Behind the Lines: The “War Books” of the Canadian Army Medical Corps, 1914–18

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When Erich Maria Remarque dedicated *All Quiet on the Western Front* to the “generation of men who, even though they may have escaped the shells, were destroyed by the war,”¹ he gave voice to a sentiment that infused most of the war books published a decade or more after the Armistice of 1918. Whether written in English, French, or German, these accounts of life and death on the Western Front painted a tale of youthful idealism betrayed by the jingoistic enthusiasm of civilians, the incompetence of staff officers, and the callous indifference of all who had the luxury to view the war from afar.² Insisting that the war had destroyed the lives of millions for no justifiable purpose, this literature of disillusionment – haunting, powerfully evocative, and forever memorable – has profoundly influenced how the Great War of 1914–18 persists in popular memory, recent academic efforts to challenge its key tenets notwithstanding. Whatever scholars might suggest to the contrary, everyone “knows” that the front-line soldier came home from the war embittered, shell-shocked, and incapable of readjusting to civilian life. He had for four years existed in a community so isolated from the comforts of civilian life that his empathy for the man on the opposite side of No Man’s Land outweighed the affection he had once felt for his family at home; he had been so traumatized by the destructive power of war that he

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¹ Erich Maria Remarque, *All Quiet on the Western Front*, trans. A.W. Wheen (New York: Ballantine Books, 1982; first published in 1929 as *Im Westen Nichts Neues*).

² In addition to *All Quiet on the Western Front*, the canonical titles in this literature of disillusionment are Robert Graves, *Goodbye to All That* (1929); R.C. Sheriff, *Journey’s End* (first produced on the London stage in 1929); Edmund Blunden, *Undertones of War* (1928); and Siegfried Sassoon, *Memoirs of an Infantry Officer: The Memoirs of George Sherston* (1930).

remained psychologically wounded; and he was absolutely convinced that the war was completely devoid of any redeeming value. Because the only ones endowed with the moral authority to speak of – and to denounce – the war were those who had endured it in the front-lines, the literature of disillusionment was also almost inevitably gendered: the “soldiers’ tale” (to borrow from Samuel Hynes) was very much the infantryman’s tale. Even when the occasional female voice could be discerned in this angry and lugubrious chorus, the lament remained the same. Vera Brittain, who served as a volunteer nursing assistant (a VAD) from October 1915 through the end of the war, published *Testament of Youth* in 1933. Mourning the loss of her fiancé, her only brother, and two close friends, and tormented by the suffering of the grotesquely wounded men who populated the war hospitals near, and far removed from, the battlefields of northern France, Brittain, too, told a heart-rending and bitter tale of a cruel and meaningless war.³

This literature of disillusionment found few admirers in interwar Canada, however. As Jonathan Vance has observed, the anger, sordidness, and relentless horror of these soon-to-be canonical war books rang false to Canadian veterans, who had known their share of misery, mud, and mayhem, but who also remembered (and relished) the occasional moments of mirth that relieved the physical and psychological stress of front-line service. It was not, Vance argues, that Canadians wanted an overly sanitized vision of combat, but they distrusted (and were disgusted by) what they took to be unbalanced accounts of war attentive only to the atrocities, the anguish, and the senseless slaughter of the Western Front. Canadians sought solace in accounts of the war that reinforced their belief in its redemptive value. The bereaved wanted to be reassured that their brothers and sons, husbands and fathers had not died in vain; the survivors found consolation in their conviction that the sacrifices of Canadian soldiers and the suffering of Canadian civilians had not been for naught. Thus they embraced a reassuring narrative in which the war had “conferred more than it wrenched away because it took Canada a few steps farther along the road to its destiny.”⁴ As Mark Sheftall has demonstrated, this repudiation of the literature of disillusionment was

³ Vera Brittain, *Testament of Youth: An Autobiographical Study of the Years 1900–1925*, preface by Rt. Hon. Shirley Williams (Harmondsworth, Middlesex: Penguin Books, 1989; first published by Victor Gollancz, 1933).

⁴ Jonathan Vance, *Death So Noble: Memory, Meaning, and the First World War* (Vancouver: UBC Press, 1997), 196. Vance discusses Canadians’ rejection of the literature of disillusionment in chapter 6, “Safeguarding the Past.”

evident in Australia and New Zealand, too. In each of these British Dominions, "the dominant narrative of the war ... focused on what was achieved between 1914 and 1918 by the nation and its soldiers, rather than on what was lost in the process."⁵ And what was achieved was a greater sense of national distinctiveness. The Great War marked an important moment in the evolutionary process by which Canada was transformed from colony to nation.

Whether disillusioned or redemptive, the novels and memoirs that most influenced public perceptions of the Great War were retrospective, shaped and sometimes distorted by the effects of hindsight. There exists, however, a rich array of wartime writings that offer an interpretation of the Canadian war experience that is neither as persistently gloomy as the literature of disillusionment nor as narrowly insular as the narratives of national awakening. During their years of service in France and Belgium, the nurses, physicians, and surgeons of the Canadian Army Medical Corps (CAMC) became conscientious and, in some cases, prolific writers. Much of what they wrote was private: letters to parents and siblings, to wives and children; diaries to capture the ebb and flow of life overseas. Private writing was, however, only one aspect of the testamentary record generated within the ranks of the CAMC. Physicians' case-books captured in spare prose the effects on a soldier's health of daily life in damp and insalubrious trenches. Surgeons' case-books, documenting both their successes and their failures, constituted the raw material upon which scholarly articles and medical innovation would subsequently be built. The commanding officers of base hospitals and casualty clearing stations maintained official War Diaries in which they kept a running tally of patient intake, mortality figures, and successful operations. The most conscientious among them took pains to note when consulting surgeons and other prominent medical men visited their units, thereby illuminating the extent to which front-line medicine was a collaborative and international enterprise. When read as a corpus, the "war books" of the CAMC tell a story that is importantly different from that conveyed by the canonical novels and memoirs of the interwar years. Insofar as they document incremental but very real improvement in the care of the sick and wounded, they resemble the "balanced" and somewhat heroic narratives that resonated so forcefully with Canadian veterans and civilians after the

⁵ Mark David Sheftall, *Altered Memories of the Great War: Divergent Narratives of Britain, Australia, New Zealand and Canada* (London: I.B. Tauris, 2009), 2.

war. Yet these texts focus less exclusively on the national triumph of plucky, resolute Canadians than on Canadian contributions to an essentially and inherently transnational collaborative effort of physicians and surgeons who learned from one another – sometimes in person and often only through print – in order to improve the medical care offered to wounded men on the Western Front.

To understand the character, the significance, and the emergent narrative produced by the “war books” of the CAMC, this article will focus on two units for which the written record is both varied and extensive: the #3 Canadian General Hospital (McGill), located approximately fifty miles from the front-lines, near Boulogne; and the #2 Canadian Casualty Clearing Station (CCCS), situated in the very shadow of the Ypres Salient. Both units confronted and were often stymied by the myriad challenges of wartime medicine; both were staffed by professionals well-trained in medical and surgical care; and both brought to the Western Front a familiarity with experimental technologies and techniques – from the use of the adjustable hospital bed (invented only a few years earlier by an American physician and spoken of invariably as a “Gatch bed”) to reliance on blood transfusion in cases of severe hemorrhage – that were either unknown or under-appreciated in the upper echelons of British medicine at the onset of the war.⁶ As importantly, the men and women who served in these two units created a written record which includes unit and personal diaries, family correspondence, medical case books, and professional publications. Edward Archibald, an up-and-coming, ambitious and talented surgeon who arrived in France with colleagues from the McGill medical school, spent more than a year in France, mostly at the base hospital but also at a casualty clearing station closer to the front. He kept case books (in an almost indecipherable hand); sent letters to his wife in Montreal, in which he expressed his homesickness, his hope that he could make a real difference in the lives of wounded men, and his despondency when he failed to

⁶ Lt. Col. Davey noted in the War Diary of the #2 CCCS that “the ‘Gatch’ bed as adapted for CCS work by Major Robertson of this unit and used by us for the last 6 months has now come into general use in the Army. We have about 25 (made by our own carpenters) in constant use for abdominal and chest cases. The Consulting Surgeon of the Second Army ... has arranged with the British Red Cross to make these beds for British stations. We have also given the plans to the Canadian Red Cross who are going to supply them to the Canadian hospitals.” War Diary, #2 Canadian Casualty Clearing Station, 10 October 1917. Library and Archives Canada, RG 9 III-D-3, vol. 5032.

do so; and he published articles in British, American, and Canadian medical journals, detailing in particular his study of surgical shock. Archibald was not, however, the only member of McGill's medical team to reflect on the conditions confronting nurses and doctors behind the lines of the Western Front. Clare Gass and Harriet Drake, two nurses who went to France with the McGill unit, documented in their diaries and letters home the challenges and rewards of wartime nursing. Several of Archibald's colleagues took advantage – as did Archibald – of their close connections to the editorial staff of the *Canadian Medical Association Journal* to inform doctors in Canada of the hospital's substantive contributions to military medicine.⁷

The written record for #2 CCCS is equally rich, comprising the unpublished case-books of Dr. A. Albert MacKay, a young Canadian physician and recent graduate of McGill, who enlisted in the CAMC in the summer of 1915; the unit's official War Diary, scrupulously maintained by the commanding officer, Dr. James Edgar Davey; the memoirs of George E. Gask, a British surgeon temporarily seconded to the Canadian clearing station in the second half of 1917; and the published articles of both Gask and Bruce Robertson, who became famous for their successes in chest surgery and blood transfusion, respectively. These sources provide a nuanced picture of medical practice in wartime by reminding us of the prevalence of illness when the front-lines were quiet and of the ghastliness of surgical cases when they were not. They reveal that the international collaboration that had characterized prewar medicine did not disappear entirely with the onset of war.

⁷ Andrew McPhail, the first professor of the history of medicine at McGill, had established the *Canadian Medical Association Journal* in 1911; when McPhail went overseas in 1915 (to serve in a field ambulance not affiliated with the McGill base hospital), other members of the McGill faculty assumed editorial management of the journal. See Ian Ross Robertson, *Sir Andrew McPhail: the Life and Legacy of a Canadian Man of Letters* (Montreal and Kingston: McGill-Queen's University Press, 2008), 46–48. McGill men who contributed articles to the *CMAJ* during and immediately after the war included J.M. Elder, "Notes from the McGill General Hospital in France," *Canadian Medical Association Journal*, 6, no. 6 (June 1916): 493–98; Lawrence J. Rhea, "Report from the Laboratory of No. 3 Canadian General Hospital – McGill," *Canadian Medical Association Journal*, 6, no. 6 (June 1916): 544–48; Edward A. Archibald, "A Brief Survey of Some Experiences in the Surgery of the Present War," *Canadian Medical Association Journal*, 6, no. 9 (September 1916): 775–95; and George E. Armstrong, "The Influence of the War on Surgery, Civil and Military," *Canadian Medical Association Journal*, 9, no. 5 (May 1919): 396–405.

For the duration of the war medical expertise did not cross No Man's Land. Although many British, French, and Canadian doctors had established close professional and personal relationships with their German peers in the years prior to 1914, these friendships and the collaborative efforts which had made them possible withered at the outbreak of war. The trans-Atlantic medical community neither shared their insights with, nor continued to learn from, their German and Austrian counterparts, and German and Austrian doctors had no opportunity to benefit from Allied innovation. However, if war undermined to some degree the broad-based internationalism of pre-war medicine, a robust internationalist ethos persisted on the Entente side of the trenches.⁸ Doctors and nurses from all allied armies worked together, attended medical seminars, and shared their insights and observations. Canadian doctors were especially well-placed to cultivate, encourage, and take advantage of these international connections. A vibrant network of medical expertise, built in large part by William Osler and his students at Johns Hopkins University, had allowed many of Canada's most distinguished physicians and surgeons to develop lasting friendships and productive professional relationships with their counterparts at American universities.⁹ These relationships continued well into the war years, sustaining a culture of international collaboration and co-operation. In 1917, for example, French, Italian, and American surgeons visited #2 CCCS to observe both Gask and Robertson at work. A year later, Harriet Drake spent time with an American unit situated close to the McGill base hospital in order to learn how to administer anesthesia, a skill the Royal Army Medical Corps had previously deemed beyond a woman's capabilities.¹⁰ She then returned to #2 Canadian CCS, where she had spent several months in 1917, but "this time," she reported with obvious pride, "I do not see the patients in the wards often but have a little chat with those who are able to chat before I put them to sleep in the operating

⁸ On this point, I would differ with Leo van Bergen who has argued that during wartime "the possibilities for exchange of knowledge – on a national, let alone an international, level – are limited ... it is the tranquility and orderliness of peacetime that are beneficial for medical science. In the absence of an enemy this allows exchange of knowledge." Leo van Bergen, "The Value of War for Medicine: Questions and Considerations concerning an often endorsed proposition," *Medicine, Conflict and Survival*, 23, no. 3 (2007), 193.

⁹ Michael Bliss, *William Osler: A Life in Medicine* (Oxford and New York: Oxford University Press, 1999), esp. ch. 6: "We all worship him."

¹⁰ Harriet Drake Fonds, P183, Osler Library, University of McGill. Letter from Harriet Drake to her sister, Daisy, dated 22 June 1918.

room. I have had 125 cases up to date."¹¹ The documentary record of #2 Canadian CCS reveals how commonplace this rotation from base hospital to casualty clearing station and back again was within the allied medical community of the Great War, forging in the process a multinational community of medical expertise and innovation.

The medical faculty of McGill University was instrumental in establishing and maintaining this transnational network. One of the most distinguished medical schools in early twentieth-century North America, McGill boasted a faculty with extensive and influential contacts on both sides of the Atlantic, a reputation for clinical excellence, and a dean determined to see his school do its bit for the war effort.¹² Dean Birkett's plan, as presented to the principal of McGill and approved by the university's governing board in October 1914, was "that McGill University should offer to the War Office, through the Canadian Minister of Militia and Defence, a completely equipped lines of communication general hospital ... officered by men chosen from the staff of the Faculty of Medicine of the University, with the ranks including a high percentage of medical and other students, and with the nursing personnel selected from graduates of the Training Schools of the Royal Victoria and Montreal General Hospitals."¹³ However generous this offer and, retrospect would suggest, however necessary this initiative, the War Office was not initially impressed. Perhaps the powers-that-be in London doubted the medical competence of their colonial cousins; perhaps they thought that the war would not last long enough to need the services McGill could offer. Whatever the case, McGill's proposal received a favorable response only after Sir William Osler interceded on behalf of his alma mater. As Regius Professor of Medicine at Oxford and arguably the most famous physician on either side of the Atlantic, Osler had unique access to and influence within the British medical establishment; his endorsement of McGill's initiative was critical to its success.¹⁴ Having won the approval of the

¹¹ Ibid., Harriet Drake to her sister, 30 August 1918.

¹² In 1910, Abraham Flexner, reporting for the Carnegie Foundation for the Advancement of Teaching, had praised McGill's medical school for its rigorous admissions standards, its exemplary laboratory facilities and library, and excellent clinical facilities: Flexner, *Medical Education in the United States and Canada* (New York: The Carnegie Foundation for the Advancement of Teaching, 1910), 324.

¹³ Ibid., 43.

¹⁴ R. C. Fetherstonhaugh, *McGill University at War, 1914–1918, 1939–1945* (Montreal: McGill University, 1947), 42–43.

War Office, McGill proceeded in the early months of 1915 to secure the equipment and recruit the medical staff – comprising 33 officers, 73 nursing sisters, and 205 other ranks¹⁵ – necessary to outfit and maintain a hospital of a thousand beds.

Insofar as McGill was the first medical faculty in the British Empire (and, as significantly, in North America) to undertake such an enterprise, it created a model of medical mobilization much imitated by other Canadian and American universities. All told, nine Canadian medical schools provided war hospitals: Toronto, Queen's, and Laval had the resources to staff a General Hospital; Dalhousie, Saskatchewan, St. Francis Xavier, and Western supported smaller stationary hospitals. The McGill model proved equally influential, and Osler's patronage just as important, in mobilizing the expertise of prestigious American medical faculties, on a strictly voluntary basis, before the United States entered the war in 1917. In the spring of 1915 Osler engaged the War Office in discussions comparable to those he had undertaken a few months earlier on behalf of McGill: could the faculties of Harvard, Chicago, Columbia, and Johns Hopkins (to name only the most famous) also finance and staff hospitals similar in scale and function to the one already authorized for McGill? Osler persuaded his protégé and close friend, Dr. Harvey Cushing, to make a case to the Harvard administration that an all-volunteer Harvard facility could justifiably contribute to the allied war effort long before the United States entered the war.¹⁶ This Harvard facility, which operated until 1917 under the authority of the Royal Army Medical Corps, was located close enough to the McGill unit to allow for social visits, friendly baseball games, and, more significantly, serious medical conversations.¹⁷

Having sailed from Montreal in May 1915, the McGill men and women set to work that summer to transform the open fields of Dannes-Camiers, twelve miles from Boulogne, into a modern hospital. (See fig. 1.) Far enough away from the front-lines to be tranquil; close enough to the coast to encourage strolls (or bicycle rides) by the shore, the site was nonetheless more rough than ready for medical practice. In July 1915, Clare Gass remarked: "These big Durbar tents are lovely to look at I hope they prove as good in rainy and stormy weather. It is so windy in this part of the country &

¹⁵ Ibid., 45.

¹⁶ Harvey Cushing, *From a Surgeon's Journal, 1915–1918* (Boston: Little, Brown, and Co., 1936), 48.

¹⁷ *The Story of US Army Base Hospital No. 5*. [by a member of the unit] (Cambridge: the University Press, 1919), 3–4.

storms come up so suddenly that the tents need to be very secure.” Of more immediate concern was the fact that there was “no water in camp at all & no hope of getting it soon.”¹⁸ Within weeks, however, “roads had been built, sanitary equipment ... installed, 257 tents and marquees ... erected, and the Hospital ... stood ready to admit its first convoy of wounded.”¹⁹ Over the next four months, the medical staff attended to 3,000 patients, many of whom had been wounded at Loos in late September; but – as Gass had feared – when the weather turned biting in October and rains rendered the tents uninhabitable, it was clear that the site was no longer viable: “Our hospital tents have been condemned as unfit for winter work. – these last rains & heavy winds have made them look the part.”²⁰ The McGill hospital opened in new quarters, a former Jesuit college recently vacated by the medical corps of the Indian Army, at the end of January 1916.²¹

Figure 1. “The Hospital at Dannes-Camiers, 1915.” *No. 3 Canadian General Hospital (McGill) in France (1915, 1916, 1917) : Views Illustrating Life and Scenes in the Hospital with a Short Description of its Origin, Organisation and Progress* (Middlesbrough: Hood and Co., 1918).

¹⁸ Clare Gass, *The War Diary of Clare Gass, 1915–1918*, ed. and intro. by Susan Mann (Montreal and Kingston: McGill Queen’s University Press, 2000), 46. Diary entry dated 26 July 1915.

¹⁹ Fetherstonhaugh, *McGill University at War*, 46.

²⁰ Gass, *War Diary*, 77. Diary entry of 3 November 1915.

²¹ “Canadian Army Medical Corps,” *Report of the Ministry, Overseas Military Forces of Canada 1918* (London: Overseas Military Forces of Canada, 1918), 396.

Whether housed under canvas or in the more secure confines of a former seminary, #3 Canadian General Hospital (McGill) cared for patients who had survived the strenuous journey from regimental aid post to field ambulance and back through the casualty clearing stations located five or six miles from the front. This is not to say that their patients were entirely out of the woods. As J.M. Elder, chief surgeon at the hospital, reported in the *Canadian Medical Association Journal*, in its first months alone McGill's doctors operated to extract shell fragments lodged deep in the brain, the liver, or embedded in an eye, and tried as best they could to avoid amputations while ever mindful of the dangerous consequences of gas gangrene infection.²² Physicians, under the direction of Dr. John McCrae – Canada's famed war-poet – cared for those afflicted by one of the many maladies brought on by trench life, including pneumonia, scarlet fever, paratyphoid, dysentery, and trench foot. Looking back over the hospital's first four months of activity, Dr. Elder noted that the hospital staff had "done over 500 operations and admitted 3,000 patients" while maintaining a very respectable mortality rate of under 3 percent.²³ (See fig. 2.) Such statistics did not, however, lessen the pain and frustration doctors struggled with when their patients died. Archibald admitted in a letter to his wife that even though doctors were accustomed to death, it was impossible for them to be indifferent to the deaths of "fine lads, in the best of their youth."²⁴ He did not mean to be callous when he confessed that after he got back to Montreal, he would be "content to see some of my patients die, whose turn it is, as it were, to die, and I will not worry over them. But here, where before I came, I thought I could bear the sight of death easier than in the hospital at home, I find I can bear it less. It is all so undeserved, so untimely, so contrary."²⁵

Archibald and his McGill colleagues had volunteered for overseas service out of a sense of patriotic obligation, but they also believed that they could bring to the war effort unique and important skills that others could not offer. This was true of the doctors, many of whom were among the most distinguished and accomplished in Canada, and of the nurses, who took legitimate pride in their professionalism and

²² J.M. Elder, Lt. Col., "Notes from the McGill General Hospital in France," *Canadian Medical Association Journal*, 6, no. 6 (June 1916): 493–98.

²³ Fetherstonhaugh, *McGill University at War*, 47.

²⁴ Edward William Archibald Fonds, P 88, Osler Library, McGill University. Edward Archibald to his wife, Agnes, letter dated 29 September 1915.

²⁵ Edward Archibald to his wife, letter dated 8 October 1915.

Figure 2. "The Operating Room." *Alexander Howard Pine, No. 3 Canadian General Hospital (McGill) in France (1915, 1916, 1917): Views Illustrating Life and Scenes in the Hospital with a Short Description of its Origin, Organisation and Progress* (Middlesbrough: Hood and Co., 1918).

formal credentials. In September 1915, when confronting the convoys of wounded from the Battle of Loos, Archibald wrote to his wife: "I doubt not that we saved some limbs and a few lives. The nursing staff of the oper. room were splendid ... This is what I came for. I feel I am doing my bit at last. I know we do the work better than most, and quicker, and have, on the whole, better judgment ... Trained surgeons are needed; and many of those working are not well trained. Here in France, we save the wounded at least one [each] day, often much more, in the matter of skilled care; and that means often all the difference between loss or preservation of life or limb."²⁶ At least in his correspondence with his wife, Archibald did not assume a false modesty when assessing the value of his contributions to the national cause: "I'm doing a good and a necessary work here; and doing it better than the next man – from Woking, or Oxford, or Sherbrooke,

²⁶ Edward Archibald to his wife, letter dated 26–28 September 1915.

or Calgary – who might have taken my place. I have certainly saved one life at least, by the proper treatment, which would have been lost by the next man.”²⁷

As Archibald knew well, the success of the hospital depended on the skill of its surgeons and the competence of its nurses. All eighty-seven nurses who had sailed from Montreal in 1915 had graduated from a three-year training program at either the Royal Victoria Hospital or the Montreal General.²⁸ Many were recent graduates, like Clare Gass, who had finished her training at the Montreal General in 1912, but there were several, including Harriet Drake, a 1907 graduate of the nursing program at the Royal Victoria, with almost a decade or more of practical experience. (See fig. 3.) These nurses were not, therefore, the dewy-cheeked young VADs who went to war knowing nothing of the art and science of nursing. Like Archibald, they took understandable pride in their professional competence, and did not suffer fools gladly. While awaiting the opening of the McGill hospital, they served in a British hospital in France, where they quickly won the respect of their colleagues. “We may have a twang and an objectionable mode of speech,” Harriet Drake noted wryly, “but there is not much fault to be found with our work.” She could not say the same, however, for a young VAD with whom she had to work: “it has been my misfortune lately to have to put up with a young thing dressed up as a nurse who has had two weeks instruction in nursing. She spends her time getting the names and addresses of all the Tommies and having them draw and write in an album ... She entirely upsets the discipline of the ward. When I asked her one night to tidy up her ward before going off duty she remarked that it didn’t matter how a ward looked at this hour of the night (7 p.m.) and any way she wasn’t a nurse. I couldn’t help replying that we all knew that very well but that unfortunately for the profession she was masquerading as one.”²⁹ Drake’s sojourn at the British hospital was happily short-lived.

However skilled the surgeons and accomplished the nurses, some of their cases proved tragically resistant to medical intervention: men who had lain unattended in muddy fields, with wounds susceptible to gas gangrene; men who succumbed to secondary hemorrhages following amputations or severe wounding; and men who could

²⁷ Edward Archibald to his wife, letter dated 3 October 1915.

²⁸ Susan Mann, “Introduction,” *The War Diary of Clare Gass, 1915–1918* (Montreal and Kingston: McGill-Queen’s University Press, 2000), xix–xx.

²⁹ Harriet Drake Fonds, P183, Osler Library, University of McGill. Letter from Harriet Drake to her sister, Daisy, dated 16 July 1915.

Figure 3. "The Sisters' Sitting Room." *No. 3 Canadian General Hospital (McGill) in France (1915, 1916, 1917): Views Illustrating Life and Scenes in the Hospital with a Short Description of its Origin, Organisation and Progress* (Middlesbrough: Hood and Co., 1918).

have been saved by a simple inoculation of anti-tetanus serum. In the fall of 1915, two cases weighed particularly heavy on Archibald's mind. One patient could certainly have been saved: "It's a case of lockjaw, following on trifling wounds, that is hurting. He ought to have got his injection of anti-tetanic serum before he came down from the front, and he did not. We have worked hard over him, but it seems useless."³⁰ A second patient presented a more complicated challenge. "He was shot through one leg, in an attack, and lay out in the dead ground between the lines for nearly 24 hours. During that time, he got another bullet through the other leg, and lost a lot of blood. However, he was in fair shape when he got here, and his wound was doing well for a week, when 5 days ago he had a big haemorrhage for it." Having concluded that only the most radical intervention would save this patient, Archibald decided to give him a blood transfusion. In the years leading up to the Great War blood transfusions were almost unheard of in Britain, but North American

³⁰ Edward Archibald to his wife, letter dated 8 October 1915.

surgeons, especially those at the most prominent university-affiliated hospitals, were becoming more and more convinced of transfusion's therapeutic potential.³¹ Yet it remained a practice of last resort: at a time when the safe conservation of stored blood was almost unheard of, transfusion had to occur directly from the donor to the patient. Thus Archibald enlisted a fellow physician and prepared to transfuse his patient. Initially, the prognosis was very promising. On 28 October 1915, Archibald confided in his wife: "I have had a splendid case yesterday and today – a man who very nearly died of a haemorrhage, and I gave him blood from Billy Howell's arm, and have probably saved his life. He was almost gone. It happened yest. morning, and all day I stuck close to him. Today he is fine, and rapidly recovering, though he still has the infection in the wound. Reford got it packed tight and stopped but yest. it came on again. I think I have got it well stopped this time." Archibald's optimism then turned to dismay: "My haemorrhage case of which I told you in last letter, to whom I had given blood twice from Howell's arm and yesterday from Refords – died this morning. I had such hopes of him."³²

In the fall of 1915, Archibald was torn: he missed his wife desperately, was anxious about his children's health, and was eager to return home; but he knew he was doing good work in France and believed that much more could be done to improve the prospects of wounded men. He was especially frustrated at the failure of modern medicine to address effectively a condition so common among the wounded that, by one estimate, there were a thousand cases a week on the Western Front.³³ Surgical (or wound) shock often threatened the lives of men who were not otherwise gravely wounded – Archibald heard on good authority of "a man who had been hit on the tibia by a very small fragment of shell" who had succumbed to shock³⁴

³¹ Peter H. Pinkerton, "Canadian Surgeons and the Introduction of Blood Transfusion in War Surgery," *Transfusion Medicine Reviews*, 22, no. 1 (January 2008), 77–78; Kim Pelis, "Taking Credit: The Canadian Army Medical Corps and the British Conversion to Blood Transfusion in WWI," *Journal of the History of Medicine and Allied Sciences*, 56, no. 3 (July 2001): 238–77.

³² Edward Archibald to his wife, letters dated 14 July 1915, 29 August 1915, 6 September 1915, 28 October 1915, 4/5 November 1915.

³³ Saul Benison, A. Clifford Barger, and Elin L. Wolfe, *Walter B. Cannon: The Life and Times of a Young Scientist* (Cambridge, MA: Harvard University Press, 1987), 391.

³⁴ Edward A. Archibald, "A Brief Survey of Some Experiences in the Surgery of the Present War," *Canadian Medical Association Journal*, 6, no. 9 (September 1916), 784.

– and thus he was convinced that countless lives could be saved if only the mysteries of surgical shock could be solved. This realization forced Archibald to make a choice. Whereas his personal affections inclined him to fulfill his promised year of service and then return to Montreal, his professional instinct prompted him to stay in France where he believed he could apply his talents profitably to this great unsolved problem of wartime medicine. To understand shock fully, however, he requested (and secured) a temporary assignment at #1 Canadian Casualty Clearing Station, located in the small town of Bailleul, ninety kilometres due east of Boulogne.

By late 1915 the CCS's had emerged as the principal site of surgical care and therapeutic innovation, and it was here – rather than in the base hospitals – that surgical shock, characterized by exceptionally low blood pressure, very low body temperature, a rapid pulse, and bodily pallor, was most pervasive. British and Canadian surgeons, prompted by the observations of their French counterparts, were reasonably certain that the miserable conditions of trench-life compounded by the rigours of medical evacuation could induce shock even in soldiers who were not otherwise seriously wounded. Frequently wet, often cold, sometimes undernourished, and usually exhausted, wounded soldiers lacked the stamina to withstand the jostling, zig-zagging evacuation that took them from the front-lines to a field ambulance and from there to a casualty clearing station.³⁵ Thus a soldier who presented none of the recognized signs of shock when he left the field ambulance was all too often in shock – and sometimes *in extremis* – by the time he reached a CCS. If the shock then went untreated, he would probably die. Wartime surgeons knew that there were many men who never made it as far as a casualty clearing station, and there were others whose wounds were so severe that no surgical intervention could save them. This was tragic enough, but perhaps even more heart-rending were the men whose wounds were not inherently life-threatening but who died nonetheless of shock. This was the condition Archibald wanted to understand; these were the men he wanted to save; and this was the problem he addressed in his professional publications.

When Archibald arrived at #1 CCCS in the early months of 1916 he was unusually well placed to undertake a serious, clinical study of

³⁵ Edward Archibald and Capt. W.S. McLean, "Observations upon Shock, with Particular Reference to the Condition as Seen in War Surgery," *Annals of Surgery* (September 1917), 281.

surgical shock. A year earlier, before leaving Montreal, he had travelled to Cleveland expressly to consult with Dr. George Washington Crile, whose textbook, *Surgical Shock*, published at the end of the nineteenth century, had made him the pre-eminent expert on shock. Crile, an affiliate of Western Reserve hospital in Cleveland, Ohio, and one of the earliest American medical men to lend his expertise to the Allied war effort, believed that shock was caused by a catastrophic failure of the circulation system, and by the beginning of the twentieth century he was, as Kim Pelis has demonstrated, “convinced that blood [transfusion] would stave off shock where saline could not.”³⁶ Familiar with Crile’s work, Archibald persuaded his junior associate at #1 CCCS, Dr. Walter McLean that together they should seek to determine if blood transfusion would indeed effectively counteract shock. The conclusions derived from their clinical analyses formed the core of three scholarly articles. A co-authored piece, which appeared in 1917 in the *Annals of Surgery*, concentrated exclusively on the phenomenon of shock; two other articles – a survey of surgical practices on the Western Front and an analysis of the benefits and limitations of blood transfusion – were published in 1916 under Archibald’s name alone, in the *Canadian Medical Association Journal* and the *Lancet*, respectively.³⁷

In the forty-four cases of surgical shock that Archibald and McLean studied, chest and head wounds were rare – perhaps because the men did not survive long enough to make it to the casualty clearing station – and “practically all [our cases] were wounds of the locomotor system or the abdomen.” Moreover, patients manifesting the most severe signs of shock rarely responded to any surgical intervention: “Of 12 cases in which the temperature was [below 92°], death within a few hours took place in 9”; and “out of 17 cases with blood-pressure below 75, only 3 rallied from shock, and these all died in two or three days from gas gangrene.”³⁸ Such patients were, therefore, beyond medical help. Could blood transfusion make a

³⁶ Kim Pelis, “Taking Credit: The Canadian Army Medical Corps and the British Conversion to Blood Transfusion in WWI,” *Journal of the History of Medicine and Allied Sciences*, 56, no. 3 (July 2001), 242.

³⁷ Archibald and McLean, “Observations upon Shock, with Particular Reference to the Condition as Seen in War Surgery”; Archibald, “A Brief Survey of Some Experiences in the Surgery of the Present War,” 775–95; Archibald, “A Note upon the Employment of Blood Transfusion in War Surgery,” *The Lancet* (2 September 1916): 429–31.

³⁸ Archibald and McLean, “Observations upon Shock,” 282.

significant difference for the patient whose symptoms of shock were less extreme? Archibald and McLean knew that "even a moderate loss of blood tends to predispose to or aggravate shock," and thus they sought to determine whether replacing the blood lost through hemorrhage would prevent or reverse the onset of shock. Yet the cases they encountered at the casualty clearing station failed to demonstrate a direct relationship between blood loss and surgical shock: they had "a considerable number of cases in which hemorrhage was either absent or very slight."³⁹ Moreover, because hemorrhage was not consistently the cause (or even a complicating factor) of shock, Archibald and McLean concluded that "intravenous salt or ... [blood] transfusion – helpful in hemorrhage, [was] useless in severe shock."⁴⁰ Intravenous saline, the preferred therapy at that time among British surgeons, had almost no positive effect on shock. Positive results following upon blood transfusion were, however, equally elusive: "transfusion of blood was done in 3 cases ... Its effect was disappointing; while the color was improved and a slight rise of blood-pressure was got, it had no more permanent effect than the gelatin [solution] or salt. In this the contrast with its truly life-saving action in cases of pure hemorrhage was most striking; after all, in shock we are not dealing with a lack of blood alone, but with some complex mechanism by which blood is continuously withdrawn from the circulation, and to transfuse simply means that your transfused blood goes lost with the rest."⁴¹ When Archibald returned to the McGill base hospital in April 1916 he was no more certain of how best to treat shock than when he had arrived at the casualty clearing station four months earlier. He confessed – in print – that he felt "rather hopeless over the treatment of these shock cases."⁴² Further inquiry and experimentation were, he believed, clearly in order. Perhaps a commission of medical experts, charged with studying the problem in greater depth, could finally solve the mystery of shock. He held out hope that resuscitation techniques, tried experimentally by other surgeons, might prove effective.⁴³ If a patient manifesting symptoms of shock upon arrival at a CCS could be kept warm and hydrated for an hour or two before undergoing surgery, he might rally sufficiently to survive the trauma of surgery.

³⁹ Ibid., 283.

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Archibald, "A Brief Survey of Some Experiences in the Surgery of the Present War," 784.

⁴³ Ibid., 785.

This, at least, seemed a promising avenue to explore, and McLean was instrumental in the months after Archibald's departure from Bailleul in testing the benefits of active resuscitation techniques. On staff at the #1 Canadian CCS until the end of 1917 (when he was killed in an aerial bombardment of the site), McLean impressed upon his senior colleagues the value of resuscitation wards where patients in shock were kept warm and hydrated, allowing their vital signs to recover sufficiently to make surgery a viable prospect.⁴⁴ By 1917 these resuscitation wards had become a standard feature of all casualty clearing stations under the authority of the British Expeditionary Force.

At first blush, Archibald and McLean's clinical study of how to treat shock would appear to have been a purely Canadian enterprise: both were McGill men whose paths had converged at a Canadian casualty clearing station on the Western Front. But their understanding of war-induced shock owed much to a French surgeon who had also published on the subject, and their experimental use of blood-transfusion had been prompted by Crile's work in American hospitals before the war.⁴⁵ That wartime medicine continued to be dependent upon the insights and experiments of an international community of experts was equally apparent in Archibald's article, published in the *Lancet* in September 1916, on blood transfusion. Here he referred to his own use of blood transfusion at the base hospital in 1915; cited, with attribution, the case-notes of a fellow McGill surgeon; consulted with colleagues whose reliance on blood transfusion was more extensive than his own and who were convinced that blood transfusion in the event of hemorrhage could be life-saving; and cited the recent scholarship of two New York surgeons who had published a year earlier on blood transfusion in the *American Journal of the Medical Sciences*.⁴⁶ Archibald's medical career in wartime France, as documented in his private correspondence and professional publications, thus illuminates an under-appreciated aspect of Allied wartime medical practice: he and his McGill colleagues, whether stationed at the base hospital or temporarily assigned to a CCS, remained embedded in an international network of medical

⁴⁴ Pelis, "Taking Credit," 264–65.

⁴⁵ Archibald and McLean, "Observations upon Shock," 281.

⁴⁶ Archibald, "A Note upon the Employment of Blood Transfusion in War Surgery," 430. The article Archibald cited was R. Ottenberg and E. Libman, "Blood Transfusion: Indications; Results; General Management," *American Journal of the Medical Sciences*, 150, no. 1 (July 1915): 36–68.

knowledge, built on personal acquaintance, professional connections, and continued access to the print culture of academic medicine.

The impulse to innovation and the collaborative character of wartime medicine, so evident in the wartime career of Edward Archibald, were also apparent throughout 1917 at the #2 Canadian Casualty Clearing Station. (See fig. 4.) One of a cluster of clearing stations located at Remy Siding (within firing range of the battlefield at Ypres), the #2 CCCS was close enough to #1 CCCS to allow for friendly baseball games and within walking distance of the British Casualty Clearing Station where Harvey Cushing practised neurosurgery in 1917 before being reassigned, following the entry of the United States into the war, to an American base hospital. The #2 CCCS was also near enough to unoccupied Belgium to allow for visits to a prominent Belgian military hospital. Housed in tents, subject to intermittent enemy bombardment, and charged with caring for the unhappy humanity evacuated from the front-lines at Ypres, the men and women of #2 CCCS did what they could to make the best of a very trying existence: they planted flowers to brighten the landscape and vegetables to vary the diet; they played tennis when the weather co-operated and made tea when it didn't. George Gask, a British surgeon who arrived at #2 CCCS in June, 1917, was rather astonished by the easy-going ways of his new Canadian colleagues. He appreciated the fact that the nurses had a tea tent every afternoon, but could not quite believe that lowly privates were welcome to mingle there with commanding officers. He recalled "once seeing there a number of junior officers with Lieut-General Currie, then commanding the Canadian Corps, and a private soldier. This sight would not have been witnessed in a British sisters' mess."⁴⁷

Bemused though he was by the unit's unorthodox atmosphere, Gask could not fault the professionalism of his temporary home: #2 CCCS was, he adjudged, the best hospital he knew of on the Western Front.⁴⁸ The work undertaken there was as impressive as it was demanding. Until June 1917, when the British assault on Messines Ridge served as the first volley in the intensive but disastrous assault on Ypres (in the campaign usually spoken of as Passchendaele), the medical teams dealt with relatively few wounded men and a great many afflicted by the panoply of illnesses exacerbated by the conditions of

⁴⁷ George E. Gask, *A Surgeon in France: The Memoirs of Professor George E. Gask, CMG, DSO, FRCS, 1914–1919* (Liskeard Books, 2002), 44.

⁴⁸ *Ibid.*, 43.

Figure 4. "Medical and Nursing Officers of No. 2 CCCS, 1917." Lawrence Bruce Robertson is seated at the right-hand end of the front row. Archives of Ontario, Bruce Robertson papers, file no. F1374. I would like to thank Peter H. Pinkerton for sharing with me his copy of this photograph. It appeared previously in his article, "Pioneers and Pathfinders: Canadian Surgeons and the Introduction of Blood Transfusion in War Surgery," *Transfusion Medicine Reviews* 22, no. 1 (January 2008): 77–86.

Figure 5. "Canadian Casualty Clearing Station #2 [probably 1917]." L. Bruce Robertson Papers, Archives of Ontario. F 1374-12, File 2 #8. I would like to thank Peter Pinkerton for sharing this image with me.

trench warfare: bronchitis, nephritis, trench fever, pneumonia, and spinal meningitis. Lt. Col. Davey's unit diary provides a striking overview of the work undertaken there, and Dr. MacKay's notebooks fill in the under-appreciated details. On 31 March, Davey tallied the admissions for the month: "661 sick; 150 wounded ... Pneumonia and acute bronchitis have diminished while ulcerative tonsillitis and diphtheria have increased ... Nephritis about the same."⁴⁹ It is not surprising that complaints of the kidneys were commonplace. As MacKay's notes make evident, trench life was not conducive to bodily comfort. One patient, a man of 29 who looked closer to 40, had been in France only four months when he fell ill with nephritis. Admitted to the casualty clearing station he suffered "pains all over, headache, dizziness, sharp cutting pains in back. Slight swelling of face and feet." Another man was similarly afflicted: in France only three months, he had "caught a bad cold and cough following very wet time in the trenches feet always wet. He reported sick and was given pills and light duty, a few days later he felt no better, feet began to swell also he noticed that his face was puffy. Trouble with passing his water ... Urine seems dark and thick. Sent to base."⁵⁰

Medical (as opposed to surgical) cases continued to predominate through the early summer. In the first days of June, however, the enemy sent gas shells into the rear lines, catching transport crews and artillery men unprepared. On 4 June 1917 Davey noted: "Admitted 300 patients in about 6 hrs. There were 30 gas shells cases among them, six being very severe."⁵¹ These gas victims suffered cyanosis, rapid breathing, irregular heart-beat, and constriction of the chest. When given oxygen, however, they usually showed significant improvement within a week. Thus Sgt. Hartley of the Royal Field Artillery was gassed on 4 June 1917 and, upon arrival at #2 CCCS was blue in the face, complained of difficulties breathing, coughed, and vomited. Given continuous oxygen, he had rallied by 13 June when his vital signs were good and his chest clear.⁵² By contrast, patients suffering the effects of gas shelling from mid-July onwards, when the German Army first used mustard gas, were in much more serious condition. Davey observed that "[t]he new gas put over by the enemy in their recent shelling is very deadly and very distressing in

⁴⁹ War Diary, #2 Canadian Casualty Clearing Station, 31 March 1917.

⁵⁰ A.A. MacKay Fonds, Po83, Osler Library, McGill University.

⁵¹ War Diary, #2 Canadian Casualty Clearing Station, 4 June 1917.

⁵² A.A. MacKay Fonds, Po83, Osler Library, McGill University.

its after effects on those who survive. In some cases the eyes are the chief organs affected. There may also be skin irritation ... Bronchial irritation is very marked but may not appear for some days after exposure and then gradually increasing in severity. One case at present in hospital cannot swallow and must be fed by rectum.”⁵³ Much of MacKay’s case load was devoted to these patients. One man, admitted on 31 July 1917, showed signs of “both the phosgene and the new gas”: swollen eyelids, conjunctivitis, cyanosis. Unlike the patients treated in June, this man’s condition deteriorated rapidly and by 4 August oxygen could offer only temporary relief. The patient died that afternoon. Another patient, exposed to gas on 30 July 1917 and admitted to #2 CCCS on the following day, presented even more alarming symptoms: “extensive blistering over both arms, legs, back, scrotum, and face.” His eyes were swollen, red, and very sensitive to light. He suffered chest pains, a cough, and was cyanotic. Although he seemed to improve briefly, a week after being admitted to the casualty clearing station, this patient also died.⁵⁴

Until July 1917, when the third battle of Ypres began, work at #2 CCCS was steady but not overwhelming. In the quieter months, physicians and surgeons could make time to attend and sponsor sessions of the Second Army Medical Society, where British and Canadian physicians and surgeons studied conditions as various as shock, gingivitis, and trench nephritis. Davey also visited the Belgian Hospital at La Parme to discuss with the chief medical officer the merits of the Carrel-Dakin method for preventing the onset of gas gangrene in leg wounds. At the same time that the staff at #2 CCCS were eager to benefit from the wisdom and experience of colleagues at other hospitals, their Allied counterparts were equally keen to learn the art and science of wartime medicine – and the administrative secrets of a well-run hospital – from the staff of #2 CCCS. On 9 April 1917, two American doctors who must have been in France long before the U.S. officially entered the war, arrived at the unit to observe and express their appreciation of the surgery undertaken at #2 CCCS. Six weeks later, Maj. Lyster of the American Medical Corps sought Davey’s advice on the organization and administration of a casualty clearing station. These American visitors came to learn from their Canadian colleagues; others came to lecture on advanced medical techniques. Thus in early June 1917, the surgeon general of

⁵³ War Diary, #2 Canadian Casualty Clearing Station, 23 July 1917.

⁵⁴ A.A. MacKay Fonds, Po83, Osler Library, McGill University.

the Royal Army Medical Corps, Sir Anthony Bowlby, accompanied Harvey Cushing and George Crile to the unit, and arranged for Crile to lecture on "Exhaustion and Restoration."⁵⁵ Eminent though these visitors were, they had no interest in intimidating with their international reputations men who had been working for months or years in the frontlines of wartime medicine. This professional modesty went a long way to win over even some of their more skeptical colleagues. Reflecting on the arrival of the American surgeons, George Gask recalled: "We were inclined at first to look a little askance at them, but we soon grew to appreciate them ... They did not send us their worst men and among them were surgeons of international reputation, such men as Cushing, Crile, Cabot ... and many others ... They said to men much younger than themselves 'You have learnt the game, we are under your orders, tell us what to do'."⁵⁶

Most of the professional visitors who arrived at #2 CCCS, whether from the British, French, Italian, or American armies, wanted to observe one of two surgeons on staff: Maj. Bruce Robertson and Maj. George Gask. Like Archibald, Robertson had become familiar with blood transfusion before arriving in France, and by 1917 had published on the subject in Canadian and British journals.⁵⁷ His article in the *British Medical Journal* on the use of blood transfusion in war surgery appeared two months before Archibald's article in the *Lancet*, and thus established him as the pre-eminent champion of blood transfusion on the Western Front.⁵⁸ In this first article, Robertson reported on cases treated at base hospitals between September and December 1915; and like the cases Archibald documented, these men suffered secondary hemorrhages, usually as a consequence of severe shrapnel wounds. Whereas Archibald's results had been less than encouraging – of the eight patients he had treated, only "one was saved by transfusion"⁵⁹ –

⁵⁵ War Diary, #2 CCCS. Davey made note of the meetings of the Second Army Medical Society on 16 March 1917, 13 April 1917, 20 April 1917, 11 May 1917; on the visit to La Parme, 16 May 1917; and on the visits by American surgeons, 9 April 1917; 25 and 26 May 1917; and 10 and 11 June 1917.

⁵⁶ Gask, *A Surgeon in France*, 45–46.

⁵⁷ L.B. Robertson and A. Brown, "Blood Transfusion in Infants and Young Children," *Canadian Medical Association Journal* (April 1915); L. Bruce Robertson, Capt. CAMC, "The Transfusion of Whole Blood: A Suggestion for its More Frequent Employment in War Surgery," *The British Medical Journal* (8 July 1916): 38–40.

⁵⁸ Pelis, "Taking Credit," 257.

⁵⁹ Archibald, "A Note upon the Employment of Blood Transfusion in War Surgery," 430.

Robertson's preliminary results offered greater hope for the future: in three out of the four cases he described, a blood transfusion appeared to save the patient's life. For example, a rifleman who "sustained multiple shrapnel wounds on December 14th 1915" was admitted three days later "to base hospital in very bad condition, with septic wounds of the left knee, right ankle, and left lung." As his condition became dire, a blood transfusion, administered on 17 January 1916, seemed his only hope. He rallied remarkably and a month later was evacuated to England.⁶⁰

Robertson's subsequent appointment to #2 CCCS allowed him, by 1917, to determine the efficacy of blood transfusion on men suffering from primary hemorrhage. Now something of a medical celebrity, he drew enthusiastic observers to the clearing station, all eager to witness his work. Davey noted in June 1917 that "The M[edical] O[fficers] recently attached are very much interested in Maj. Robertson's 'transfusion of blood' work and watched some demonstrations with keen interest. Maj. Robertson's work in this line has been most favorably reported upon by the Consultant Surgeons in the Army."⁶¹ A month later, Davey once again singled Robertson out for particular praise: "The work of Major Robertson ... has been of an exceptionally high order. As one of the chief and early advocates of Blood Transfusion, he has so popularized this method of resuscitation that it has become one of first importance in CCS work. He himself is recognized among consulting Surgeons and Surgeon Specialists as an authority in the method of carrying it out and his results in this CCS have been little short of marvellous."⁶² Taking a proprietary (and justifiable) pride in the accomplishments of his staff, Davey was pleased to report in October 1917 that Robertson had completed a second article on the efficacy of blood transfusion, this one destined for publication in the *Lancet* in June 1918.⁶³ Unlike his first analysis of blood transfusion in frontline medicine, which had been based on only a handful of cases, by 1917 Robertson was able to derive conclusions from sixty-eight transfusions undertaken at #2 CCCS. Of these sixty-eight patients, fifty-seven suffered from primary hemorrhage, nine from secondary hemorrhage, and two from acute

⁶⁰ Robertson, "The Transfusion of Whole Blood: A Suggestion for its More Frequent Employment in War Surgery," *British Medical Journal* (8 July 1916), 39–40.

⁶¹ War Diary, #2 CCCS, 3 June 1917.

⁶² Ibid., 31 July 1917.

⁶³ Ibid., 10 October 1917.

carbon-monoxide poisoning. Thirty-six of the fifty-seven primary hemorrhage patients recovered fully and were evacuated to a base hospital in good condition; fifteen showed initial improvement but then succumbed to shock, gas gangrene, or other causes; four showed no benefit from the procedure; and two had a harmful reaction due to blood-type incompatibility.⁶⁴ Blood transfusion was not a magic bullet guaranteed to save every wounded soldier, but its benefits were indisputable.

So, too, with the innovative practices George Gask pioneered in chest surgery during his time at #2 CCCS. Shortly after Gask and his principal assistant, Capt. K.D. Wilkinson (both of the Royal Army Medical Corps) were seconded to the unit in June 1917, Davey sought (and received) permission to allow them to specialize in the treatment of chest wounds. Improvement in this field of wartime surgery had been slow – it was only at the end of 1916 that surgeons had recognized that chest wounds should be treated in the same way as wounds to the extremities⁶⁵ – and as late as 1917 many of the patients evacuated to the casualty clearing stations were suffering the effects of inadequate treatment at the Field Ambulances. Davey observed, for example, that “[t]he chest wounds as a rule reach us in bad condition. Bandages and plugging get loose and patient is generally in collapsed condition from haemorrhage.”⁶⁶ Thus expert attention at the casualty clearing stations was ever more vital, and would become invaluable in the second half of 1917, when the British assault on Ypres overwhelmed all medical facilities close to the Salient. In the first day of the offensive, #2 CCCS admitted 2200 patients and by the end of the month, it had admitted 8493 wounded, requiring 1913 operations.⁶⁷ Compelled to work sixteen-hour shifts in the early days of the offensive, and twelve-hour days as a matter of routine, the medical staff at the clearing station suffered the effects of long hours and relentless stress. However, they did good work and saved lives. Gask’s surgical team alone performed 365 operations between 7 June and 31 August 1917 and he and Wilkinson detailed their core recommendations – open the chest widely, repair the damaged organs,

⁶⁴ L. Bruce Robertson, “A Contribution on Blood Transfusion in War Surgery,” *The Lancet* (1 June 1918), 762.

⁶⁵ Maj. Gordon Taylor, “On Abdomino-Thoracic Wounds of Warfare,” *The British Medical Journal* (2 August 1919), 132.

⁶⁶ War Diary, #2 CCCS, 10 May 1917.

⁶⁷ *Ibid.*, 1 August 1917, 31 August 1917.

remove all foreign bodies and then close the chest – in an article published at the end of the year in the *British Medical Journal*.⁶⁸

Months before their article appeared in print, however, they had welcomed British, American, French, and Italian surgeons of international reputation who made their way to Remy Siding to observe their procedures and, as importantly, to share insights drawn from their own experiences.⁶⁹ Thus Gask learned from his American colleagues new techniques for the administration of anesthesia, using equipment that allowed for the simultaneous delivery of gas and oxygen. Davey noted that the “results are splendid. The patient keeps a perfectly natural appearance and breathes quietly. He comes out without nausea as soon as the anesthetic ceases. There is no shock or bronchial irritation.”⁷⁰ Of all the surgeons who visited #2 CCCS, however, Gask was most keen to consult with Pierre Duval, a consulting surgeon to the French First Army who was headquartered nearby and who, like Gask, was one of the most important and innovative chest surgeons in the Allied ranks.⁷¹ During his five-month tenure at #2 CCCS Gask developed a productive professional relationship (and lasting friendship) with Duval, who visited Remy Siding in July 1917; two months later, during a brief lull in the ongoing battle, Gask and Wilkinson spent two days in temporary residence at Duval’s hospital near Dunkirk.⁷² Whether Gask and Wilkinson shared their insights into the effective surgical treatment of chest wounds in conversations with visiting surgeons or in articles destined for a wider audience of medical professionals, their work – like that of Robertson – became part of the written record of medical innovation on the Western Front. In 1917 George Crile

⁶⁸ G.E. Gask and K.D. Wilkinson, “Remarks on Penetrating Gunshot Wounds of the Chest, and their Treatment,” *The British Medical Journal* (15 December 1917), 781. Gask provided a summary of the article’s recommendations, rendered in layman’s terms, in *A Surgeon in France*, 46.

⁶⁹ Davey noted the following visits: 14 July 1917, Maj. Duval; 5 Sept. 1917, Lt. Col. T.R. Elliott; 5 Oct. 1917, Dr. Raffaele Bastianello: “the Italian Surgeon . . . is interested in chest surgery and came to see Maj. Gask’s work”; 16 Oct. 16, Lt. Col. T.R. Elliott: “arrived for a few days of observation on chest work.”

⁷⁰ War Diary, #2 CCCS, 3 September 1917.

⁷¹ In an article published in 1919, Maj. Gordon Taylor observed that “it is to Pierre Duval, of the French Army, and to Colonel Gask . . . that the credit is due of evolving a technique in dealing with wounds of the thorax.” “On Abdomino-Thoracic Wounds of Warfare,” *The British Medical Journal* (2 August 1919), 131–32.

⁷² Gask, *A Surgeon in France*, 52.

impressed upon the readers of the *Journal of the American Medical Association* that "at the beginning of the war the base hospital was the place where the most important surgical work was done – now the most important work is done at the casualty clearing stations."⁷³ The experiences and written accounts, both professional and private, of men and women serving in the CAMC bear this out.

This analysis of how men and women serving in the Canadian Army Medical Corps experienced and wrote about their wartime service brings to light a story that is importantly different from the one captured in the canonical war books of the Great War. It is, like all honest accounts of the war, aware of the suffering caused by years of attrition and ineffective offensive campaigns. Davey knew that the uniquely awful conditions at Passchendaele inflicted unspeakable pain on the wounded and caused infuriating setbacks to the doctors who hoped to save them. In late September 1917, having supervised the medical care of wounded soldiers for more than two years, he could still be appalled by the spectacle of anguished humanity that presented itself at the entrance to the clearing station: "the victims of the bomb raids are beginning to arrive. They are the worst mangled casualties one can imagine [*sic*]. Several have already died. Others will soon follow."⁷⁴ And like Vera Brittain, who also served in the Ypres Salient in late 1917, he could lament the prevalence of gas gangrene among the men rescued from the mud of Passchendaele.⁷⁵ Whereas techniques for preventing the onset of gas gangrene had proved very effective earlier in the year, when it was possible to evacuate the wounded quickly and attend to them promptly, soldiers who lay in the mud of Ypres for four or five days before stretcher-bearers could rescue them often arrived at casualty clearing stations with festering wounds infected with gas gangrene.⁷⁶ But Davey knew as Brittain would not acknowledge that regrettable setbacks were offset by real advances: new ideas and innovative practices observed in person and circulated

⁷³ George W. Crile, M.D., "Standardization of the Practice of Military Surgery – the Clinical Surgeon in Military Service," *Journal of the American Medical Association*, 69 (1917): 291.

⁷⁴ War Diary, #2 CCCS, 29 September 1917.

⁷⁵ Brittain wrote of her experiences in the fall of 1917: "Through my new surgical hut in the 'front line' of the hospital passed a ceaseless stream of Tommies from the Salient ... My letters home tell the same story of perpetual convoys, of haemorrhages, of delirium, of gas-gangrene cases doomed from the start." Brittain, *Testament of Youth*, 383.

⁷⁶ War Diary, #2CCC, 14 October 1917.

in print made wartime medicine more effective in 1917 than it had been in 1914. Without doubt Canadians made real contributions to this aspect of the war – as they did on the battlefields on France and Belgium – but the story conveyed in their private and professional texts is not one of narrowly nationalist triumphalism. Rather, it is a tale that stresses – and ultimately celebrates – the advantages accrued from transnational co-operation and collaboration.

RÉSUMÉ

Durant la Première Guerre mondiale, plusieurs infirmières, médecins et chirurgiens ont servi au sein du Corps médical de l'armée canadienne (CMAC), que ce soit au nord de la France ou en Belgique. Ils sont devenus des écrivains consciencieux et, dans certains cas, prolifiques : plusieurs d'entre eux ont écrit des lettres, tenu des journaux intimes, poursuivi la rédaction d'abécédaires et de rapports officiels ou encore soumis pour publication des articles à des revues professionnelles. L'histoire que ces « livres de guerre » racontent est fort différente de celle transmise par ce qui est aujourd'hui reconnu comme la littérature du désillusionnement, laquelle était largement dominante durant l'entre-deux-guerres. En effet, ils mettent plutôt en évidence une amélioration graduelle mais très réelle des soins dispensés aux malades et aux blessés. Ils montrent également que les Canadiens ont participé à l'élaboration d'un réseau fondamentalement transnational d'expertise et d'innovation médicales et qu'ils ont largement contribué au maintien de ce réseau.