sail"—particularly in disease control—near the turn of the 19th century. Nelson's medical history was well documented and provides a window into some typical maladies and injuries of the day for the ocean-going warrior or explorer. His initiation to disease and injury under sail started early, as a midshipman of 17, in 1775. At this young age, sickness contracted in the East Indies induced partial paralysis. A couple of years later he contracted malaria in the West Indies, a disease that recurred periodically throughout his life.

In 1780, during his first command, Nelson headed an expeditionary force up the San Juan River in Nicaragua during the rainy season. The ground covered by this force was a low-lying, swampy coastline where yellow fever was endemic. Within a few days most of the men were desperately ill (including Nelson), probably with yellow fever, but Nelson was among the 380 survivors of this hapless 1800-man force. Then, after a spell under medical care for depression in the late 1780s, Nelson was on active service in Corsica in 1792 where he sustained a laceration of his back and lost sight in his left eye during battles near this island. In 1797, he again needed medical services after he suffered an abdominal wound during a military encounter at Cape St. Vincent. Not long after, during the battle at Tenerife in the Canary Islands, Nelson's right elbow disintegrated when it was hit with grapeshot. Two surgeons performed an amputation just below the shoulder. His luck ran out at Trafalgar, in 1805, when a French sharpshooter's bullet delivered a fatal injury.

Largely as a result of Admiral Nelson's full and intimate understanding of the challenges of providing effective shipboard medical care, in 1805 (the year of Nelson's death), medical reforms in the Royal Navy became a reality. Much of the emphasis was directed at proper diet and disease prevention—an emphasis, it seems, that