

## A LOOK AT LATE 18TH CENTURY MEDICAL PRACTICES

*Meant as merely an introduction into this subject for interested persons, this piece contains no references or bibliography -- the expectation being one of further study beyond this brief synopsis if one so desires.*

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The world of 18th century medicine and surgery is as foreign to our encampment audiences as tribal life in New Guinea is to any modern North American. It is not the tools, the techniques or even the surroundings that attract the audience into spending a few minutes in our surgical camp -- the attraction is the primordial sense that life, human or otherwise, is a very fragile commodity. A few years after I developed my rope line discussion, in the late 1970s, I began to interrupt my talk with the observation that, as hard as I tried, the audience always seemed to view the surgical camp from the perspective of being a patient rather than a surgeon. The attempt at humor would break the tension people felt when confronted with the mechanics of death no matter how far removed the threat might have been. In other words, before submerging anyone into the statistical references that can predominate a historical lecture, camp experience or written piece, I attempted to bridge an emotional gap with the viewer or reader before taking on the task at hand.

This being said, let us look generally at the late British Colonial period from the 21st century perspective by way of a literary device to better illustrate the distance surgery has traveled over the last two hundred and twenty five plus years. Let us climb aboard H.G. Wells' "Time Machine" and plunge into the past -- stopping first in 1865 and considering a world without sterile surgical instruments. If you wanted to risk deadly infection then climb back aboard and continue on into the past -- this time stopping in 1846 where I am going to jump off. The risk of infection may be palatable to you, but the inevitability of pain prior to the use of anesthesia is where I am drawing the line!

Surgically speaking, the overwhelming difference between the 18th and 21st centuries is the lack of anesthesia and antiseptics during the period we portray. The birth of surgical anesthesia in 1846 was actually conceived in 1844 by Horace Wells, a dentist at Hartford, Connecticut using nitrous oxide in dentistry that led to chloric ether being used by William Morton of Charlton, Massachusetts in July of 1844 to fill a tooth. A local chemist, Charles Jackson convinced Morton to try sulphuric ether that he used to extract a deeply-rooted bicuspid tooth. Morton then traveled to Boston and persuaded Dr. John Warren of Massachusetts General Hospital to attempt a surgical procedure with sulphuric ether. On Oct. 16, 1846 (65 years after the surrender at Yorktown), Warren successfully removed a vascular tumor from the left side of a patient's neck. In December of 1846, Robert Liston amputated a thigh on an etherized patient. On Jan. 19, 1847, Sir James Simpson, professor of obstetrics at Edinburgh used ether in midwifery and on Nov. 4, 1847 first substituted chloroform during surgery.

The other surgical milestone, antiseptics or sterile instruments and procedure takes us to Scotland. While Louis Pasteur was investigating fermentation and putrefaction in France, Joseph Lister, professor of surgery at the University of Glasgow set out to prevent the development of microorganisms in wounds. Traveling to London and seeking out permission to read Sir John Pringle's 18th century medical book, "Observations on the Diseases of the Army," published in 1752, Lister read Pringle's concept of antiseptics and his failed attempts at finding a way to retard, if not stop, infection in wounds. Lister went back to Edinburgh and toiled for years in search of surgical sterility. After trying chloride of zinc and the sulphites Lister settled on carbolic acid which he employed in a surgery to set a compound fracture on Aug. 12, 1865 (almost 84 years after Yorktown). In 1867, Lister published his results in the "Lancet," the British Medical Journal, under the title "On the Antiseptic Principle in the Practice of Surgery."

In the late 18th century, medical science was divided into three practices: general physics (the general practitioner), apothecary (the pharmacist) and chirurgery (the surgeon). Thus far I have mentioned only surgery that was actually the least attended medical function until the late 19th century when antiseptics improved surgical success. The most often-performed medical treatment was the use by apothecaries or medicinals such as roots, bark and other natural materials which were ingested, rubbed on the skin or placed into wounds in an attempt to alter the patient's "internal imbalance." Another distinction that needs to be made is that most children beyond the age of six years old began to attend to their own medical needs. It is more probable that you could imagine someone that young grinding roots into powder for a medicine rather than stitching closed his or her own skin once the infection had subsided, but such was more the rule than the exception prior to the 1850s. The age of specialization in medical science would not take place until the mid-1800s, over two generations into our future. That is not to say that there were no professional physicians and surgeons. The medical colleges of Edinburgh, London and Berlin had been graduating doctors for well over 100 years. It is that college-educated medical people were not available to the vast majority of society anywhere in the world of the 1770s and 1780s. If you ever do venture back aboard a time machine be prepared to care for yourself or possibly pay a lifetime's worth of wages for "proper" surgical attention.

By the time of the battles of Lexington and Concord in 1775, the average life expectancy was 33 years old in British America. One half to two-thirds of those under the age of two years old were dying of disease, infection and poor diet. Almost one half of those who survived into adulthood, older than 16 years old, would have, by 21st century standards, a noticeable loss of sight, hearing and teeth and even impaired reasoning. A large part of the colonies were, quite literally, a "third world" area incapable of protecting its people from the ancient scourges of disease and starvation.

It is hard to imagine that most people in British America, including people as memorable as George Washington, purged themselves regularly, but they did. Whether purging was accomplished by bleeding, blistering, boiling, sweating, vomiting or excreting -- the desired result was to balance one's humors or to remove "bad air" or "evil spirits" from one's body. Today, we can look back and realize that they were only successful at altering symptoms -- fever was reduced, bleeding from wounds was reduced as blood pressure dropped and respiration was calmed, but the cause of the disability was not being addressed. If anything could be obvious to those in the 21st century it is that surgical interference ninety years before antiseptics would produce an infection capable of killing the patient slightly less than half of the time. Again, it needs to be mentioned that one-half to two-thirds of the human population died before the age of two and avoided the chance of being added to the adult surgical deaths due to unclean tools. If today's operating rooms used unsterile instruments, the hospital death rate due to infection would undoubtedly soar to 60% or more.

The earlier reference to "bad air" or "evil spirits" needs to be addressed by traveling into the more distant past. Though the American Revolutionary period heralded great advances such as the political and economical thought of Adam Smith and John Locke, the musical composition of Beethoven and Mozart and the fine cabinetry in the Chippendale style, those advances were overshadowed by the Christian fundamentalism that had stifled medical research for the previous 13 centuries. From the beginnings of the Holy Roman Empire's dominance in central Europe during the 5th century after Christ, physicians could only pay lip service to their Hippocratic oath to do all that was in their power to save the lives of their patients. The inconceivable fact, by 21st century sensibilities, was that until the mid-1800s in Europe and North America no physician was supposed to be arrogant enough to presume to save what only God was capable of giving and taking -- human life. And so physicians and surgeons were relegated to the seemingly menial tasks of reducing fever, swelling and bleeding and setting fractures.

In 1763, there were less than 300 college-trained physicians, surgeons and apothecaries for a British Colonial population of about 2-1/2 million. The first medical college degree was not

conferred in what would be the United States until 1770. It was in the military environment of the late 18th century that the need arose for quickly educating a small group of common soldiers in General Washington's Continental Army. John Jones, the professor of surgery at King's College in New York City (Columbia University by 1801) wrote "The Plain, Concise, Practical Remarks on the Treatment of Wounds and Fractures," a surgeon's manual that was distributed to all of the army's regiments by late 1776. Within two weeks of receiving Jones' manual, the surgical volunteer was expected to begin his medical practice. Often times, the intern was temporarily assigned to a more established surgeon in another regiment who had camp and battle-wound experience invaluable to the intern.

Aside from the more obvious duties of a regimental surgeon, it was the medical officer who could alter the formation and marching orders of the orderly sergeant because of health conditions among the men. Even physically fit soldiers were to spend no more than two hours per day in direct sunlight while on duty. To do more was thought to run the risk of initiating a fever. Frequent or daily bathing was regarded as unhealthy, but the army medical department required all military personnel to bathe at least once a week, usually on Friday morning. Official papers indicate that occasionally men would only be persuaded to bathe in the nearest water at the point of a bayonet. Another health problem was either the lack of clothes in the colder months or the uncleanness of clothes being worn. The medical staff recommended clothes washing at colors or other formations as well as while soldiers were patients.

The medical staff also advised the command at both the regiment and battalion levels of the necessity of moving the camp for various health reasons. In fact, of the nearly sixty movements that Washington's camp made, all but a handful were health-related. The three most common reasons for uprooting the colonial encampment were:

1. The lack of available land for latrines both downwind and at a higher level than the military camp;
2. The loss of ground cover (grass and weeds) which would cause dust or "bad air" to rise into their bodies when walking and marching kicked up the dust from the camp streets and
3. The lack of sufficiently clear water for drinking, bathing, cooking and flushing out wounds. This last point brings up an interesting story from medical records on microfilm at the National Archives in Washington, D.C. Before a surgical area in western Pennsylvania could be relocated because of a lack of water, wounds were being flushed with grain alcohol and the resulting lack of infection that they did not comprehend nearly doubled their success rate after surgery. The unbelievable fact was that when clear water was again available the wounds were not flushed with alcohol and infection surged returning the death rate of not surviving normal exploratory surgeries to its normal level of about 55%.

While the surgeon might have appeared active in treating his 18th century patients, it was the general physician and apothecary who battled the greatest enemy of the Continental Army -- disease. Glancing at the statistics will reveal the urgency of preventing the spread of disease in Washington's camp. Throughout the 6-1/2 years of the American Revolution, from April 19, 1775 at Lexington, Massachusetts to October 19, 1781 at Yorktown, Virginia, approximately 210,000 men served in the army with the greatest number at one time being 35,000 in November of 1778. There were 16 major battles and about 2,200 minor confrontations that produced about 8,900 battle deaths of which 15% to 20% were due to bayonet wounds. The even more startling figure, though, is the number who died while in the congressional encampments -- just under 80,000! Less than 10% of the total deaths were due to battle injuries. Although the surgeons were undoubtedly busy after their regiments were engaged with the enemy, the vast amount of the time spent by the medical men was in isolating disease from the healthy troops.

We have discussed infection as it related to surgery, but the overwhelming risk of infection was in contracting diseases from each other. From the beginning of human evolution man had been in a constant battle with disease due to a lack of nutrition, poor sanitary habits and ill-timed physical contact. Just 6 years before the signing of the Declaration of Independence there was a smallpox epidemic in London that killed one quarter of the city's population. The same disease was so bad among the congressional forces through 1776 and early 1777 that General Washington ordered what would be the first mass inoculation of a large organization in history -- on his troops and, although a few died of the treatment, hundreds and perhaps thousands were saved. At this time in history there were four plagues running rampant in the world -- smallpox, typhus, diphtheria and cholera. While less than 10% of the colonial forces died of battle wounds, almost 20% died of these plagues in the encampments. What caused the other two-thirds to die? It was not a series of epidemics or battle injuries that killed so many of Washington's soldiers -- it was dirty water.

Dysentery, or diarrhea, was the greatest scourge not just in Washington's camp, but in the whole world at that time in history. One of the simpler problems for most of 21st-century America is keeping one's self clean and eating and drinking uninfected items, but was almost insurmountable for 18th century inhabitants because of their sanitary practices. Anyone growing up in late colonial America was taught by word and example the habits that would make them socially acceptable and, in their view, physically healthy. Unfortunately, they were accustomed to drinking filthy water and not bathing regularly. Life became a terrible problem anytime people lived in confined quarters, such as a military encampment. The struggle to feed large numbers of soldiers in a timely manner produced an even greater chance of dysentery than in farmhouses or villages. The constant battle, not between British regulars and colonials, but with intestinal diarrhea was very much at the forefront of concern for both the Congress and Gen. Washington.

The practical manifestation of this concern was the creation of a large military medical department attached to the Continental Army. From a staff in Philadelphia, the medical department coordinated procedures, equipment and drugs regulated by Congress' medical committee. The medical department administered seven military hospitals, dozens of flying or temporary hospitals and 88 regimental facilities throughout the colonies. Hundreds of regimental surgeons died of disease during the War. Their efforts and sacrifice are remembered with a memorial at the American Medical Association building a few blocks north of the White House in Washington, D.C. today.