

**British Military Medicine during the Long Eighteenth Century:  
A Relationship between Preventative and Reactionary Medicine, Supply,  
and Empire**

by

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*To my grandparents William and Shelia Baker;  
thank you for your unfailing love and support.*

**ABSTRACT:**

This MA report analyses British military medicine during the long eighteenth century through an examination of the interaction between preventative and reactionary forms of medical treatment. Study of three theatres of military conflict, the American Revolution (1775-83), the Napoleonic Wars (1803-15), and the West Indies during the period from (1775-1815), will showcase the obstacles to successful medical treatment and their solutions while illuminating the integral relationship between preventative and reactionary medicine. Analysis will include a focus on the provisioning of supplies, threats to health, and administrative mismanagement and the resolution of these difficulties through transport reform, prophylactic treatment, and the reorganization of the administrative system. This investigation will argue that experience in preventative and reactionary treatment methods and military administration and supply gained from previous theatres of conflict were successfully implemented during the Peninsular Campaign (1808-14) of the Napoleonic Wars and thus simultaneously reflected continuity and change within the medical system.

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## INTRODUCTION:

An analysis of military medicine provides key insights into the practice of medicine in the long eighteenth century (1688-1815) particularly within the interaction of preventative and reactionary forms of medical treatment. With the growth of the British Empire throughout the century, especially after the Treaty of Paris ended the Seven Years War in 1763, British military forces encompassing both the British Army and the Royal Navy were pressed into a wider sphere of service. The purview of military service stretched throughout the boundaries of the British Atlantic World from the torrid regions of the West Indies and West Africa to the more temperate climes of North America and the British Isles and the ocean in between. Despite the growth in responsibility, the military services were actually reduced during the peacetime period between 1763 and 1775, an eventuality that disguised the extent of an ever-present manpower shortage. The importance of keeping trained soldiers and sailors in place at duty stations was readily visible to military commanders, and military medicine was increasingly called upon to maintain force deployment at acceptable levels.

While the military medical establishment was expected to provide care for sick and wounded personnel, a multitude of obstacles hindered this important task. These obstacles can be divided into two categories: those that fell under the domain of medicine such as epidemics and battle wounds, and those considered the auspices of administration. Medical obstacles were often outside the control of medical practitioners working within the eighteenth-century medical system. Indeed, the epidemic diseases responsible for the highest mortality and morbidity amongst British servicemen- malaria, typhus, and typhoid- were not curable until the twentieth century, while yellow

fever remains incurable.<sup>1</sup> In order to combat this reality military medicine incorporated both preventative and reactionary methodologies. The administrative obstacles were the largest impediments to successful medical care that could be influenced by human action in order to induce positive change. As such, these obstacles were the easiest to overcome. They existed within three domains: the hierarchical structure and nature of the military administration, the supply and transport system responsible for conveying both goods and individuals, and the military medical establishment which established a lack of continuity within the medical system between military conflicts due to the high turnover of medical practitioners. An examination of three theatres of military conflict during the latter half of the eighteenth century and early nineteenth century- the American Revolution (1775-83), the Napoleonic Wars (1803-15), and the West Indies during the period from (1775-1815) - will show these obstacles and their solutions while illuminating the integral relationship between preventative and reactionary medicine. Analysis will include a focus on the provisioning of supplies, threats to health, and administrative mismanagement and the resolution of these difficulties through transport reform, prophylactic treatment, and the reorganization of the administrative system. This investigation will argue that experience in preventative and reactionary treatment methods and military administration and supply gained from previous theatres of conflict were successfully implemented during the Peninsular Campaign (1808-14) of the Napoleonic Wars and thus simultaneously reflected continuity and change within the medical system.

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<sup>1</sup> Philip Curtin, *Disease and Empire: The Health of European Troops in the Conquest of Africa* (Cambridge: Cambridge University Press, 1998), 9-10.

There were two principal types of eighteenth-century military medical treatment. One employed reactionary forms of care after illness or injury had been inflicted. This form of treatment was time-sensitive, especially when dealing with injuries, and also may or may not have been successful. In addition, there was also proactive treatment which utilized preventative measures in an attempt to avoid the necessity of later treatment. Given that the most effective way of preventing injuries from combat was the avoidance of combat, an option that was fundamentally unavailable for the military, the majority of preventative medicine centred on the prevention of illness and disease. However, both forms of treatment had an equal basis for functioning within the military medical system owing to the dual function of military forces as combat and garrison forces. The reliance of the military system on both forms of medicine did not preclude the emphasis on prevention by many medical practitioners, such as army surgeons John Pringle (1707-82) and William Blair (1766-1822).<sup>2</sup> The beliefs of Blair and Pringle were echoed by their medical counterparts in the navy. The realities of naval service – including isolation, prolonged voyages, and lack of reinforcements – made preventative treatment a requisite of naval medicine. This necessity was clearly demonstrated by the many East India Company ships that had to be crewed by Indian sailors known as *lascars* for the return trip to England partly owing to the illness or death of their English crews.<sup>3</sup>

The importance of preventative and reactionary medical treatment to contemporary military practitioners has been well acknowledged within the

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<sup>2</sup> John Pringle, *Observations of the Diseases of the Army in Camp and Garrison in Three Parts* (London, 1752), ix; William Blair, *The Soldier's Friend: or The Means of Preserving the Health of Military Men; Addressed to the Officers of the British Army* (London and Dublin: 1798), 7.

<sup>3</sup> Michael Fisher, "Working Across the Seas: Indian Maritime Labourers in India, Britain, and in Between, 1600-1857," *International Review of Social History* 51, Supplement 14 (2006), 21-23.



historiography of the past sixty years. The majority of works focusing on reactionary treatment have, unsurprisingly, tended to examine surgical practices.<sup>4</sup> Preventative medicine is most often a factor in discussions of naval medicine, with the treatment of scurvy as a focal point.<sup>5</sup> However, even with the recognition of these forms of medical treatment and the acknowledgement of the contemporary medical framework there has been an alarming tendency in historical writings to blame the medical system for the problems facing the military medical establishment. This placement of blame forces the reader's attention upon something that was outside the control of military medical practitioners - the contemporary medical system - and detracts attention from extra-system problems such as administration, transport, and supply.<sup>6</sup> These three external obstacles have been addressed in a separate, more compartmentalized body of literature.<sup>7</sup> Such compartmentalized study was beneficial for in-depth analysis on each individual subject. However, an integration of these subjects within scholarship concerning military medicine permits an alternative, more broad-ranging analytical approach.<sup>8</sup> This has been employed in other studies of the military in the eighteenth century, but which do not focus on medical aspects. A key example is the work of N.

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<sup>4</sup> The primary example of this trend being Matthew Kaufman, *Surgeons at War: Medical Arrangements for the Treatment of the Sick and Wounded in the British Army during the Late Eighteenth and Nineteenth Centuries* (London: Greenwood Press, 2001). Other examples include: Martin Howard, *Wellington's Doctors: The British Army Medical Services in the Napoleonic Wars* (Staplehurst: Spellmount, 2008), 147-178; Richard A. Gabriel and Karen S. Metz, *A History of Military Medicine, Volume II: From the Renaissance Through Modern Times* (New York: Greenwood Press, 1992), 143-215.

<sup>5</sup> Christopher Lloyd and Jack L. S. Coulter, *Medicine and the Navy 1200-1900, 4 vols. Vol. III: 1714-1815* (Edinburgh: E. & S. Livingstone Ltd., 1961), 293-328.

<sup>6</sup> Neil Cantile, *A History of the Army Medical Department*, vol. 1 (Edinburgh: Churchill Livingstone, 1974); Richard Blanco, *Wellington's Surgeon General: Sir James McGrigor* (Durham, N.C.: Duke University Press, 1974).

<sup>7</sup> Examples include: R. Arthur Bowler, *Logistics and the Failure of the British Army in America 1775-1783* (Princeton, N.J.: Princeton University Press, 1975); David Syrett, *Shipping and the American War 1775-1783: A Study of British Transport Organization* (London: The Athlone Press, 1970); John Brewer, *The Sinews of Power: War, Money, and the English State, 1688-1783* (London: Unwin Hyman, 1989).

<sup>8</sup> Bowler, 3.

A. M. Roger on the Royal Navy.<sup>9</sup> There also exists no comprehensive study of military medicine that assigns detailed attention to both the Royal Navy and the British Army. Analyzing both allows the reader to grasp the similarities and differences between the medical systems of the two entities, but also highlights the interdependency of the two medical services operating from within the same medical system. This form of integration, which will be practised throughout this report, allows for more comprehensive conclusions concerning late eighteenth-century military medicine to emerge. This will be facilitated by the examination of primary sources including correspondence of military commanders and medical practitioners, as well as medical treatises that detailed advancements in medical science and aspects of disease prevention. Broad analysis will demonstrate the importance of the interactive relationship between medical treatment, medical practitioners, military commanders and supply, transport, and empire.

Since the mid-twentieth century, the significance of individuals in the practice of military medicine has been readily recognized by scholars. Many authors have utilized the work of particular individuals as a central point for study. The emphasis on individuals has developed into two approaches. One of these is biographical studies, such as *Nelson's Surgeon* by Laurence Brockliss, John Cardwell, and Michael Moss, and Richard Blanco's *Wellington's Surgeon General*, which examine the life of an individual medical practitioner and through this form of study infer broader conclusions regarding the nature and peculiarities of military medicine.<sup>10</sup> The second approach,

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<sup>9</sup> N. A. M. Rodger, *Command of the Ocean* (London: Allen Lane, 2004), 378; N. A. M. Rodger, *The Wooden World: An Anatomy of the Georgian Navy* (London: Fontana Press, 1988), xi.

<sup>10</sup> Blanco; Laurence Brockliss, John Cardwell, and Michael S. Moss, *Nelson's Surgeon: William Beatty, Naval Medicine, and the Battle of Trafalgar* (Oxford: Oxford University Press, 2005).

representing the majority of other works respecting eighteenth-century military medicine, examines a multitude of medical practitioners with frequent reference to prominent individuals such as James Lind (1716-94).<sup>11</sup> Furthermore, the focus on individuals has extended to military commanders, such as Admiral Horatio Nelson (1722-1805) and Arthur Wellesley the Duke of Wellington (1769-1852), due to their positions of power within the military medical establishment.<sup>12</sup> The use of individuals as a methodological hub of analysis was partly a recognition of the power of individuals (regardless of whether medical practitioners or military commanders), but was also representative of the prominence of individuals within the source material. This emphasis was especially present in the printed medical treatises that delineated the various innovations in medical treatment and aspects of disease prevention.<sup>13</sup> While the importance of individuals to the study of eighteenth-century military medicine cannot be ignored, the specific attention on individuals can negate the work of a broad cohort of practitioners who were responsible for the care of the majority of military personnel. This was particularly evident for regimental surgeons who provided most, if not all, medical care to the men of a specific regiment. Therefore, while the work of individuals will form a necessary component of my study, attention must also be paid to those medical and military men outside the category of 'Great Men.'

Although the prominence of preventative medicine in the naval context has been well acknowledged in the historiography,<sup>14</sup> this influence has not been present in studies

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<sup>11</sup> Lloyd and Coulter, 296-303; Kaufman, 11-27

<sup>12</sup> Brockliss et al., 98.

<sup>13</sup> Robert Hamilton, *The Duties of a Regimental Surgeon Considered: With Observations on his General Qualifications; and hints relative to a More Respectable Practice, and Better Regulation of that Department* (London, 1794), i; Alexander Aberdour, *Observations on the Small-pox and Inoculation* (Edinburgh, 1791), 8.

<sup>14</sup> Lloyd and Coulter, 70-93, 293-328; Rodger, *Command of the Ocean*, 484-485; Brockliss et. al, 91-94.

of the medical system of the British Army. Such works have instead chosen to emphasize surgical innovations and other forms of reactionary treatment, primarily to combat casualties.<sup>15</sup> This oversight negates the importance of preventative medicine in the army context, as well as a great deal of contemporary writing on the subject of health preservation.<sup>16</sup> Indeed, preventative medicine was a key factor of army medicine particularly due to the ongoing manpower shortage that plagued the service throughout the latter half of the eighteenth century and the early nineteenth century, and the need to deploy forces throughout a vast empire. Therefore, an examination of both preventative and reactionary forms of treatment in land- and sea-based military services will help achieve a more balanced picture of military medicine within the British empire, between 1775 and 1815.

In order to address the above issues within the historiography, three approaches to study were here. First, it is necessary to consider all contemporary medical decisions within the framework of the humoral medical system without assigning blame to the system. Second, the works of individuals must be included in such a manner that allows for a more comprehensive inclusion of practitioners. Third, it is the goal of this report to present a more comprehensive approach to the study of military medicine. This will be achieved through a comparison of the North American, West Indian, and Peninsular theatres of conflict, a method which will be facilitated by using a broad chronological lens and an approach that encompasses both the army and the navy. The development of this inclusive methodology will be further enhanced through an examination of the

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<sup>15</sup> Howard, 143; Kaufman, 23.

<sup>16</sup> Many treatises had the goal of 'preserving the health of soldiers' such as the work of Donald Monro (1728-1802). Donald Monro, *Observations on the Means of Preserving the Health of Soldiers, and of Conducting Military Hospitals* (London, 1780).

tripartite relationship between medicine, military operations, and supply and transport. By eliminating the segregation of these entities, which has been present in the historiography to date, it will be possible to draw broader, more comprehensive conclusions about British military medicine in the long eighteenth century. The report reveals the importance of previous experience in military conflicts to improving medical treatment during the Napoleonic Wars.

In order to provide adequate contextualization of military medicine during this period, the general precepts of humoral theory must be understood. The humoral system formed the basis of medical thought during the early modern period and was the framework through which all changes and recommendations in medicine were understood.<sup>17</sup> The humoral theory of medicine originated from the Roman physician Galen (129-216 AD) and the Hippocratic treatises written between 420 and 350 BC.<sup>18</sup> These medical writings were 'rediscovered' during the Middle Ages and remained the foundation of medical thought until the mid-nineteenth century.<sup>19</sup> Humoral theory divided the body into four humours: black bile (also known as melancholy), yellow bile (also known as choler), phlegm, and blood. Each of these humours possessed particular attributes aligning to the Aristotelian four elements of nature (earth, air, wind, and fire), and additionally the constitutional qualities of age, gender, and temperature.<sup>20</sup> Each individual had a particular make-up of humours that formed the basis of his/her individual constitution. Good health, according to humoral principles, derived from a

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<sup>17</sup> Andrew Wear, *Knowledge and Practice in Early Modern English Medicine, 1550-1680* (Cambridge: Cambridge University Press, 2000), 37.

<sup>18</sup> *Ibid.*, 35.

<sup>19</sup> Jacques Bos, "The rise and decline of character: humoral psychology in ancient and early modern medical theory," *History of the Human Sciences* 22(3) (2009), 30.

<sup>20</sup> Wear, 37, 38.

balance of the four humours. An imbalance of the humours, whether from the excess or deficiency of a particular humour, caused illness. In order to restore the necessary balance of the humours, medical and lay practitioners prescribed treatments that included purges, vomits, sweating, bloodletting, and blistering.<sup>21</sup> Supplementing the humours were the non-naturals.<sup>22</sup> The non-naturals provided other rationales for the causes of illness and were the results of choices made by individuals. Included in these explanations for illness was miasma or bad air. Since the fourteenth century miasma had been viewed as the causal agent of various diseases such as plague and fever. Bad air was believed to originate from putrefaction, the decaying process of dead bodies and plants. The foul smell given off by such a process was believed to transmit disease and provided a rationale for contagion.<sup>23</sup> Until the late nineteenth century military medical practitioners continued to identify miasma as the cause of tropical fevers and scurvy, diseases responsible for the deaths of thousands of servicemen.<sup>24</sup> This belief influenced many decisions made by military medical practitioners including the placement of hospitals, the design of barracks, and the use of a ventilation system on board ships.

While the humoral system remained the basis of medical thought for approximately five hundred years, this does not mean to suggest that medical philosophy remained stagnant. During the eighteenth century, the medical system evolved concurrently with the Enlightenment and was part of wider changes in British

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<sup>21</sup> Ibid., 39.

<sup>22</sup> Ibid., 156.

<sup>23</sup> Lucinda Cole, "Of Mice and Moisture: Rats, Witches, Miasma, and Early Modern Theories of Contagion," *The Journal of Early Modern Cultural Studies* 10(2) (2010), 66-67.

<sup>24</sup> Gregg Mitman and Ronald L. Numbers, "From Miasma to Asthma: The Changing Fortunes of Medical Geography in America," *History and Philosophy of the Life Sciences* 25 (2003), 393-394; Rodger, *The Wooden World*, 106.

society, including increased focus on rationality and empiricism.<sup>25</sup> As the eighteenth century progressed, the emphasis of the medical system shifted from reactionary treatment to a greater focus on preventative medicine. This modification in medical thought evolved from the connection between the environment and medicine, as well as the recognition that preventing illness, particularly tropical diseases, was reliant on effectively managing environmental factors.<sup>26</sup> The emphasis on preventative medicine also stemmed from medical advancements in eighteenth-century prophylactic treatments. For instance, by mid-century, empirical evidence had demonstrated that citrus and spruce beer were not only effective treatments for scurvy, but that they were also useful in warding off the illness.<sup>27</sup> Furthermore, as shown by clinician Harry Wain, the practice of inoculation, used by the military beginning in the Seven Years War, and later vaccination implemented by the army in 1801, had demonstrated the ability to prevent smallpox.<sup>28</sup> The measurable success of these preventative treatments reinforced the importance of preventative medicine and facilitated the perpetration of these methods among medical practitioners. Before the wider military establishment initiated such measures, individual military medical practitioners often adopted such preventative treatments due to their demonstrated success, if they had the inclination and financial means to procure them.<sup>29</sup> This manner of gradually adopting various methods of

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<sup>25</sup> James C. Riley, *The eighteenth-century Campaign to Avoid Disease* (London: The Macmillan Press Ltd., 1987), 5; Roy Porter, *The Enlightenment* (Atlantic Highlands, N.J.: Humanities Press International, 1990), 66.

<sup>26</sup> *Ibid.*, xv.

<sup>27</sup> Paul E. Kopperman, "The British Army in North America and the West Indies, 1755-83: A Medical Perspective," in *British Military and Naval Medicine, 1600-1830*, ed. Geoffrey Hudson (New York: Rodopi, 2007), 72.

<sup>28</sup> Harry Wain, *A History of Preventative Medicine* (Springfield Il.: Charles C. Thomas, 1970), 175-189.

<sup>29</sup> Tabitha Marshall, "The Health of the British Soldier in America, 1775-1781," (PhD Diss., McMaster University, 2006), 47; William Paine, "Instructions for the Acting Purveyor at Hospital Halifax N.S.," William Paine Papers 1768-1832, 19 July 1782.

preventing disease among medical practitioners also served to demonstrate utility of such measures to the military hierarchy and assisted in proving their worth for service-wide use.

The unsuitability of whites to work in hot climates became ingrained in the medical system and established the tenet that non-Europeans, particularly Africans and those of African descent, were suited for labour in torrid climates.<sup>30</sup> Medical justification for the use of non-Europeans as labourers was appropriated by the British Army to utilize blacks for fatigue duties in the Americas and the West Indies during the Seven Years War, the American Revolution, the French Revolutionary, and the Napoleonic Wars, as has been shown by Roger Buckley and Peter Voelz.<sup>31</sup> Blacks were also enlisted to fight, particularly in the West Indian Regiments that were formed to protect the valuable colonial possessions in the 1790s.<sup>32</sup> Military service, as shown by Peter Voelz, was frequently an opportunity for enslaved blacks to gain their freedom, with the prospect of emancipation used by military commanders to entice slaves to enter into service.<sup>33</sup> From a medical perspective, black recruiting ensured that in the torrid zones there was an ample supply of non-Europeans to perform fatigue duties.

Military medicine by definition combined medical thought and practice with military realities. During the eighteenth century, the British military medical establishment was heavily constrained by the administrative principles of both the

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<sup>30</sup> Karen Ordahl Kupperman, "Fear of Hot Climates in the Anglo-American Colonial Experience," *The William and Mary Quarterly* 41(2) (1984), 215.

<sup>31</sup> Roger N. Buckley, *Slaves in Red Coats: The British West Indian Regiments, 1795-1815* (New Haven: Yale University Press, 1979), 2; R. Norman Buckley, *The British Army in the West Indies: Society and the Military in the Revolutionary Age* (Gainesville, Florida: University of Florida Press, 1998), 99; Peter M. Voelz, *Slave and Soldier: The Military Impact of Blacks in the Colonial Americas* (New York: Garland Publishing, 1993), vi.

<sup>32</sup> Buckley, *Slaves in Red Coats*, 3.

<sup>33</sup> Voelz, 6.



British Army and the Royal Navy. Although maintaining a healthy and effective fighting force was an important military concern, the needs of military medical practitioners and their sick and wounded patients were often assigned lower priority than tactical or strategic goals by military commanders.<sup>34</sup> In accordance with this military prioritization, all high-level medical decisions,<sup>35</sup> such as the placement of hospitals and the dispersion of medical staff, rested with the military administration or the regimental commanding officer, not with medical personnel.<sup>36</sup> An example of this, as noted by historian Michael Howard, may be found in the relationship between the chief medical officer and his commanding officer, James McGrigor (1771-1858), and the Duke of Wellington during the Peninsular Campaign.<sup>37</sup> Upon learning of the military plans for the upcoming battle of Salamanca, McGrigor requisitioned wagons for the transport of the wounded and set up an evacuation route without informing Wellington of his plans.<sup>38</sup> After hearing of these plans Wellington angrily informed McGrigor:

'I shall be glad to know,' exclaimed his Lordship [Wellington], 'who is to command the army? I or you? I establish one route, one line of communication for the army; you establish another, and order the commissariat and supplies by that line. As long, as you live, Sir, never do so again; never do anything without my orders.' I [McGrigor] pleaded that 'there was no time to consult him to save life.'<sup>39</sup>

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<sup>34</sup> Howard, 11.

<sup>35</sup> The term 'high-level' in this instance refers to 'big picture' decisions such as the placement of hospitals and the organization of evacuation routes for the wounded. 'Lower-level' decisions would include such concerns as patient treatment.

<sup>36</sup> Ibid.

<sup>37</sup> Ibid., 11.

<sup>38</sup> Blanco, 131.

<sup>39</sup> James McGrigor, *The Autobiography and Services of Sir James McGrigor, Bart. Late Director-General of the Army Medical Department with an appendix of Notes and Original Correspondence* (London: Longman, Green, Longman, and Roberts, 1861), 302.

The problem with McGrigor's arrangements was not the arrangements themselves, which were part of his duties as a medical officer, but that he had put in place such provisions without consulting Wellington. While in principle military commanders had the authority to issue all high-level orders, including those affecting medical matters, this was not always possible.<sup>40</sup> McGrigor was again called upon to act without command authorization when arranging the evacuation from Ciudad Rodrigo to Oporto.<sup>41</sup> McGrigor was further reprimanded for this plan, although it had proven extremely effective.<sup>42</sup>

By removing agency from medical personnel, military administration exacerbated what was commonly an already deficient medical situation. Problems of agency were heightened due to the low status of regimental and ships' surgeons, despite the fact that these individuals were often the only source of medical care available.<sup>43</sup> Even high-ranking medical practitioners could only provide recommendations for medical arrangements and wait for their suggestions to be enacted by military commanders.<sup>44</sup> Given the lack of standardized medical training for British military service, something which existed in continental armies, there was limited opportunity for the advancement of military medical personnel and their ideas.<sup>45</sup> Furthermore, the diversity in education and training produced variations in the standard of medical treatment, which could be detrimental to the health of sick and wounded servicemen.

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<sup>40</sup> Howard, 107.

<sup>41</sup> Ibid.

<sup>42</sup> McGrigor, *The Autobiography and Services of Sir James McGrigor*, 310.

<sup>43</sup> Blanco, 15; Rodger, *The Wooden World*, 21.

<sup>44</sup> Kaufman, 17.

<sup>45</sup> Institutions that taught military medicine had been established in France, Prussia, and Russia during the mid-eighteenth century: Gabriel and Metz, 123, 126, 129; Brockliss et. al., 97.

The agency that medical practitioners lacked in influencing wide-ranging medical decisions did not hamper their ability to provide care for individual patients. The military administration mandated that all decisions regarding medical treatment were securely in the hands of medical practitioners. On board ship, for example, the surgeon's cockpit, where most medical procedures occurred, could be arranged however the surgeon desired. Furthermore, naval surgeons had complete authority over the food and drink served to the sick on board.<sup>46</sup> Although it was difficult for a regimental practitioner to exert the same sort of control over regimental hospitals, once such organizations were established they were also under nominal control of their medical practitioners.<sup>47</sup>

The military medical establishment also changed over time, particularly at the upper level of the administration. For the majority of the period under consideration the army and the navy had their own medical boards. The Army Medical Board was disbanded twice during this period of study.<sup>48</sup> It was principally, but not always, composed of three physicians. In the Royal Navy, the Sick and Hurt Board was responsible for all medical officers and naval hospitals.<sup>49</sup> At the practitioner level, the army medical establishment was further divided into two services: the staff service and the regimental service. Medical staff officers manned the general hospitals, which were set up to handle the large numbers of casualties resulting from combat. These officers

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<sup>46</sup> Rodger, *The Wooden World*, 91; Lloyd and Coulter, 92-93.

<sup>47</sup> Kaufman, 8.

<sup>48</sup> The Army Medical Board was first disbanded after the end of the Seven Years War when John Hunter was appointed as head of the Army Medical Department. The Board was again disbanded after the medical disaster of the Scheldt/Walcheren campaign in 1809. *Ibid.*, 33; Howard, 15-16.

<sup>49</sup> The Sick and Hurt Board was formally known as the Commissioners for the Care of Sick and Wounded Seamen and of Prisoners of War. The Sick and Hurt Board was disbanded in 1806 and was replaced by the Transport Board, which took over the responsibilities until 1817. P. K. Crimmin, "The Sick and Hurt Board and the health of seamen c. 1700-1806," *Journal for Maritime Research* December (1999), 48-49.

were also responsible for the running of permanent hospital installations such as the Royal Chelsea military hospital in London. The second service was the regimental branch, attached to the service of a specific regiment. Both branches of medical service operated on the same rank system. In theory, the more qualified medical personnel were given the title of surgeon while the less qualified served as a surgeon's mate.<sup>50</sup> Every regiment was to be equipped with at least one surgeon and mate, though more mates could be warranted if they were deemed necessary by the regiment's commanding officer. While the same hierarchical system, as seen in the biography of William Beatty by Laurence Brockliss et al., also existed in the naval service, the number of medical personnel aboard ship was determined by the size of the ship. A single deck sloop only warranted a surgeon's mate and a two-deck ship of the line was entitled to a surgeon and a mate, while the largest ships (such as Nelson's HMS *Victory*) had a complement of one surgeon and four assistants.<sup>51</sup> Both army and navy surgeons underwent examinations in front of the Company of Surgeons in order to assess their qualifications.<sup>52</sup> There were, however, marked improvements in the proficiency of the surgeons in both the army and the navy, with advancements in medical science, and improvements in the pay and status of military medical practitioners.<sup>53</sup>

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<sup>50</sup> The rank of surgeon's mate in the army was changed to assistant surgeon in 1796 in an attempt to elevate the status of these practitioners. Howard, 23. The same change was made in the navy in 1805 at the same time that naval surgeons were given an official uniform. Lloyd and Coulter, 33-34.

<sup>51</sup> However, staffing numbers for medical personnel were rarely met. During the Battle of Trafalgar *Victory* only had two assistant surgeons. Brockliss et. al., 7.

<sup>52</sup> These examinations were described by contemporaries as mainly perfunctory in nature especially in wartime. However, it is difficult to ascertain whether these examinations were successful in determining whether a surgeon was ready for service. James Watt, "Naval and Civilian Influences on Eighteenth- and Nineteenth-century Medical Practice," *Mariner's Mirror* 97(1) (2011), 148; Gabriel and Metz, 100.

<sup>53</sup> Tabitha Marshall, "Surgeons Reconsidered: Military Medical Men of the American Revolution," *Canadian Bulletin of Medical History* 27(2) (2010),

Until 1779, all medicines for the army were acquired by the Apothecary General and shipped to their destinations through the provisions of the Treasury.<sup>54</sup> A naval surgeon was responsible for his own medicine chest, which included both medical instruments and medicines. Medicines for naval use were supplied, often at conflation prices, by an adjunct of the London Society of Apothecaries known as the Navy Stock Company.<sup>55</sup> Fortunately, during the latter years of the eighteenth century the purchase of medicines was increasingly subsidized.<sup>56</sup> Regimental surgeons were required to purchase their own instruments, but medicines would be provided by the Apothecary General and shipped by the Transport Board through the 'medicine money' of their regiment.<sup>57</sup> These revenues were the result of a pay stoppage that was deducted from the pay of each member of the regiment.<sup>58</sup> General Hospitals did not issue a pay stoppage on the men in their care in order to pay for medicines, receiving them instead directly from the Apothecary General through a medicine allowance.<sup>59</sup> Medicines were not the only supplies that were shipped by the Transport Board; all 'necessaries' – including food and clothing – were shipped in the same manner. The efficient issue and transport of medicinal and other necessary supplies were essential to the practice of preventative and reactionary medicine in all theatres of war.

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<sup>54</sup> Syrett, 121, 139.

<sup>55</sup> Brockliss et. al., 15.

<sup>56</sup> Lloyd and Coulter, 15-16.

<sup>57</sup> Marshall, "Surgeons Reconsidered: Military Medical Men of the American Revolution," 305.

<sup>58</sup> Tabitha Marshall, "The Health of the British Soldier in America, 1775-1781," (PhD Diss., McMaster University, 2006), 62.

<sup>59</sup> Norman Baker, *Government and Contractors: The British Treasury and War Supplies 1775-1783* (London: Athlone Press, 1971), 184.

## THE EIGHTEENTH CENTURY: The American Revolution

The American Revolution was the first eighteenth-century military conflict that demonstrated the deficiencies within the contemporary framework of military medicine. The first of these deficiencies stemmed from how both the medical establishment and the larger military organization were seemingly surprised when frustration and anti-British sentiment in the Thirteen Colonies became an open military conflict with the battles of Lexington and Concord on 19 April 1775.<sup>60</sup> This is not to suggest that some British colonial officers did not foresee the eventuality of war or the need to aggressively prepare for a military contingency. In the autumn of 1774, General Thomas Gage (1719/20-1787) estimated, in a letter to the Secretary at War Lord William Barrington (1717-93), that the colonials would be able to "overwhelm us with forty to fifty thousand men."<sup>61</sup> The British would need at least twenty thousand new recruits to counteract such a rebel force, as well as cavalry and artillery units.<sup>62</sup> However, the recognition of the need for substantial numbers of British reinforcements in the American colonies did not ensure that such recruitment transpired.<sup>63</sup> Thus, at the outbreak of hostilities the British Army and the Royal Navy were unready for war, particularly on such a large scale. The rapid recruitment of large numbers of men that followed Lexington and Concord highlighted several problems relating to military medicine, such as supply difficulties and the need for preventative medicine.

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<sup>60</sup> Oscar Reiss, *Medicine and the American Revolution: how diseases and their treatments affected the colonial army* (Jefferson, N.C.: McFarland & Co., 1998), 11; J. Revell Carr, *Seeds of Discontent: The Deep Roots of the American Revolution 1650-1750* (New York: Walker & Company, 2008), 329-330.

<sup>61</sup> General Thomas Gage to Lord William Barrington 3 October 1774 quoted in Clarence Carter, ed., *The Correspondence of General Thomas Gage with the Secretaries of State, and with the War Office and the Treasury 1763-1775*, Vol. II (Hamden Conn.: Archon Books, 1969), 656.

<sup>62</sup> Ibid.

<sup>63</sup> Sylvia Frey, *The British Soldier in America: A Social History of Military Life in the Revolutionary Period* (Austin: University of Texas Press, 1981), 4.

The importance of preventative medicine was even more explicit when the conflict soon spread to the valuable West Indies, where the French anticipated being able to use the distraction of rebellion in the Thirteen Colonies as an opportunity to conquer the British island colonies. These two theatres of military conflict presented many diverse challenges to the military medical system, including: extremes in climate, logistical and supply considerations, and medical contingencies. In order to surmount these challenges a combination of preventative and reactionary treatments were employed. These diverse challenges, their potential solutions, and the impact of both on military medicine will be discussed here in order to demonstrate the origin of the foundations of successful military medical treatment.

The first major obstacle to successful military medical practice that needed to be overcome was that of physical distance between Britain and its American colonies. The American Revolution was the first large-scale overseas deployment of troops, coupled with an extensive naval commitment, in the history of the British Empire.<sup>64</sup> While there had been previous military conflicts in the North American theatre, most notably the Seven Years War (1756-63), the number of British regulars deployed was relatively small at only twenty-five regiments.<sup>65</sup> These regiments were heavily augmented with colonial recruits. During the first two years of the Seven Years War colonial recruitment and enlistment eclipsed that occurring in the British Isles by 3,000 men.<sup>66</sup> Neither were the peacetime garrison commitments following the Treaty of Paris large

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<sup>64</sup> Rodger, *Command of the Ocean*, 333.

<sup>65</sup> Robert Henderson, "British Regular Regiments in North America 1755-1763," accessed 3 August 2011, <http://www.militaryheritage.com/charts/7warchtb.htm>.

<sup>66</sup> Stephen Brumwell, *Redcoats: the British soldier and the war in the Americas, 1755-1763* (Cambridge: Cambridge University Press, 2006), 19.

enough to display the deficiencies present in the system of military administration.<sup>67</sup>

With the growth in the military commitment following the outbreak of the American Revolution, the problems in the logistical system and the effects that these deficiencies could have on the military medical system were compounded.

Therefore, based on previous combat experience in North America, it was not logistically impossible to fight a trans-Atlantic war. Indeed, since the seventeenth century there had been a system in place to allow military garrisons to be deployed to North America and the West Indies.<sup>68</sup> The recent conflict of the Seven Years War and the garrison requirements of the interwar period should have laid the foundation for future military activity in both North America and the West Indies, regardless of the size of conflict.<sup>69</sup> Ideally, this infrastructure should have also facilitated the distribution of medicines and other supplies necessary to medical practice. However, there was a distinct lack of continuity in the military administration from 1763 to the outbreak of hostilities in 1775, which had repercussions in terms of the ability of medical practitioners to successfully perform their duties.

The reasons for this lack of continuity primarily rested on the differences between the actualities of wartime and garrison duties. Following the established method of raising an army and a navy for war, the military forces grew rapidly during the Seven Years War.<sup>70</sup> The change to a peacetime force in 1763 resulted in large numbers of personnel being placed on half-pay or discharged outright. A large standing

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<sup>67</sup> Approximately one-fifth of British Army regular regiments served in North America between 1763-75. Michael McConnell, *Army and Empire: British Soldiers on the American Frontier, 1758-1775* (Lincoln and London: University of Nebraska Press, 2004), xvii.

<sup>68</sup> Buckley, *The British Army in the West Indies*, 49; John Grenier, *The First Way of War: American war making on the frontier, 1607-1814* (Cambridge: Cambridge University Press, 2005), 66.

<sup>69</sup> Buckley, *The British Army in the West Indies*, 55; McConnell, 102.

<sup>70</sup> Frey, *The British Soldier in America* 4-5.



army and navy were not justifiable expenses and were therefore quickly curtailed as soon as the opportunity arose.<sup>71</sup> Historian Michael McConnell has established that the garrison army of the interwar years differed greatly in its make-up when compared to the wartime army. Garrison soldiers, particularly those in North America, were typically older career soldiers whereas wartime recruits tended to be younger.<sup>72</sup> As such, the provisioning of this sort of armed force was significantly altered. These older soldiers were more accustomed to military expectations and could, for instance, be called upon to tend gardens to supplement their rations while their static duty station allowed for the establishment of permanent facilities for this valuable food service.<sup>73</sup> Gardening was deemed to be such an important activity by soldiers that laying out a garden patch was one of the first activities of a new garrisoning force, and a successful and diverse garden was a source of pride for a regiment.<sup>74</sup> A large and diverse garden had the added benefit of providing fresh stores for winter and helping to limit instances of scurvy.<sup>75</sup> These activities were not available to the mobile forces during the American Revolution and scurvy once again became a medical problem, as supply lines were unable to follow the army's movements.

The older garrison army also required a different sort of medical care. Due to their more advanced age and little need to serve in an active combat role, the most common ailments that plagued this group were epidemic typhus (commonly known as 'camp fever'), smallpox, and respiratory diseases, which all resulted from close and

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<sup>71</sup> Gage to Barrington 22 February 1766 quoted in Carter, ed., 340.

<sup>72</sup> McConnell, 142-144.

<sup>73</sup> Ibid., 105.

<sup>74</sup> Ibid.

<sup>75</sup> Ibid., 110.

unsanitary quarters.<sup>76</sup> In addition to these camp diseases, military forces stationed in North America were also exposed to many illnesses associated with seasonal malnutrition and exposure, including scurvy in winter, and yellow fever and malaria in summer.<sup>77</sup> The experience gained concerning the treatment of these diseases during the inter-war period should have been easily applied to medical practice during the American Revolution, as the same diseases were present. However, the lack of continuity within the medical establishment between the two intervals forced medical practitioners to re-learn these treatments.

The medical practitioners who were in charge of treating these men in peacetime service also differed from their wartime counterparts. Army surgeons, especially staff surgeons, were rapidly discharged from service as the military establishment downsized following the cessation of conflict. The regimental surgeons who remained in service throughout the interwar period were often at the end of their careers and had no opportunity for advancement. Due to the practice of only retaining a limited number of medical practitioners on half-pay most army surgeons chose to establish a civilian medical practice, which offered more opportunities for profit than retention in military service.<sup>78</sup> This was an expressly appealing choice to many of the surgeons who had enlisted during the war out of patriotic duty and not due to the opportunities for pay. In

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<sup>76</sup> Ibid., 114-115.

<sup>77</sup> Ibid., 115. For seasonal outbreak of yellow fever and malaria see: Darrett Rutman and Anita Rutman, "Of Agues and Fevers: Malaria in the Early Chesapeake," *William and Mary Quarterly* 33(1) (1976), 39; Trevor Burnard "'The Countrie Continues Sicklie': White Mortality in Jamaica, 1655-1780," *Social History of Medicine* 12(1) (1999), 57.

<sup>78</sup> Howard, 240; Marshall, "Surgeons Reconsidered: Military Medical Men of the American Revolution," 312.

fact, the relatively low rate of pay for surgeons in both the army and the navy was a popular grievance until the end of the Napoleonic Wars.<sup>79</sup>

The high turnover rate of military medical practitioners from service in one war to the next ensured that there was little continuity of medical knowledge and even less transmission of the lessons learned in previous conflicts. This explained why military medical practitioners in the American Revolution began with such a steep learning curve and why the lessons that had emerged out of the Seven Years War had to be re-learned. This process of re-education on the medical advancements from previous conflicts and innovations of these techniques was neither fast nor without consequences. There were frequent shortages of 'necessaries' and medicines for the British troops fighting in North America. In many instances, medical practitioners purchased medicines out of pocket and were reimbursed later, an option that was only available to those units who had a medical practitioner equipped with the funds to do so.<sup>80</sup> The system of transport for medicines, involving their shipment from Europe and then dispersal throughout the military stations in North America, also delayed the arrival of such medicines. This method of shipment was most troubling for regimental medical practitioners who were among the very last to receive supplies. Procuring emergency allocations from general hospitals in the area could ease the resulting shortages of medical supplies. This procedure was evidenced by a 1782 request from regimental medical practitioners stationed at Trois Rivières, Quebec:

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<sup>79</sup> Kaufman, 7; John M. Cardwell, "Royal Navy Surgeons, 1793-1815: A Collective Biography," in *Health and Medicine at Sea, 1700-1900* eds. David Boyd Haycock and Sally Archer (Woodbridge: The Boydell Press, 2009), 38; John Bell, *Memorial Concerning the Present State of Military and Naval Surgery addressed several years ago to the Right Honourable Earl Spencer First Lord of the Admiralty and now submitted to the public* (Edinburgh, 1800), 20.

<sup>80</sup> William Paine Papers 1768-1832, 12 August 1783.

Mr. Austin Surgeon to the Royal New Yorkers, Mr. Starch Surgeon to the 44th Regiment and Mr Mensries Surgeon to the 24th Regiment have each of them requested to be supplied with a few medicines from the General Hospital, sufficient to answer the exigency of this interval, till the arrival of the ships from Europe; I shall be glad to be inform'd by the first opportunity, whether their requisitions are approved by his Excellency the Commander in Chief.<sup>81</sup>

In addition to demonstrating how regimental practitioners relied on general hospitals for assistance, the above request also shows how distance and weather affected the distribution of supplies. Spring was a particularly lean time of year for provisions as it marked the end of the previous year's requisitions. As such, requests for additional medicines could be – and were – denied depending on what was available at the General hospitals themselves.<sup>82</sup>

Even if medicines were available within the supply network this did not ensure that they could reach units that needed them. Winter transportation to inland units was exceedingly difficult owing to frozen rivers and the great hindrance of travelling overland. The transport of medical personnel was also hindered by winter weather. One such case representing this difficulty was that of Mr. Menzies, a surgeon serving the naval station at Detroit who had been called into service with the 84th Regiment of Foot. Due to winter weather, it was impossible for him to join his new regiment at Trois Rivières until the spring.<sup>83</sup> This delay left the 84th Regiment under the care of only one medical practitioner, an assistant surgeon, who had recourse to medical help by assigning some of his patients to beds in a nearby General hospital, space permitting.<sup>84</sup>

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<sup>81</sup> WO 28/6, General Hospital Three Rivers, 26 April 1782.

<sup>82</sup> Kaufman, 78.

<sup>83</sup> WO 28/6 William Barr to Captain Lernoult Adjunct General, 9 February 1781.

<sup>84</sup> Ibid.

Instances like this could negatively affect the ability of medical practitioners to provide medical care to the servicemen under their charge.

Other necessary goods were also at the mercy of the transatlantic transport system. There were frequent complaints that special seasonal issue and standard issue clothing was late in arriving or completely absent.<sup>85</sup> The failure of the military administration to provide proper clothing and other necessities to troops hampered not only their ability to fight, but also posed a risk to their health. There were several complaints by military commanders attesting to the 'nakedness' of their soldiers and their want of various other types of supplies.<sup>86</sup> Mismanagement at the administrative level has often been blamed for the deficiencies of these supplies, but this was not the sole cause of the shipping and distribution problems. For British supplies to reach their forces in North America, they had to overcome many obstacles. While weather always presented a threat to ocean crossings, supply ships also had to fend off the American and French navies and privateers.<sup>87</sup> The Admiralty Board continually worried about the state of supplies in the American War. These concerns were voiced by Admiral Hugh Palliser (1723-96), a member of the Board in 1778: "I am very uneasy about the state of our provisions in America. I am afraid they have not enough to carry them through the winter, and the ships going out with supplies, the odds is against them that they will not get hold of the coast, or that they will be blown off the coast."<sup>88</sup> While all supplies were important, winter supplies were especially crucial as it was difficult to procure food and other necessities from the finite supply of the local population. Furthermore, upon a

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<sup>85</sup> Marshall, "The Health of the British Soldier in America, 1775-1781," 144.

<sup>86</sup> Ibid., 145.

<sup>87</sup> Ibid.

<sup>88</sup> George Barnes and John Owen, eds., *The Private Papers of John, Earl of Sandwich, First Lord of the Admiralty, 1771-1782, volume 4* (London: Navy Records Society, 1938), 130.

successful Atlantic crossing, there was the issue of finding a safe harbour that was sufficiently close to troop locations to avoid difficult and dangerous overland transport.<sup>89</sup> Rerouting of supplies to avoid fighting further delayed provisions and could have a detrimental effect on the health of troops and the ability of medical practitioners to provide adequate medical care.

It was not just army forces that were inhibited by supply deficiencies. In 1778, the acute supply and logistical problems of waging a large-scale war across the ocean became manifest in the navy. Admiral Augustus Keppel (1725-86), the commander in chief of the naval forces in America, was concerned that the fleet would be unable to sail "for want of provisions."<sup>90</sup> Any delay in the fleet's departure from Spithead would further impede the shipping of supplies to North America by taking away naval protection from transport ships. Unguarded naval convoys were susceptible to capture by privateers. The loss of the goods that these ships carried could have detrimental effects on the health of servicemen and the ability of medical practitioners to care for them.<sup>91</sup>

In addition, troop reinforcements needed to be transported across the Atlantic to the war in North America. The British Army administration was reluctant, at least in the initial years of the war, to recruit a portion of necessary troops from the colonial population, a practice utilized in previous North American conflicts. The rationale for this was two-fold. First, due to the civil war nature of the conflict it was difficult to ensure the loyalties of colonial troops. Second, it was believed that colonial troops were

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<sup>89</sup> Transport overland was made difficult by poor road conditions, foul weather, and the risk of attack from American forces. Marshall, "The Health of the British Soldier in America, 1775-1781," 145.

<sup>90</sup> Rodger, *Command of the Ocean*, 337.

<sup>91</sup> A similar example being, WO 28/6, General Hospital Three Rivers, 26 April 1782.

medically inferior to troops imported from Britain or Ireland. This inferiority stemmed from empirical evidence that colonials were more susceptible to contagious diseases such as smallpox and respiratory ailments to which troops born in Britain had developed immunity.<sup>92</sup> The failure and/or inability to use Loyalist troops to ease the manpower shortage within the British Army had multiple medical repercussions. The imported supplemental troops from Britain were often young and inexperienced with military life, resulting in a greater probability of battlefield injuries. In addition, there was a greater initial susceptibility to the so-called 'camp diseases' of typhus and typhoid amongst new recruits because these men had recently been placed in the close confines of military living and brought many infections into the Army. Furthermore, as this was the first time that these men had travelled to North America they were also unacclimatized and had not developed the immunity to many environmental diseases that their colonial or former garrison army cohorts had developed after significant postings in the region. The lack of acclimatization was of particular concern with the shift to the Southern Campaign in 1778 where tropical diseases existed.<sup>93</sup> Although acclimatization will be discussed in greater detail below, it is sufficient to say that the lack of immunity amongst troops serving in the southern states reinforced the importance of preventative medicine.

The manpower shortage that affected the army during the American Revolution also affected the Royal Navy. N. A. M. Rodger described why the manpower shortage during this war was so acute:

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<sup>92</sup> Robert Middlekauff, *The Glorious Cause: the American Revolution, 1763-1789* (Oxford: Oxford University Press, 2005), 530-32.

<sup>93</sup> Marshall, "The Health of the British Soldier in America 1775-1781," 19.

The manning problem in the American War was more severe than ever before, because a large proportion of Britain's naval manpower was already committed to the transport force, the naval squadron and the extensive amphibious and inland operations in North America, before the main fleet mobilized at all.<sup>94</sup>

The need to fill the ranks of the navy in order to effectively fight in the American Revolution therefore had medical repercussions when the navy was forced to press landsmen into service. The pressing of men into naval service was made substantially more difficult by the loss of manpower resources from the American colonies. Although these men were not the skilled sailors, they were necessary members of the naval service and freed up topmen from positions that could be performed by landsmen.<sup>95</sup> The issue was further exacerbated by the repercussions of the American Revolution in Britain.<sup>96</sup> However, the impressment of large numbers of men into naval service brought contagious diseases into the service and hampered the practice of naval medicine.

Military medicine benefitted from reform of the transport system, which began in 1779 when the responsibility for transporting army provisions was assumed by the Commissioners of the Navy.<sup>97</sup> According to historian David Syrett, transport reforms relied on "the ability of the Admiralty, Navy Board, and Treasury to coordinate their activities."<sup>98</sup> The reforms ideally meant that the Treasury would make the requisite supplies available for loading on the agreed upon schedule, the Navy Board would provide a sufficient number of transport ships to carry the tonnage, and the Admiralty

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<sup>94</sup> Rodger, *Command of the Ocean*, 395.

<sup>95</sup> Ibid.

<sup>96</sup> Ibid., 396.

<sup>97</sup> Syrett, 139.

<sup>98</sup> Ibid., 140.



would supply warships to escort the convoy to North America.<sup>99</sup> Escort ships helped to lower the number of transports captured by the enemy, ensuring that goods reached their destination.

Logistically, the transshipment of goods, whereby through coastal and river shipping supplies reached their destinations, was also streamlined. Before 1779, provisions destined for East Florida and New York were shipped from Cork, Ireland, while those provisions intended for Canada, the West Indies, and West Florida shipped from the River Thames.<sup>100</sup> Furthermore, in order to compile the necessary goods for the Cork shipment, dry goods needed to be shipped from England; conversely assemblage of the required goods for the shipment from the River Thames required wet goods to be shipped from Ireland.<sup>101</sup> This system contained two unnecessary transshipments of goods before the Atlantic voyage had even begun. By making Cork the sole embarkation point for all goods regardless of final destination, the transshipment problem was solved. On the North American side, the shipment process was also made more efficient following the 1779 system reforms. Supplies destined for Canada and the West Indies would be shipped in their own convoys. Those intended for the American colonies would land at New York, before being distributed through coastal shipping.<sup>102</sup>

The solutions that had been put in place to alleviate the transport and supply difficulties presented by the American Revolution were a significant move in the right direction. Supply and logistical issues were not completely solved. There continued to

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<sup>99</sup> Ibid. The region surrounding Long Island Sound was particularly dangerous due to privateer activity. Ibid., 127.

<sup>100</sup> Ibid., 143.

<sup>101</sup> Ibid.

<sup>102</sup> Ibid., 139.

be deficiencies in the supply of medicines and other necessities.<sup>103</sup> The successful streamlining of the supply system established an efficient and necessary framework for supplying British military forces. The logistical work completed during the American Revolution was further expanded during the French Revolutionary wars and enabled a more efficient practice of military medicine during the Peninsular Campaign.<sup>104</sup>

In addition to the difficulty of ensuring that supplies and personnel reached their required destination, the environment of North America was often inhospitable. Although the North American climate did not instill fear in British and colonial populations like that of the West Indies, the climate did generate concerns for medical practitioners.<sup>105</sup> The primary hindrances to medical practice in North America were climatic extremes. Winter in regions north of the Chesapeake brought numbing and dangerous cold, while summer in the same regions could be oppressively and debilitatingly hot. In the southern regions, scorching temperatures persisted throughout half the year and could completely paralyze an army through fatigue and disease.<sup>106</sup> Military medical practitioners needed to adapt military procedures in order to assist in reducing the environmental health risk to soldiers.

The most vulnerable to harsh climates were sick and wounded personnel. For this reason, it was necessary to construct hospitals that were protected from the cold of winter and ventilated in the heat of summer. William Barr, a surgeon and the hospital purveyor for the military forces in Canada, detailed the importance of establishing a

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<sup>103</sup> Marshall, "The Health of the British Soldier in America, 1775-1781," 145.

<sup>104</sup> Howard, 22-23, 214.

<sup>105</sup> Kupperman, 215.

<sup>106</sup> Gary Puckrein, "Climate, Health and Black Labor in the English Americas," *Journal of American Studies* 13(2) (1979), 180.

winterized hospital at Québec City in 1778 in a letter to General Guy Carleton (1724-1808) the commander of British forces in Canada:

Some few disbursements will be necessary to make [the building] a good Winter Hospital; but when Your Excellency considers that the expence is for the comfort & happiness of the poor Sick Soldier, I am persuaded the money will be no longer an object with you; besides I have to inform you that by having this house fitted up for a winter Hospital, you will save to the Public the following Rents which I formerly Paid.<sup>107</sup>

It is clear that Barr believed that without proper winter facilities, the threat of exposure would hamper the recovery of the sick and wounded. Exposure could also cause further illness such as frostbite. These dangers were also recognized by General Carleton, who dispensed £200 for the provisioning of the above winter hospital.<sup>108</sup>

Hospitals were equally vulnerable to the heat of summer as the cold of winter. Summer conditions, in addition to generating an immediate threat to health, contributed to the spread of contagion.<sup>109</sup> High temperatures, close quarters, and a lack of ventilation contributed to the spread of disease and further aggravated the fevers that many of the patients were suffering. Within the framework of humoral medicine, a lack of ventilation was blamed for causing bad air that spread contagion. Based on this belief, many military medical practitioners suggested that changes be made in the location of and manner in which hospitals were erected.<sup>110</sup> One of these practitioners was Donald Monro (1728-1802), a staff surgeon during the Seven Years War, who outlined his recommendations for the placement of summer hospitals as follows:

In summer, when the moveable or flying hospital is ordered into villages, large barns, and the largest airy houses, are the best.... In warm climates,

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<sup>107</sup> WO 28/6, William Barr to Guy Carleton, 25 August 1778.

<sup>108</sup> WO 28/6 William Barr to Captain Le Masstre, 27 August 1778.

<sup>109</sup> Marshall, "The Health of the British Soldier in America, 1775-1781," 141.

<sup>110</sup> Monro, 90; John Pringle, 121.

particular care ought to be taken to choose proper places for erecting hospitals. The situation ought not only to be dry and airy, but likewise at a distance from large woods and marshes, and out of the draught of winds which come over such grounds, otherwise the hospitals will often be unhealthy.<sup>111</sup>

Monro's suggestions for hospital placement had many health benefits. Adequate ventilation and space between patients would allow for cleaner, less contagious rooms. Distance from woods and marshes limited exposure to malaria-carrying mosquitoes and decreased the rate of malarial infections. While the connection between malaria, the mosquito, and water sources was not made in the eighteenth century, miasmatic theory and empirical observations fostered the belief that marshes should be avoided.<sup>112</sup> The relationship between the locations of West Indian hospitals and the reduction in fevers in the late eighteenth century has been made by historian Roger Buckley.<sup>113</sup>

The stationing of hospitals in healthier regions became a standard practice during the French Revolutionary Wars, and demonstrated the effectiveness of both preventative and reactionary forms of medicine. Medical practitioners set up hospitals in response to outbreaks of disease and illness, and employed preventative measures to ensure that these hospitals did not further generate or propagate sickness. For example, wards were set up in order to isolate those sick with fevers from patients with other illnesses or wounds, thereby helping to contain infection, and when possible medical practitioners would be assigned to a specific ward, thereby further reducing the threat of cross-contamination.<sup>114</sup>

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<sup>111</sup> Monro, 91-92.

<sup>112</sup> Rutman and Rutman, 44-45.

<sup>113</sup> Buckley, *The British Army in the West Indies*, 11.

<sup>114</sup> *Ibid.*, 314-315.

Furthermore, the dead were buried as quickly as possible, a practice which lessened further exposure to contagion.<sup>115</sup>

However, it was not just sick and wounded servicemen who were exposed to the extremes of the North American climate. Indeed, all troops were equally exposed to unhealthy conditions. The winter months were particularly troublesome because troops wintering in northern regions needed to be satisfactorily clothed against the elements. The standard uniform for an eighteenth-century British foot soldier consisted of a cloth coat, waistcoat, breeches, stockings, shoes, and a shirt.<sup>116</sup> The breeches, stockings, and coat, in spite of being fashioned out of wool, were insufficient attire to survive out-of-doors in winter north of the Carolinas. Fortunately, due to its previous experience in the Seven Years War, the army was aware of the threats that the North American climate could pose to troops. Army surgeons thus urged the adoption of proper winter attire.<sup>117</sup> In response to these recommendations and previous experience in this theatre of war, winter overcoats were issued to the men as well as mittens, leggings, and hats.<sup>118</sup> By pre-emptively supplying winter uniforms, the British Army nearly eliminated cases of frostbite.<sup>119</sup> The same proactive issuance of clothing was also applied to summer wear. Summer linen breeches were issued in order to off-set the high temperatures and regiments were encouraged to adopt colonial forms of uniform in order to more effectively campaign in all types of weather.<sup>120</sup> Adaptations to uniform included the

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<sup>115</sup> *Ibid.*, 215.

<sup>116</sup> Marshall, "The Health of the British Soldier in America, 1775-1781," 141-142.

<sup>117</sup> Monro, 316; Thomas Simes, *The Military Guide for Young Officers, Containing A System of the Art of War* (London, 1776), 358.

<sup>118</sup> Hew Strachan, *British Military Uniforms 1768-1796: The dress of the British Army from official sources* (London: Arms and Armour Press, 1975), 17.

<sup>119</sup> Marshall, "The Health of the British Soldier in America, 1775-1781," 142.

<sup>120</sup> *Ibid.*, 141.

shortening of coats and swapping leather shoes for either moccasins or gaiters.<sup>121</sup> The willingness of the British army to adapt the summer uniform helped to reduce the probability of heatstroke, a malady that frequently plagued the British Army's Hessian allies throughout the American Revolution.<sup>122</sup>

#### THE EIGHTEENTH CENTURY: The West Indies

The harshness of the West Indian climate was unparalleled in any other theatre of war during the late eighteenth century. The West Indies were viewed by the British as the most deadly of colonial possessions and the rationale for this perception was climatic in nature.<sup>123</sup> Interestingly enough, the same climate that made the islands so deadly to European colonists was also what made them the most profitable of colonial possessions.<sup>124</sup> Historian Karen Kupperman described the relationship between heat and wealth as follows: "Early modern science taught that there was a direct trade off between heat and [crop] abundance.... Colonists marvelled at how swiftly crops came to fruition, leading to claims of 'incredible usurie' in increase as well as multiple harvests every year."<sup>125</sup> As suggested by Kupperman, the wealth of the islands made them highly desirable to both the French and the Spanish<sup>126</sup> and therefore the British West Indian colonies were continually vulnerable to attack, requiring garrison forces to be

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<sup>121</sup> Ibid., 150-151, 154.

<sup>122</sup> Ibid., 141.

<sup>123</sup> Kupperman, 213.

<sup>124</sup> Buckley, *The British Army in the West Indies*, 10-12.

<sup>125</sup> Kupperman, 217-218.

<sup>126</sup> The Bahamas was particularly vulnerable to attack, owing to distance from other British West Indian colonies and reliance on American ports for supplies instead of receiving shipments directly from Britain. Such vulnerability was exploited by American rebels as well. An expedition of seven American warships arrived in March 1776 and quickly took the capital of Nassau. The Americans remained on the islands for two weeks before leaving uncontested. Maya Jasanoff, *Liberty's Exiles: American Loyalists in the Revolutionary World* (New York: Alfred A. Knopf, 2011), 219.

established.<sup>127</sup> Unfortunately, the European garrison forces were highly susceptible to disease.<sup>128</sup> Tropical fevers generated such a great loss of life in the troops of the West Indian garrisons that the turnover rate was remarkably high.<sup>129</sup>

The West Indian islands were noted by contemporary travel writers, medical practitioners, and colonists as being one of the worst disease environments in the world.<sup>130</sup> Thomas Trapham (d. ca 1692), for example, in his 1679 *Discourse of the State of Health in the Island of Jamaica*, set out to warn his countrymen of those practices that "happy and agreeable enough to the northern Climes, but unsuitable to the torrid Zone, where through the great activity of Nature most sudden changes are effected a sound health oft precipitated into Distemper, and such Distempers posting to the Grave."<sup>131</sup> The need for preventative medicine, and the avoidance of a 'posting to the Grave,' was clear in such an environment. The British military stationed in the islands applied two measures to combat the hostile disease environment: the use of non-European troops as garrison forces and the use of preventative medical practices.

The European colonists had used African and indigenous slaves as labourers since the first island settlements. The dark colour of skin of the West African slave was believed to have originated from extensive exposure to the powerful rays of the sun in the equatorial regions.<sup>132</sup> In the early eighteenth century, this belief went so far as to

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<sup>127</sup> Buckley, *The British Army in the West Indies*, 11.

<sup>128</sup> Burnard, 46.

<sup>129</sup> Buckley, *The British Army in the West Indies*, 272.

<sup>130</sup> Trevor Burnard has demonstrated that Jamaica was the most deadly of the West Indian colonies. Burnard, 57.

<sup>131</sup> Thomas Trapham, *A Discourse of the State of Health in the Island of Jamaica. With a provision therefore Calculated from the Air, the Place, and the Water: The Customs and Manners of Living, etc.* (London, 1679), 4.

<sup>132</sup> Winthrop D. Jordan, *White Over Black: American Attitudes Toward the Negro, 1550-1812* (Chapel Hill: University of North Carolina Press, 1968), 13. The eighteenth-century theory whereby race was environmentally determined was known as monogenism; it specified that all humans were the children of

suggest that if an African slave was removed from the tropical climate he would gradually adopt a paler, even white complexion.<sup>133</sup> Conversely, it was believed that Europeans who settled in the tropics would adopt a darker complexion over time. These beliefs, however, soon proved incorrect through the continual presence of white Europeans in the West Indies and African slaves in Europe.<sup>134</sup> For the greater part of the eighteenth century, the majority of medical practitioners considered skin colour to be unchangeable.<sup>135</sup> Nevertheless, skin colour was still utilized as a rationale for why blacks were best suited to work in the West Indian climate and why that climate was so harsh for Europeans. By using African labour, white plantation owners spared themselves and their families' arduous work and freed them to establish the planter ruler class.<sup>136</sup> However, blacks were not immune to tropical fevers or the harshness of labour in the hot sun, despite appearances to the contrary. Observations that non-Europeans suffered fevers to a lesser degree than colonists led to the perception that blacks were in fact immune to these diseases.<sup>137</sup>

Given the vulnerability of the islands to attack and the relatively small body of white inhabitants from which to draw a militia, it was necessary to use blacks for

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one set of first parents. Conversely, the theory of polygenism permitted multiple sets of first parents. By doing so "polygenism denies environment has the power to cause differences in physical appearance." Monogenism was the dominant philosophical racial theory by the latter half of the eighteenth century. Norris Saakwa-Mante, "Western Medicine and Racial Constitutions: Surgeon John Atkins' theory of polygenism and sleepy distemper in the 1730s," in *Race, Science and Medicine, 1700-1960* eds. Waltraud Ernst and Bernard Harris (London and New York: Routledge, 1999), 29-30,

<sup>133</sup> Puckrein, 181.

<sup>134</sup> Roxann Wheeler, *The Complexion of Race: Categories of Difference in Eighteenth-Century British Culture*, (Philadelphia: University of Pennsylvania Press, 2000), 4.

<sup>135</sup> Jordan, 16.

<sup>136</sup> Richard Dunn, *Sugar and Slaves: The Rise of the Planter Class in the English West Indies, 1624-1713* (Chapel Hill: University of North Carolina Press, 1972), 170-171.

<sup>137</sup> Mark Harrison, "'The Tender Frame of Man': Disease, Climate, and Racial Difference in India and the West Indies, 1760-1860," *Bulletin of the History of Medicine* 70(1) (1996), 75.



emergency defence.<sup>138</sup> There were three reasons for the small settler population: the minimal need for white plantation labour, the reluctance of white colonists to settle, and the high mortality rate from tropical diseases. Jamaica, for example, had a settler population of 8,230 with a slave population of 75,000 in 1730.<sup>139</sup> While the settler mortality rate decreased after the 1730s due to more successful medical treatment, the demographic structure of the island was not altered.<sup>140</sup> By virtue of the disease environment, Jamaica and the other West Indian islands were unable to maintain white settler populations without prodigious immigration from Europe.<sup>141</sup> Historian Peter Voelz describes the need of blacks for defence in the following manner:

Throughout the entire colonial period and in virtually every area of the Americas, the black man was appreciated for this military worth at one very important time - in an emergency. It is in times of alarm, when whites were driven to desperation, that they reached out to blacks, usually slaves, to be rescued from death or captures and gave them the two things most denied them in bondage- weapons and freedom. And blacks responded, not as usually feared - against their masters, but rather in their support, and not grudgingly by most indications, but willingly, often beyond even the hopes of the surprised whites.<sup>142</sup>

Reliance upon black troops, throughout the colonial Americas, for defence in the event of emergency attack or invasion was therefore an act of desperation as well as a medical outcome. Black soldiers did not appear to fall victim to the same diseases that paralyzed European armies, hence they could outlast an invading force whilst preserving the health of British regulars. The ability with which slaves could be turned

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<sup>138</sup> Buckley, *Slaves in Red Coats*, 2. During the American Revolution, for example, twelve regiments of British Regulars were sent to the West Indies. Eleven per cent of each regiment died before reaching the islands and many of those who survived the passage were quickly invalidated back to Britain. These circumstances further required the use of blacks as emergency soldiers. Ibid., 4.

<sup>139</sup> Throughout the seventeenth and eighteenth centuries, the population of the white settlers in the West Indies was dwarfed by the African population by a ratio of 9:1. Burnard, 52.

<sup>140</sup> Ibid., 53.

<sup>141</sup> Ibid.

<sup>142</sup> Voelz, 23.

into soldiers in crisis situations diminished resistance to the formation of a standing black regiment.

Black troops had been used by both sides during the American Revolution and demonstrated the viability of slaves as soldiers on a more permanent basis. For British forces, the use of blacks served a three-fold purpose. First, these men helped to ease the manpower shortage in the military. Second, there was the perception, especially in the Southern colonies, that blacks were immune to tropical diseases, as well as being brutally effective soldiers. Finally, by offering freedom to any slave that decided to join the British cause, it was possible that the rebel side would be drained of some of its labour force.<sup>143</sup> Removing slaves from rebel-owned plantations could have the dual economic hardship of forcing the purchase of new slaves and threatening harvest yields. The American Revolution marked the first use of blacks on a more than expeditionary level, with the establishment of standing regiments and other smaller units that would remain active for the duration of the conflict.<sup>144</sup> Social historian Sylvia Frey postulated that the "British experience in the American Revolution demonstrated the possibility of

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<sup>143</sup> On 7 November 1775, the Lieutenant Governor of Virginia, Lord John Dunmore issued the first proclamation promising freedom to those slaves of rebel masters who fought for the British cause. Dunmore hoped that such measures would assist in "the more speedily reducing this Colony to a proper Sense of their Duty, to his Majesty's Crown and Dignity." *Dunmore's Proclamation, November 7, 1775* accessed 21 July, 2011, <http://www.jstor.org.proxy.hil.unb.ca/stable/pdfplus/10.1525/hsns.2011.41.1.41.pdf>. In the month following Dunmore's Proclamation "more than five hundred slaves left their masters and became black Loyalists. Thomas Allen, *Tories: Fighting for the King in America's First Civil War* (New York: Harper Collins, 2010), 155. Other proclamations stipulating freedom for the slaves who fought for the British cause were issued throughout the colonies.

<sup>144</sup> Not all enlistments were for the duration of the war. However, units raised on a situational basis, such as the Black Pioneers and other temporary forces such as construction details, remained active throughout the American Revolution. Mary Clifford, *From Slavery to Freedom: Black Loyalists After the American Revolution* (Jefferson, N.C.: McFarland, 2006), 26-27, 61. Units such as Captain Martin's Black Pioneers represented the first use of a permanent black force and served as partial justification for future use of such forces. Todd W. Braisted, "The Black Pioneers and Others: The Military Role of Black Loyalists in the American War for Independence," in *Moving On: Black Loyalists in the Afro-Atlantic World*, ed. John W. Pullis (New York: Garland Publishing, 1999), 11-12.

using slaves as a permanent military force."<sup>145</sup> The success of these permanent black forces, favourable opinions of military officers regarding the conduct of black units, and the harsh medical environment of the West Indies on the European constitution all contributed to the formation of the West Indian Regiments.<sup>146</sup> Some members of the British black units of the American Revolution continued to serve the British cause in exile, including 241 veterans who enlisted on St. Lucia.<sup>147</sup>

The troop situation in the West Indies during the French Revolutionary Wars was just as dire as in previous conflicts. In 1794, the British military garrisons only had 2,000 men listed as fit for duty to defend eleven island colonies. This small number was deemed to be woefully inadequate to provide successful defence of the islands, a feat that army commander General Charles Grey (1729-1807) believed would only be possible with at least 10,000 troops.<sup>148</sup> In order to immediately correct the troop deficiency, provide adequate defence for the colonies, and launch expeditions toward French colonial possessions, the West Indian Regiments were established. In order to supplement the troop levels created by the formation of the West Indian Regiments, 27,000 troops were sent from Britain over the two-year period from 1795-96. Their losses from disease were staggering: 6,000 reinforcements had died in St. Martinique by March 1796.<sup>149</sup>

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<sup>145</sup> Sylvia Frey, *Water From the Rock: Black Resistance in a Revolutionary Age* (Princeton N.J.: Princeton University Press, 1991), 89.

<sup>146</sup> Voelz, 165.

<sup>147</sup> Ibid. Other black veterans continued their service in garrison and road construction details in Nova Scotia and New Brunswick before eventually being discharged and given land grants. Clifford 62-63.

<sup>148</sup> Voelz, 162. General Grey had succeeded General Carleton as the commander of British forces in America in December 1782 and had served in the American colonies and the West Indies. Rory Cornish, "Grey, Charles," *Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004).

<sup>149</sup> On average only one-third of each regiment escaped death by tropical fever. This force was the last large British force sent to the West Indies before the end of hostilities in 1815. J. R. McNeill, *Mosquito*

The West Indian first regiment was formed on 16 April 1795 in order to counteract the threat posed by both French Royalists and French Nationalists on the Caribbean islands.<sup>150</sup> A second regiment was commissioned soon after on 2 May.<sup>151</sup> Both regiments were to consist of blacks and mulattoes then residing in the West Indies. Henry Dundas (1742-1811), the Secretary of State for War, in a letter soliciting royal approval for the raising of the regiments, attested to the usefulness of black troops in hot climates by citing their ability to perform fatigue duties and their proficiency at pursuing insurgents.<sup>152</sup> Over the course of the French Revolutionary Wars, six additional West Indian Regiments were commissioned.<sup>153</sup> The regiments, which consisted of white officers and black foot soldiers, were highly effective fighting units. The use of local black troops eliminated the need to import large numbers of European soldiers into a harsh disease environment and thus enabled these European troops to be used in other regions of conflict.<sup>154</sup>

The effectiveness of the West Indian regiments was attributed by many military commanders to the lack of seasoning that these troops had to undergo, making for quick reinforcements and improved survival rates. Seasoning, or acclimatization, was the period of sickness that all new European arrivals to the islands underwent before adapting to the climate. Physician Hans Sloane (1660-1753) detailed the deadly effects

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*Empires: Ecology and War in the Greater Caribbean, 1620-1914* (Oxford: Oxford University Press, 2010), 246-247.

<sup>150</sup> Buckley, *Slaves in Red Coats*, 20.

<sup>151</sup> Ibid.

<sup>152</sup> Ibid; Henry Dundas to the Duke of York, 16 April 1775, W.O. 6/131.

<sup>153</sup> Ibid., 135. By October 1818 all the regiments had been disbanded, with the exception of the First and Second, which retained a peacetime contingent of 650 soldiers each.

<sup>154</sup> Although black soldiers had a significantly lower mortality rate from tropical disease, there were five thousand disease-related deaths between 1795 and 1815. Howard, 182.

of tropical fevers in his *A Voyage to Jamaica* (1707)<sup>155</sup> and outlined his views of acclimatization:

A great many were of opinion that this Fever was what is call'd the Seasoning, that is to say, that every New-comer before they be accustomed to the Climate and Constitution of the Air in *Jamaica*, are to have an acute Disease, which is thought to be very dangerous, and that after this is over, their Bodies are made more fit to live there, with less hazard than before; and this is not only thought so in the Island, but in *Guinea*, and all over the remote Eastern parts of the World.<sup>156</sup>

Sloane was sceptical of the seasoning process, referencing the morbidity of permanent inhabitants of Jamaica, as well as the lack of sickness among some of the recently arrived Europeans.<sup>157</sup> Africans and Native Americans were widely perceived to be immune from the procedure entirely or believed to suffer for a short period before recovering their full capabilities.<sup>158</sup> The belief in acclimatization persisted throughout the late eighteenth and early nineteenth centuries among medical practitioners and the general European population.<sup>159</sup> The ability of blacks to escape the seasoning process was noted by army physician John Hunter (1754-1809):

Europeans, after remaining some time in the West Indies, are less liable to be affected by the causes of fever than on their first arrival. The negroes afford a striking example of the power acquired by habit of resisting the causes of fevers; for, though they are not entirely exempted from them, they suffer inevitably less than Europeans.<sup>160</sup>

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<sup>155</sup> Hans Sloane, *A Voyage to the Islands Madera, Barbados, Nieves, S. Christophers and Jamaica, with the Natural History of the Herbs and Trees, Four-footed Beasts, Fishes, Birds, Insects, Reptiles, &c.*, Vol. 1 (London, 1707), xcvi.

<sup>156</sup> *Ibid.*, xcvi.

<sup>157</sup> *Ibid.*

<sup>158</sup> Christian Warren, "Northern Chills, Southern Fevers: Race-Specific Mortality in American Cities, 1730-1900," *The Journal of Southern History* 63(1) (1997), 33; Susan Klepp, "Seasoning and Society: Racial Differences in Mortality in Eighteenth-Century Philadelphia," *William and Mary Quarterly* 51(3) (1994), 500.

<sup>159</sup> Mary Dobson, "Mortality Gradients and Disease Exchanges: Comparisons from Old England and Colonial America," *Social History of Medicine* (1989), 270; Puckrein, 181. Seasoning also occurred in the American colonies, especially surrounding Chesapeake Bay where cases of 'seasoning' had been documented as early as 1680. Rutman and Rutman, 43.

<sup>160</sup> John Hunter, *Observations on the Diseases of the Army in Jamaica; and on the best means of Preserving the Health of Europeans, in that Climate* (London, 1788), 24.

Europeans, if they survived the first seasoning ordeal, would be far more likely to continue to survive in the West Indian environment. However, it was still difficult to convince those who did not seek the wealth of the islands to go through the seasoning process.<sup>161</sup> Historian Roger Buckley has demonstrated that many soldiers and sailors deserted upon hearing that they were to be sent to the Caribbean, or during the summer months after their arrival, due to their fear of disease.<sup>162</sup> Furthermore, the fear of the West Indian climate and the seasoning process eliminated another potential source of troops, German mercenaries, increasing the value of the black troops of the West Indian Regiments.<sup>163</sup>

Tropical fevers were equally deadly to the sailors of the Royal Navy stationed in the West Indies. Bartholomew James (1752-1828), a lieutenant and transport agent serving on St. Martinique, described the situation thus in a 1794 journal entry:

The dreadful sickness that prevailed in the West Indies is beyond the power of the tongue or pen to describe. In a few days after I arrived at St. Pierre I buried every man in my boat twice, and nearly all of a third boat's crew, in fevers; and shocking and serious to relate the master, mate, and every man and boy belonging to the *Acorn* transport, I came from England in, and had continued my pennant on board during the whole of the time up to May 12. The constant affecting scenes of sudden death was in fact dreadful to behold, and nothing was scarcely to be met but funeral processions in this town, of both officers and soldiers; and the ships of war was so extremely distressed that many of them had buried almost all of their officers and seamen.<sup>164</sup>

The conditions detailed by James considerably hampered the British naval force. In order to ease the strain on European sailors in the region, blacks were also recruited into

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<sup>161</sup> Kupperman, 227.

<sup>162</sup> Buckley, *The British Army in the West Indies*, 220-221.

<sup>163</sup> *Ibid.*, 62. German mercenaries provided 29,000 men during the American Revolution. The use of German troops was so great that German forces outnumbered British regulars in Canada by 1783. Marshall, "The Health of the British Soldier in America 1775-1781," 16.

<sup>164</sup> John Laughton and James Sullivan eds., *Journal of Rear-Admiral Bartholomew James* (London: Navy Records Society, 1896), 241-242.

the Royal Navy. Coastal shipping in the Leeward Islands for example was dominated by black sailors and provided a pool of able seamen that could be recruited into naval service.<sup>165</sup> Certain naval medical practitioners believed that shore parties in the West Indies should be exclusively composed of blacks in order to prevent infection to white sailors.<sup>166</sup>

Preventative medicine was an essential component of military medical practice due to the harsh disease environment of both North America and the West Indies. Additionally, this form of medicine was part of a larger trend in eighteenth-century military medicine. John Pringle (1707-82), Physician-General during the War of Austrian Succession (1740-48), delineated the importance of preventative medicine in the preface to his *Observations on the Diseases of the Army* (1752).<sup>167</sup> This same insistence and focus on the prevention of disease in military forces was found in the work of William Blair (1766-1822), an army surgeon during the American Revolution. For Blair, attention to preventative medicine was a duty that would not only preserve the life of servicemen but also protect the state which they served. This sentiment was stated by Blair in *The Soldier's Friend* (1798), a treatise that advocated for the use of preventative medicine and other proactive practices:

*On the Importance and Practicability of preserving the Health of Soldiers:*  
Health is the main spring of action, both in public and private affairs: it is that, without which all our motions must languish, and our designs become vain. The health of an army must therefore be of equal importance with its

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<sup>165</sup> W. Jeffrey Bolster, *Black Jacks: African American Seamen in the Age of Sail* (Cambridge, Mass.: Harvard University Press, 1997), 18. Slaves who had been impressed into the navy were often returned at the request of their masters. Rodger, *The Wooden World*, 160.

<sup>166</sup> McNeil, *Mosquito Empires*, 79. Christopher Lloyd, *The Health of Seamen: Selections from the Works of Dr. James Lind, Sir Gilbert Blane and Dr. Thomas Trotter* (London: Navy Records Society, 1965), 193-194.

<sup>167</sup> John Pringle, *Observations on the Diseases of the Army in Camp and Garrison in Three Parts* (London, 1752), ix.

existence; or rather, I should say, an army without health is a burden to the state it was intended to serve.<sup>168</sup>

The potential burden to the state, noted by Blair, was a feature of service in the West Indies especially when coupled with the manpower shortage within the military and the harsh disease environment. Preventative treatment methods were essential to maintaining an adequate fighting force in the British colonial Americas. These methods included prophylactic treatments and the amelioration of the design and location of hospitals and garrisons. The use of black soldiers and sailors may also be viewed as a preventative medical measure as their use removed British regulars from unhealthy regions entirely or supplanted European troops in fatigue duties.

Prophylactic treatments were the most common in the West Indies, where the danger to health was the most acute. These measures included the use of Cinchona to prevent the onset of tropical fevers. Cinchona, commonly referred to as Peruvian or Jesuits bark, had been used by the indigenous population of South America to prevent and treat tropical fevers. Jesuit missionaries first utilized the bark as a treatment in the seventeenth century.<sup>169</sup> The drug was transported back to Spain and its use was quickly adopted by other European colonial populations and medical practitioners.<sup>170</sup> Although it was not until the nineteenth century that alkaloids located in the bark's molecular

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<sup>168</sup> William Blair, *The Soldier's Friend: or the Means of Preserving the Health of Military Men; Addressed to the Officers of the British Army* (London and Dublin, 1798), 7.

<sup>169</sup> There is debate within the scholarship over the first European use of cinchona. One version attributes this milestone to the Countess of Chinchon, the wife of the Spanish viceroy to Lima, in 1623. Cinchona is believed to be derived from the misspelling of her name. The second version states that Jesuits observed the use of the bark and requested samples that they could bring back to Spain in the 1620s. Saul Jarcho, *Quinine's Predecessor: Francesco Torti and the Early History of Cinchona* (Baltimore: Johns Hopkins University Press, 1993), 1-6.

<sup>170</sup> *Ibid.*, 7.



structure were distilled as quinine, cinchona had been long used as effective prophylactic and treatment for malarial fevers.<sup>171</sup>

The differential diagnosis of the various tropical fevers was beyond the reach of eighteenth-century medical practitioners. As cinchona was the only medical treatment that had been empirically shown to aid in the prevention and treatment of tropical fevers, the bark was often prescribed for all instances of tropical fevers.<sup>172</sup> George Pinckard (1768-1835), an army physician who accompanied the disastrous Abercromby expedition to the West Indies in 1796,<sup>173</sup> described the use of cinchona as follows:

You will not be surprised to know that rumour has been busy on the subject of the prevailing sickness.... In consequence of such remarks, and in order to satisfy my own feelings, trying every means which it was in my power to obtain, for the relief of the sick, I have solicited the aid of the medical men of the country, both English and Dutch, and requested them to oblige me by attending frequently at the hospital... but I find that here, as at [British Guiana], the disease is treated in the same manner as the common remittent fever of the country, and nearly the whole reliance confided to the bark - that great sheet-anchor of West India practice. This was prescribed in ample quantity, and in various forms, but it wholly failed of success.<sup>174</sup>

As Pinckard described, 'the bark' was the staple of medical practice in the West Indies, even when it was not a successful form of treatment. The limited efficacy of cinchona against the scourge of yellow fever placed doubt upon its value as a prophylactic, especially given the difficulty of procuring the bark as the specific species of cinchona

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<sup>171</sup> McNeil, *Mosquito Empires*, 74. There are four strains of malaria, but only two that commonly infect humans. *Plasmodium vivax* is more benign and *Plasmodium falciparum* is more virulent. Quinine is effective in both cases. Rutman and Rutman, 34. *Vivax* was present throughout the world while *falciparum* was restricted to the West Indies, Africa, and the Southern United States. Dobson, 289.

<sup>172</sup> Thomas Percival, "Experiments on the Peruvian Bark," *Philosophical Transactions (1683-1775)* (1767), 227.

<sup>173</sup> This expedition was disastrous due to the extreme morbidity and mortality attributed to tropical fevers. George Pinckard, *Notes on the West Indies: Written during the Expedition under the Command of the Late General Sir Ralph Abercromby*, vol. III (London, 1806), 79.

<sup>174</sup> *Ibid.*

was only obtained in the Andes mountains at elevations higher than 2,500 meters.<sup>175</sup> Despite these concerns, cinchona continued to be used well into the nineteenth century as a fever treatment, alone or in combination with other methods such as bleeding, mercury, blistering, and cold-water baths.<sup>176</sup> Sailors on shore parties would routinely be given prophylactic doses of cinchona while serving in tropical regions.<sup>177</sup> These activities demonstrate the reliance on preventative measures in military medicine and reveal how practitioners responded to specific disease environments.

Other measures, in addition to cinchona, were necessary to combat and prevent tropical fevers. As replacing the entire fighting forces of the British Army and the Royal Navy with black forces was neither a viable solution nor one that was advocated by the British government, it was expedient for military forces to enact procedures that mitigated the morbidity and mortality of their servicemen.<sup>178</sup> These measures included arriving on location and campaigning at times when the mosquito population was lowest. While eighteenth-century medical practitioners had not identified the mosquito as the carrier of tropical fevers, the presence of 'sickly seasons' had long been noted.<sup>179</sup> As such, it was advisable to conduct military campaigns in the southern American colonies during the spring. During the Southern Campaign of the American Revolution, British forces successfully captured the southern ports of the Carolinas in

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<sup>175</sup> Jarcho, 196.

<sup>176</sup> McNeil, *Mosquito Empires*, 75-78. James Lind recommended the use of bleeding, blistering, and opiates in conjunction with the use of cinchona bark. James Lind, *An Essay on Diseases Incidental to Europeans in Hot Climates* (London, 1792), 240-242.

<sup>177</sup> Gilbert Blane, *A Short Account of the Most Effectual Means of Preserving the Health of Seamen, particularly in the Royal Navy* (London, 1781), 41.

<sup>178</sup> The colonial government of Jamaica heavily resisted the implementation of a black regiment on the island and lobbied Parliament to prevent recruitment efforts. Buckley, *Slaves in Red Coats*, 43.

<sup>179</sup> Kupperman, 232. Dobson, 272.

the spring of 1780, only to be decimated by the summer 'sickly season.'<sup>180</sup> Nicholas Durand, a French travel writer, noticed the connection between hot weather and sickness among settlers surrounding Chesapeake Bay in 1686:

Along the seashore and also along the rivers which contain salt, because of the tide, the inhabitants in these places are rarely free from fever during the hot weather; they call this a local sickness; but the salt in the rivers disappears about twenty leagues from the seas, just as one enters the county of Rappahannock, and those who live beyond that point do not suffer from it.<sup>181</sup>

Many medical practitioners made observations similar to those of Durand, connecting low-lying marshy areas such as those along the shoreline with miasma.<sup>182</sup> The bad air from these regions could be avoided if newcomers reached the colonies at specific times of the year. Military commanders were also privy to this information. In 1766, General Gage delayed the departure of new recruits from New York to Florida until the end of summer in order to avoid sickness.<sup>183</sup> When travelling to the West Indies it was advisable to arrive between December and May, a stipulation that J. R. McNeil noted was well known by European strategists since the 1690s.<sup>184</sup> Caution extended to those forces stationed off shore as well. In the late eighteenth century, the naval surgeon Elliot Arthy delineated the danger and cause of tropical fevers in the West Indian naval service: "The loss of seamen is here again occasioned by the Yellow Fever, in consequence of impressing seamen onshore, and out of merchantmen, in the West-

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<sup>180</sup> J. R. McNeil, "Yellow Jack and Geopolitics: Environment, Epidemics, and the Struggles for Empire in the American Tropics," *OAH Magazine of History* 18(3) (2004), 12. The best arrival time for the Carolinas was in late autumn. Kupperman, 232; Kopperman, 65.

<sup>181</sup> Nicholas Durand quoted in, Gilbert Chinard, ed., *A Huguenot Exile in Virginia, or Voyages of a Frenchman exiled for his Religion with a description of Virginia & Maryland* (New York: The Press of the Pioneers Inc., 1934), 174.

<sup>182</sup> Mitman and Numbers, 393.

<sup>183</sup> Kopperman, 65.

<sup>184</sup> J. R. McNeil, "Ecology, Epidemics and Empires: Environmental Change and the Geopolitics of Tropical American, 1600-1825," *Environment and History* 5 (1999), 180.

Indies; through, also improper medical treatment of the Fever; and through the want of a sufficient quantity of the Peruvian Bark."<sup>185</sup> Naval ships were encouraged to anchor away from shore winds and to limit time on shore particularly at night. Gilbert Blane (1749-1834), a naval physician, recommended that "seamen should be allowed to go on shore as little as possible, especially at night, for they are here exposed not only to the land air from the marshes that are generally near the shore, and thereby catch intermittent fevers, but they also find the means and opportunity of getting drunk."<sup>186</sup> If sailors did not go ashore they would avoid the marsh air, as Blane suggested. They would also avoid exposure to disease-carrying mosquitoes and thus tropical fevers.

While avoiding the deadly southern torrid zones, the northern regions of North America also faced environmental obstacles. A harsh winter presented a significant barrier to good health. The North American winter eliminated any supply of fresh fruit and vegetables beyond that which could be procured before the first snows, contributing to incidents of scurvy.<sup>187</sup> The death toll due to scurvy was entirely preventable and had two common remedies: spruce beer and citrus fruits. The efficacy of spruce beer had been first demonstrated to the French in the seventeenth century. Spruce beer was used extensively in the American Revolution. In 1777, by decree of George III, a half-gallon of spruce beer was issued as an anti-scorbutic and part of the daily ration to all troops

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<sup>185</sup> Elliot Arthy, *The Seamen's Medical Advocate: Or An attempt to shew that Five Thousand Seamen are, annually, during the War, Lost To the British Nation, in the West-India Merchants' Service, on-board Ships of War on the West-India Station, through the Yellow Fever* (London, 1798), 122.

<sup>186</sup> Blane, *A Short Account of the Most Effectual Means of Preserving the Health of Seamen*, 40.

<sup>187</sup> As an example of scurvy's potency, a British force of 7,300 had been reduced to 3,000 able-bodied men by scurvy during the battle of Quebec in the winter of 1759/60. Erica Charters, "Disease, Wilderness Warfare, and Imperial Relations: The Battle for Quebec, 1759-1760," *War in History* 16(1) (2009), 1. Paul Kopperman has described this outbreak of scurvy as "perhaps the worst outbreak of scurvy ever to hit the British Army." Garrisons throughout Canada, the Ohio River Valley and New York were all afflicted with the disease. Kopperman, 70.

serving in North America, a provision that remained in place until the end of the war.<sup>188</sup>

Owing largely to the consumption of spruce beer, a large outbreak of scurvy was avoided in the British regiments of the American Revolution.<sup>189</sup>

The same good fortune was not present among the sailors of the Royal Navy, so scurvy continued to be the greatest cause of morbidity and mortality amongst sailors.<sup>190</sup> Long voyages accompanied by little dietary diversification and a lack of fresh fruit and vegetables ensured that scurvy persisted in the navy throughout the eighteenth century. Even soldiers transported across the Atlantic fell victim to scurvy, an outcome far more likely on board ship than on shore.<sup>191</sup> Citrus as a cure for scurvy in sailors was documented as early as 1562.<sup>192</sup> Historians have credited James Lind and his experiments on board HMS *Salisbury* as the impetus for the push to adopt a ration of citrus fruits as a preventative measure in daily naval rations in the mid-eighteenth century.<sup>193</sup> In the *Salisbury* experiments, conducted in 1747, Lind treated twelve patients (divided into groups of two) with cider, vitriol, vinegar, seawater, garlic, and oranges and lemons, giving one cure to each group. The trials determined that oranges and lemons were the best course of treatment for scurvy.<sup>194</sup> The results of these discoveries were published in 1753 in *A Treatise of the Scurvy*. Following this publication, citrus was further adopted by medical practitioners as a cure and

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<sup>188</sup> Kopperman, 73.

<sup>189</sup> Ibid., 72-73.

<sup>190</sup> Lloyd and Coulter, 293.

<sup>191</sup> Soldiers on board transport ships only received two-thirds of a sailors' rations. Marshall, "The Health of the British Soldier in America, 1775-1781," 16-17.

<sup>192</sup> Thomas Freeman of the *Minion* left money to the ship's surgeon in his will for the purchase of anti-scorbutics, including oranges. J. D. Alsop, "Sea Surgeons, Health and England's Maritime Expansion: The West African Trade 1553-1660," *Mariner's Mirror* 76(3) (1990), 219.

<sup>193</sup> Lloyd and Coulter, 296-307, 321. Historian Michael Bartholomew has recently attempted to downplay the influence of Lind's experiments in the adoption of citrus as an anti-scorbutic. Michael Bartholomew, "James Lind and Scurvy: A Revaluation," *Journal for Maritime Research* (2002), 1-2.

<sup>194</sup> James Lind, *A Treatise of the Scurvy, In Three Parts. Containing An inquiry into the Nature, Causes, and Cure, of the Disease* (Edinburgh, 1753), 516-519.

prophylactic for scurvy.<sup>195</sup> The increased use included medical trials during the voyages of explorer James Cook, the success of which advanced the use of citrus as an anti-scorbutic.<sup>196</sup>

The Admiralty has been blamed by both contemporaries and historians for its delay in adopting citrus as a preventative measure on board ship.<sup>197</sup> There were, however, many obstacles that needed to be surmounted before citrus could become standard issue in the Royal Navy. The limited supply of fresh fruit, the inability to adequately preserve the juice in a manner that provided Vitamin C, and the cost of supplying ships were all prohibitive factors.<sup>198</sup> When lemons and limes were finally introduced service-wide in 1795, the year after Lind's death, the benefits were immediately noted.<sup>199</sup> At Haslar hospital, the cases of scurvy dropped from 329,000 per year in 1782 to 20,000 per year in 1799.<sup>200</sup> By the end of the Napoleonic Wars, scurvy had "almost disappeared from the fleet," with annual cases measured in single digits rather than thousands and demonstrating how advancements in medicine were dependent upon supply and administrative elements.<sup>201</sup>

Military hospitals were also a component of preventative medicine. The use of winter hospitals in the northern regions assisted in limiting the exposure to the elements that would hamper potential recovery.<sup>202</sup> Proper winter hospital installations could also

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<sup>195</sup> R. E. Hughes, "James Lind and the Cure of Scurvy: An Experimental Approach," *Medical History* 19(4) (1975), 343.

<sup>196</sup> Lloyd and Coulter, 303.

<sup>197</sup> Rodger, *Command of the Ocean*, 484-485. Rodger, *The Wooden World*, 86-87. Lloyd and Coulter, 321.

<sup>198</sup> Early preservation methods for citrus juices entailed the boiling and distilling of the fruit into a concentrate known as rob. This method of preservation significantly decreased, or in some instances, completely destroyed the curative properties. Lloyd and Coulter, 315-316.

<sup>199</sup> Ibid., 322.

<sup>200</sup> Ibid., 329.

<sup>201</sup> Ibid., 326.

<sup>202</sup> WO 28/6, William Barr, 25 August 1778.

reduce infections of pleurisy and pneumonia, which were the seasonal afflictions in the northern regions from November to May.<sup>203</sup> In warmer climates, the location and construction of hospitals could provide the greatest preventative benefit. As suggested by Donald Monro in 1780, hospitals should be situated in dry and elevated regions, minimizing where possible the threat of infection of tropical fevers.<sup>204</sup> When constructing hospitals that were intended to be fixed entities, such as general hospitals, it was recommended that they should feature large and airy corridors and rooms. This form of design diminished heat and allowed for ventilation and was the same construction that had been adopted by plantation owners.<sup>205</sup>

Another method of preventing disease included measures to improve the cleanliness of military personnel. Improved cleanliness not only prevented the onset of disease, it also helped to control the spread of infection.<sup>206</sup> In conjunction with such efforts were plans to redesign barracks hospitals and garrisons to ease crowded conditions.<sup>207</sup> These installations were notorious for overcrowding, especially in winter when tenting was not a viable option.<sup>208</sup> William Barrington in his "Instructions for the direction of the Hospital established for the Forces in Canada" in 1776 stipulated:

The Senior Physician by appointment, is to attend the General Hospitals to visit the Sick and prescribe for them such Diet and [Medicines] as he shall Judge most proper, to give directions to have them conveniently lodged in Wards with a free Air. Kept clean and not crowded, to assign the several parts of duty to the other Physicians who may be imploy'd to the Master

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<sup>203</sup> Marshall, "The Health of the British Soldier in America, 1775-1781," 22.

<sup>204</sup> Monro, 91-92.

<sup>205</sup> Kupperman, 234-235.

<sup>206</sup> Typhus and typhoid were both spread by lice. Marshall, "The Health of the British Soldier in America, 1775-1781," 141.

<sup>207</sup> Ibid.

<sup>208</sup> Hamilton, 46.

Apothecary, and Mates, and in order for the more effectual care of the Sick....<sup>209</sup>

When instructions like those of Barrington were followed by medical practitioners and military commanders the preventative measures instituted helped to control the spread of epidemics and infection. Such prophylactic methods established throughout North America and the West Indies provided the basis for preventative medicine in later conflicts.

Smallpox inoculation and vaccination were additional preventative measures that were utilized within military medicine during the long eighteenth century. Smallpox was present in all regions of North America and the West Indies.<sup>210</sup> The disease was extremely contagious and could rapidly spread through army camps and garrisons.<sup>211</sup> British army medical practitioners had been practising inoculation among troops and the colonial population since the Seven Years War.<sup>212</sup> Inoculation, the process whereby a healthy patient was infected with a small specimen of the smallpox virus from the pustule of a living victim, was a dangerous but effective procedure.<sup>213</sup> Traditionally, inoculation had been practiced in Asia, Africa, and the Balkans. This knowledge was transported to Western Europe and the colonies during the early eighteenth century.<sup>214</sup> Frequent smallpox outbreaks were such a problem in the Continental Army during the Revolutionary period that the disease has been cited as the

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<sup>209</sup> W.O. 28/6 William Barrington, "Instructions for the direction of the Hospital established for the Forces in Canada," 28 February 1776.

<sup>210</sup> Dobson, 289.

<sup>211</sup> Reiss, 14.

<sup>212</sup> Charters, 23.

<sup>213</sup> Wain, 173.

<sup>214</sup> Mark Harrison, *Disease and the Modern World: 1500 to the Present Day* (Cambridge: The Polity Press, 2004; repr. edn, 2005, 2006), 61-62.



reason for the failure of the American campaign into Canada in 1776.<sup>215</sup> The prevention of smallpox changed rapidly following Edward Jenner's successful vaccination experiment.<sup>216</sup> Vaccination, which used cowpox as the immunization agent, was considerably safer than inoculation and did not cause the patient to fall ill with a mild case of smallpox, avoiding debilitation and allowing servicemen to continue with their duties.<sup>217</sup> With the publication of Jenner's *An Inquiry into the Causes and Effects of the Variolae Vaccinae* in 1798, which detailed the vaccination process, vaccination became the primary method of smallpox prevention.<sup>218</sup> The success of vaccination was quickly demonstrated in a military setting, when the first military expedition to be vaccinated was that of General Abercromby to Egypt in 1801.<sup>219</sup> The adoption of vaccination by the military showcased the validity of preventative medicine within the military administration.

#### THE NINETEENTH CENTURY: The Peninsular Campaign

The Peninsular Campaign of the Napoleonic Wars demonstrated the potential for the various elements of military medicine to coalesce into an effective system of care. However, while the campaign illustrated the tremendous capacity to successfully deal with the ever-present problem of attending to the sick and the wounded, there were also many examples where the reality was very much the opposite. Cornet Francis Hall, a soldier with the 14th Light Dragoons, upon witnessing the horrendous conditions at

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<sup>215</sup> Ann Becker, "Smallpox in Washington's Army: Strategic Implications of the Disease During the American Revolutionary War," *Journal of Military History* 68 (2004), 382.

<sup>216</sup> Wain, 189.

<sup>217</sup> Ibid., 188.

<sup>218</sup> Wain, 190-191; Edward Jenner, *An Inquiry into the Causes and Effects of the Variolae Vaccinae, a disease discovered in some of the Western counties of England, particularly Gloucestershire, and known by the name of the Cowpox* (London, 1798), 56.

<sup>219</sup> Howard, 216.

Celerico hospital in Portugal, complained that, "two patients occupied each bed, and when one died another was brought in to fill his place, and share in mind as well as body, the infection of his disease."<sup>220</sup> It was not necessary for such conditions to persist, as was demonstrated by hospital reforms. A higher standard of care was possible by utilizing the improvements in preventative medicine, transportation, and administration that had emerged during the American Revolution and the West Indian conflicts of the French Revolutionary Wars. Nonetheless, the improvements to the medical system were neither universal nor in some instances long lasting. Hospitals, for instance, were notorious for alternating between periods of adequate and inadequate patient care. The number of patients in a specific institution often determined the standard of care. Fewer patients ensured that better care was provided, due to a lower patient-practitioner ratio. In order to maintain adequate care levels, regimental surgeons were often pulled from their stations in order to be sent to general hospitals.<sup>221</sup> There continued to be instances of patients languishing in deplorable conditions and soldiers perishing in large numbers due to epidemic diseases. Those occasions where improvements had been implemented were the result of the influence of individual military commanders and medical practitioners, medical advancements, and situational realities. The significance of these individuals and their circumstances will become clear through an examination of preventative and reactionary forms of medicine, transport, and administration.

During the Peninsular Campaign previously established methods of disease prevention were improved due to necessity, command influence, and a growing appreciation that medicine was an important military provision. Experience gained

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<sup>220</sup> Cornet Francis Hall, "Recollections in Portugal and Spain During 1811 and 1812," *Royal United Services Journal* 56(418) (1912), 1737.

<sup>221</sup> Howard, 137.

from the North American winters during the American Revolution and the Seven Years War taught the importance of proper shelter from the elements. James McGrigor, in the winter of 1812/13, recommended that the men be adequately quartered either in huts or in private homes rather than in tents. If these facilities were not possible, the best alternative would be the construction of fireplaces in order to warm the troops.<sup>222</sup>

Unfortunately, as noted by historian Martin Howard, these suggestions for improved comfort and the health of servicemen were only slowly implemented due to their high cost, forcing continued exposure to the elements.<sup>223</sup>

From a medical perspective, moisture was just as detrimental to good health as exposure to cold due to the connection between dampness and disease. John Pringle, an army physician, outlined the medical relationship between wetness and fevers among soldiers, "the men will either by duty or by misconduct often suffer from wet ground, wet clothes, nocturnal damps and colds. And the danger of their falling into these diseases is the greater, as the interchanges of heat and cold are some sensible and frequent in the field than in quarters."<sup>224</sup> These observations, made during the War of Austrian Succession, demonstrate the importance of previous experience in the practice of military medicine. The connection between illness and the damp was also remarked upon during the Peninsular Campaign. Joseph Donaldson, a soldier with the 94th Scottish Regiment, noted in his 1865 memoirs that "during the time we were in the Peninsula, the troops suffered much from exposure to rain; and nothing renders a soldier so uncomfortable as having wet clothes about him; or, I believe, hurts his health more

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<sup>222</sup> James McGrigor, "Sketch of the Medical History of the British Armies in the Peninsula of Spain and Portugal, During the Late Campaigns," *Medico-Chirurgical Transactions* (1815), 394.

<sup>223</sup> Howard, 213.

<sup>224</sup> Pringle, 10.

when first exposed to it."<sup>225</sup> Donaldson's observations are particularly illuminating as he did not possess a medical background, yet he was able to discern the same conclusions as medical practitioners regarding dampness and health. This was partly due to shared understanding of medical philosophies in the general population but it was also the result of his observations of the situation. In order to prevent discomfort and decrease the risks to health he recommended that infantrymen be issued oilskin coverings similar to those worn by their officers. Equipping men in such a manner would have been, according to Donaldson, "neither expensive nor heavy," but would "have been the means of saving many lives."<sup>226</sup> The failure of the military to issue protective clothing to troops and to quickly establish provisions for adequate winter shelter was a major administrative shortcoming, and the result of financial considerations, not a deficiency of medical practitioners or the medical knowledge of the time. These instances also indicated the lack of agency in medical practitioners. Due to the low status of medical practitioners in the military hierarchy, their opinions did not often carry sufficient weight to influence policy.

There were, however, great medical successes that occurred during the Peninsular Campaign as a result of preventative medical knowledge gained in other conflicts, such as the American Revolution, being favourably applied. One area was that of seasoning or acclimatization. Before reinforcements from Britain arrived on the frontlines of the Iberian Peninsula, they were first shipped to Cadiz or Gibraltar. At these relatively healthy coastal locations soldiers could be gradually introduced to drill in the hot summer

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<sup>225</sup> Joseph Donaldson, *Recollections of the Eventful Life of a Soldier* (Philadelphia: G. B. Zieber & Co., 1865), 101.

<sup>226</sup> Ibid.

heat without causing a shock to the constitution.<sup>227</sup> When this provision was not possible, troops were often detained at their ports of arrival in order to initiate acclimatization.<sup>228</sup> Furthermore, greater acclimatization could be facilitated if it could be scheduled in such a manner so that these new men joined their units at the end of the fall campaign season.<sup>229</sup> Another form of seasoning was also necessary, whereby new recruits survived the period of adjustment to the health hazards of military life, including close quarters and exposure to disease.<sup>230</sup> New recruits, as previous experience in the West Indies and the American Revolution had demonstrated, were more susceptible to disease than experienced troops. For instance, McGrigor attributed the high morbidity of the 7th Regiment of Foot to the number of new recruits serving in the unit. For the period between 19 August 1811 and 20 May 1812, forty-eight per cent of new recruits succumbed to disease, compared to just six per cent among the seasoned troops.<sup>231</sup> The proper selection of recruits could further lower morbidity and mortality rates. Referring to statistics showing that sixty per cent of the new recruits who died in the 7th Regiment were from urban occupations, with forty per cent coming from farming backgrounds, McGrigor recommended that future recruits come from agricultural backgrounds.<sup>232</sup>

The knowledge of how to eradicate scurvy as a cause of death was another gain for preventative medicine established during previous conflicts and one which continued to be successfully implemented in the Napoleonic Wars.<sup>233</sup> The prevention of scurvy demonstrated the intersection of the transport system with preventative medicine and

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<sup>227</sup> Howard, 211.

<sup>228</sup> McGrigor, "Sketch of the Medical History of the British Armies," 466.

<sup>229</sup> Howard., 211-212.

<sup>230</sup> Ibid., 211.

<sup>231</sup> McGrigor, "Sketch of the Medical History of the British Armies," 467.

<sup>232</sup> Ibid., 468.

<sup>233</sup> Scurvy was not listed as a cause of death on the Army medical returns between 1811-15. Ibid., 479-481.

continuity within the military medical system. The disappearance of scurvy was due to a plentiful and inexpensive supply of citrus fruits present in the Iberian Peninsula. In addition, the supply and transport system for necessities had been significantly streamlined as a result of previous experience, mitigating disruptions that had been present throughout the eighteenth century. With the food supply only rarely impeded, troops enjoyed a balanced diet regularly throughout the year, further contributing to the elimination of scurvy.<sup>234</sup>

The same preventative medical measures which were being introduced into the army were also implemented in the navy during the Napoleonic Wars. Gilbert Blane considered the year 1796 to be "an era in the history of the health of the navy."<sup>235</sup> With citrus in use throughout the navy and effectively eliminating scurvy in that year, the next greatest cause of morbidity and mortality in the naval service was fevers. Blane credited the "sudden decrease of sickness in the first years of this century" to preventative measures such as "improvements in the method of promoting ventilation and cleanliness, and particularly to the strict discipline adopted and enforced in the Channel fleet."<sup>236</sup> The use of ventilators helped to circulate fresh air below decks and to remove foul air.<sup>237</sup> Uniforms and frequent swabbing of the deck helped to maintain cleanliness and assisted in maintaining discipline.<sup>238</sup> These preventative measures fostered a healthier navy as evidenced by a forty-nine per cent reduction in the admissions of fever patients at Haslar

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<sup>234</sup> Food supplies were only severely disrupted by retreats and advances surrounding battles. Ibid., 423.

<sup>235</sup> Gilbert Blane, "Statements of the Comparative Health of the British Navy, From the Year 1779 to the Year 1814, With Proposals for its Farther Improvement," *Medico-Chirurgical Transactions* (1815), 503.

<sup>236</sup> Ibid.

<sup>237</sup> Fan-like ventilators had first been proposed in the mid-eighteenth century. Rodger, *The Wooden World*, 106-107.

<sup>238</sup> Rodger, *Command of the Ocean*, 527.

hospital between 1759 and 1799.<sup>239</sup> The reduction in patients demonstrated the auspicious effects of preventative medicine and the transference of medical knowledge from one military conflict to the next.

The influence of military commanders was also crucial for the introduction of preventative medical measures. Historian Matthew Kaufman described Wellington as "particularly concerned" with the welfare of the soldiers under his command.<sup>240</sup> Wellington was instrumental in improving the cleanliness of hospitals and would, as in the case of Santander hospital in 1814, institute quarantine during outbreaks of epidemic disease.<sup>241</sup> In order to stem epidemics amongst new arrivals of troops, all soldiers departing from Britain were screened for evidence of disease and cleanliness on Wellington's orders.<sup>242</sup> Wellington's involvement was also influential in procuring winter clothing for soldiers and ensuring that it was delivered to regiments in a timely manner.<sup>243</sup> In addition to these preventative measures, after initial reluctance, in 1812 Wellington gave unprecedented authority to medical practitioners to enact medical decisions in order to more effectively manage the medical system.<sup>244</sup> With this new authority, McGrigor transferred patients out of general hospitals and into regimental hospitals.<sup>245</sup> At the command level, regimental hospitals were often seen as interfering with military operations, hence Wellington's reluctance. However, regimental hospitals were often cleaner, cheaper, and had fewer instances of contagious disease than general

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<sup>239</sup> Lloyd and Coulter, 329.

<sup>240</sup> Kaufman, 25.

<sup>241</sup> Howard., 127.

<sup>242</sup> McGrigor, "Sketch of the Medical History of the British Armies," 465.

<sup>243</sup> In addition to winter clothing, some regiments were also given linen trousers for summer wear. Ibid., 469.

<sup>244</sup> Howard, 137.

<sup>245</sup> Ibid.

hospitals. Regimental hospitals had the added benefit of care being provided by medical practitioners known to the patients.<sup>246</sup>

Command influence was also important in the navy. Nelson, who suffered from many medical ailments during his naval service, was especially concerned with the welfare of the men under his command.<sup>247</sup> With the assistance of his agent-victualler Richard Ford, Nelson was an instrumental force in ensuring that the Mediterranean Fleet was meticulously victualled with supplies of fresh fruit and vegetables, including citrus fruits. Laurence Brockliss et. al. praise Nelson's efforts through which one million pounds of fresh beef and forty-seven thousand pounds worth of fruit and vegetables were consumed by approximately six thousand men between February 1804 and April 1805.<sup>248</sup> In the four-month period from October 1804 to January 1805, 62,400 oranges and 35,700 lemons were supplied to fend off scurvy.<sup>249</sup>

The increased cooperation between medical practitioners and military commanders was a response to the heightened status of the medical profession in both the army and the navy. Nelson's surgeon, William Beatty (d. 1842), was consulted by Nelson and HMS *Victory*'s captain Thomas Hardy (1769-1839) on medical matters and measures necessary for the improvement of health aboard ship.<sup>250</sup> In 1804, in recognition of the importance of retaining skilled surgeons in order to maintain the health of the fleet, Nelson offered a "powerful endorsement" of the surgeons' petitions for improved pay and

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<sup>246</sup> Marshall, "Surgeons Reconsidered: Military Medical Men of the American Revolution," 303.

<sup>247</sup> Since first joining the navy as a boy, Nelson had fallen victim to malaria, yellow fever, dysentery, and scurvy. Brockliss et al., 84.

<sup>248</sup> The number of men in the Mediterranean Fleet at this time fluctuated between six and eight thousand. Ibid., 86.

<sup>249</sup> Ibid.

<sup>250</sup> Ibid., 96.



status.<sup>251</sup> The relationship between Wellington and McGrigor, though sometimes uncertain, also demonstrated how surgeons and the tasks they performed were valued by the military establishment, a contrast to the status of medical personnel in previous conflicts wherein surgeons were considered uneducated and unable to perform their duties.<sup>252</sup>

In addition to the improvements noted in preventative medical treatments, the Peninsular Campaign was a theatre for reforms in reactionary medicine. Much like preventative treatment forms, the amelioration of reactionary medicine relied on advancements in medical knowledge, situational realities, and the influence of individuals. Advancements in amputation techniques, such as the removal of a leg by an incision through the hip joint which was successfully performed by George Guthrie (1785-1856) in the aftermath of the Battle of Waterloo, denoted clear advancements in medical technology.<sup>253</sup> Such advancements were also the result of the personal experience of the surgeon and the situation in which the amputations were performed. The more experienced the surgeon, the greater likelihood that the operation could be preformed quickly and efficiently. Furthermore, operations that were conducted immediately following trauma had a higher probable rate of survival. Both of these conditions, of experience and location, were met by Guthrie following Waterloo. Guthrie only performed one other operation in addition to the example above. Although both of these procedures were complex and exceedingly difficult, Guthrie had ample

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<sup>251</sup> Ibid., 97.

<sup>252</sup> Howard, 11-12.

<sup>253</sup> Kaufman, 17. Guthrie was an extremely accomplished surgeon, who entered the army as an assistant surgeon in 1801 before his sixteenth birthday. Additionally following Waterloo he performed a ligation of the femoral artery by the patient's calf muscle allowing the foot to remain attached. Ibid., 15, 17.

time to perform them, a luxury unavailable to many other practitioners.<sup>254</sup> Guthrie and other military surgeons often benefitted from the knowledge and experience that had been gained by civilian surgeons throughout the eighteenth century. Civilian surgeons and anatomists like Charles Bell (1774-1842) were contracted by the Army Medical Department to provide lectures to military surgeons on anatomy and surgery, which facilitated the transfer of new information.<sup>255</sup> The improved treatment of open fractures generated by gunshot wounds received in combat, for example, was the application of advancements in civilian medical knowledge in a military situation.<sup>256</sup>

Advances in medical science and surgical techniques were only beneficial to wounded servicemen if surgical procedures could be performed quickly after receiving an injury. This observation was the result of previous experience with military surgery in the eighteenth century. For instance, army surgeon John Bell (1763-1820) noted in 1800 that speed was important in "procuring adhesion," a necessary component in successful operations.<sup>257</sup> In order to expedite the transfer of wounded men to the surgeons, field hospitals were established in close proximity to the battlefield.<sup>258</sup> Field hospitals had been used throughout the eighteenth century. These hospital installations had been used by regimental surgeons and were often stationed within cannon distance of a battle.<sup>259</sup> By 1813, the field hospital system had been transformed. Field units were now part of the staff branch of the medical service. Staff surgeons often had more experience and were more efficient in performing operative procedures than their

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<sup>254</sup> Ibid., 17; Howard, 75-76.

<sup>255</sup> Ibid., 19-20; Howard, 147-148.

<sup>256</sup> Gabriel and Metz, 144.

<sup>257</sup> John Bell, *Discourses on the Nature and Cure of Wounds* (Edinburgh: 1800), 13-14.

<sup>258</sup> Kaufman, 85-87.

<sup>259</sup> Howard, 141. Field hospitals were also known as flying hospitals.

regimental counterparts. In theory this meant that more of the wounded could be seen more quickly than under the previous field hospital system.<sup>260</sup> Field hospital establishments were further improved by the introduction of portable, hard-sided hospital buildings. Wellington wrote to his brother Sir Henry Wellesley (1773-1847), then a diplomatic envoy to Spain, in January 1814 on the importance of military hospitals, especially portable installations:

It is quite impossible for a large army to carry on extended operations without military hospitals. We have had nearly 30,000 wounded upon this frontier since the month of June last, besides the sick which there must be among so many men kept in a constant state of exertion; yet I am certain that no individual has been put to the slightest inconvenience for which he has not received compensation; and I must add, that the inconvenience of having hospitals at all has been much relieved by my having provided portable buildings, brought from England purposely to be constructed into hospitals.<sup>261</sup>

The large number of wounded noted by Wellington could not be treated in the stationary general hospitals available, thus field hospitals were a great asset in ensuring that adequate medical care was obtained by injured servicemen. Additionally, portable field hospitals, which allowed for quicker amputations, significantly reduced the necessity of secondary operations and rates of gangrene.<sup>262</sup> Following the battle of Toulouse in the spring of 1814, the mortality rate for primary amputations was 11.7 per cent, far lower than the typical rate of 25-30 per cent.<sup>263</sup> These favourable results may be attributed to the above field installations instituted by Wellington.

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<sup>260</sup> Kaufman, 77.

<sup>261</sup> "Duke of Wellington to Sir Henry Wellesley January 14, 1814," in John Gurwood, ed., *Selections from the Despatches and General Orders of Field Marshal the Duke of Wellington* (London: John Murray, 1851), 787.

<sup>262</sup> Primary amputations were the first operations performed on an injury, while secondary amputations were performed in order to remove gangrenous tissue and create a clean wound field that could heal without infection. Secondary amputations had a higher mortality rate than primary operations due to the stress of the second operation without anaesthetic and the higher probability of infection. Kaufman, 19.

<sup>263</sup> *Ibid.*, 77.

Speedy transport of the wounded from the battlefield to a field hospital or to a general or regimental hospital was crucial to minimizing discomfort to the patient and increasing the survival rate. As previously mentioned, by moving the field hospital closer to the battlefield, the time required to transfer a patient to surgery could be reduced. Unfortunately, no standard battlefield evacuation system existed in the British medical service. The French army under the direction of surgeon Dominique Larrey had established an ambulance corps for the removal of the wounded from the battlefield in the 1790s.<sup>264</sup> The British relied on members from each regiment to remove their wounded fellows from the battlefield. This system was notoriously inadequate.<sup>265</sup> George Ballingall (1780-1855), an army surgeon who had served in India and taken part in the 1815 occupation of Paris, delineated the need to establish a suitable system for battlefield evacuation:

For this purpose, the only effectual provision seems to be, the formation of an Hospital Corps, placed entirely at the disposal of the medical staff, and consisting of men either enlisted and embodied solely with this view, or transferred to the hospital establishment in consequence of having, from years or from accidents, become less effective in the line. A body of men of this description, trained to the particular duties required of them, qualified to attend the sick in the hospitals, as well as to succour and bear off the wounded in the field, would preserve the integrity and effective force of regiments; would afford a degree of comfort to the sick and wounded, to which they are too often strangers; and would give an efficiency to the medical staff, which the most zealous devotion to the duties of the service cannot otherwise ensure.<sup>266</sup>

A hospital corps such as that suggested above would increase the survival rate and help eliminate the suffering of the injured through quickly obtaining medical care. The importance of quickly evacuating the wounded from the battlefield was also noted by

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<sup>264</sup> Kaufman, 84-85.

<sup>265</sup> Howard, 85-86.

<sup>266</sup> George Ballingall, *Outlines of Military Surgery, Third Edition* (Edinburgh: Adam and Charles Black, 1844), 92-93.

army surgeon John Gideon Millingen (1782-1849), who suggested that each member of a hospital or ambulance corps be outfitted with a blanket and a nine-foot long pike. Members of the corps working in pairs would be able to form a stretcher out of the pikes and one blanket and cover the wounded patient with the second blanket.<sup>267</sup> In inclement weather the pikes and blankets could also be used to provide shelter to the wounded while awaiting treatment in hospital.<sup>268</sup> These recommendations for the amelioration of the transport of men from the battlefield arose from the experience of the Napoleonic Wars. They were not, however, implemented until the mid-nineteenth century. There are many possible explanations for the delay in forming a hospital corps. The simplest is that the war ended before such recommendations could be installed and the period of peace that followed saw the typical reduction of the medical establishment as in previous conflicts. The establishment of a hospital corps would also require the enlistment of men specifically for the purposes of filling the corps. This would necessitate a costly reorganization of recruitment efforts and changes to regimental hierarchy. The cost and the need to reorganize made the suggestion of a British hospital corps unappealing to the military administration at the start of the nineteenth century.<sup>269</sup>

Transport of the wounded to general and regimental hospitals was equally difficult. At the beginning of the Peninsular campaign, civilian vehicles were hired to perform this task. These consisted mostly of open ox carts which exposed the wounded

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<sup>267</sup> The blankets would also be affixed with straps to brace the weight of the patient and holes through which to insert the pikes. John Gideon Millingen, *The Army Medical Officer's Manual Upon Active Service; of, Precepts for his Guidance in the Various Situations in which he may be Placed; with Observations on the Preservation of the Health of Armies upon Foreign Service* (London: Burgess and Hill, 1819), 22-24.

<sup>268</sup> *Ibid.*, 225.

<sup>269</sup> Kaufman, 85.

to the elements and owing to rough roads a great deal of jarring.<sup>270</sup> The wooden wheels on Portuguese carts were also ungreased, causing a great deal of noise and adding to the jolting of passengers.<sup>271</sup> Army surgeon Henry Milburne in 1809 described the carts in the following manner:

A more inconvenient, ill-constructed, clumsy carriage cannot be well conceived.... The shocking inconvenience of such a jolting conveyance for the sick and wounded persons may easily be conceived; added to which the noise they make in the most disagreeable possible, the revolution of the axletrees producing a kind of humming monotonous sound, something similar to the drone of a bagpipe, which may be heard at the distance of a mile or upwards.<sup>272</sup>

By transporting hospital patients in a fashion as such that described by Milburne, the suffering of the sick and the wounded was greatly increased. Additionally, transport convoys were also at risk of being captured by the enemy as the front lines shifted and armies manoeuvred, resulting in the potential for even further discomfort.<sup>273</sup> Beginning in 1812, McGrigor began to institute transport reforms. These reforms included the introduction of spring wagons which provided a smoother, more comfortable ride.<sup>274</sup> Transport convoys were also conducted along routes that could be protected and were more in line with the army's movements.<sup>275</sup> Changes in hospital placement from landlocked regions to locations alongside rivers allowed for the use of barges to transport the wounded. Transport by water was the fastest and most efficient form of long distance

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<sup>270</sup> Howard, 90-92.

<sup>271</sup> Ibid., 90.

<sup>272</sup> Henry Milburne, *A narrative of circumstances attending to the retreat of the British army under the command of the late Lieut. Gen. Sir John Moore; with a concise account of the memorable battle of Corunna* (London, 1809), 94-95. Quotation on Ibid., 90-91.

<sup>273</sup> Although designed to bring more comfort, some men found the spring wagons to be more uncomfortable owing to their tendency to bounce. Ibid., 92.

<sup>274</sup> Ibid., 93.

<sup>275</sup> Ibid., 88.

medical transportation.<sup>276</sup> While these transportation measures continued to be supplemented by requisitions of civilian transport, McGrigor's reforms, implemented as a result of Wellington's confidence in his decisions and the improved status of military medical practitioners, greatly increased the comfort of transport easing the suffering of wounded servicemen.

It was during the Peninsular Campaign that the administrative system within the military medical establishment was improved. The previous administration, the Army Medical Board, was disbanded due to its ineptitude at preparing for and handling the Scheldt expedition in 1809.<sup>277</sup> Causality rates were significantly higher than expected, with 4,000 soldiers dying from 'Walcheren' fever, and 11,000 more being invalided back to Britain. William Fergusson (1773-1846), who had served as Inspector General of Army Hospitals in Portugal, was particularly upset with the management of the situation by Physician-General Lucas Pepys (1742-1830). According to Fergusson, "when at an after period he [Pepys] was ordered to proceed to the succour of the distressed army in Walcheren, refused to obey putting on record his official declaration, that he had no knowledge of camp and contagious diseases."<sup>278</sup> A Commission of Enquiry following the expedition concurred with Fergusson's views and concluded that the high morbidity and mortality rates were due to an insufficient number of medical practitioners and the incompetence of the medical board. The Commission also determined, according to Matthew Kaufman, that the "gross inefficiency of the Board was directly responsible for

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<sup>276</sup> Ibid., 96-97.

<sup>277</sup> Kaufman, 33.

<sup>278</sup> James Fergusson ed., *Notes and Recollections of a Professional Life, by the late William Fergusson, Esq. M. D. Inspector General of Military Hospitals* (London: Longman, Green, and Longmans, 1846), 56.

the unnecessary loss of thousands of soldiers' lives each year."<sup>279</sup> This demonstrates the degree of authority that the army medical administration had over medical practitioners and the installations manned by these practitioners. The culpability of the medical board also underscores the improvements of consecutive medical administrations.

Even prior to the Scheldt expedition there were several complaints made against the Medical Board. The three board members, while all possessing medical qualifications, had limited military experience.<sup>280</sup> Their positions, for which they were paid £2 per day, were part-time and thus allowed the pursuit of other medical activities. For example, Thomas Keate (1745-1821), the inspector of regimental hospitals, also served as a surgeon to St. George's, Royal Chelsea, and York Military hospitals. In addition to his positions as an inspector for the National CowPox Establishment and an examiner for the College of Surgeons, he also maintained a private surgical practice.<sup>281</sup> In light of their extensive outside commitments, the members of the Army Medical Board were rarely in their offices and only infrequently held meetings to determine the medical arrangements necessary for military expeditions.<sup>282</sup> This negligence resulted in expeditions, like the Scheldt, being launched with inadequate provisions of medical practitioners and medical supplies.

Improvements to the military medical situation were immediately noted upon the dissolution of the Medical Board in 1809. A new Army Medical Board was formed in 1810 and its members were all full-time officers who had notable military and

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<sup>279</sup> Kaufman, 32.

<sup>280</sup> Ibid., 29.

<sup>281</sup> Ibid.

<sup>282</sup> Ibid., 31.



administrative experience.<sup>283</sup> Following the introduction of the new board, a more streamlined administrative system was established with increased contact between the Board and medical personnel. The concerns of medical practitioners in the field were given greater consideration and local administrators, such as McGrigor, were given more authority to enact medical measures. Surgeons who did not hold a degree from Oxford or Cambridge were also encouraged to apply for promotion to physician, a point of discord between the previous administration and military medical practitioners.<sup>284</sup> However, this new provision succeeded in retaining many highly competent surgeons who would have otherwise left the military service in order to enter into private practice.

#### CONCLUSION:

The Peninsular Campaign represented the culmination of improvements in supply, transportation, and preventative and reactionary medicine, which increased the effectiveness and efficiency of the British Army and the Royal Navy. The amelioration of the medical system required that all facets of medical treatment and the military administration function together successfully. Additionally, each of these components needed to evolve and improve within the framework of their establishments. Such improvements were the result of previous experience within several theatres of conflict in the late eighteenth and early nineteenth centuries.

The American Revolution demonstrated the need for adequate supplies and military personnel (which included, but were not limited to, those of a medical nature)

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<sup>283</sup> Ibid., 33.

<sup>284</sup> The previous medical board had limited opportunities for promotion to those with an Oxbridge degree. This eliminated the majority of surgeons, who possessed a degree from the Scottish or Continental universities, from applying for promotion. Ibid., 30-31. In the naval medical service, approximately sixty per cent of surgeons originated from the Irish and Scottish universities. Cardwell, 40-41.

while validating improvements in hospital and garrison design for inclement weather. The transportation reforms after 1779 improved the capacity of the Royal Navy to adequately supply a large force stationed overseas with medicines, clothing, food, and other necessities. These same principles, of reducing the necessity of transshipment and overland transport, could be applied in other theatres of conflict throughout the world, including the Iberian Peninsula. The threat posed to troops by inclement weather was reinforced by experiences in Canada and north of the Chesapeake, confirming the necessity of sufficient housing and clothing for soldiers. Furthermore, the military encounter with the North American climate strengthened the belief that in order for requisite medical care to be provided to servicemen, hospital installations must also be able to withstand the elements.

The West Indian conflicts during the American Revolution and the French Revolutionary Wars (1775-1802) taught the British military the value of preventative medical treatments, which included seasoning, cinchona bark, and the consumption of citrus to ward off scurvy. The need to defend these valuable colonial possessions placed the health of thousands of servicemen at risk of contracting tropical fevers. In order to combat the harsh disease environment, the West Indian Regiments were created to reduce reliance on European soldiers in such settings, thereby reducing the health risks. Seasoning could be used to aid in preserving the health of those troops who needed to be sent to the West Indies. Additionally, the prophylactic use of cinchona helped to prevent and treat malarial fevers in both the army and navy, while citrus fruits issued to the navy would ultimately help to eradicate the threat of scurvy. As in the northern climes in North America, the design of hospitals and barracks in the West Indies was

modified to help prevent illness and promote healing by increasing ventilation and introducing wards to stem cross-contamination.

Successful military medicine, as seen in some instances during the Peninsular Campaign, required the application of knowledge acquired from previous conflicts in the Americas and thus simultaneously reflected continuity and change within the medical system. It also culminated from the recognition of the important relationship between preventative and reactionary forms of medical treatment, military administration, and supply and transport. Reforms to the transport of patients ensured that they would be moved more quickly, comfortably, and safely. The improvements in transport extended to the speedy and efficient movement of other necessary supplies including food, clothing, and medicines. Meanwhile, medical treatment was advanced through a greater respect for and understanding of the role of medical practitioners by the military administration, and by the further development of medical techniques and theories. These changes were the result of the influence of individuals including medical practitioners and military commanders, as has been widely acknowledged in the historiography of military medicine during the long eighteenth century. However, there continued to be occurrences where adequate medical care was not provided. These cases were often the result of financial considerations and situational constraints. Nevertheless, an examination of the Peninsular Campaign at the beginning of the nineteenth century does illustrate the tremendous capacity of the newly reformed military medical and administrative systems to apply the knowledge gained from previous conflicts in order to benefit sick and wounded servicemen. These changes are most noticeable through an in-depth investigation of military medicine in both the army

and the navy throughout the later half of the eighteenth and the early nineteenth centuries. Such analysis reveals the crucial role of military medicine in fostering the growth and development of the British empire, by helping to increase the efficiency and effectiveness of British military forces.

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**"Pearl Harbor: An Analysis of Historiographical Controversy"**  
**Making History: Challenging the Past**  
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