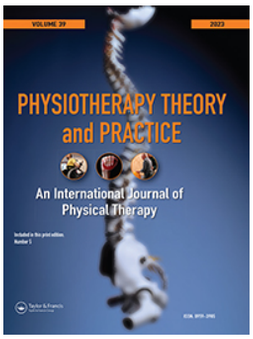

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PROFESSIONAL THEORETICAL ARTICLE

Is physiotherapy a luxury? What can the perplexing absence of the physical therapies tell us about the profession's future?

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ABSTRACT

Physiotherapists interested in the profession's future have turned in recent years to historical evidence to understand how the physical therapies were practiced before the advent of modern healthcare. However, studies to date suggest that their practice was largely confined to social elites, and those from working-class or poor populations rarely, if ever, experienced them. To test this theory further, this study focuses on British sailors during the Napoleonic wars (1803–1815). Utilizing historical and semi-fictional accounts, this study shows that healthcare on board naval fighting ships concentrated almost entirely on the prevention of disease, and the medical and surgical management of acute trauma. Even though sailors experienced shocking levels of traumatic injury, none appear to have experienced any form of physical therapy. This study supports the argument that prior to the 20th century, the physical therapies were luxuries available primarily to those with surplus time and money, and that widespread access to physiotherapy has relied on state-sponsored universal health coverage. It follows, then, that the decline of universalized healthcare may have profound implications for many marginal groups in society, as well as the physiotherapy profession itself.

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Introduction

This paper is the third in a series of empirical investigations into the conditions that have made physiotherapy historical and socially possible (Nicholls and Harwood, 2016; Nicholls and Harwood, 2017; Nicholls, 2021; Nicholls, Harwood, and Bell, 2016).[1] A number of authors in recent years have sought to explain how physiotherapy came into being, arguing that the profession owes its existence to the legacy of Pehr Henrik Ling and Swedish Remedial Gymnastics (Ottosson, 2005, 2011; Terlouw, 2007) the desire to legitimize therapeutic touch (Nicholls and Cheek, 2006; Nicholls, 2017) and the pursuit of new health professional roles that allowed women to escape gender stereotypes (Heap, 1995; Linker, 2005a, 2005b; Nicholls, 2021; Ottosson, 2016; Owen, 2014; Schiller, 2021). Others have argued that physiotherapy came into being, or expanded rapidly, as a result of World War I and the polio epidemics in the early 1900s (McMeeken, 2014; Murphy, 1995).

The problem with many of these studies is that they do not adequately explain why physiotherapy became a profession when the physical therapies had been practiced by all civilizations for thousands of years. Why did Ling's medical gymnastics, for instance, lead to the birth of physiotherapy when the Greeks had used medical gymnastics 2,500 years earlier? Given that wars have been common to all civilizations, why did physiotherapy only emerge as a significant profession after 1918? Clearly, the presence of illness and injury alone in society is not enough to justify the creation of a specific professional body. Nor is it enough in itself to simply have modalities at hand that can be used therapeutically because populations around the world have had both of these since the dawn of humanity. For professions to form, a set of specific historical conditions need to be met that go beyond simple supply and demand equations.

In physiotherapy's case, recent studies have argued that organized forms of physical therapy emerging in the 18th and 19th century were luxuries enjoyed only by those with sufficient time and money to afford them, and that many people in need would have had no access (Nicholls and Harwood, 2016; Nicholls and Harwood, 2017; Nicholls, 2021, 2022; Nicholls, Harwood, and Bell, 2016). Studies also suggest that physiotherapy would only become widely available to people with the advent of universal health coverage in the 20th century (Nicholls, 2022).

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So, we might argue that physiotherapy emerged not in response to widespread social need, but rather as a luxury, or indulgence, for some, made possible by increasing affluence in some countries in the Global North. By any standards, the need for widespread access to physical therapies would have been extremely high in the 18th and 19th centuries, in part because of the lack of effective modern medicine and surgery, but also because of the precarity of people's lives. The Industrial Revolution introduced aggressive and hazardous work practices for many, with death and injury in mills, mines, farms, factories and foundries, appallingly common for adults *and* children. The absence of social welfare meant that injury at work cast many people onto family and friends, with little charitable aid or professional help available. As a result, chronic disability, poverty, and premature death were common but accepted social norms.

Today's workplace standards have eradicated much of the morbidity and mortality associated with the Industrial Revolution in many high-income countries, but conflict zones and work in the military remain areas where physical injury is an occupational hazard. Thankfully, healthcare for those injured in war is much better today, with the budget for Veterans Affairs in the US alone currently exceeding $200 billion per year (Department of Veterans Affairs, 2021). This sum amounts to 5% of the entire US federal budget and the fifth-biggest expenditure of any of the country's federal agencies. As a consequence of this level of spending, military veterans in the United States and many comparable countries receive some of the best medical, surgical, and physical rehabilitation care of any population.

Today, we would take for granted that a person disabled in the line of duty or anyone with a major debilitating illness or injury, for that matter would receive some form of physical therapy. However, access to a physiotherapist is a relatively recent historical event, and one associated closely with the creation of extensive, publicly-funded healthcare. Yet, we know very little about the kinds of physical therapy available to people before the advent of the physiotherapy profession and the emergence of universal health coverage.

Were there any organized forms of physical therapy offered for people in mills, mines, and factory-towns during the Industrial Revolution, for instance? We know of the "sanitary" public health reforms and the provisions in Poor Law for workers' health and well-being, as well as advances in microbiology, pharmacology, surgery, and "scientific" nursing that would come later in the 19th century (Betsinger and DeWitte, 2021; Levine-Clark, 2019; Mackenbach, 2021; Szreter, 2003). However, to date even considering Tissot and Ling's work on medical gymnastics (MacNalty, 1965; Wikström-Grotell, Broberg, Ahonen, and Eriksson, 2013) and the focus on scoliosis management after the Napoleonic wars (Licht, 1965) which did not arrive in the UK until the latter half of the 19th century (Roth, 1852); the physical therapies have only appeared in the literature of the period as luxuries available only to those with surplus time and money and offering little to industrial workers. Few opportunities existed for the majority of people to experience organized forms of physical therapy who could not access the European and American spa centers (Murrell, 1886; Pugh, 1794; Shaw, 1825; Shew, 1854).

This study therefore looks at an archetypical population of people highly suited to physical therapy: Royal Navy sailors during the Napoleonic wars (1803–1815). This population was chosen because it offered a number of significant features: 1) Unprecedented levels of traumatic injury, highly amenable to physical therapies; 2) Relatively poor standards of medical and surgical care; and 3) The ongoing need for fit and able sailors, as well as the dangers of being disabled from the service in the absence of widespread social welfare.

The approach to the data in this study draws from critical comparative literature in which a number of primary and secondary texts are examined for the discourses they promote. Key to this study has been a Foucauldian approach to the voices that are privileged and those that are marginalized. Conventionally, there is no repeatable "method" to follow here, rather texts are read and compared for statements that convey particular forms of knowledge or contextual truth and, in doing so, reveal the ruptures and matrices of power that underlie those ideas that are promoted by some authorities and voices over others. For a more detailed explanation of this method see (Fadyl, Nicholls, and McPherson, 2012; Hook, 2001; Nicholls, 2009; Tamboukou, 1999.

Pivotal among the texts used in this study were the semi-fictional writings of Patrick O'Brian. O'Brian (born Richard Patrick Russ, 1914–2000) was an English novelist, naval historian, translator, and biographer considered by some to be "The greatest historical novelist of all time" (Wilson, 2020). As well as writing the 21-book Aubrey-Maturin series, which made his reputation as a historian and novelist, O'Brian also translated the novels and memoirs of Simone de Beauvoir and a biography of Charles de Gaulle from French to English, wrote 12 other novels and short stories, as well as biographies of Picasso and Joseph Banks.

Although semi-fictional accounts have not appeared in the physiotherapy literature before they have been used in comparative literature studies, cultural studies, historiography and philosophy for many years (LaCapra, 1989; White, 2005). Equally, O'Brian's books have been used as the basis for critical commentary in other historical analyses (Casey, 2007; Coker, 2013; Glausser, 2003; Halbrooks, 2021; Liebersohn, 2007; Metzdorff, 2013; Surawicz and Jacobson, 2018). Mark Carnes (2004) has suggested that "historians need the novelist's guidance on the workings of the emotion and imagination as much as novelists need the historian's discipline to anchor the imagination to fact." They remain, however, a novel and unusual data source for comparative investigations into physiotherapy. The following section explores the advantages of employing semi-fictional accounts when examining the everyday lives of common sailors.

Why O'Brian's Aubrey-Maturin series?

The 21 books that make up the "Aubrey-Maturin" series cover the 12-year Napoleonic wars from 1803–1815, The books represent a single, continuous, 6,000-page account of the adventures of Captain Jack Aubrey and his surgeon colleague Dr Stephen Maturin. The books, for some, represent the most comprehensive, accurate, and accessible account of life on-board a timber naval fighting ship ever written (Bayley, 1991; Ollard, 1994; Reynaud, 2017; Webb, 2000) with many characters being "either directly historical or hav[ing] their roots in the real" (Brown, 2014)[2].

As well as their many adventures, what O'Brian's books show most vividly is that life as a sailor on-board a frigate or a Man O' War was almost always perilous. As well as atrocious weather and constant threats from colossal seas and enemy action, hundreds of men were frequently cramped together into confines little bigger than a double-decker bus. Lacking refrigeration, food was rarely fresh, and rations were supplemented by copious amounts of alcohol and tobacco. Accidental injuries were commonplace, but became appallingly frequent during battles, where direct fire from "grape-shot" and enormous splinters from shattered hulls often killed or seriously maimed sailors.

382 ships and nearly 104,000 men were lost during the Napoleonic wars, and more than 72,000 Royal Navy seamen suffered disease or injury (White, 2014) and these figures only represent losses from British sailors, drawn from a population of a little over 11 million people at the time. To put this loss of life into perspective, it would be equivalent to more than two million American Navy personnel dying in combat over the same 12-year period (Schuyler, 2006).

O'Brian is particularly detailed in describing individual injuries, illnesses, and the various medical and surgical procedures used. Crucially, his accounts are entirely consistent with known practices of the time. As are the descriptions of the surroundings, facilities, tools, and resources used by the doctor and his various assistants.

So, although they are fictionalized accounts, the Aubrey-Maturin series provides important insights into a world in which the physical therapies ought to have been as vital as providing adequate rations, practicing canon firing, and repairing sails. After all, sailing ships represented a world unto themselves; a world in which everything needing to be done had to be done in situ where amputations, concussions, fractures, soft-tissue injuries, and the sequelae of medical and surgical treatments were frequent, but where there was also no room physically or metaphorically for passengers, and long-term debility would have been a massive burden on the rest of the crew.

Although O'Brian's writings provide a rich description of the conditions that might call for physical therapies on board his ships, however, this paper also draws on a wide range of analyses of primary data from the Napoleonic wars to ascertain what evidence exists for the incidence and prevalence of relevant injuries, and the practice of physical therapies on board naval fighting ships. Before exploring this data, however, we should establish what role the physical therapies played in Britain during the late 18th and early 19th centuries.

The physical therapies in the 19th century

It is tempting to think that the physical therapies were born with the formation of the physiotherapy profession, but it may be more accurate to say that physiotherapy arrived just as massage, electrotherapy, manipulations, hydrotherapy, and gymnastics were being supplanted by germ theory, pharmacology, anaesthetics, X-rays, and other techno-medical innovations in the medical imagination (Nicholls, 2017).

In many ways, the 19th century was the century of the physical therapies, partly because they offered gentler and more conservative solutions to the many physical and mental health problems prevalent in society than were available through "heroic" medicine and surgery. Consequently, many of the "modern" physical therapies had, by the early 19th century, established a significant pedigree. In 1600, for instance, William Gilbert published *De Magnete* and describes magnetism for the first time, launching the science of electricity.

The 18th century saw the first demonstration of electricity conducted through nerves producing a muscle contractions, and the therapeutic application of electricity. Frank Krusen (1942) suggested that 18th century electricity "was the sensation of the scientific world." It is perhaps worth noting, though, that the organized treatment of disease with electricity would not be established in England until 1856, and domestic electricity was not widely available until the late 1800s.

But electrotherapy was not the only physical therapy to rise to prominence in the 19th century. Indeed, two decades after Isaac Newton split a beam of light with a prism, Walter Harris's 1689 *De Morbis Acutis Infantum* showed, for the first time, that ultraviolet light could help children with calcium uptake and prevent growth deformities. The early 19th century also saw the discovery of carbon arc light, and the first demonstration that clean air and sunlight were therapeutic. By the middle of the 19th century, sunlight was being used extensively for the treatment of tuberculosis, which, in turn, led to radical reforms in urban design in the latter half of the 19th century.

Having waned in Europe for a thousand years, hydrotherapy came back into popularity in the early 1800s thanks to Vincent Priessnitz, a Silesian peasant, who used hot compresses and water to treat an injury caused by a kick from a horse (Krusen, 1942). Priessnitz attracted physicians from all over Europe and formed the first hydrotherapy institute. By the middle of the 19th century, "water cures" and various forms of hydro- and thermo-therapy, existed throughout Europe. Physiological experiments on the effects of "scientific hydrotherapy began in the mid-1800s, as did the first scientific treaties" on the practice.

Mechanotherapies and gymnastics had become popular as early as the 13th century, but it was the work of Ambrose Paré and Geromina Mercurialis's 16th century illuminated manuscript *De Arte Gymnastica* that began the renaissance in exercise as therapy. Friction manipulations, exercise and medical gymnastics were first described in the 17th century, and the 19th century saw major advances by Ling, Schreber, Shaw, Zander, and Graham (Bergman and Marklund, 1989; Ottosson, 2005, 2010, 2011; Terlouw, 2007, 2007; Wikström-Grotell, Broberg, Ahonen, and Eriksson, 2013).

So at some level we know that the physical therapies were all well developed and of significant interest to the medical community who valued them alongside other medical and surgical approaches. What is sometimes missing from accounts of the physical therapies in the 18th and 19th centuries, however, is the population of people they served, and this is a critical argument for this paper. How familiar would a naval midshipman be, for instance, with organized forms of massage, electrotherapy, and hydrotherapy?

With a few exceptions, we know that most of the physical therapies would not have been available to working people. There was no organized national healthcare system, and so these therapies would have only been available to those with sufficient time and money to afford them. In all likelihood, this excluded many working class men, the elderly, and most women and children.

Given the high prevalence of soft tissue injuries on board naval fighting ships, and the importance of manning ships with fit and strong sailors, one would imagine the physical therapies being an integral part of the running of an efficient ship. What evidence exists, then, for their widespread use during the Napoleonic wars?

Analysis

Injuries and illness were an inevitable consequence of the growing size of the Napoleonic war ships with their increasingly destructive munitions. Even by comparison with the toll of industrial accidents on land during the Industrial Revolution, injury and illness at sea was frequent and brutal. By the time the Napoleonic wars ended, more than one million husbands, fathers, sons and brothers had fought for Britain in the army and navy, and 315,000 of these men had died (Best, 1982). Nevertheless, the incidence of sickness among serving seamen actually fell "from one man in 2.45 in 1779 to 1 in 10.75 by 1813 and death rates for the same years from 1 man in 42, to 1 man in 143.45" (Crimmin, 2007). Crimmin (2007) argued that much of this was due to improvements in hygiene, diet, and the "more regular provision of clean, warm clothing," rather than advances in medical or surgical science though. Good naval husbandry had a paradoxical effect, however, as improvements in preventative medicine only served to strengthen the effectiveness of naval ships as killing machines, and all forms of battle from local skirmishes to full-scale multi-ship warfare brought even more complex injury. It is said for instance that Napoleon's surgeon, Dominique Jean Larrey, performed 200 operations, most of them amputations during a 24-hour period alone in 1812 (Metzdorff, 2013).

Injuries that were not fatal mostly involved trauma to skin, muscle, and bone. Fractures, pneumothoraxes, and traumatic brain injuries were the most common either as a result of blunt/sharp-force trauma from flying

wooden splinters, or from falls by accident or from collapsing rigging. The risks of rapid blood loss and "mortification," or gangrene, were common sequelae, and along with pain management became the mainstay of surgical care in and around the time of battle.

O'Brian (1979) painted a vivid picture of the daily burden of soft-tissue injuries on the ship's complement. Even after a heavy storm, the sick bay invariably held men carrying sprains, heavy bruising, strained articulations, crushed fingers and toes. In one report, a sailor has three ribs "stove in," another has two toes and both ears taken by frostbite, another has an un-united fracture most likely due to scurvy, a sailor recovering from an arm amputated for frostbite, and one case of paralysis due to tertiary syphilis.

Soft-tissue trauma due to flying "splinters" or the "ragged fragments of timber violently rent from the planks or sides of the ship" (Watt, 1975) caused significant injury, which often produced keloid scarring and ischemic contractures because of the endemic scurvy among sailing crews of the time. In one incident a two-foot long splinter nearly ruptures an artery in a sailor's neck (O'Brian, 1976) and in another an officer has an eye torn out, teeth shattered by grape shot, and his neck ripped open to reveal his carotid artery (O'Brian, 1970). Injuries from hand-to-hand fighting were also often devastating. In one battle, a ship's "boy" has both arms "slashed to the bone" (O'Brian, 1972). One of the lieutenants suffers grape shot to his thigh, a sword cut to his shoulder, and two broken ribs (O'Brian, 1972). These sound grotesque descriptions, but they are entirely in keeping with the brutality of open-sea battles (Watt, 1975). Perhaps some of the least troublesome injuries were the frequent fractures and dislocations. In one story, a helmsman breaks his arm when the spokes of the ship's wheel spins erratically during a violent storm (O'Brian, 1983); another acquires a compound fracture of the femur (O'Brian, 1981); and another fractures both tibia and fibula (O'Brian, 1984).

Sometimes traumatic injuries result from more preventable circumstances. Two sailors inflict broken limbs on each other fighting with "loggerheads" while drunk (O'Brian, 1994) and drunkenness also accounts for a great deal of trauma caused by sailors falling down the main hatches or falling overboard. In one story, a drunk sailor falls from a yard-arm, "bounces" off a backstay and into the sea (O'Brian, 1972). In another, a popular "top man" falls from a high mast hitting a port lid on the way down, severely injuring his thoracic cage, and yet, he doesn't die, but is carried to the sick bay for treatment (O'Brian, 1970).

Added to this, severe traumatic head injuries often resulted from flying objects. In one story, one of the midshipmen is heavily concussed by a falling "block," but Maturin declines to "trephine" him (O'Brian, 1976). While in the book made famous by the film *Master and Commander*, another sailor fractures his skull falling down a ladder. Maturin trepans the skull to remove the fractured portion, which is then covered over by a three-shilling piece hammered flat (O'Brian, 1970).

Throughout the 18th and 19th centuries, however, the most common form of acquired disability for sailors resulted from amputations, which were far more common at sea than in civilian life. This was in part because many sailors died from blood loss rather than the force of the trauma itself, but also because compound fractures and fractures through the joint often resulted in significant foreshortening or chronic draining osteomyelitis. For these reasons, early amputation became the norm in most cases of trauma to the limbs (Helling and McNabney, 2000).

Again, O'Brian paints a powerful picture of the spectacle of surgical amputation performed on board, often in the midst of rolling seas and the full scale bombardment of unrelenting canon fire. Dozens of limbs are excised during the 21-book series. One sailor injures his leg in two separate battles, resulting in the limb being first surgically repaired, then amputated (O'Brian, 1980). Maturin performs an amputation at the shoulder for a whaler with a "mangled arm" (O'Brian, 1999) and for a foot crushed by a recoiling gun (O'Brian, 1993). In one story, he even undertakes a full leg amputation at the hip, without anaesthetic (O'Brian, 1993).

"Mutilation," Lincoln (2007) reminds us, "was common in the Navy and the loss of a limb was to be born with equanimity. Amputations [were] portrayed as opportunities to display personal courage, and here doctors contribute to popular conceptions of heroism" (Lincoln, 2007). Visible wounds were "badges of bravery," whereas illness and death caused by disease were "considered somehow ignoble, a death for cowards and common men," at least in military circles.

The presumed heroism of the disabled sailor at least offers a counter-narrative to many of the prevailing images of disabled people in 18th and 19th century literature. Here, where disabled characters exist at all in stories, they often appear as proxies for physical and mental "otherness," or to function as a vehicle to show the power of redemption, hard work, and struggle in the face of malign fate, expert-derived cure, institutionalization, or death (Farr, 2019; Mounsey, 2014; Shakespeare, 1994).

This perception of injured sailors as noble victims of circumstance may well have been fueled by Nelson's

heroic image, but attitudes toward post-injury therapy and rehabilitation may also have been influenced by stories of Nelson's recovery from his above-elbow amputation (Michals, 2015). One account by Lord Spencer (not Nelson's surgeon) illustrates what appears to be a very relaxed attitude toward Nelson's recovery from major surgery. Spencer suggests that Nelson "seems likely to recover entirely from the effect of his wound." Michals (2015) quite rightly I believe, comments that "there may be something surprising about this official statement that a one-armed man who was also permanently blind in one eye was expected to be 'entirely recovered' and so fit to return to active military duty; fit to go to war." Michals (2015) also reminds us that "Nelson's military success did not depend on his own physical strength or wholeness but his ability to command men and ships," and so the image of the one-armed Admiral proved a powerful symbol of "heroic military masculinity." Unlike Nelson, however, most sailors would have depended on their own physical strength and power, agility, dexterity, motor skill, and embodied technical mastery to do their work. So the image of the heroic injured sailor must be read against the possibility of them no longer being able to perform the duties for which they were enlisted.

The British navy may not have made the health and wellbeing of its seamen its top priority (Mills, 2007). The top priority was always going to be military victory and conquest, but it was certainly not indifferent to the "continual and insoluble problem" of sailors' health (Crimmin, 2007). Indeed, it created a Sick and Hurt Board to administer care for wounded seamen and prisoners of war, and placed a surgeon in all of its larger fighting vessels (Brockliss, Brockliss, Cardwell, and Moss, 2008; Hudson, 2007b). Felker (2012) suggested that, "As ships could not sail without sailors, nations with maritime aspirations recognized the importance of keeping sailors healthy." "In general," Caputo (2022) argued "the Admiralty dedicated growing attention and substantial resources to seamen's health, mainly because the British state needed skilled seafarers, and faced an increasing shortage." Many surgeons also "emphasized the economic case for better healthcare at sea" (Lincoln, 2007). Fit and healthy seamen represented a considerable investment, and replacing injured men and supporting "invalids" in hospital was considered a vast expense. It is perhaps surprising then that in the medical and surgical management of illness and injury during the Napoleonic wars, so much attention was paid to the prevention of disease, and so little given to the rehabilitation of injury.

As a physiotherapist reading the primary and secondary accounts of naval healthcare during the period, one cannot fail to notice the almost complete lack of any physical therapies or forms of physical rehabilitation from accounts of naval healthcare. Instead, the emphasis falls squarely on: medical and surgical practice and innovation (Coulter and Lloyd, 1961; Crumplin, 2009; Lincoln, 2007; McLean, 2010); governance of the Sick and Hurt Board (Crimmin, 2007; Harrison, 2007); contest between medical/surgical intervention and broader "economical mass remedies" and other health prevention measures (Harrison, 2007; Mackenbach, 2021; McLean, 2010; Mills, 2007); and the physical spaces in which medicine was practiced (Hudson, 2007a; Jones, 1989; Stevenson, 2007). What is also represented in the literature is the suggestion that naval healthcare either took a preventative stance, concentrating on the period before illness or injury occurred (e.g. in the management of scurvy, improving cleanliness onboard, and abstinence measures to limit the spread of syphilis), or in the acute phase with the immediate medical management of fevers or diseases, or the surgical treatment of injury as a result of battle, or the rapid spread of a dangerous contagion (Lincoln, 2007; Stevenson, 2007). In Haycock and Archer (2009) and McLean (2010) recent edited collections on the history of British naval health and healthcare we are given detailed accounts of infectious diseases, war wounds, hygiene, nutrition, sanitation and architecture, and medical training, recruitment, and administration. There are chapter on hospitals in Britain where we even learn who did the laundry, nursed the sick, and helped the surgeons with routine tasks. We are given detailed accounts of dietary improvements, questions are raised of the surgeons' education and social standing, the role of surgeons on board ships, the Sick and Hurt Board's role in administering illness on board and at home, and how illness should be managed during colonial conquests including the care of enslaved peoples, prisoners, and migrants.

Similarly, Crimmin (2007) suggested that the Sick and Hurt Board was primarily concerned with dealing with the common illnesses and diseases which afflicted seamen (note, not injuries). These were mainly scurvy, dysentery, rheumatism, rupture, ulcers, fevers such as typhus, malaria and yellow fever, smallpox, depression, madness, and venereal disease, but Crimmin (2007) also makes the important point that *"Apart from battle wounds, many of these complaints were not so different from those which afflicted their contemporaries ashore"*. So as Crimmin (2007) suggested, apart from battle wounds what often set sailors apart from the general public was the frequent, often complex and compound soft tissue injuries they suffered, and yet throughout all of these accounts no mention is made of any physical

therapies, remedies, or forms of physical rehabilitation offered to ill or injured sailors; remedies which would be ideally suited to these kinds of problems. In the literature as a whole, the long aftercare that must have occurred for sailors recovering from injury, surgery, or debilitating illness; the experiences of sailors coping with chronic pain, loss of function, or disability; and the therapies that might have occurred as a form of early rehabilitation are rarely if ever mentioned. Yet most of the measures that concerned the Sick and Hurt Board, and the doctors that served them, related to "better ventilation; an avoidance of over-crowding; better-preserved food; clean, warm clothing; and a warm, dry atmosphere even though none of these requirements were medical solutions in themselves" (Crimmin, 2007). So, while British naval ship's surgeons were responsible for all of the "seasickness, abscesses, boils and toothache" (Fremont-Barnes, 2007) as well as the "prevention of scurvy, the treatment of venereal diseases and yellow fever, the quarantine of those with communicable diseases, and many other less surgical aspects" (Metzdorff, 2013) all of which "were quite difficult to achieve in the eighteenth-century navy" (Crimmin, 2007), no accounts indicate that surgeons, or anyone else on board for that matter, had any responsibility for physical therapy or rehabilitation which *were* eminently feasible.

The professional and wider social standing of the ship's surgeon in the late 18th and early 19th centuries is, perhaps of importance here. While it is true that their warrant officer status placed surgeons on a par with "carpenters, boatswains and gunners … who, for much of the century, were more highly paid and frequently more highly regarded as being essential to the ship" (Crimmin, 2007), the quality of naval surgeons was very high, evidenced by the professional achievements of surgeons after the Napoleonic wars (Haycock and Archer, 2009). Baker and McCullough (2018) argued though that the standard of naval medical and surgical care was indeed far from consistent, in part because of the highly experimental nature of early 19th medicine, even on land. Crimmin (2007) also reminds us that naval surgeons had to provide all of their own surgical instruments and medicines, sometimes at quite considerable expense reinforcing, again, the belief that having a surgeon on board ship was as much a favor to the medical community as it was a vital function of the naval machine. "The result of this niggardly financial provision, the lack of status, and the hazards of the job," Crimmin (2007) suggested, "meant that there were never enough surgeons for all ships to carry one, with inevitable consequences for seamen's health."

One argument that has traditionally bolstered the status claims of ship surgeons is that naval medicine was highly paternalistic, and that surgeon's had both a free hand to practice how they wished, and used the passive, confined population of ill and injured sailors as a floating laboratory. Part of this argument stems from the fact that medicine generally was highly experimental in the 18th and 19th centuries. Recently, however, there have been moves to revise the physician-centric naval healthcare histories, most notably in Crimmin (2007) work on the autonomy of sailors, and emerging studies of military nursing (Gruber von Arni, 2007; Hacker, 1981; Jones, 1989). A number of authors now suggest that government officials and the medical profession at large were far less paternalistic and controlling when it came to naval medicine than had previously been thought (Jewson, 1976; Lawrence, 1996; Lemisch, 1968).

This reflects shifting attitudes toward military healthcare toward the end of the 18th century in Britain. Prior to 1790, politically-active physicians had "diagnosed widespread ill-health generally as symptomatic of the rottenness of the ancien régime body politic" (Lincoln, 2007). Doctors argued that health was a natural human right, and so everyone was "entitled to competent advice about their health and its self-management" (Lincoln, 2007). What this claim provoked, though, was the question of whether "ordinary people" should be given basic information about healthcare, or be left to treat themselves? Should expert help be available to all? The problem with this belief, as it was argued by its detractors "was that people rarely acted in their best interests, were absurdly credulous when it came to health matters, and often had to be compelled to follow doctors" orders.

By contrast, Caputo (2022) and Edwards (2021) argued that sailors were far from the "imprudent, reckless, passive subject in need of medico-naval discipline," but were instead "active individual[s] with high levels of control and self-determination over their health and wellbeing," who may have found that becoming a sailor actually widened "the portion of the medical marketplace" available to them (Jenner and Wallis, 2007). While this may be true of venereal diseases, though, it is less likely to be the case for men carrying congenital or acquired physical injuries like fractured legs, amputated arms, and chronic bronchitis.

If the British navy was less controlling and paternalistic than had previously been thought, it was certainly not indifferent to sailors' health. For instance, we know that the British governments had made successive special provisions for "sick, hurt and maimed Soldiers and

Mariners in England and Wales" since the 16th century (Lin, 2000) including the construction in 1690 of the Royal Hospitals of Chelsea and Greenwich "to provide long-term care and pensions for disabled soldiers and seamen." Men were eligible to use these hospitals if they had "served the nation well as 'good' soldiers or sailors and had been disabled because of their service" (Lin, 2000) and had passed the acute stage of their illness or injury. In 1761, a permanent naval hospital was completed (Haslar Hospital), which "remained for some years, the largest brick building in Europe and had cost over £100,000, enough to build three battleships" (Crimmin, 2007). Crimmin (2007) suggested that the hospital was primarily built to remove sick men from ships "before they could infect others," to restore the men to health, and to control desertion through greater security. However, Hudson (2007b) disputed this, suggesting that Haslar represented "a new type of institution for the chronically disabled;" an institution whose focus, one might assume, would be much more on rehabilitation than on prevention, or acute medical and surgical management. There is little doubt that sailors were cared for in these hospitals, but despite hosting what would, by today's measures, amount to an enormous rehabilitation facility, the emphasis was unquestionably on managing contagious diseases. For instance, Hudson (2007a) remarked that the main function of the Greenwich hospital was on managing sailors who were too disabled to work; "with a vast majority being disabled in body, with a minority suffering from illness." Although the hospital was "designed for the 'tedious incurable'," the focus lay only on the opportunities this gave for "military medics" to "dissect, experiment on, and observe continuous subjects" (Hudson, 2007a). There is no evidence of any health professional at Haslar, Stonehouse, Chelsea, or any of the other naval hospitals of the time, employed to deliver any form of physical therapy or rehabilitation.

But the absence of physical therapies cannot be explained by ignorance, because physical therapies had been used before by the navy to rehabilitate its sailors, sometimes at remarkable cost. Gruber von Arni (2007) for instance, reports that in the mid-17th century, injured British sailors recovering at the Savoy Hospital were transported en masse to the hot springs at Bath for "spa water treatment." This became an annual event and was, by some margin, the most expensive outgoing for the hospital for some years. In May 1653, for instance, 220 soldiers, a surgeon, a physician, and an apothecary (note, no "therapist" as such) traveled to Bath to superintend the treatment, costing £1600 - "an extraordinary sum" (Gruber von Arni, 2007). Given the sheer cost of the excursion, Gruber von Arni (2007) suggested that "a reduction in overall expenditure would, inevitably, have resulted from a rapid cure in Bath compared with expensive on-going in-patient care at the Savoy or Ely House," but there appears to be no evidence that any of the physical therapies used at the spa translated to physical rehabilitation on board any of the naval ships, or to ship-based practices that might have reduced the number of sailors needing such expensive care in the first place.

The spa resort at Bath clearly offered physical resources that were not available on board ship and in the case of the thermal waters, in many places on shore either. However, unlike the ship's sick bay, which needed to accommodate "cots" for sick sailors, secure storage for the physician's drugs and surgical equipment, as well as enough space and light to allow a whole body to be operated upon, the practice of any physical therapies would not have required any specialized facilities that were not already available onboard. In some ways the wooden fighting ships of the Napoleonic wars with all of their ropes, pulleys and beams were fully functioning, ready-to-hand, open water gymnasiums. Not only was there space for exercise reconditioning, hydrotherapy, gait retraining, stretching, muscle strengthening, functional rehabilitation, even massage, but sailors also had the time. Granted, often the period of "watch" for seamen would have involved a great deal of active work, but there were also long periods of time when they would have been resting or engaged in routine, non-combat, non-hazardous sailing. During these times, sailors cleaned their dress uniforms, serviced guns and rigging, repaired sails, held ceremonies, played music and danced. So, there would have been plenty of time for therapeutic work, if the sailors had chosen to do it. This therapeutic time would have been especially useful to the sailors because it would have taken them many weeks or months to recover from some of the trauma they had suffered. We know that even with today's advances in anaesthetics, surgery, antibiotics, pain medication, clinical diagnostics, and therapy, no one suffers an amputation, a compound fracture, or a traumatic brain injury without needing days, weeks, or even months of respite and rehabilitation before they are well enough to return to the kinds of heavy manual work that sailors would have been required to do sheeting anchors, hauling masts, and climbing rigging in a storm. Yet the literature suggests that sailors were only briefly inconvenienced by major trauma or injury.

O'Brian (1999) accounts illustrate this beautifully. In almost every case throughout the 21-book series, little is made of the significance of trauma for the sailors involved. In one case one of the carpenter's crew has

an arm amputated, but there is no mention of whether he continues with his trade and, if not, whether he is retained, set down at the next port, or "carried" by the ship until they return home many months later. This pattern repeats throughout the Aubrey-Maturin series. In one episode, the surgeon, Stephen Maturin, is imprisoned and tortured. We only hear of his injuries after the fact, but we are told that he was put on a "rack" and subsequently could not walk. His fingers were broken with thumbscrews, and the fingernails of his right hand were torn out (O'Brian, 1980). In another story, a sailor presents with two gummata (soft swellings often surrounding the heart), a terminal feature of tertiary syphillis (O'Brian, 1989), and Captain Jack Aubrey suffers life-threatening pneumonia (O'Brian, 1979). On another occasion, Captain Aubrey injures his leg sufficient enough for him to "limp for weeks" (O'Brian, 1991). All of these are serious health problems that by present day standards would warrant lengthy periods of rehabilitation and recuperation. Yet in all cases no obvious aftercare, pain management, prosthetic support, or prolonged physical rehabilitation is described or provided. In only one other story is there any mention of sailors being "invalided" out of the navy (O'Brian, 1970), presumably because their injuries were too disabling to allow them to carry on their particular craft.

So, just as we cannot account for the lack of the physical therapies on the basis that there were not enough of the right "kind" of injuries, that the navy didn't care enough, or that ship's lacked the necessary facilities, we cannot explain their absence on the basis of a lack of skilled personnel either. Gruber von Arni (2007) has shown that 18th-century hospital-based nurses took on some of what might be considered physical therapy, including managing patients' rest, and exercise in the form of "mobilization," but these accounts are sparse, and Gruber von Arni (2007) acknowledges "the nonrecognition of the achievements of those who cared for military casualties," describing the omission as "surprising to say the least." What we do know, however, is that no nurses traveled on board Napoleonic fighting ships, and Crumplin (2009) has suggested that where nursing was indicated, young doctors serving their apprenticeships worked in the sick bay as nurses bandaging and assisting the surgeon alongside the loblolly boys. So perhaps these young doctors undertook the rehabilitation work? Again, there is no historical evidence to support this, so it remains only speculation.

It is conceivable that accounts of the physical therapies are absent from the historical record because they were not performed in any 18th and early 19th centuries social sphere either. There is certainly a corresponding lack of historical evidence for the use of physical therapies in the growing industrial economies of Europe during the period (Levine-Clark, 2019; McIvor, 2020; Stiker, 1999; Turner and Blackie, 2022; Watson, Roulstone, and Thomas, 2020). This is striking because, like naval warfare during the Napoleonic era, rapid industrialization had created new temporal and spatial pressures on bodies of working people including children (Paterson, 2020). In the early 19th century, at the high-point of the Industrial Revolution, for example, industrial accidents among factory, foundry, mill and mine workers were appallingly high, and there are extensive studies of the public health measures that grew out of this period (Brunton, 2004; Harris, 2004; Loudon and Loudon, 1986; Lucey and Crossman, 2014). However, here also the long sequelae of injury and illness, and the importance of regaining bodily strength, flexibility, motor control, dexterity, coordination and function, as well as reducing pain and regaining confidence through touch, mobilization, exercise, heat and cold, water, and even electricity are almost entirely ignored in favor of accounts of heroic medicine, public health discoveries, and social philanthropy.

No insights into the physical therapies at sea can be gained from the physiotherapy literature either, because no accounts exist that detail the physical therapies specifically at sea during the Napoleonic wars. Of course, Ling's work at the Royal Central Institute of Gymnastics in Stockholm had a military strain to it, because much of his early work concentrated on military gymnastics (Ottosson, 2005, 2011) and there was a great deal of attention paid to physical culture toward the end of the nineteenth century (Heffernan, 2022; Vertinsky and Hargreaves, 2006) but in all cases this concentrated on the development of the physical competence of land-based officers and soldiers, and not on the rehabilitation of injured seafarers.

We are left then with two possible explanations: 1) that the physical therapies were simply not practiced; or 2) that they were practiced but were not recorded. The final section of this paper addresses these two possibilities.

Discussion: is physiotherapy a luxury?

Because of its international reputation, size, and prestige, we perhaps take-for-granted that physiotherapy is a necessary adjunct to modern-day healthcare, and assume that the physical therapies have always been an important way for people to overcome illness and injury, but the few critical studies of the physical therapies from the period immediately before the formation

of the physiotherapy profession suggest that their use was connected more to prevailing social conditions than to any particular physical need.[3] This has important implications not only for our understanding of the historical and social conditions that made the formation of the physiotherapy profession possible, but also as a way to understand the changing face of physiotherapy today and into the future. In simple terms, what this paper argues, in line with the few similar studies that precede it, is that the physical therapies only became available to everyone not just those with sufficient time and money to enjoy them with the advent of the universalized health coverage. Prior to World War I, physiotherapy was almost exclusively available to people within the affluent classes, but for the vast majority of others even those exposed to devastating physical illness and injury the physical therapies were a non-entity or at best an indulgence and a luxury.

Anders Ottosson (2016) work on Pehr Henrik Ling and the Royal Central Institute of Gymnastics (RCIG) founded in 1813 echoes this finding. In his studies, Ottosson (2016) suggested that the work of the Institute was highly restrictive, concentrating on educating only the most elite members of Swedish society; During the first half of the nineteenth century the typical physiotherapist was either a nobleman or a member of the upper bourgeoisie in charge of a science of their own making. He was also often a man of the sword normally an officer in the Swedish army (Ottosson, 2016).

A full RCIG diploma "permitted students to work as physical educators and physiotherapists, and also gave them the right to the prestigious title 'Director of Gymnastics'" (Ottosson, 2016). Graduates used this qualification to spread Ling's message of medical gymnastics across Europe in the latter half of the 19th century, enhancing the profession's standing, such that "medical physicians sometimes worked as their employees in leading clinics" (Ottosson, 2016).

It is highly unlikely that many of these Sjukgymnasten would have treated injured mine- and mill-workers, working-class and poor people. Rather, given their pursuit of professional status and prestige, they would have concentrated their work on individual, private fee-paying clients from the middle and upper social classes of Swedish society.

Further support for the idea of physiotherapy as a luxury for the few comes from a recent study of the female masseuses who became the archetypes of physiotherapist in Britain in the latter part of the 19th century (Nicholls, 2021). These women drew directly from the Swedish medical gymnasts who had emigrated to the UK, and used both Ling's medical gymnastics and established approaches to massage and electrotherapy to develop forms of proto-physiotherapy for middle and upper-class women with neurasthenia and hysteria. What these women achieved created the conditions in which physiotherapists could differentiate themselves from nurses, in part by aligning closely with the medical profession and visiting the patient's home, rather than attending the patient for the full 24-hours, as the nurses did. The masseuses also adopted a more detached, objective approach to therapy, in contrast to the sisterly, angelic role emphasized by the new "scientific" Nightingale nurses. These and other features were essential for physiotherapists when they came to establish themselves as autonomous practitioners for private, fee-paying clients after 1894 (Nicholls, 2017), but their professional identity was unquestioningly built around the appeal to a small number of middle and upper-class "society" women, not the masses of urban poor thronging the streets of London in the 1880s and 90s.

Similarly, a study analyzing the role that the physical therapies played in the colonization of Aotearoa New Zealand in the 19th century has shown that despite the fact that colonial settlers must have arrived with significant knowledge of European physical therapy practices and faced some dire health problems that would have been highly amenable to physical therapy and rehabilitation they showed no interest in setting up physical therapy services, and there are no extant records of any physical therapies even being practiced (Nicholls and Harwood, 2017; Nicholls, Harwood, and Bell, 2016, 2016). The prevailing attitude among settlers appears to be that basic survival took precedence over "niceties" like massage, gymnastic exercise, or other forms of physical therapy, despite the fact that leg fractures, traumatic brain injuries, and severe soft tissue trauma was remarkably common among gold miners, foresters, and farmers. Indeed, European-style physical therapies only appeared in Aotearoa New Zealand, to any significant extent, as luxuries associated with colonial tourism after 1903.

From these studies, and the data presented here from the Napoleonic naval wars, a set of common themes emerge. On the one hand, early forms of physiotherapy appeared around a discrete section of the population, namely those with sufficient surplus time and money to indulge in them as luxurious alternatives to pre-modern forms of medicine and surgery. Conversely, a whole section of the population largely poor, working class, and otherwise impoverished people who were exposed to daily physical trauma, illness and injury, neither accessed nor appeared to practice physical therapies for themselves, their families, or their immediate communities.

What we know mostly from centennial histories of physiotherapy is that the profession only became available to the general public with the advent of universal health coverage and the establishment of various forms of welfarism in the first half of the 20th century. Had the National Health Service in the United Kingdom and other forms of public healthcare provision not been established, it is uncertain whether the physiotherapy profession would have ever become the orthodox provider of physical therapy services that it is today.

This "contract" between the state and the physiotherapy profession becomes all the more significant as many high-income countries now look to roll back welfare state provisions and push more and more healthcare into the hands of individual consumers. If the neoliberal market economy pushes further into healthcare in the years to come, it is not unthinkable that we may return to conditions similar to those found in 18th and 19th century Europe where the physical therapies are no longer available to all on the basis of need but, once again, become luxuries and indulgences available only to those who can afford to pay for them.

As with the seamen of Napoleonic war ships, and the mill, mine and factory workers of the Industrial Revolution, physical therapies will still be "available," just as they had been available to people for thousands of years, but the exigencies of life, and the lack of access to suitably qualified professionals, might relegate exercise, massage, mechano-therapy, electrotherapy, and hydro-therapy once again to the history books.

In early 2022, in the book *Physiotherapy Otherwise* Nicholls (2022) suggested that professions like physiotherapy were entering a post-professional era in which their role as primary providers of orthodox physical therapy was diminishing. The book went on to argue that the profession's response to this should not be to push for more elitism, specialization, and elevated social prestige, but that physiotherapists should actively work to return the physical therapies to common ownership. In other words, physiotherapists should reverse their historical professionalization project of securing a protective professional enclosure around the physical therapies, and focus instead on widening access and improving therapeutic knowledge and competence of as many people as possible. For a detailed discussion of this argument see Nicholls (2022). This study supports that conclusion. Histories of "common" everyday practices of the physical therapies are almost invisible in the literature, and physiotherapy; the profession which claims to have the strongest mandate to speak about the physical therapies has done little to change this.

First-hand accounts of people's use of everyday physical therapies do not exist within the professional literature which if it focuses on first-hand experience at all, follows medicine in trying to uncover narratives of its great professional pioneers. However, in recent years everyday accounts of healthcare practices, among consumers, clients, and patients, have begun to pervade the medical, nursing, psychology, and midwifery literature, and these accounts have shown just how diverse healthcare practices have become.

Partly because of physiotherapy's reluctance to study, understand, and promote the common practices of the physical therapies in the community, we know almost nothing about their use and prevalence. We do not know if people simply jettison physical therapies when they are no longer part of a formal healthcare service, or whether they find alternative sources of advice and support "outside" the orthodox healthcare sector. Physiotherapists are also resistant to physical therapies that exist outside the mainstream, orthodox, Western healthcare systems among indigenous service providers, for instance and physiotherapists are only now beginning to understand some of the ways people with longstanding health conditions like chronic breathlessness, chronic pain, congenital and acquired long-term disabilities, draw on unsanctioned, idiosyncratic and experiential approaches to the physical therapies to navigate their way through their illness experiences.

Where factual accounts fall short, fictional stories can play a role, particularly in exploring some of the mundane and quotidian challenges of illness and injury. Patrick O'Brian's work is an exemplary example of this because his stories are, in many ways, more evocative than a descriptive historiography, and no less "real" than verbatim first-hand narratives. Historical fiction can tend, like professional historiography, to focus on the great and the good, but it can also tell stories of everyday life that otherwise would pass into archival memory without rousing any interest.

Physiotherapists looking to understand the direction the profession is taking might consider looking at historical accounts to find echoes of the kinds of social and cultural issues that have shaped people's use of the physical therapies in the past, and where historical records are absent as almost inevitably they will be they might look to other sources of data to understand how massage, manipulations, electrotherapy, gymnastics, and the other physical therapies have shifted and changed over time, because these may provide the

strongest clues to the ways people will engage with the physical therapies in the future.

Notes

1. Throughout the text I have used the term "physiotherapy" to refer to the profession, and the "physical therapies" to refer to the modalities (e.g. massage, tissue mobilizations, hydrotherapy, and exercise). This is a convenience used to distinguish the practices that existed before the physiotherapy profession was formed. I acknowledge that this may be misleading for those working in the United States who are called physical therapists.
2. For a thorough discussion of the links between O'Brian's fictional accounts and historical events see Liebersohn (2007).
3. The social conditions that are perhaps most notable here are the emergence of germ theory and medicine as a discrete professional entity, as well as new professional roles for women and the rapid expansion of the professional classes; war and growing concern for alternatives to veterans' reparations; social Darwinism, eugenics, and the growing physical culture movement; and the ongoing appeal of spa therapies for the leisure classes (Armstrong, 1995; Krusen, 1942; Linker, 2005b, 2011; McKenzie, 2013; Nicholls, 2017; Ottosson, 2010, 2016; Schiller, 2021; Wikström-Grotell, Broberg, Ahonen, and Eriksson, 2013).

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