R. Tait McKenzie’s Medical Work and Early Exercise Therapies for People with Disabilities

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I showed [McKenzie] a letter I had received from a rising man in our profession who wanted to know what I could tell him about Dr. Luther Gulick... McKenzie’s comment was that it was strange that a man who had done so much for us should be forgotten so soon. “I guess,” he said, “that this will happen to all of us so far as our work in physical education is concerned. And if it is not entirely forgotten, our endeavors most likely will be misunderstood or misconstrued by persons who will not try to understand the conditions that prompted us to do what we did.”

—William A. Stecher, colleague of R. Tait McKenzie in the playground movement in Philadelphia (1944)

The roots of physical activity and sport for people with disabilities lie in medical concerns, in late-nineteenth-century Europe and North America, for the “correction” of disabilities through the use of exercise as a form of physical therapy. Disability sport in its present form would grow out of medical therapy during World War II, but the idea of using activity for its therapeutic value arose quite some time earlier. One of leaders in the development of physical therapeutics and exercise therapies in the late 1800s and early 1900s was Canadian-born doctor Robert Tait McKenzie. McKenzie’s comment on Gulick’s work could apply equally to his own work in orthopedics and the treatment of disabilities. McKenzie remains well known for his work in physical education and his realistic sculpture of athletes in a style similar to that of ancient Greek art. However, the third aspect of his professional career, his work in the medical field, is largely unrecognized, despite the volumes written about him.

This article examines McKenzie’s medical work, in the attempt to understand it in terms of “the conditions,” the times in which he worked. McKenzie focused his medical practice on the treatment of patients with physical disabilities, a practice that spanned the late 1880s to the years of the First World War. He wrote a considerable amount about this work in journal articles and in book form. These writings permit a reconstruction of McKenzie’s ideas on the treatment of people with disabilities using physical therapies. McKenzie’s medical writings are analyzed as a window into the wider medical discourse on the treatment of disabilities using
physical therapies, with a particular focus on the use of exercise. Major influences on McKenzie’s work are considered, as a means of assessing trends and events that influenced the therapeutic modalities employed by the medical field for the treatment of people with disabilities, at the time.

Focusing on McKenzie is not meant to exceptionalize him. Rather, in looking at people and events that influenced him, my intention is to discuss wider trends and historical conditions. McKenzie was an important figure in early rehabilitative medicine because several times in his life he put himself in a position where he could affect the types of therapies utilized. As described in one history of rehabilitation, “McKenzie introduced exercise into medical practice, and was its greatest exponent in the first quarter of the twentieth century.” However, his writings should be considered less as original contributions to the medical discourse, and more as reflecting the “state of the art” of the discourse on exercise and disability.

The concept of “discourse” on any topic goes beyond what is said or written. Discourses are structured ways of speaking about the world of social experience, and organizing meaning within a social context. Social practices and institutions, such as education, politics, law, or in this case, medicine, are constituted by and situated within forms of discourse. For Michel Foucault, with whose work the concept of discourse is mainly associated, institutionalized bodies of knowledge and the cohesive fields of practice based on this knowledge were known as discursive formations. The knowledge produced within a discursive formation contributes to the construction of social reality because it has “effects of truth,” even though the discourses themselves are not necessarily true or false. In reference to the topic at hand, medical discourses on physical disability and disability therapies are important because they construct a particular social reality, influencing societal views on people with disabilities. This in part determines the social possibilities open to people with disabilities, and their relationship to their own bodies.

The focus for this article is the discourse on medical treatment of disabilities. Therapeutic modalities are not often a topic of research within the history of medicine. Few histories of medicine consider medical treatments other than surgical techniques and drug therapies. For example, in his history of the orthopedic specialty, Roger Cooter considers the relative place of “operative methods” (surgery) versus “conservative methods,” such as the use of braces, massage, and other physical therapies. However, he does not go into much detail on the methods themselves.

A number of more specialized works consider the history of professions related to rehabilitation and physical medicine, but even these tend not to look at therapies very much. Many, such as Wendy Murphy’s Healing the Generations: A History of Physical Therapy and the American Physical Therapy Association and Jeanne Barclay’s In Good Hands: A History of the Chartered Society of Physiotherapists, 1894–1994, are institutional histories of professional associations and groups. The focus tends to be on how occupational groups, such as physiotherapists, occupational therapists, and vocational educators, came into being and professionalized. Other works, such as those by Russell Dean and C. Ebso Obermann read more like a who’s who of important people in various professions involved.
Some authors have discussed physical therapies to a certain extent. Murphy’s work and that of Audrey Davis briefly highlight the use of electrotherapy, Zander exercise machines, Swedish gymnastics, massage, heat and light, and remedial baths in early forms of physical therapy, but do not go into any detail.\textsuperscript{15} Glenn Gritzer and Arnold Arluke’s \textit{The Making of Rehabilitation} includes much reference to changes in electrotherapeutic techniques over time.\textsuperscript{16} However, the primary focus of this book is on the political economy of the struggle for professional prominence between electrotherapists and orthopedic specialists.

In sum, the literature on the actual treatment of people with disabilities is sparse, and the little that is available tends to focus on surgical techniques. This article examines the writing of one physician, R. Tait McKenzie, in detail, in order to begin to shed some light on the early treatment of disabilities through physical means.

McKenzie’s medical work can be divided into three stages, in terms of his location and the focus in his medical practice and writings. The first stage encompasses his time at McGill University from 1885 to 1904. During this period, he worked at the university, kept a private medical practice on the side, and primarily wrote about preventative medicine and the treatment of spinal curvatures. In the second stage, during his time at the University of Pennsylvania from 1904 to the start of the First World War, he continued to lecture and practice medicine and he produced two volumes of his book \textit{Exercise in Education and Medicine}.\textsuperscript{17} In the last stage, during the years of the First World War, McKenzie affected thousands of people through his work in the Royal Army and his writings on rehabilitation for convalescent soldiers.

\section*{The Early Years at McGill, 1885–1904}

As a young man, McKenzie attended Lisgar Collegiate in Ottawa for one year and then moved in 1885 to McGill University, in Montreal, where he pursued both his undergraduate and medical degrees, finishing in 1892. While completing his studies, he competed in football, athletics, and gymnastics, winning the coveted Wicksteed medal for best all-around gymnast in 1889.\textsuperscript{18}

McKenzie stayed at McGill for nearly 20 years, occupying a variety of academic and medical positions. He was named assistant gymnastics instructor in 1888, and promoted to director in gymnastics in 1890.\textsuperscript{19} Upon graduation with his medical degree in 1892, McKenzie interned at Montreal General Hospital so that he could remain at McGill as the instructor of gymnastics.\textsuperscript{20} In the fall of 1893, he approached the board of governors of the university with a plan to improve student health through medically supervised physical activity, a program already in place at Harvard University. In his new position resulting from this initiative, as the first medical director of physical training at a Canadian university, McKenzie provided individual consultations on exercise and hygiene for hundreds of students over the years.\textsuperscript{21}

During his time at McGill, McKenzie assumed a number of other responsibilities, including lecturer and demonstrator in anatomy, and instructor in physical
culture. During this period, he also commenced his career as a sculptor, beginning with a set of masks entitled *Effort, Breathlessness, Fatigue, and Exhaustion.*

**Medical Practice and Writing During the McGill Years**

In addition to his other activities, McKenzie kept an active medical practice throughout his years in Montreal. He achieved some renown in orthopedics for his treatment of spinal curvatures with exercise. As described in one biographical note, “the young physician was now well on his way to success, his original ideas on the treatment of Scoliosis rapidly bringing him fame in his profession all over Canada.”

McKenzie wrote six medical articles between 1894 and 1904, mostly dealing with specific measurement and treatment of disabilities through exercise. He laid out the future direction for much of his medical practice in the earliest of these, “The Therapeutic Uses of Exercise” (1894). In it, McKenzie expounded upon three aspects of exercise that he believed made it therapeutic:

1. It relieves congestions by equalizing the circulation.
2. It acts as a sedative to the nervous system probably through its action on the circulation.
3. It strengthens and enlarges muscle, bones, and ligaments, and would thus apply to all conditions caused by weakness or inequality of development.

In this first article, McKenzie discussed a number of disease conditions improved by therapeutic exercise, including sprains, constipation, chronic dyspepsia, obesity, chorea, and consumption. For diseases and disabilities, he advocated the use of light and heavy gymnastics, as they could be “adapted to the strength of the strong, or the weakness of the weak, that the greatest benefit might be obtained without the danger of overtraining.” He considered athletics “questionable, or at least very limited” in its therapeutic application, as the competitive element led to too much strain and overexertion. He placed particular stress on his growing area of expertise, the treatment of spinal curvatures by exercise and posture. McKenzie insisted that despite professional disagreement on the root causes of lateral curvatures of the spine, all physicians studying them agreed that “one of the main causes... is muscular debility, including faulty positions of sitting and standing.”

In this article, McKenzie also discussed his definition of the term *exercise.* He suggested that it included active and passive movements and massage, for all of these stimulated blood flow in desirable ways. In describing the various types of movements, McKenzie mentioned several people and systems of activity influential to his thought. These included Archibald McLaren and his form of British physical education, the Swedish Ling Gymnastics system, and the pulley-weight machines developed by Dudley Sargent at Harvard.

As McKenzie felt that no instrument of measurement for spinal curvatures offered enough accuracy, he designed an instrument himself and described it in 1898 in “The Accurate Measurement of Spinal Curvatures, with the description of a New Instrument for the Purpose.” The instrument consisted of an iron rod with clamps for the hips and shoulders, and an arm that permitted tracing the outline of
the patient’s back, hips, and shoulders onto a sheet of paper. From this, accurate measurements of the degree of deformity could be made and improvements over time documented. The instrument itself was not important because it does not seem that it came into any wider use. However, the idea for it is important in demonstrating McKenzie’s growing interest in the exact measurement of deformity.

In his 1900 article “The Place of Physical Training in the School System,” McKenzie proposed that many of the physical problems of adult life manifested themselves in childhood. McKenzie pointed to the structure of the school day and increasing urbanization as causes of a lack of activity in children:

This vital necessity for almost constant movement, is part of the process by which [the child] grows, and anything that interferes with it, interferes with his complete growth and development. Hence we find the weaker ligaments and growing, plastic bones soon tire under the strain, the back curves forward, the shoulders round, and the condition of “skewed back” is seen with the flattening of the chest and the cramping of the thorax. . . . That a complete system of physical training can greatly improve this condition of school life will be generally admitted. . . .

McKenzie expressed ideas gaining momentum in the form of the playground movement. This movement first arose in the late 1880s in Germany, spreading to the United States and Canada in the early 1900s. Led primarily by social workers, people in the playground movement advocated the construction of planned and supervised playgrounds in urban areas as a way to eliminate the “evils of tenements and slums.” McKenzie later became involved personally with the Playground Association and Boy Scouts in Philadelphia.

McKenzie established his position on the origins and treatment of spinal deformities by 1901. In that year, he published an article entitled “The Treatment of Spinal Deformities by Exercise and Posture.” This article reinforced his earlier suggestions that the school life of children caused spinal problems. Coining the term the scoliosis of fatigue, McKenzie argued that the weakening of the muscles and ligaments “is so often the most frequent form that it is really the rule in practice, and curvatures due to other causes . . . are comparatively rare exceptions. It is in these fatigue cases that we must look to exercise for its best results. In fact I cannot see how any other treatment can be rationally advocated.” This exercise treatment required individual attention. He noted that, “just as in the use of drugs, we may get a little nearer to the trouble by prescribing accurately, for the exact condition, so we may also get our results more quickly and surely by striking directly at certain groups of muscles, localizing the exercise to the exact region we wish to affect.” Although specific exercises varied from case to case, McKenzie grouped them into three broad categories. The first, breathing exercises, expanded the lungs and broadened the chest. Secondly, he promoted what he called straight exercises (akin to modern calisthenics), in which both sides of the body were exercised individually but equally, working sequentially through the muscle groups. The third category involved targeting specific muscles affected by the deformity, through active and passive movements and manual manipulation.

Other physicians of the time included exercise therapies in their battery of treatments for scoliosis. Few put as great a emphasis on the use of exercise as did
McKenzie, although some, such as Bernard Roth of London and American physician Jacob Teschner, developed their own series of exercises to treat spinal curvatures. For many physicians, exercise served as an underlying therapy secondary to braces or traction, but most of the cases that were reported involved treating more severe forms of scoliosis with structural involvement of the vertebrae. McKenzie tended to stay away from severe cases, in the worry that making extravagant claims for the benefits of exercise would bring the treatment into disrepute. He also avoided treatment of curves brought on by Pott’s disease (tubercul spondylitis) for similar reasons, stating the following:

In speaking of deformities, I would like to be understood as excluding such conditions as Tuberculosis or Pott’s Disease, and most cases of rickets, being of the same mind as Ecclesiastes the preacher, when he says, “Who can make straight that which He (The Lord) hath made crooked?”

McKenzie’s work on scoliosis should be situated within the wider “posture reform” movement of the late Victorian era, especially as his interest lay in less severe forms. From the 1880s to the mid-twentieth century, physicians and physical educators considered faulty posture a physical and moral problem. Yosifon and Stearns argue that the posture movement arose in the 1880s as a response to relaxation in Victorian dress codes and an increase in consumer culture, both of which led to a more relaxed, lounging style of personal carriage and deportment. As reformers assumed that poor posture indicated a general deterioration of physical and moral personhood, posture became a topic for public health and school hygiene education, almost to the level of a moral panic. The movement held currency all over the world, but especially in North America and in countries built upon the British system of education.

The newly organizing profession of physical education incorporated posture reform as part of its efforts at professionalization. Posture provided the physical education field with a topic in which its practitioners could make diagnoses, prescribe remedies, and teach prevention, so it had important currency in the young discipline. With his dual professional life, McKenzie would have felt the influence of the posture movement within the fields of medicine and physical education.

Themes and Influences in Early Medical Writing
Themes running through McKenzie’s early work expressed influences related to personal contacts and to wider discourses in medicine and physical education. Two particularly identifiable themes were the necessity of individualized exercise prescription, and the need for exact measurement of deformity and improvement.

The importance that McKenzie placed upon individual improvement in his charges likely came from his involvement with gymnastics at McGill. Frederick Barnjum, the athletic director at McGill when McKenzie first arrived in 1885, influenced the forms of gymnastics with which McKenzie became familiar. Barnjum had moved to Montreal in 1859 from England and shortly after began work with the Montreal Gymnastics Club, where he developed his own system of movements. He had instructed gymnastics in Montreal for nearly 25 years before McKenzie first became his pupil, and Barnjum’s system was carried on by his successors (including McKenzie) after his untimely death from meningitis in 1888.
Barnjum borrowed heavily from Archibald MacLaren’s English system of gymnastics in developing his own. Key facets of MacLaren’s system included concern for individual progress, and a progressive “overload theory” of training. Keeping these tenets, Barnjum added movements with Indian clubs and barbells to the apparatus-based method.

Demonstrating Barnjum’s personal impact, McKenzie wrote three pieces on gymnastics in tribute to him. In an 1891 article for the *Dominion Illustrated Monthly*, he credited Barnjum with the physical development of thousands of students and club members. In 1897, McKenzie wrote an article for the *Physical Education Review* on “Frederick Barnjum and His Work.” That same year, McKenzie himself posed as the model for a pamphlet called “Barnjum’s Bar-Bell Drill.” With such obvious regard for his former instructor, it is not difficult to perceive that the idea of individualized training passed from MacLaren, to Barnjum, and to McKenzie.

McKenzie’s familiarity with systems of gymnastics went beyond those based in English models. Very likely he took his notion of the term *exercise* as meaning more than just physical activity from his acquaintance with Swedish gymnastics. The conception that any means of increasing blood flow and circulation to the muscles was the same as exercise formed part of Swedish Ling gymnastics, with its extensive usage of massage. The Ling system had been influential in physical education in North America since the early 1800s and greatly influenced the development of allied medical disciplines such as physical therapy.

Individual exercise prescription also held an important place in the exercise system developed by Dudley Sargent of Harvard University, one of the early leaders in American physical education. Sargent individualized his gymnastics with pieces of gymnasium equipment known as “developing appliances,” many of which operated on weights and pulleys. From the late 1880s into the first decade of the 1900s, Sargent’s system vied for dominance with Swedish gymnastics, German turnverein gymnastics, and other forms in what is known as the “battle of the systems.” With McKenzie’s involvement as a physical educator and gymnastics instructor, he would have been familiar with these developments, and with the advantages and disadvantages of the various systems.

McKenzie’s predilection for measurement of the body, and its capacities and deformities, came mainly from personal associations and his involvement in anthropometry. According to biographer Jean McGill, when McKenzie first became assistant instructor in gymnastics at McGill in 1887, he felt “uncertain of his qualifications for the task,” and registered in a summer course at Harvard, led by Sargent. The course introduced him to Sargent’s system of exercise, and to the study of anthropometry, the nineteenth-century pseudo-science that attempted to relate the potential of the human body to its physical proportions. McKenzie noted that the course “inflamed my imagination and began to exercise a fascination that has never left me. I resolved that I, too, would wield a spade in digging up new facts in this untilled field [anthropometry].”

Anthropometry was a movement located mainly within physical education. Roberta Park described it as follows:

The anthropometry movement was preoccupied with ideal *forms*, statistical abstractions derived from scores of measurements of the length and girth of various body segments of thousands of individuals. Based on these, individual
measurements were judged to be deficient in certain attributes, and students were required to engage in gymnastic programs devised to correct whatever measurements were deemed inferior.61

The movement was very much part of the mainstream of physical education in the late 1800s and early 1900s. For example, the first subcommittee of the American Association for the Advancement of Physical Education (established in 1885) was concerned with anthropometry.62

Patricia Vertinsky described a number of historical antecedents to anthropometry, tracing it as part of a long line of eighteenth- and nineteenth-century sciences concerned with measuring, comparing, and interpreting variability in the body. These included physiognomy, phrenology, and comparative anatomy.63 In its heavy use of statistical measurement, such as with medians and averages, anthropometry had obvious ties to the rise of statistics in the 1800s. Unfortunately, most of the early statisticians tended to be eugenicists, and anthropometry also had ties to the eugenics movement.64

The influence of the anthropometry discourse is evidenced in McKenzie’s insistence on measurement, in his sculpting of what he perceived as the ideal body, and in his preference for work with machines in remedial exercise therapy.65 He maintained that machines allowed for very specific prescription of and compliance to exercise treatments, and for exact measurement of the advances being made.66 In later war work, he modified and used some of Sargent’s weight training machines and developed his own for particular body parts.

One important aspect of anthropometry and other physiognomic “sciences” was its relation to concepts of the “normal” and the “ideal” human body. As discussed by Lennard Davis, normalcy is a constructed concept.67 Vertinsky argues that the idea of a normal shape and size of body was a feature of modernizing nineteenth-century society. “Normal” was a concept that, when subjected to statistical revision, became conflated with historical ideals of body type.68 Davis notes that “the concept of a norm, unlike that of an ideal, implies that the majority of the population must or should somehow be a part of the norm. The norm pins down that majority of the population that fall under the arch of the standard bell-shaped curve.”69 Further, “once the idea of the norm entered North American and European culture, a normal body became an imperative.”70

People with disabilities obviously fell outside the range of “normal” body types. This had an impact beyond just being labeled as different. Physicians and physical educators felt an imperative to “normalize” the body, through various means. Exercise therapies, as advocated by McKenzie and others, constituted part of the attempt at normalization. McKenzie’s involvement with anthropometry likely influenced his concerns for treating disabilities through exercise, throughout his medical career. Interestingly, given McKenzie’s later influence in developments in the medical field, this means that physical activity and sport programs for people with disabilities have ties, through anthropometry, to early statistical work and eugenics. The motives to correct or normalize disabled bodies may have been dubious, but they form an early link in events leading to current forms of disability sport.
The University of Pennsylvania in the Prewar Years, 1904–1915

In 1904, the University of Pennsylvania built a new gymnasium and athletic grounds, and recruited McKenzie for the directorship of the newly established Department of Physical Education. As part of the employment agreement, McKenzie kept his private medical practice on the side. During this second stage of his medical career, in the years spent at Pennsylvania from 1904 to 1917, McKenzie became a recognized leader in physical education and a high-profile contributor to the medical discourse on disability and physical activity. Adding to his workload, McKenzie’s career as a sculptor greatly advanced during this period. During the years before the war, McKenzie produced some of his more famous athletic pieces, including The Joy of Effort, a large bronze set into the Olympic stadium at Stockholm in 1912, and The Competitor (1906), which was featured on the cover of the Sport History Review for years.

McKenzie still managed to keep up his involvement in medicine and physical therapy. He became involved in a number of important American medical organizations and societies, such as the Pennsylvania Medical Association, and the Charaka Medical Society of New York, an exclusive club of physicians that met once a month for lunch and “congenial conversation.” In 1907, he presented some of his earlier work to the College of Physicians of Philadelphia in a paper entitled “The Anatomical Basis for the Treatment of Scoliosis by Exercise.” That same year, named Professor of Physical Therapy in the medical faculty, he began to lecture on the subject.

The majority of McKenzie’s writing in the early years at Pennsylvania years dealt with either physical education or the relationship between sport and art. His anthropometrical leanings moved away from measuring athletes’ bodies to expressing his conception of the ideal body in his sculptures. However, in the years leading up to the war, McKenzie wrote what was arguably his most important work, his textbook Exercise in Education and Medicine. With this book, McKenzie made contributions to multiple fields, including physical education, public health, and physical therapy.

McKenzie’s Book Exercise in Education and Medicine

McKenzie had apparently collected material for some time in anticipation of writing the first edition of the book:

I had made it a habit to write a paper on some aspect of my work at least once a year. These were accumulating. I was meeting with many new and stimulating experiences and when the representative of a leading publishing house proposed that I write a textbook on Physical Education, I welcomed the suggestion.

The audience that McKenzie addressed in the preface indicated the book’s dual purpose:
The following pages are addressed to students and practitioners of physical training; to teachers of the youth; to students of medicine and its practitioners, with the purpose to give a comprehensive view of the space exercise should hold in a complete scheme of education and in the treatment of abnormal or diseased conditions.75

*Exercise in Education and Medicine* was one of the first texts in physical education that attempted to cover the field in its entirety. Notable texts in physical education before McKenzie’s book, such as MacLaren’s *A System of Physical Education,* had explained very specific systems of gymnastics or other forms of exercise.76 By contrast, the physical education section of *Exercise in Education and Medicine* covered a variety of topics, including various gymnastics systems, the physiology of athletic movement, and physical education programs for schools and colleges.77

In the first half of the book, chapters were titled “Massage and Passive Motions” (Chapter III) and “Exercise by Apparatus” (Chapter IV). In his expanding definition of the concept of “exercise,” McKenzie included massage, manipulation, and the use of mechanical devices. He again insisted that any means of producing blood flow and stimulating the muscles and ligaments should be considered “exercise.”78

McKenzie demonstrated his familiarity with various systems of gymnastics in “The German System of Gymnastics” (Chapter V) and “The Swedish System of Gymnastics” (Chapter VI). He gave much credit to the Swedish system for its “medical gymnastics”:

> Classification of the movements of massage . . . have been largely the work of the Swedish practitioners, and all the duplicate movements were described and named by Ling with extreme exactness, so that a prescription of exercise may be written with clearness and accuracy.79

McKenzie praised Ling gymnastic movements as a scoliosis treatment because “their accuracy makes them peculiarly effective in correcting the tendency of school-children to assume abnormal and hurtful postures,” and they served “as an antidote to evil effects of the school desk.”80

McKenzie included chapters titled “Physical Education of the Blind and Deaf-Mute” (Chapter XII) and the “Physical Education of Mental and Moral Defectives” (Chapter XIII). The inclusion of these two chapters set a precedent, likely being the first instance of adapted physical education explicated in any significant text.81 McKenzie apparently conducted a fair amount of research on these topics before writing about them. According to biographer McGill, he arranged meetings of various professional associations so that he could visit progressive institutions for the hearing and visually impaired, and even prisons.82 In these chapters, McKenzie suggested that sports and games had therapeutic benefit for people with hearing, visual, or cognitive disabilities and aided in their overall development as human beings. However, despite advocating recreation and sport for people in these groups, McKenzie demonstrated prevailing opinions in education and medicine by unquestionably accepting their institutionalization.83

For the second part of the book, aimed at the medical field, McKenzie set the goal of providing a comprehensive overview of the many physical therapies in use. He commented as follows:
In the realm of medicine, the application of physical medicine was in the hands of masseurs... electricity was looked on with suspicion by the profession... and the use of radiant heat and light was just beginning to attract attention. Hydro-therapy was confined to the spas and Turkish baths. No attempt had been made to give a comprehensive view of the whole subject giving the possibilities and especially the limitations of these apparently new but really old and fundamental methods of medical treatment.84

In addition to material on disease conditions benefited by therapeutic exercise, such as obesity and heart disease, McKenzie included chapters on conditions that might more properly be called disabilities. He included a chapter on his orthopedic specialty, scoliosis (Chapter XVII); a chapter on other structural deformities, such as round back and stooped shoulders (Chapter XVI); and a concluding chapter on “The Treatment of Locomotor Ataxia by Exercise.”85 In this chapter, McKenzie discussed the exercise treatment of Swiss physician H.S. Frankel in depth. Frankel developed a therapy that took patients through a graduated series of exercises, with the aim of progressive muscular control.86 McKenzie argued that practitioners had treated ataxia with reeducational movements some 40 years before Frankel’s work, but he gave Frankel credit for inventing many of the later retraining devices in use.87 McKenzie described Frankel’s exercise treatment in depth, including details on equipment for fine motor training of the hands, feet, and general locomotor system.88

The expanded second edition of the book, published in 1917, kept most of the older material but included a number of additions.89 In the physical education section, McKenzie extended the physiological section into four chapters; added a new chapter on community groups, such as the Boy Scouts and the YMCA (Chapter XI); and an extra chapter on gymnastics entitled “The War of the Systems in France” (Chapter X). The medical part of the book received the biggest overhaul, with new chapters titled “Vibration and Massage” (Chapter XIX) and “Mechanical Means for Massage and Exercise” (Chapter XX). In these chapters, McKenzie demonstrated his familiarity with developing medical technologies. Other physicians, mainly those aligned with electrotherapy, had experimented with machines for vibration and massage throughout the early 1900s.90

Another important addition was a chapter titled “Infantile Paralysis from Anterior Poliomyelitis” (Chapter XXXII). In this, McKenzie synthesized much of the general medical discourse on the treatment of paralytic polio. He recommended rest and support of the limb in the acute stage, and then voluntary movement, electricity, and massage to keep up the muscle tone. He also advocated vibration for its stimulatory effect and reeducational movements performed before a mirror or in a bath.91 Such a combination of techniques was fairly typical, as physicians struggled to find ways to effectively cope with the after-effects of a disease they did not really understand until well into the twentieth century.92

McKenzie’s book reflected the widening of discourse about people with disabilities at the turn of the twentieth century, in both medicine and physical education. Exercise in Education and Medicine mirrored internal changes in medicine in the study and treatment of disability, external influences from the educational field, and the residual influences of gymnastics movements.
In the early 1900s, the medical field recognized the rehabilitative uses of various forms of physical therapy. For example, a group of physicians established the Boston Medical Baths in 1903 as an “institution for physical therapeutics where private patients could be carefully treated and suitable researches carried on.” This grew into the Institution for Physical Therapeutics, affiliated with Massachusetts General Hospital, by 1908. Under the direction of Joseph H. Pratt, this facility offered treatments through hydrotherapy, gymnastics, and mechanotherapy (machines for passive movement, vibration, and massage).

Part of the increasing concern for treating people with disabilities was driven by increasing funding for medical research and the work in industrial medicine of reformers like Alice Hamilton. At the same time, the “trial-and-error pedagogy” utilized in residential schools for people with sensory, mental, and physical disabilities began to achieve some success. New ideas on the possibilities for educating people with disabilities filtered out from the educational field. As well, the various gymnastics movements influenced physical education and medicine well into the twentieth century. The “medical gymnastics” of the late 1800s became corrective gymnastics and corrective physical education in the 1920s and 1930s.

*Exercise in Education and Medicine* also contributed to medical discourse, promoting rising ideas on rehabilitation in a highly visible form. Fielding Garrison, editor of the *Index Medicus*, acknowledged the range of topics in the second edition of the book by listing it under subject headings for both “Hygiene of Person” and “Massage and Physiotherapy.” Put into wide use in Europe and North America, *Exercise in Education and Medicine* received praise from both fields of practice. It ultimately went to three editions owing to popular demand and the fast pace in the change of physiological and medical knowledge.

In the years leading up to the First World War, McKenzie moved away from medicine somewhat, devoting his time to his art and his work in the Physical Education Department at Pennsylvania. He still found the time to revise his text for the second printing. In many ways, McKenzie unknowingly prepared himself for the war years in rewriting *Exercise in Education and Medicine*. He would put to good use the knowledge gained in updating older sections and writing new sections on topics such as nerve pain and developments in physical therapeutics.

**Wartime Medical Work, 1915–1918**

The period of McKenzie’s wartime medical work is the shortest of the three in his medical career, lasting less than three years. However, the rest of his medical career had prepared him for the exigencies of war and he drew on his range of accumulated experience and knowledge in his war work. Furthermore, this period is the one that, without a doubt, had the most lasting impact on the medical field.

McKenzie volunteered for the medical service soon after the outbreak of the war. After receiving an 18-month leave of absence from the university, McKenzie and his wife departed for England in May, 1915. Finding that he could not join the Canadian Army Medical Service because he had not applied in Canada, McKenzie instead joined the British Royal Army Medical Corps (RAMC).

Shortly after his enlistment, the RAMC realized that the writer of the reference text *Exercise in Education and Medicine* was on course at Aldershot. McKenzie
was promoted to the rank of major and assigned to an inspection tour of training camps on England’s south coast. McKenzie identified two major problems in the camps. First, many men stationed in the camps were in such poor physical condition that they could not undertake basic physical training and thus could not be put into service. Many nations involved in the war faced this problem, and it served as a spur to the growth of physical education and physical training programs during and immediately after the war. A second, more particular problem that McKenzie found was the great number of injured men lingering in the camp hospitals, for whom physical training could expedite recovery. To alleviate these problems, McKenzie suggested a reorganization of the camp system in England. This ultimately took the form of the Home Command Depot system, with a split between training camps and convalescent camps, each type with its own physical training methods. McKenzie himself took command of the Heaton Park Command Depot, the largest of the convalescent depots, capable of serving some 5,000 men.

**Wartime Writings**

McKenzie published throughout his time in the service. Between 1915 and 1918, he produced eleven publications on the training and rehabilitation of military men. Many of these articles were quite repetitive, or even full reprints of earlier material. It would seem that McKenzie focused on getting his work out to as wide a professional audience as possible. His articles appeared in the *Royal Society of Medicine Proceedings*, the *American Physical Education Review*, the *Canadian Medical Association Journal*, and the *Pennsylvania and New York Medical Journals*—testimony, perhaps, to the perceived medical significance of his work.

In his writings, McKenzie described nine categories of injuries commonly seen in Home Front camps. These included healed wounds with scar tissue, physical wounds of the nerve, old wounds with protruding parts, joint injuries, “hysterical” stiffness, exhaustion, shell-shock, functional heart cases, and general weakness. Such a wide variety of convalescent cases, in unprecedented numbers for any war, required that the medical field move well beyond drug therapies and surgical techniques as the treatment regimen, a necessity clearly recognized by McKenzie.

In addition, McKenzie discussed a range of physical therapies that came into more frequent use during the war. Characteristically, he incorporated many of them into his expanding concept of “exercise,” adding other means of increasing local blood flow to his armament of physical activity, massage, and passive movement. In cases with nerve damage, muscles were stimulated with electric currents, to aid in the maintenance and development of muscle tone and nerve sensitivity. Cases with copious amounts of scar tissue, joint adhesions, or rheumatic troubles received massage treatments, external applications of dry heat, and hydrotherapy. McKenzie learned a great deal about the use of remedial baths through his association with Dr. R. Fortescue Fox at Heaton Park, who became a leading balneologist and hydrotherapist in Britain after the War.

Forms of physical activity still comprised the core of McKenzie’s treatment plan. In the depots, patients undertook exercise therapies both in groups and individually. In group exercises, men with similar cases executed forms of gymnastics and drill by “squads,” performing sequential movements on the commands of an
As much as possible, McKenzie and his staff tailored exercises to the individual soldier’s needs, enabled mainly through the use of exercise machines. During the First World War, elaborate machines for physical therapy became incredibly popular across the warring nations. One is still hard pressed to pick up a history book about veterans without finding at least some pictures of disabled veterans using such devices. This form of therapy naturally fed into, and off of, McKenzie’s love of exercise machines. McKenzie himself designed and built many of the machines for active and passive movements used at Heaton Park.

By the beginning of 1917, McKenzie returned to Pennsylvania because his 18 months of leave had expired. By then, the United States had entered the war. McKenzie accepted an invitation to consult at Walter Reed Hospital, in Washington, where he made recommendations on planning for remedial measures. He also undertook an inspection tour of the Canadian Military Convalescent Hospitals at the request of the Military Hospitals Commission in late 1917.

In 1918, McKenzie compiled his wartime writings and experiences into a booklet entitled *Reclaiming the Maimed: A Handbook of Physical Therapy*. This small book had a significant impact on the treatment of people with disabilities worldwide. For example, the Surgeon-General’s Department advocated its use, and both the United States Army and Navy adopted *Reclaiming the Maimed* as their official rehabilitation manual. The government of France also adopted the work as a rehabilitation manual, and it served as a standard reference on a wide scale.

Many of the therapies described in this book had proven effective throughout the war in various warring nations; afterwards, they formed the basis of modern physical medicine. New rehabilitation professions such as occupational therapy and physiotherapy arose from the events of the war, and physical therapies took a more important place in the discourse on the treatment of people with disabilities.

McKenzie’s writings during the war offer some insight into social and economic discourses circulating in medicine and the wider society. In one of his articles, he wrote, “the fact must not be lost sight of that even though a man is not sent back in category ‘A’ his opportunities for a career in civil life after the War have been enormously increased, and the burden on the Nation in future pensions correspondingly lightened.” This statement contains two important elements. On one hand, it shows concern for the individual soldier and support for occupational retraining of disabled veterans. On the other, it displays economic considerations and worry over the social impact of a large group of people with disabilities. Other physicians expressed similar concerns, especially as the war declined in 1918.

Physical treatment was viewed as only one part of the “disabled soldier issue.” As noted in a Military Hospitals Commission report, “One of the problems taken up in the early stages of the Commission’s work was the provision of vocational training for men in the hospitals, and re-education for those unable to follow their previous occupations after discharge.” National governments responded to the large number of newly disabled by establishing programs for the physical rehabilitation and vocational retraining of disabled soldiers.

Humanitarian interests and a collective sense of guilt motivated the concerns for reestablishment, at least in part. Joanna Bourke describes how men disabled in the war achieved a status denied other people with disabilities. There was a sentimentalization of the war wounded into the early 1920s, a fact that ascribed a
meaning of patriotism or valor to their absent parts or functions. Societal attitudes shifted from blaming the individual’s social or moral failings for their disability, to assuming a more collective sense of guilt, partly because of conscription during the war. This led to a desire to rehabilitate and reestablish returning soldiers in as “normal” a life as possible.

On the other hand, a more utilitarian concern predominated much of the discussion on rehabilitation and re-establishment. Many physicians, government officials, and social reformers worried that a large number of the convalescent soldiers would become dependent on public assistance and disability pensions, and thereby become a great drain on society as a whole. Throughout the late Victorian era, people with disabilities generally were perceived in Western societies as indigent, dependent, and unproductive. Robert Murphy calls this a “contamination of identity,” where people’s disabling conditions were understood as embedded in the entire fabric of their physical and moral personhood. Public officials and physicians feared that the large number of newly disabled would sink into mendicancy and dependency if not put back to work.

Governments and social reformers wanted to get disabled soldiers back to work as part of the rebuilding of society. For example, a British government publication entitled *The Ministry of Healing: Britain’s Care of the Wounded* went to great lengths to provide “the means taken to re-equip them [disabled soldiers], so that in spite of their disabilities, they may earn their own living and become useful members of the community.” The book included pictures of blind veterans working a poultry farm and men with amputations learning to be carpenters.

An economic imperative underscored this whole issue. Since the turn of the century, industrial intensification was such that labor markets had forced out smaller artisans in favor of production by large factories. The wider societal pressure upon the medical profession to rehabilitate and “reeducate” veterans with disabilities should partly be placed in an overarching capitalist ethic, as booming industries needed the men returned to the labor force. As discussed by Brad Byrom, prior to the war, physicians really only attempted to rehabilitate children with disabilities. They tended to look upon adults with disabilities as “unsalvageable.” Only when the size of the labor force was threatened by the large amount of potential workers disabled in the war did physicians turn to rehabilitating adults.

McKenzie optimistically once noted that “many men coming to the hospitals are sent back with a vocational training which they before lacked, and thus a wound may really be a blessing in disguise.” So, he seems to have been a firm believer in the value of vocational retraining. In the case of any individual physician, advocating for vocational reeducation might be indicative of feeling outside pressures on his or her work. Conversely, it might indicate a keen reading of the contemporary social condition, and using it to muster support for that work. Either way, these forms of societal pressure made up an integral part of the “gestalt” in which McKenzie and other physicians carried out their wartime efforts.

**Postwar Years, 1919–1938**

After the war, McKenzie never resumed a private medical practice, mostly because of his focus on his artistic work. For example, McKenzie received commissions for a number of commemorative statues at war’s end. The detail crafted into his
commemorative statues suggests that he likely had little time for much else but his art and his duties at the university.

McKenzie wrote a handful of small articles related to medicine and health in the years immediately after the war. However, he seemed to turn back toward physical education for his professional writing. McKenzie made his last major written contribution to the medical field by revising *Exercise in Education and Medicine* for a third time. The third edition of the book incorporated McKenzie’s wartime writings into the earlier chapters. Much of *Reclaiming the Maimed* appeared word for word in this third edition of *Exercise in Education in Medicine*, along with many photographs from the wartime manual. *Exercise in Education in Medicine* again received a favorable reception and went into wide use as a textbook. It remained a standard reference work on physical education and physical therapy for many years.

McKenzie remained actively involved in professional associations right until the end of his life. Appropriately for a man who had devoted his life to medicine and physical education, the 70-year-old McKenzie held the position of president of both the American Academy of Physical Medicine and the American Academy of Physical Education, at the time of his sudden death from heart failure on 28 April 1938.

**Conclusion**

R. Tait McKenzie voiced some of the earliest and most consistent perspectives advocating the therapeutic benefits of exercise for people with physical disabilities. His work most certainly had an impact for people with scoliosis and other structural deformities in the earlier periods of his work, and for hundreds, perhaps thousands, of disabled veterans of the First World War, as many physicians treated these veterans in consultation with McKenzie’s writings. Thus, McKenzie’s work and writing, in keeping with the tenets of this analysis, must be understood in terms of wider movements and discourses.

McKenzie’s work in the late 1800s and early 1900s indicates a fair amount of cross-fertilization of ideas, methods, and discourses from a number of rising professions related to medicine, physical therapies, and physical education. As seen in the early stages of McKenzie’s involvement with exercise therapies, the varied gymnastics movements of the late 1800s cultivated a concern for individual health and development and promoted the beneficial effects of manipulative therapies. The playground and posture reform movements opened a site of common interest between medicine and physical education, centered on therapeutic and preventative physical activity and hygiene. Anthropometric concerns influenced a variety of fields through the search for ideal body types and measurements of the body’s capacities. Many of the early professional physical educators, like McKenzie, were also medical doctors, and their work promoted a cross-fertilization of ideas, which seems to be missed, in large part, by medical historians.

In truly discursive fashion, McKenzie’s work in exercise therapy not only reflected the wider discourses influencing medicine, but also reinforced these discourses through the prominence and dissemination of his own writing. For
example, statistically based “sciences” encouraged the normalization of disabled bodies, leading to greater emphasis on medical treatment and correction. McKenzie’s writing stemmed from and fed into this discourse by always advocating correction through a variety of active and manipulative means. Similarly, we can read social and economic concerns of physicians during the First World War within McKenzie’s writing. As expressed by him and many others, the medical field as a whole felt that part of the mission of rehabilitation was to prevent a potential economic decline owing to great numbers of newly disabled people who presumably (in the opinion of the time) would be a drain on the system. Considering the wider influences on McKenzie in combination with his impact on physical therapies reinforces the point that the social context is always a key facet of historical study, even when dealing with individuals who might be held up as one of those traditional “great men of history.”

Finally, as reflected in McKenzie’s writings, such diverse matters as gymnastics movements, anthropometric measurements of the body, and economic concerns for rehabilitating convalescent soldiers stand as antecedents to or influences on physical and rehabilitation medicine, and important aspects leading to physical activity and sport for people with disabilities. In hindsight, many of these movements and discourses created less than positive or even disempowering framings of people with disabilities, and what supposedly benevolent physicians had to do for them. Ultimately though, they constitute a diverse package of precursors leading to exercise therapies during the Second World War, and from there, to current forms of disability sport.

Notes


2. In order to use the currently appropriate “people-first” language, whereby the person is emphasized before the disability, the term people with disabilities is used throughout this paper, instead of “the disabled.” At times, for the sake of grammatical sense, terms such as disabled soldiers or convalescent soldiers are used, but all attempts have been made to stay with people-first language. On this matter, see Karen P. DePauw and Susan J. Gavron, *Disability and Sport* (Champaign, IL: Human Kinetics, 1995), 5–6.


Publishing Company Ltd., 1980) recognized the importance of McKenzie’s wartime medical work but did not go into any depth on his medical writings. Frank Cosentino’s *Almonte’s Brothers of the Wind* (Burnstown, ON: General Store Publishing House, 1996) was a double-biography of McKenzie and Dr. James Naismith, aimed largely at a popular and undergraduate audience. The February 1944 issue of the *Journal of Health and Physical Education*, an R. Tait McKenzie memorial issue, consisted mainly of personal recollections. Some of McKenzie’s medical contributions were brought to light in Jack W. Berryman, *Out of Many, One: A History of the American College of Sports Medicine* (Champaign, Illinois: Human Kinetics, 1996): 3–9, but the discussion of him was necessarily brief in a work with such a wide scope.

5. This article is delimited to McKenzie’s medical writings. The University of Pennsylvania Archive has autobiographical notes by McKenzie that would likely shed further light on the topic, but the medical writings used herein still permit a good reconstruction of McKenzie’s work and the wider medical field at the time. Further, even though McKenzie wrote on topics related to health, hygiene, and preventative medicine, the main focus here will be McKenzie’s writings related to physical therapy and rehabilitation.

6. For example, he wrote an influential textbook for both physical education and medicine, and held a position of responsibility in the Royal Army Medical Corps during World War I. Both of these aspects are discussed in detail later.


10. Michel Foucault, “Truth and Power,” in *Power/Knowledge*, ed. C. Gordon (Brighton: Harvester Press), 116–119. This article does not constitute a “discourse analysis” in the true methodological sense, but it is based on the recognition of medicine as a discursive formation, and of the truth effects of discourse. This was one section of a wider discourse analysis of medical journal articles in the late 1800s and early 1900s, which drew on nearly 600 articles and monographs. See Fred Mason, “‘Straightening Children and Reconstructing Men’: Medical Discourse on Physical Therapies and People with ‘Disabilities,’ 1885–1920.” PhD Dissertation, University of Western Ontario, 2004.


15. Audrey B. Davis, 8–25; Murphy, 12–39. Murphy’s book makes a good reference book for a popular audience, but contains no bibliographic entries or notes.


17. R. Tait McKenzie, *Exercise in Education and Medicine* (Philadelphia/London: W.B. Saunders Company, 1909). Revised second and third editions of the book were published in 1917 and 1923 by the same company. The 1917 printing’s text was prepared in 1913, yet the year of copyright was 1915.

18. On McKenzie’s early life, see Cosentino, 1–0, McGill, 1–0.


22. Cosentino, 99. The point of the masks was to demonstrate the anatomy of facial features under different conditions of athletic effort. McKenzie wrote an article describing the masks in the *Journal of Anatomy* in 1905 in an article entitled “Facial Expression of Violent Effort, Breathlessness and Fatigue.”


26. Ibid., 566.

27. Ibid.

28. Ibid., 571.

29. Ibid., 564–566.


32. Ibid., 32. Modifications mine.
34. Ibid, 134. On the playground movement in general, see Schwendener, 133–142; Mabel Lee and Bruce Bennett, “1885–1900: A Time of Gymnastics and Measurement,” *Journal of Health, Physical Education and Recreation*, 31 (April, 1960): 38. In England, the playground movement was mirrored by an “Open Air Schools Movement.” Spurred by fears of the tuberculosis contagion and by the common treatment of open-air living, which helped with pulmonary symptoms, English physicians and social reformers promoted countryside schools for children from urban tenements. These literally had the sides out of them to allow open-air access, and outside games and sport were promoted for the “pre-tuberculous” children sent to them. See Linda Bryder, “‘Wonderlands of ButterCup, Clover and Daisies’: Tuberculosis and the Open-Air Schools Movement in Britain, 1907–39,” in *In the Name of the Child: Health and Welfare, 1880–1940*, ed. Roger Cooter (London: Routledge, 1992), 72–95.
35. Stecher, 59.
37. Ibid., 748.
38. Ibid.
39. Ibid., 748–749.
44. Ibid., 746.
45. As Yosifon and Stearns explain, clothes became less restricting and so less stiffening of the spine. Consumer culture led to furniture that allowed a more lounging position, and a desire


50. On Barnjum, see Cosentino, 28–29; McGill 11–12, 18.


59. McGill, 20. The Harvard Summer School of Physical Education was a series of summer courses aimed at workers in the field of physical education. Courses were offered from 1887 to 1932. Many of the earliest professional physical educators in North America attended at some point. See Gerber, 298–301.


62. Lee and Bennett, 30, 40. Anthropometry is still a subfield of kinesiology, but its infancy and heyday were in the late nineteenth century.


65. How far McKenzie went into the eugenicist aspect of anthropometry needs further analysis. The topic was raised by Patricia Vertinsky in a session at the 2002 North American Society for Sport History Conference. From the data used here, McKenzie should not be read as an eugenicist, but his “ideal type” in art, and some of his more anthropometrical writings might provide more information if subjected to analysis. Of course, none of his biographers ever alludes to eugenicist tendencies. What is certain is that McKenzie had heavy involvement in recording anthropometric measurements and expressing them in his art. Park notes that “no American physical educator in the late 1800s was as ardent an anthropometrist as Dudley Allen Sargent.” Park, “Sport, Gender and Society in a Transatlantic Victorian Perspective,” 75. I would argue that McKenzie was the second most ardent anthropometrist in physical education, but that he expressed it more in his art. For example, he used 400 measurements from Sargent’s studies to sculpt *The Athlete* in 1903.


68. Vertinsky, 96.


70. Vertinsky, 96.

71. McGill, 44.

72. McGill, 166.


77. For the purposes of this article, I will concentrate only on those sections relating to disabilities and physical therapies.


79. Ibid., 59.
80. Ibid., 101.
81. Sherill & DePauw, 55.
84. Quoted in McGill, 67.
85. The symptoms of locomotor ataxia, which we know to be syphilitic in origin, included a slow, progressive wasting of all parts of the body, and a loss of coordination and tendon reflexes. The Latin literally translates as “wasting back,” tabes dorsalis.
87. McKenzie, Exercise in Education and Medicine, 1909, 384.
88. Ibid., 393.
89. The second edition of Exercise in Education and Medicine was published in 1917, but there is some confusion as to when it was completed. The copyright date is 1915, but in the preface, McKenzie wrote “During the four years since the publication of this book . . .” (1917, p. 7), which would be indicative of its being completed in 1913. Why it would take until 1917 to publish the book is a mystery. Completion in 1913 or 1915 is all the same for the purpose of this article, putting it properly into the second stage, before McKenzie’s involvement in the war.
92. Naomi Rogers, Dirt and Disease: Polio Before FDR (New Brunswick, New Jersey: Rutgers, 1996). Rogers’s book offers a good social analysis of early attempts at the prevention, diagnosis, treatment, and research on polio in the first two decades of the 1900s, especially as related to the major epidemic in New York in 1916.


97. On Alice Hamilton’s work and industrial medicine in the late 1800s and early 1900s, see Taylor’s celebratory, yet informative chapter on her, pp. 63–84.

98. On residential schools and their influence in the mid to late 1800s, Sherill and DePauw, 60, 63, 64.


100. Fielding H. Garrison (Ed.), *Index Medicus*, 2nd Series, 13 (July, 1915), 636; (September 1915), 747. Perusal of listings for other books in the *Index Medicus* indicates that a book appearing more than once was unusual.


102. These are the reasons McKenzie gave for revising the book in the second edition, 1917, 7.

103. Unless otherwise noted, the information in the chronology of McKenzie’s war work comes from Hussey, 54–56, who interviewed McKenzie himself shortly after the war.

104. Amusing anecdotes about how his identity was discovered are detailed in Cosentino, 116, and Hussey, 54.


110. See George D. Kearsley and John Glyn, *A Concise International History of Rheumatology and Rehabilitation* (London: Royal Society of Medicine, 1991), Chapters 1–3. Throughout his war service, Fox promoted the use of “remedial baths” for a variety of chronic, disease, or


124. *The Ministry of Healing: Britain's Care of the Wounded*. (Reading: Petty & Sons Ltd., 1918), no page number (quote from the foreword).

125. Byrom, 141.

127. On the number of commissions McKenzie received, see “A Biographical Sketch of R. Tait McKenzie,” 86, or McGill, 100–117. For an in-depth discussion of McKenzie’s design and creation of war memorials, see Hussey, 64–78. Alternatively, his biographers suggest that he had seen so much destruction of human bodies that he no longer wanted to work in medicine. This seems somewhat speculative. See Cosentino, 121, 125; McGill, 101.

