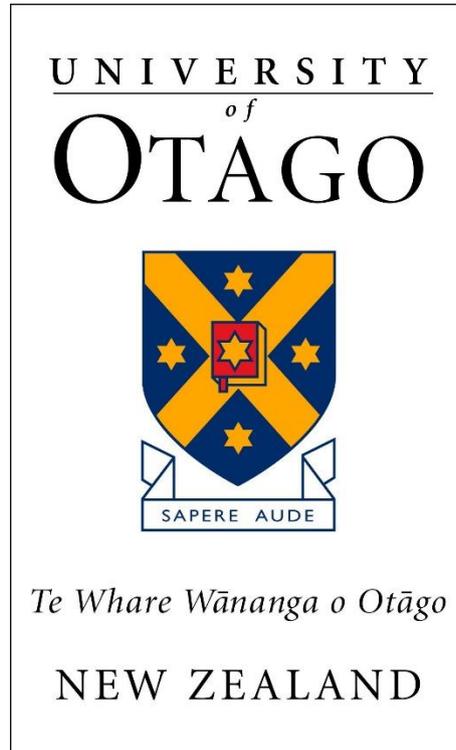


**Military Medicines:
ANZAC Military Pharmacy, 1914-1918**



Lee Ellen Doughty

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Abstract

Military pharmacy is a niche subset of the wider pharmacy profession. As a small component of the armed forces, the role encompasses unique military requirements beyond usual pharmacy practice. This thesis analyses the role and experience of New Zealand and Australian pharmacists who served *as pharmacists* during World War I (WWI), rather than as soldiers in combatant units. This history of the pharmacists of the Australian and New Zealand Army Corps (ANZAC) also provides a window into a little-recognised sector of the armed forces: supply and support. It argues that the role expectations of military pharmacists did not align with those of other serving health practitioners during the war, and that these disparities had their genesis in professional and social tensions within the civilian sphere.

Historically, pharmacists have served as unseen or ‘silent’ specialist health professionals within military contexts. In this thesis, I consider social and cultural factors that shaped the wartime expectations of ANZAC military pharmacists throughout WWI. In particular, I examine the ‘invisibility’ of pharmacy, alongside perceptions of professionalism, educational pathway differences between pharmacists and other health practitioners, and the impact of social class and status on military rank. This analysis is based primarily on military and pharmacy records for WWI, together with period publications. A detailed database created for this thesis of all New Zealanders who served as pharmacists during the war provides case studies and conclusions to support the thesis.

In particular, I argue that the military’s position on the role and status of pharmacists derived mainly from the perception that they were ‘in trade’. This sensibility

was problematic. Perceived mainly as purveyors of medicinal commodities, the role of pharmacists in maintaining the fighting strength of ANZAC forces was rarely appreciated, either during the conflict or in subsequent accounts. The supply of medicines and therapeutics as medical commodities is, however, intrinsically tied to the economics of war, which proved to be a growing concern as the conflict wore on. While New Zealand pharmacists were proscribed in their aspirations for advancement, I demonstrate that Australian pharmacists were most valued for their business skills, especially in supply, contracting, inventory control and cost savings.

Throughout WWI, the professional skills and knowledge offered by New Zealand pharmacists was not recognised through granting of commissioned rank. In Australia, honorary commissions were only granted to pharmacists later in the war, primarily for logistical and managerial roles. By being ‘in trade’, pharmacists were considered to be of the wrong social class; military structure at the time largely reserved officer status for social or professional élites. Social assets were at least as important as merit for progression through the ranks. The drive for professional recognition through the granting of commissioned rank became the dominant political issue facing New Zealand and Australian military pharmacists, shaping their experiences throughout the war. Examining the underpinning cultural and social factors is thus key to understanding the marginalisation of pharmacists within the military framework.

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I have been extremely fortunate to have had keen interest in the project from a number of people within the pharmacy profession, both in New Zealand and Australia. Their insight and experience bring a depth and richness to the thesis with an understanding of the political background of pharmacy during this period, as well as facilitating access to official pharmacy records. Many thanks are therefore due to **John Fraser**, Professional Practice Fellow of the School of Pharmacy (retired); **Bill Kelly**, Chair of the Pharmacy Board of Australia; and in particular, **Euan Galloway**, past Chief Pharmacist of the Pharmaceutical Society of New Zealand, who assisted as my unofficial Wellington-based ‘research assistant’. Truly, Euan, I could not have done this without you!

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A special note of thanks to Squadron Leader **Nick Williamson** (RAAF), for the invitation to present at the Australian Defence Force MILSIG (Military Special Interest Group) Annual Meeting in July 2018. Having the opportunity to give current serving military pharmacists insight into their professional heritage and history has been the highest point of this PhD journey. While it might be *my* research, it is ultimately *their* story.

To my fellow PhD room-mates, I thank you for your support and encouragement. Writing a PhD can be a lonely experience and understanding from those who are going through the same process is invaluable. Particular thanks go to **Rakhee Raghunanadan** and **Eeva-Katri Kumpula**, for many discussions and cups of coffee (and mojitos), lots of laughter, and for maintaining my sanity!

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Finally, to all the fine men and women serving in the New Zealand and Australian armed forces, both past and present, I thank you. Truly, I stand on the shoulders of giants.

Dedication



Fig. 1: William Trenton Doughty, L. Doughty. Personal Collection

This thesis is dedicated to the memory of my father's cousin William Trenton Doughty, 2nd Lieutenant, Wellington Infantry Regiment, 1st Battalion (F Company), New Zealand Expeditionary Force. He was killed in action 31 July 1917 during the siege of La Basse-Ville on the first day of the Third Battle of Ypres (Passchendaele), aged 27. Lt Doughty rests in Mud Corner Cemetery, Comines-Warneton, Belgium.

We will remember them

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List of Abbreviations

AG	Adjutant-General
AAMC	Australian Army Medical Corps
AAPS	Australian Army Pharmaceutical Service
ADFA	Australian Defence Force Academy
AIF	Australian Imperial Force
ANZAC	Australian and New Zealand Army Corps
APC	Australasian Pharmaceutical Conference
APNN	<i>Australasian Pharmaceutical Notes and News</i>
AJHR	<i>Appendices to the Journal of the House of Representatives (New Zealand)</i>
AJP	<i>Australasian Journal of Pharmacy</i>
BDM	Births, Deaths and Marriages (Department of Internal Affairs, New Zealand)
BEF	British Expeditionary Force
BMJ	<i>British Medical Journal</i>
BP	<i>British Pharmacopoeia</i>
C&DA	<i>Chemist and Druggist of Australasia</i>
C&DUK	<i>Chemist and Druggist UK</i>
CAG	<i>Commonwealth of Australia Gazette</i>
CO	Commissioned Officer (2 nd Lieutenant and higher ranks)
CPANZ	Central Pharmaceutical Association of New Zealand
CPSA	Council of Pharmaceutical Societies of Australasia
CSL	Commonwealth Serum Laboratories
DCM	Distinguished Conduct Medal
DDGMS	Deputy Director-General Medical Services
DGMS	Director-General Medical Services
DHQ	Divisional Headquarters
DMS	Director of Medical Services
GOC	General Officer Commanding

MM	Military Medal
MO	Medical Officer
MP	Member of Parliament
MPS	Member of the Pharmaceutical Society (New Zealand)
NCO	Non-commissioned Officer (from Corporal up to and including Warrant Officer)
NSW	New South Wales (Australian state)
NSWPS	New South Wales Pharmaceutical Society
NZEF	New Zealand Expeditionary Force
NZG	<i>New Zealand Gazette</i>
NZHPA	New Zealand Hospital Pharmacists' Association
NZMC	New Zealand Medical Corps
PBNZ	Pharmacy Board of New Zealand
PBV	Pharmacy Board of Victoria (Australia)
PDL	Pharmaceutical Defence Limited
PDMS	Principal Director of Medical Services
PSA	Pharmaceutical Societies of Australasia (pre-1973)
PSA (National)	Pharmaceutical Society of Australia (National body, post-1973)
PSGB	Pharmaceutical Society of Great Britain
PSSA	Pharmaceutical Society of South Australia
PSNZ	Pharmaceutical Society of New Zealand
PSV	Pharmaceutical Society of Victoria
QLD	Queensland (Australian state)
QM	Quartermaster
QMG	Quartermaster-General
QPS	Queensland Pharmaceutical Society
RAF	Royal Air Force
RAMC	Royal Army Medical Corps (British)
RMO	Regimental Medical Officer
SA	South Australia (Australian state)

TAS	Tasmania (Australian state)
USA	United States of America
VIC	Victoria (Australian state)
WA	Western Australia (Australian state)
WWI	World War 1
WWII	World War 2

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Introduction

*“Not many are left, and not many are sound
And thousands lie buried in Turkish ground,
These are the Anzacs; the others may claim,
Their zeal and their spirit, but never their name.”¹*

On 10 August 1914, the first New Zealanders with pharmaceutical training enlisted in the New Zealand Expeditionary Force (NZEF) to serve God, King and country. Walter Hall (aged 24), Arthur Roberts (aged 23) and George Yallop (aged 20) were all posted to the New Zealand Medical Corps (NZMC). Walter Hall was initially sent to Samoa as part of the Samoan Advance Party to capture the German radio station there, and later worked as the dispenser on both the *Maheno* and *Marama* hospital ships.² Arthur Roberts was posted to No. 2 Field Ambulance and worked on the front line in France as a stretcher-bearer, earning both the Distinguished Conduct Medal (DCM) and Military Medal (MM) for “conspicuous gallantry and devotion to duty in the field”.³ George Yallop, although not a registered and qualified pharmacist, was also sent overseas and was detailed for duty in the dispensary at the New Zealand Convalescent Hospital, in Hornchurch, United Kingdom (UK).⁴ All three men returned to New Zealand after the war’s end.

Although all three men were posted to the NZMC, only one was a registered and qualified pharmacist. Yet Arthur Roberts was detailed to a stretcher-bearer company, while the two unregistered and unqualified men were posted to work in dispensaries. This disregard for pharmacy qualifications by the military authorities was not, however,

¹ Christopher Pugsley, *Gallipoli: The New Zealand Story*, 4th ed. (Auckland: Raupo, 2008), 346.

² ‘HALL, Walter Ernest - WWI 3/782 - Army’, 1914-1918, W5539/69 49325, Archives New Zealand, Wellington; Arthur W. B. S. Foljambe, *The New Zealand Hospital Ship Maheno: The First Voyage, July 1915 to January 1916* (Auckland: Whitcombe and Tombs, 1916), 55.

³ ‘ROBERTS, Arthur - WWI 3/282, WWII 800694 - Army’, 1914-1945, W5922/64 98333, Archives New Zealand, Wellington.

⁴ ‘YALLOP, George William - WWI 3/42, WWII 1/21/7 - Army’, 1914-1945, W5922/82 126041, Archives New Zealand, Wellington.

unusual. Not only were Roberts' professional qualifications marginalised by the military hierarchy, but the diverse wartime experiences of all three men had one factor in common – their enduring obscurity in official documentation and subsequent historiography. It is these experiences that this thesis resurrects.

Military pharmacy is a niche subset of the wider pharmacy profession. As a small component of the armed forces, the role encompasses unique military requirements beyond usual pharmacy practice. This thesis is an analysis of the role and experience of New Zealand and Australian pharmacists who served *as pharmacists* during World War I (WWI) between 1914 and 1918, rather than as soldiers in combatant units. This history of the pharmacists of the Australian and New Zealand Army Corps (ANZAC) also provides a window into a little-recognised sector of the armed forces: supply and support. It argues that the role expectations of military pharmacists did not align with those of other serving health practitioners during the war, and that these disparities had their genesis in professional and social tensions within the civilian sphere. As such, it is neither fully a military nor a medical history of the ANZAC forces during the war. Rather, in this thesis, I consider social and cultural factors that shaped the role and subsequent wartime expectations of the ANZAC military pharmacist. In particular, I consider the 'invisibility' of pharmacy, alongside perceptions of professionalism, educational pathway differences between pharmacists and other health practitioners, and the impact of social class and status on military rank. This analysis is based primarily on military and pharmacy records for WWI, together with period publications. A detailed database created by the researcher for this thesis of all New Zealanders who served as pharmacists during the war provides case studies and conclusions to support the thesis (see Appendix 1).

In particular, I argue that the military's position on the role and status of pharmacists derived mainly from the perception that they were 'in trade'. This sensibility was problematic as, while pharmacists were perceived mainly as purveyors of medical commodities, the role of pharmacists in maintaining the fighting strength of ANZAC forces was rarely appreciated or understood, either during the conflict or in subsequent accounts. The supply of medicines and therapeutics as medical commodities is, however, intrinsically tied into the economics of war, which proved to be a growing concern as the conflict wore on. While New Zealand pharmacists were proscribed in their aspirations for advancement, I demonstrate that Australian pharmacists were most valued for their business skills, especially in supply, contracting, inventory control and cost savings.

Throughout WWI, the professional skills and knowledge offered by New Zealand pharmacists were not recognised through granting of commissioned rank. In Australia, honorary commissions were only granted to pharmacists later in the war, primarily for logistical and managerial roles as a supply function rather than for their professional knowledge. By being 'in trade', pharmacists were considered to be of the wrong social class; military structure at the time largely reserved officer status for members of the social or professional élite. The drive for professional recognition through the granting of commissioned rank became the dominant political issue facing New Zealand and Australian military pharmacists, shaping their experiences throughout the war. Examining the underpinning cultural and social factors is thus key to understanding the marginalisation of pharmacists within the military framework.

In New Zealand and Australia today, the two usual areas of pharmacy practice that newly-qualified pharmacists are directed towards after finishing their university studies

and intern year prior to registration as a pharmacist are community or retail pharmacy, and hospital pharmacy. Both of these areas involve patient-centred service and care, either through direct patient contact in a community-based retail context, or with reduced patient contact through ward staff within the more institutionalised setting of a hospital, preparing charted medications for inpatients and overseeing discharge medication regimes. The role of the pharmacist as a specialist health professional within a military context or framework is, however, largely unseen. Military pharmacy is primarily hospital-based pharmacy, but with specific additional military applications and practiced within a sub-culture that is not normally visible to the wider public. In the same way as a hospital pharmacy, the military operates as a closed and highly specialised institution that rarely interacts with the general public and does not rely on retail trade for its funding or income stream.

The unique combination of two diametrically opposed professions – the provider of medicines to promote health and wellbeing, and the professional soldier with attendant narratives of state-sanctioned violence and death – is an area of the pharmacy profession that has gone largely unnoticed by New Zealand and Australian researchers, as well as those from other countries. In neither country have the histories of military pharmacists been recognised or documented to any degree of depth. The first wide-ranging examination of the New Zealand Medical Services during WWI since Andrew Carbery's publication in 1924 has been recently released including a brief and broad overview of military pharmacy, but this overview is concerned mainly with documenting the stories of a few pharmacists' war experiences. No significant analysis of their position within the military structure has been attempted.⁵

⁵ Anna Rogers, *With Them Through Hell: New Zealand Medical Services in the First World War* (Auckland: Massey University Press, 2018), 308–13.

One of the reasons for the limited historical investigation is due to the support role military pharmacists played during the war, meaning they are, in the main, ‘silent voices’ in the archival record. On the very few times that they appear in the archival record, military pharmacists are located in a distinctly subaltern position to other medical professionals, including doctors, dentists, and nurses. This thesis thus investigates and explores this little-considered area of the pharmacy profession by examining the experiences, roles and expectations of New Zealand and Australian pharmacists who served in the ANZAC forces during WWI, charting the evolution of pharmacy as a health profession within the highly-structured institution of the military. It also addresses and seeks to fill large gaps in the historiographies of WWI, medical, health, and pharmacy history.

In order to fully understand the development and role of military pharmacy and to locate the topic fully within its context, it is first essential to look briefly at the general history and development of pharmacy as an occupation or a profession. This is addressed in the section below, where the broad evolution of pharmacy from very early non-Western cultures to the later British industrial environment is charted. British pharmacy practice was transplanted to both New Zealand and Australia with the migration of pharmacists (or ‘chemists’) to the newest colonies of the British Empire from the late eighteenth and throughout the nineteenth centuries.⁶ It is the developments within pharmacy during these centuries that underpin the profession of pharmacy in the New Zealand and Australia of today.

⁶ Early pharmacists were known colloquially as ‘chemists’, a shortened form of ‘chemist and druggist’; this has been slowly superseded by the term ‘pharmacist’ to indicate the difference between industrial and analytical chemists working in laboratories and those who worked with medicines and drugs. For this thesis, the term ‘pharmacist’ will be used as it is today to maintain this distinction.

Similarly, a brief history of the beginning of WWI and the opening months of the war is also required to illustrate the connections between New Zealand and Australia, and their relationships with Britain. Although both countries had attained a degree of independence from their previous status as colonies of the British Empire, the links to Britain had not fully been severed in terms of foreign policy and military operation. New Zealand and Australia remained Dominions of the British Empire. It is therefore necessary to also locate the thesis topic within the martial expectations and events that were prevalent during the early twentieth century, and the strength of ties, both social and cultural, to the British Empire.

Background

A Brief History of Pharmacy

The use of medicines in many different forms to alleviate sickness has been a part of the human experience from time unknown. It is, however, only after the development of writing systems and advent of the written record that we are able to identify with any certainty early attempts at the curing of illness in the ancient world through study of ancient texts, while the remedies and practices of earlier, prehistoric civilisations remain unknown at this point in time.⁷ Named for its discoverer Georg Ebers, one of the earliest examples of a pharmacopoeia is the Egyptian Ebers Papyrus, which dates from approximately 1550BC. This early *materia medica* contains 875 recipes for medicines including details such as precise weights and measurements, along with over 700 specific therapies. It is very likely, however, that these recipes are far older than the actual papyrus itself and almost certainly will have been passed down through earlier centuries by oral

⁷ The terms 'prehistoric' and 'historic' specifically define the periods of time prior to and after the invention of writing and the written record.

transmission.⁸ Similarly, over 6,600 medical texts on clay tablets dating from 1900-391BC and written in cuneiform script were discovered in the palace library of King Assurbanipal of Assyria, recording in detail 250 vegetable and 120 mineral drugs.⁹ Although these ancient records of medicines have been preserved for an extraordinary period of time, as with twentieth century archival material, those who worked with or handled medicines and their practices have been omitted in these very early records.

In England (and later Britain), the first separation of the role of apothecary from pepperers and spicers (merchants) occurred in the thirteenth century. Pepperers and spicers continued through the guild system from the fourteenth century as part of the Fraternity of St Anthony (London) to eventually devolve into the Grocer's Company in the fifteenth and sixteenth centuries. At around the same time, the role of the apothecary divided into apothecaries, druggists and alchemists.¹⁰ The Society of Apothecaries was created in the seventeenth century, and the practice of medicine (devolving into today's general practitioners (GPs)) was formally separated from that of pharmacist during the eighteenth century.¹¹ This division of occupation, albeit with a significant degree of overlap between the roles, continued throughout the nineteenth century, eventually becoming the hegemonic structure for pharmacy in Britain and her associated Dominions to current times. The Pharmaceutical Society (London) was formed in 1841, and encompassed the previous occupations of chemist and druggist, as well as the later role of pharmacist (see Figure 2).¹²

⁸ George E. Trease, *Pharmacy in History* (London: Bailliere Tindall and Cox, 1964), 5. See Glossary for definition of *materia medica*.

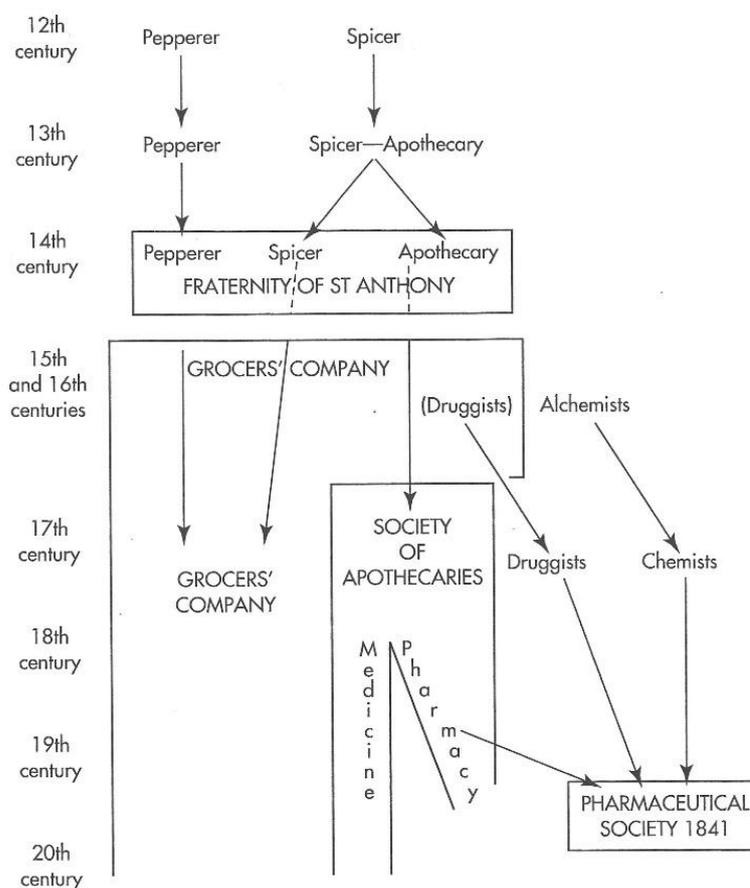
⁹ *Ibid.*, 6; Edward Kremers and George Urdang, *Kremers and Urdang's History of Pharmacy*, ed. Glenn Sonnedecker, 4th ed. (Philadelphia: Lippincott & Co., 1976), 5.

¹⁰ Trease, 33.

¹¹ John A. Hunt, 'The Evolution of Pharmacy in Britain (1428-1913)', *Pharmacy in History* 48, no. 1 (2006): 35.

¹² Trease, 33; Stuart Anderson, ed., *Making Medicines: A Brief History of Pharmacy and Pharmaceuticals* (London: Pharmaceutical Press, 2005), 12.

Figure 2: Diagram of the evolution of the pharmacy profession



Source: *Making Medicines: A Brief History of Pharmacy and Pharmaceuticals*, 12.

The practice of pharmacy in Britain was firmly tied to social status, as early practitioners (chemists, druggists and pharmacists) were, from their origins as part of the Grocers' Company, primarily shopkeepers or merchants. After the apothecaries became GPs, chemists and druggists remained 'in trade', and their social position was thus considered to be very much lower to middle class.¹³ Education for pharmacists in Britain until the mid-twentieth century was conducted through a traditional apprenticeship system,

¹³ Kremers and Urdang, 114. The term 'Britain' refers to the island of Great Britain, and includes England, Scotland and Wales. This is post-Union (Scottish) of 1707 and after the union with the Kingdom of Ireland in 1801, but before the secession of the Irish Free State in 1922, with the subsequent creation of Northern Ireland. The term 'Britain' is still used colloquially to refer to the United Kingdom of Great Britain and Northern Ireland.

without any formal university-awarded degree or qualification.¹⁴ The first recognised School of Pharmacy was opened in London in 1842 by the Pharmaceutical Society, the year after the Society's inception. This was broadly driven by a desire for a uniform or standardised system of education for pharmacists, fuelled by the rise of professionalism and a growing awareness of the role of pharmacy as a health profession.¹⁵ A university level Bachelor of Pharmacy degree course offered by the University of London's Faculty of Medicine was not introduced until 1924, but had little uptake until after the Second World War, and pharmacists continued to be trained through the indentured apprenticeship system.¹⁶ In New Zealand and Australia, pharmacy continued to use the apprenticeship model solely until the mid-twentieth century, when it became a technical college course.¹⁷

In continental Europe, the course of pharmacy professional development took a different direction. Separation of the roles of pharmacist and medical practitioner were recognised and enforced as early as the thirteenth century. Frederick II of Hohenstaufen, Emperor of Germany and King of Sicily issued his Edict of Palermo in 1231, which stated categorically that the practices of medicine and pharmacy were distinctly different occupations with their own separate skills and responsibilities, and that physicians and apothecaries (medicine dispensers) were forbidden to enter into business together in order to protect the poor from potential exploitation.¹⁸ This edict is also the first example of nation-state regulation of medicines, as it included governmental oversight of the provision

¹⁴ Melvin Earles, 'The Development of Pharmaceutical Education', in *Making Medicines: A Brief History of Pharmacy and Pharmaceuticals*, ed. Stuart Anderson (London: Pharmaceutical Press, 2005), 97.

¹⁵ *Ibid.*, 99, 103.

¹⁶ *Ibid.*, 107–8.

¹⁷ Reg Combes, *Pharmacy in New Zealand: Aspects and Reminiscences* (Auckland: Pharmaceutical Society of New Zealand, 1981), 127–29; Gregory Haines, *Pharmacy in Australia: The National Experience* (Sydney, N.S.W.: The Pharmaceutical Society of Australia, 1988), 322–23, 327, 333, 335; Susan Heydon and Stephen Duffull, *Pharmacy at Otago: The First 50 Years - The School, The Profession and The People* (Dunedin: New Zealand's National School of Pharmacy, 2013), 1–2.

¹⁸ Stuart Anderson, 'Pharmacy in the Medieval World, 1100-1617AD', in *Making Medicines: A Brief History of Pharmacy and Pharmaceuticals*, ed. Stuart Anderson (London: Pharmaceutical Press, 2005), 39–40; Haines, *Pharmacy in Australia: The National Experience*, 3.

of drugs, a defined schedule of specific medicines that were permitted to be dispensed, and mandated stock control with a shelf life of only one year for pharmaceuticals.¹⁹ Although legally effective only in Italy and Sicily, the concepts contained within the Edict spread relatively quickly to mainland Europe, with Switzerland developing their Apothecary's Oath along similar lines in 1271.²⁰ This early European recognition of pharmacists as *bona fide* health professionals contrasts with the social position of British pharmacists. Pharmacists in Europe enjoyed a higher social standing with a similar status to doctors through early recognition as health professionals.²¹ British pharmacists, however, continued to be perceived as primarily merchants or shopkeepers, or otherwise 'in trade', and continued to be characterised as occupying a lower stratum of social class. As colonies of Britain, pharmacy education and practice in New Zealand and Australia were structured using the British rather than European model as British pharmacists emigrated and transferred their knowledge and practices to their new settlements. The intersections between social class and the drive for status and recognition, and the conflict with professional business models will be explored further in the thesis.

The first written reference in modern European literature to a pharmacist working within a military context came from France during 1630.²² In the French army, pharmacists (*pharmaciens-chimistes*) were well established and recognised, attaining full recognition and ranking equal to that of French military doctors from 1928.²³ In England, apothecaries and dispensers were employed in military hospitals after King Charles I reorganised the army in 1660, and in the following year, the position of Apothecary-General was created as part of the Army Medical Board alongside the Physician-General

¹⁹ Anderson, 'Pharmacy in the Medieval World, 1100-1617AD', 40.

²⁰ *Ibid.*

²¹ Kremers and Urdang, 115.

²² *Ibid.*, 83.

²³ *Ibid.*, 83.

and Surgeon-General.²⁴ From 1856, however, apothecaries had become incorporated into the medical officer role with the evolution of apothecaries into GPs, while dispensers working within the Army were trained in-house and held the lower ranks of Sergeant-Dispenser or Sergeant-Compounder.²⁵ This structure was continued in both the New Zealand and Australian armies from the late nineteenth and early twentieth centuries as the Dominions took the British pattern as the model for their own military systems.

A Brief History of World War I

In Sarajevo during the Northern Hemisphere summer of 1914, Gavrilo Princip, a nineteen-year-old Bosnian Serb activist fired two shots which killed Archduke Franz Ferdinand, heir to the dual throne of the Austro-Hungarian Empire, and his wife, Duchess Sophie of Austria.²⁶ The assassinations created a diplomatically explosive situation, with Austria-Hungary delivering to Serbia an unreasonable and unacceptable ultimatum specifically designed to provoke armed confrontation with Serbia. This ultimatum was rejected, and Austria-Hungary declared war on Serbia on 28 July 1914. As a result of various alliance treaties that had been previously negotiated, Russia and Germany then took sides, with Russia supporting the Serbs (as part of the Pan-Slavic nations), and Germany standing alongside Austria-Hungary. After Germany implemented its Schlieffen Plan for mobilisation which involved moving troops through France's territory, France responded with the deployment of its own army. Germany then declared war on France on 4 August and, when denied permission to cross Belgium's borders into France, declared

²⁴ John Walton, Paul Beeson, and Ronald Bodley Scott, eds., *The Oxford Companion to Medicine*, vol. II N-Z (Oxford: Oxford University Press, 1986), 1064.

²⁵ The Royal Navy (RN) was the first English military service to recognise official qualifications for pharmacists, appointing qualified pharmacists as dispensers from 1872, and with recognition of the title 'pharmacist' from 1916. RN pharmacists held commissioned officer rank. Walton, Beeson, and Scott, II N-Z:1064.

²⁶ As representative references for the origin and beginning of the war, see John Keegan, *The First World War* (London: Pimlico, 1999), 56-77; David Stevenson, *1914-1918: The History of the First World War* (London: Penguin Books, 2004), 10-43.

war on this neutral country as well on the same day. In response to the disregarding of Belgium's neutrality and the violation of her borders by German troops, Britain then declared war on Germany. Within a week, almost the whole of Europe along with its various imperial colonies was at war.

In New Zealand, the declaration of war by Britain was announced to the general public by Sir Arthur Foljambe, the Earl of Liverpool and Governor of New Zealand, from the steps of Parliament in Wellington on 5 August 1914.²⁷ Although they were self-governing Dominions at this time, New Zealand and Australia remained part of the British Empire (along with India, South Africa, Canada and Newfoundland). This meant that the Dominions had no choice in whether to go to war or not – they were considered to be remnant colonies of Imperial Britain with neither the legal ability to make any treaty with another nation nor the facility to determine their own foreign policy, and were therefore under the overall control of the British Imperial Government.²⁸ As a result, a small New Zealand contingent left for German Samoa on 15 August to capture the radio station there, while the first NZEF departed for Europe in late October 1914. Similarly, an Australian force was dispatched to take German New Guinea in September 1914, and the first Australian Imperial Force (AIF) also embarked for overseas deployment in early November of that year, meeting up with and joining the New Zealand cohort in convoy.²⁹ Originally intended to go to England for initial training, the New Zealand and Australian contingents were instead diverted to Egypt as their proposed quarters in Larkhill, England would not be ready in time; just prior to their arrival in Egypt the two forces were formally

²⁷ 'War Declared', *Evening Post*, 5 August 1914, 8.

²⁸ Jonathan Curtis, "'To the Last Man' - Australia's Entry to War in 1914', Parliament of Australia Research Papers 2014-15, 31 July 2014.

http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1415/AustToWar1914. (31 January 2017). The Dominions did, however, have the ability to choose the degree of support they would be prepared to provide to Britain.

²⁹ Jeffrey Grey, *A Military History of Australia* (Cambridge: Cambridge University Press, 1999), 87.

merged to become the ANZACs.³⁰ This was due in large part to New Zealand being unable to field a full division of soldiers, and the New Zealand Infantry and Mounted Rifles were thus grouped with the 4th Australian Infantry.³¹

A Note On ‘Establishments’

Military units have a structure for personnel known as an ‘establishment’ which specifies the numbers of officers, non-commissioned officers, members of the rank and file, and their respective roles required within a unit. A common theme that runs through the experiences of both New Zealand and Australian military pharmacists is that there were more pharmacists seeking to practice their profession than there were positions available within the establishment to accommodate them. War establishments had different staffing requirements based on whether they were situated at the front, along lines of communication, or at a rearward base.³² Based on this allotment of personnel and their respective roles, dispenser or compounder positions available to pharmacists were indeed limited. As an example, in the Australian army during the early part of the war, dispensers came under the control of Medical Stores within the Medical Corps or Service, and only one dispenser was required in either a base depot or an advanced depot according to the existing unit establishment (see Tables 1 and 2 below).³³

³⁰ Alexander Godley, *Life of an Irish Soldier* (London: John Murray Ltd, 1939), 163; Grey, *A Military History of Australia*, 88.

³¹ Jeffrey Grey, *The Australian Army* (Melbourne: Oxford University Press, 2001), 40. A division comprised approximately 20,000 men; the initial New Zealand cohort consisted of approximately 8,500.

³² The line of communication is the physical route that connects an operating military unit with its supply base to facilitate and ensure an uninterrupted supply of materiel and men. Establishments applied to both New Zealand and Australian military organisations.

³³ Arthur Graham Butler, *The Official History of the Australian Army Medical Services in the War of 1914-1918*, vol. III (Sydney, N.S.W.: Halstead Press, 1943), 505. ‘Sgts’ is the abbreviation for Sergeants.

Table 1: War Establishment for Base Depot of Medical Stores (near Expeditionary Base)

Detail	Officers	Staff-Sgts and Sgts	Rank and File	Total	Remarks
Major	1	-	-	1	(a) One to be a carpenter
Quartermaster	1	-	-	1	
Dispenser & Clerk	-	1	-	1	
Packers & Storemen	-	-	4(a)	4	
Cutler	-	-	1	1	
Batmen	-	-	2	2	
Total	2	1	7	10	

Source: The Official History of the Australian Army Medical Services in the War of 1914-1918, vol. III, 505.

Table 2: War Establishment for An Advanced Depot of Medical Stores (at the railhead)

Detail	Officers	Staff-Sgts and Sgts	Rank and File	Total	Remarks
Major	1	-	-	1	(a) Is a Corporal
Dispenser	-	1	-	1	(b) One to be a carpenter
Clerk	-	-	1(a)	1	
Packers & Storemen	-	-	2(b)	2	
Batmen	-	-	1	1	
Total	1	1	4	6	

Source: The Official History of the Australian Army Medical Services in the War of 1914-1918, vol. III, 505.

Similar establishments were in effect for hospital and troop ships, hospital trains, and field ambulances, as well as all other units in the ANZAC armies, including front line and fighting units. Establishments, therefore, underpin and determine the organisational structure and man-power levels of all areas of the defence force for both countries, in both support and forward operational areas.

Historiography and Historical Sources

Pharmacists in the New Zealand armed forces worked under British Imperial regulations for medical services in a support role during WWI. They were not promoted above the rank of Sergeant or Staff-Sergeant (non-commissioned officers), and the record of their day-to-day experiences and war effort is for the most part ‘silent’ in the archival material and established historical narratives produced directly after the war. Australian military pharmacists were also under the British Imperial regulations during the early part of the conflict but this changed as the war progressed. Nonetheless, the experiences of the Australian pharmacists were similarly muted. Historical narratives and official histories of WWI for both countries focus predominantly on the officer corps, generals-in-charge and their strategies, politicians, and diplomatic efforts during the duration of hostilities. Contemporary accounts of the war are therefore elite sources as they were primarily written by officers, about officers, and for officers (‘top down’), or in the case of Australia’s official war historian C. E. W. Bean, to promote and reinforce a ‘heroic’ national myth-building narrative.³⁴ Although these works provide valuable insight into the workings and structure of their respective armies and individual units at the time, the histories of those holding rank lower than 2nd Lieutenant as non-commissioned officers (NCOs) as well as those who served behind the front line in non-combatant and support roles such as pharmacists remain largely unwritten.³⁵

Military histories of WWI from the mid-twentieth century tend to focus primarily on the front-line soldier fighting and dying on the cliffs of Gallipoli or in the trenches of the Western Front, those who interacted directly with the combatants such as doctors,

³⁴ Mervyn F Bendle, ‘Charles Bean and the Origins of the Anzac Legend’, *Quadrant* 58, no. 11 (2014): 48–49.

³⁵ 2nd Lieutenant was the lowest commissioned officer rank at the time of the war. Warrant Officer is the highest non-commissioned officer ranking, one rank above Staff-Sergeant.

surgeons and nurses, or those at high level who made the strategic, tactical or political decisions.³⁶ Military pharmacists were NCOs and worked mainly in rearward support areas; there is no existing historiography that directly addresses or analyses their experience during WWI. With the exception of Anna Roger's recently-published work on the New Zealand Medical Service during WWI where she devotes a short section in a chapter to pharmacists, military pharmacy and its practitioners are invisible in more recently written narratives of the war, in both New Zealand and Australia, as well as other international works.³⁷

One example of where military pharmacists could have been included is Emily Mayhew's 2013 work on stretcher-bearers, chaplains, nurses, surgeons and ambulance drivers. While her book deals with groups of medical staff and those who worked alongside them who have been less-researched, Mayhew also does not recognise military

³⁶ As a representative sample of historiography, see H. T. B. Drew, ed., *The War Effort of New Zealand...* (Auckland: Whitcombe and Tombs, 1923); Andrew D. Carbery, *The New Zealand Medical Service in the Great War, 1914-1918* (Auckland: Whitcombe and Tombs, 1924); Charles E. W. Bean, *The Australian Imperial Force in France: 1917*, 3rd ed. (Sydney, N.S.W.: Angus & Robertson, 1935); Charles E. W. Bean, *The Australian Imperial Force in France: 1916*, 4th ed. (Sydney, N.S.W.: Angus & Robertson, 1936); Charles E. W. Bean, *The Story of ANZAC: From the Outbreak of War to the End of the First Phase of the Gallipoli Campaign, May 4, 1915*, 5th ed. (Sydney, N.S.W.: Angus & Robertson, 1936); Bill Gammage, *The Broken Years: Australian Soldiers in the Great War* (Canberra: Australian National University Press, 1974); Michael Tyquin, *Gallipoli: The Medical War - the Australian Army Medical Services in the Dardanelles Campaign of 1915* (Kensington, NSW: NSW University Press, 1993); Grey, *A Military History of Australia*; Keegan, *The First World War*; Grey, *The Australian Army*; Stevenson, *1914-1918: The History of the First World War*; John Crawford and Ian McGibbon, eds., *New Zealand's Great War: New Zealand, the Allies and the First World War* (Auckland: Exisle Publishing, 2007); Mark Harrison, *The Medical War: British Military Medicine in the First World War* (Oxford: Oxford University Press, 2010); Kirsty Harris, *More Than Bombs and Bandages: Australian Army Nurses at Work in World War I* (Newport, NSW: Big Sky Publishing, 2011); Joan Beaumont, *Broken Nation: Australians in the Great War* (Crows Nest, N.S.W.: Allen & Unwin, 2013); Emily R. Mayhew, *Wounded: From Battlefield to Blighty, 1914-1918* (London: The Bodley Head, 2013); Christopher Pugsley, *Fighting For Empire: New Zealand and the Great War of 1914-1918* (Auckland: Bateman, 2014); Christopher Pugsley, *Gallipoli: The New Zealand Story*, 5th ed. (Auckland: Libro International, 2014); Glyn Harper, *Johnny Enzed: The New Zealand Soldier in the First World War 1914-1918* (Auckland: Exisle Publishing, 2015); Rogers, *With Them Through Hell: New Zealand Medical Services in the First World War*; John Connor, *Someone Else's War: Fighting for the British Empire in World War I* (London: I. B. Tauris, 2019).

³⁷ Along with the above, see also Jan Bassett, *Guns and Brooches: Australian Army Nursing from the Boer War to the Gulf War* (Oxford: Oxford University Press, 1992); Peter Rees, *Anzac Girls: The Extraordinary Story of our World War I Nurses* (Crows Nest, N.S.W.: Allen & Unwin, 2014); Anna Rogers, *While You're Away: New Zealand Nurses at War, 1899-1948* (Auckland: Auckland University Press, 2003); Ana Carden-Coyne, *The Politics of Wounds: Military Patients and Medical Power in the First World War* (Oxford: Oxford University Press, 2014).

pharmacists and the role of pharmacy in treating the sick and injured.³⁸ Similarly, a single mention of the pharmacy car in a hospital train is the only time in Ana Carden-Coyne's book on military patients and medical power that pharmacy, pharmacists or medicines are referred to.³⁹ While the development of specialised fields of surgery (particularly plastic and maxillofacial surgery), nursing, and psychiatry during the period have been well-explored, support services and the auxiliary health professions such as pharmacy, ophthalmology and physiotherapy (massage) and their practices within the military context are fresh fields of study.⁴⁰

Although there is a lack of secondary material directly concerned with military pharmacy, there is nevertheless a range of primary sources to draw on. These include contemporary works such as official national histories of both the New Zealand and Australian WWI experience, as well as a wide-ranging assemblage of government records held in archives and other institutions in Wellington and Canberra, national War Memorial records, unit diaries, and enlistment records for both countries. Photographs are also valuable primary sources, and although there are few images of WWI pharmacy and pharmacists for both countries, a number have been reproduced and interpreted in this thesis. Secondary literature on social and cultural factors relate to specific themes of professionalism, social class, and educational pathways that have been identified as contributing elements within the analysis in this thesis. These include sociological studies of professionalism, the role of social class in the selection of Army officers and military

³⁸ Mayhew, *Wounded: From Battlefield to Blighty, 1914-1918*.

³⁹ Carden-Coyne, 49.

⁴⁰ See, for example, Reginald Pound, *Gillies: Surgeon Extraordinary* (London: Michael Joseph, 1964); Jan Bassett, *Guns and Brooches: Australian Army Nursing from the Boer War to the Gulf War*; Anna Rogers, *While You're Away: New Zealand Nurses at War, 1899-1948*; Joy Damousi, 'Australian Medical Intellectuals and the Great War', *Australian Journal of Politics and History* 53, no. 3 (2007): 136-450; Thomas Scotland and Steven Heys, eds., *War Surgery 1914-18* (Solihull, England: Helion and Company, 2012); Peter Rees, *Anzac Girls: The Extraordinary Story of Our World War I Nurses*.

hierarchies, and the place of developing educational pathways for professionals working in the health sector.⁴¹

While a great many histories relating to various aspects of medical practice have been written at different times throughout the centuries, the history of pharmacy and pharmacy practice as a discrete professional entity or practice in the modern Western world has not enjoyed a similar level of historiographical analysis. Stuart Anderson, in his introduction to *Making Medicines: A Brief History of Pharmacy and Pharmaceuticals*, identifies the relationship of pharmacy to the practice of medicine as an important theme in order to situate pharmacy within the medical historiography.⁴² This does not, however, mean that pharmacy practice and profession should be studied only as an adjunct to the

⁴¹ For example, see Hester Maclean, *Nursing in New Zealand: History and Reminiscences* (Wellington: Tolan, 1932); Alexander M. Carr-Saunders and Paul A. Wilson, *The Professions* (Oxford: Clarendon Press, 1933); Charles Newman, *The Evolution of Medical Education in the Nineteenth Century* (London: Oxford University Press, 1957); Geoffrey Millerson, *The Qualifying Associations* (London: Routledge & Kegan Paul, 1964); R. F. Stockwell, *The Origins of the Dental Profession in New Zealand* (Dunedin: New Zealand Dental Association, 1977); W. J. Gardner, *Colonial Cap and Gown: Studies in the Mid-Victorian Universities of Australasia* (Christchurch: University of Canterbury, 1979); Tom Brooking, *A History of Dentistry in New Zealand* (Dunedin: New Zealand Dental Association Inc., 1980); Margaret Pelling, 'Medical Practice in Early Modern England: Trade or Profession?', in *The Professions in Early Modern England*, ed. Wilfred Prest (New York: Croon Helm, 1987), 90–128; Michael Belgrave, 'Medicine and the Rise of the Health Professions in New Zealand, 1860-1939', in *A Healthy Country: Essays on the Social History of Medicine in New Zealand*, ed. Linda Bryder (Wellington: Bridget Williams Books, 1991), 7–24; Neil J. Smelser, *Social Paralysis and Social Change: British Working-Class Education in the Nineteenth Century* (Berkeley: University of California Press, 1991); Thomas Neville Bonner, *Becoming a Physician: Medical Education in Britain, France, Germany, and the United States, 1750-1945* (Baltimore, MD: John Hopkins University Press, 1995); John C. Burnham, *How the Idea of Profession Changed the Writing of Medical History* (London: Wellcome Institute for the History of Medicine, 1998); Richard Breen, 'Why Did Class Inequalities in Educational Attainment Remain Unchanged Over Much of the 20th Century?', in *Understanding Social Change*, ed. Anthony Heath, John Ermisch, and Duncan Gallie (Oxford: Oxford University Press, 2005), 54–72; Mark Bostridge, *Florence Nightingale: The Woman and Her Legend* (London: Penguin Group, 2008); Rosemary O'Day, 'Social Change in the History of Education: Perspectives on the Emergence of Learned Professions in England, c. 1500-1800', in *Social Change in the History of British Education*, ed. Joyce Goodman, Gary McCulloch, and William Richardson (London: Routledge, 2008), 7–26; Harold Silver, 'Higher Education and Social Change: Purpose in Pursuit?', in *Social Change in the History of British Education*, ed. Joyce Goodman, Gary McCulloch, and William Richardson (London: Routledge, 2008), 133–48; Geoffrey Field, "'Civilians in Uniform': Class and Politics in the British Armed Forces, 1939-1945", *International Labor and Working-Class History* 80 (2011): 121–47; Patrick Bury, 'Barossa Night: Cohesion in the British Army Officer Corps', *British Journal of Sociology* 68, no. 2 (2017): 314–35; Chantal Stebbings, *Tax, Medicines and the Law: From Quackery to Pharmacy* (Cambridge: Cambridge University Press, 2018).

⁴² Anderson, *Making Medicines*, 4.

practice of medicine, but rather that academic study of pharmacy *in its own right* has been somewhat limited.

With its strong association with trade, pharmacy has also been studied in conjunction with disciplines other than medical history such as business or economic history. Histories have also been written as corporate biographies of individual pharmaceutical companies such as Burroughs Wellcome and Company (UK), Allen and Hanburys Limited (UK), Glaxo (New Zealand), or Nicholas International Limited (Australia).⁴³ While these publications examine the origins and economic growth of specific companies, they are placed in context within the development of the pharmaceutical industry as an economic entity, rather than alongside the development of the pharmacy profession and practice itself. With the exception of R. Grenville Smith and Alexander Barrie's book on the beginnings of Nicholas International Limited, a company which originated from the lifting of Australian trademark restrictions for Bayer-produced (German) Aspirin in 1915, the period covering WWI is often either missing completely or reduced to a single paragraph within these corporate histories. Similarly, Judy Slinn, Jonathan Liebenau and John Lesch also locate their work investigating research and development of specific medicines or drug formulations within the context of business history by studying pharmacy and pharmaceuticals within economic or medical history frameworks.⁴⁴

⁴³ See, for example, Geoffrey Tweedale, *At the Sign of the Plough: 275 Years of Allen & Hanburys and the British Pharmaceutical Industry 1715-1990* (London: John Murray, 1990); Julia Millen, *Glaxo: From Bonnie Babies to Better Medicines* (Palmerston North, N.Z.: Glaxo N.Z., 1991); Roy Church and E. M. Tansey, *Burroughs Wellcome & Co: Knowledge, Trust, Profit and the Transformation of the British Pharmaceutical Industry* (Lancaster: Crucible Books, 2007); R. Grenville Smith and Alexander Barrie, *Aspro – How a Family Business Grew Up* (Melbourne: Nicholas International Ltd, 1976).

⁴⁴ See, for example, Judy Slinn, "Research and Development in the U.K. Pharmaceutical Industry from the Nineteenth Century to the 1960s," in *Drugs and Narcotics in History*, ed. Roy Porter and Mikuláš Teich (Cambridge: Cambridge University Press, 1996), 168-186; Jonathan Liebenau, "Industrial R&D in pharmaceutical firms in the early twentieth century", *Business History* 26 (1984): 329-46; John E. Lesch, *The*

Secondary literature on the development of the pharmacy profession in New Zealand and Australia is also limited. Reg Combes, a retired pharmacist, published his work on the development of the pharmacy profession in New Zealand in 1981, in conjunction with the centenary of the Pharmaceutical Society of New Zealand (PSNZ). In his own words, his book was never intended to be a definitive history; rather, it is in the nature of a broadly chronological, reflective narrative of the profession from its early beginnings and its subsequent development in New Zealand.⁴⁵ It is, however, the only comprehensive work on the history of the pharmacy profession in New Zealand that has been produced thus far.

Similarly, Gregory Haines' book *Pharmacy in Australia: The National Experience*, published in 1988 by the Pharmaceutical Society of Australia, remains the only full history on the development of the pharmacy profession in Australia within a national context.⁴⁶ Its main focus, however, is the political dissonance and rivalries between the individual Pharmacy Boards of the various Australian states, and charts the development and eventual consolidation into an overarching national or federal regulatory body for the profession. This work takes a broadly thematic narrative as its structure. While pharmacy in New Zealand had a national focus from 1880 when the first national Pharmacy Board of New Zealand was established, pharmacy regulation in Australia was managed along state boundaries, and cohesive national pharmacy regulation did not occur until 1977 with the establishment of the federal Pharmaceutical Society of Australia (PSA National).⁴⁷ Histories of various state-based pharmacy development and a single state Pharmacy Board

First Miracle Drugs: How the Sulfa Drugs Transformed Medicine (New York: Oxford University Press, 2007).

⁴⁵ Combes, 9.

⁴⁶ Haines, *Pharmacy in Australia: The National Experience*.

⁴⁷ *Ibid.*, 368.

have been produced, but not for all states.⁴⁸ Haines' *National Experience* work remains the only pharmacy history that has a national overview.

The nature of the topic means that this thesis spans a number of different historical disciplines. These include military history, health history including the history of health professions and health education, and social history including economic history. Although not strictly a military, health or economic history, this thesis nevertheless seeks to synthesise aspects of all three types of historical discipline. The thesis is, however, most closely aligned to a social history of military pharmacy.

The writing of military histories has, until relatively recently, taken the form of operational narratives, written by historians who focused on strategies and tactics, battles won and lost, amount of ordnance used, tonnage of shipping sunk, and reducing the men who fought the war to numbers on casualty lists, dealing only with operational, diplomatic or political aspects.⁴⁹ Taking a detached 'heroic' approach, these military histories were initially written directly after the event by officers who served during the conflict and served to justify and glorify the nation's war effort with a strong patriotic and celebratory motif.⁵⁰ As time created distance, academic historians recreated these scenes of human drama without delving over-much into the social impact of war, but continued to frame

⁴⁸ Gregory Haines, *'The Grains and Threepenn'orths of Pharmacy': Pharmacy in N.S.W. 1788-1976* (Kilmore, VIC: Lowden Publishing Co., 1976); Gregory Haines, *A History of Pharmacy in Victoria* (Melbourne: Australian Pharmaceutical Publishing Co. in association with the Pharmaceutical Society of Australia (Victorian Branch), 1994); Janette Bomford and David Newgreen, *The Pharmacy Board of Victoria: A History, 1877-2005* (Parkville, VIC: Pharmacy Board of Victoria, 2005).

⁴⁹ Jay Winter and Antoine Prost, *The Great War in History: Debates and Controversies, 1914 to the Present* (Cambridge: Cambridge University Press, 2005), 3.

⁵⁰ For example, see H. T. B. Drew, *The War Effort of New Zealand*; Andrew Carbery, *The New Zealand Medical Service in the Great War, 1914-1918*; A. G. Butler, *The Official History of the Australian Army Medical Services in the War of 1914-1918*.

these narratives in dominant nationalistic contexts.⁵¹ Analyses of the war have been carried out by traditional military historians, who identified the mistakes made in strategy for use as learning tools for later military tacticians, but without situating the work within wider contexts of cultural, economic and social perspectives.⁵² With the rise of the disciplines of postmodernist, social, and cultural history however, emotion history frameworks have been applied to the experiences of WWI, focusing on loss and grief, memorialisation and commemoration.⁵³ As such, while the broader social impact of war has relatively recently become the subject of academic analysis, this has been predominantly limited to aspects of personal loss, grief, tragedy, commemoration of the noble sacrifice of the glorious war dead, and the men who returned from the war damaged and broken.⁵⁴ It is only from the 1970s that soldiers' lived experiences of WWI have begun to be analysed with a social history lens, through close reading of surviving diaries and letters, and the recording of oral histories obtained from surviving soldiers and their family members.⁵⁵ The two streams of historical discipline – military and social – have, unfortunately, remained largely separate. There has been, therefore, a distinct schism between the traditional operational histories written by military historians, and histories of conflict written by social historians.

In his 2008 article “Cuckoo in the nest”, the late Jeffrey Grey argued that this disconnection is the result of a significant lack of integration between these two disciplines

⁵¹ Winter and Prost, 4. Australia's continuing perpetuation and lionisation of the ANZAC myth is a prime example.

⁵² Winter and Prost, 3.

⁵³ Jeffrey Grey, ‘Cuckoo in the Nest? Australian Military Historiography: The State of the Field’, *History Compass* 6, no. 2 (2008): 460–61.

⁵⁴ Grey, ‘Cuckoo in the Nest?’, 462. See also Joan Beaumont, *Broken Nation: Australians in the Great War*; Jock Phillips, *To the Memory: New Zealand's War Memorials*, (Nelson, N.Z.: Potton & Burton, 2016).

⁵⁵ For example, see Marina Larsson, *Shattered Anzacs: Living With The Scars of War*, (Sydney, N.S.W.: University of New South Wales Press, 2009); Glyn Harper, *Johnny Enzed: The New Zealand Soldier in the First World War 1914-1918*; Emily Mayhew, *Wounded: From Battlefield to Blighty, 1914-1918*. There are no longer any WWI veterans still living.

of history. Grey discussed the particular challenges involved in reintegration, including the unpopularity of traditional operational military history within academia, and determined that “the reluctance of academic historians to engage with war...is in part a reflection of left-liberal sensitivities that reject war and the military as legitimate subjects of academic inquiry in and of themselves”, along with reticence on the part of social historians to learn the ‘language’ and logic of military structures as key factors contributing to this schism.⁵⁶ This concept has been expanded from an earlier article, in which Grey stated that military historians were, in fact, theory-averse, while social historians were too far removed from the military world and therefore had no understanding of the highly specialised military domain.⁵⁷ In short, military and social historians did not talk to each other, did not understand each other, and moved in significantly different historical spheres.

Along different lines, Australian military historian Joan Beaumont, while also recognising the division between social and traditional military historians, takes the position that this schism is mainly a gendered issue. Beaumont noted that the highly masculinised operational narratives of war were written by military historians who are mainly men, while social historians who are more focused on the intangible aspects of war and its impact on emotions, culture, and society were predominantly women.⁵⁸ Again, the lack of interaction between the two groups is alluded to.

Like all historical disciplines, military history has also begun to evolve, moving away from the primarily operational narrative and broadening to encompass social and

⁵⁶ Grey, ‘Cuckoo in the Nest?’, 464.

⁵⁷ Jeffrey Grey, ‘Writing about War and the Military in Australia’, *Australian Historical Studies* 34, no. 122 (2003): 385.

⁵⁸ Joan Beaumont, ‘The State of Australian History of War’, *Australian Historical Studies* 34, no. 121 (2003): 167–68, doi:10.1080/10314610308596243.

cultural contexts. This relatively recent interdisciplinary bridging of the operational and the social contexts has become known as ‘war history’ or ‘war and society’. Although integrating the two very different approaches can be somewhat problematic, nevertheless strenuous efforts are being made to reduce the large historiographical gap between military and social histories that had been previously identified by both Grey and Beaumont. War history contains a much smaller operational element, and uses this to foreground and contextualise the social aspects of the narrative.⁵⁹

From the late eighteenth to the mid-twentieth centuries, medical history has mainly been written by members of the medical profession, with triumphal motifs focusing on the accomplishments of the ‘great and the good’.⁶⁰ These positivist narratives mainly celebrate the role and achievements of doctors and surgeons, and consider that the development of medical practice and medical technological innovation has been uniformly progressive, in a cycle of continuous improvement. Focusing mainly on “great doctors making great discoveries”, until post-modernism in the 1960s medical histories were rarely critical of the medical profession, and the roles played by other health practitioners were largely overlooked.⁶¹ Early medical history has thus been primarily ‘history from above.’

Health history and the education of health professionals are other areas of history that this thesis considers. Health history as a discipline has been particularly strong from the 1960s after the development of the New History movement, exploring systems of health and the framing of disease, the roles of those working in the health sector,

⁵⁹ See, for example, Anna Rogers, *With Them Through Hell*; John Crawford and Peter Cooke, *No Better Death: The Great War Diaries and Letters of William G. Malone* (Auckland: Exisle Publishing, 2014); Peter Stanley, *Bad Characters: Sex, Crime, Murder and Mutiny in the Great War* (Sydney: Murdoch Books, 2010).

⁶⁰ John C. Burnham, *What Is Medical History?* (Cambridge: Polity Press, 2005), 2–4; Keir Waddington, *An Introduction to the Social History of Medicine: Europe Since 1500* (London: Palgrave Macmillan, 2011), 2.

⁶¹ Burnham, *What Is Medical History?*, 3; Waddington, 3.

innovations in the application of science to medicine, and population health (epidemiology).⁶² The writing of health histories generally serves three specific functions: determination of lessons learned from past events to support current positions on how we perceive and respond to health issues; to apportion blame in response to health crises; and to challenge preconceptions and entrenched attitudes.⁶³ As ‘history from below’, it is the last role of health history that contributes a partial framework for analysis of the experience of military pharmacists during the war, and the attitudes and perceptions of the military authorities and officers towards them.

As noted earlier, this thesis is mainly aligned with social history. As such, it examines discourses around the cultural and social elements of professionalism, education, class, and status, and how these affected military pharmacists and their role. Medical and health histories typically investigate three main historical actors: the patients; the healers; and the diseases or physical infirmity (disability) themselves. Social history, on the other hand, places the lived experience of the ordinary person or groups of people at the centre, investigating the “breadth, depth, and interlaced aspects” of societal elements and cultural factors that impact on that experience.⁶⁴ There are, however, significant overlaps between cultural history and social history, with no definitive distinction between the two.⁶⁵ Both disciplines include histories of the powerless as well as the powerful.

Cultural history examines the general processes of societal development, including the particular habits or behaviours of a group or a period, as a “system of shared meanings,

⁶² Burnham, *What Is Medical History?*, 5; Virginia Berridge, ‘Introduction to History in Health’, in *Principles of Social Research*, ed. Judith Green and John Browne (Maidenhead, U.K.: Open University Press, 2009), 146.

⁶³ Berridge, 146-48.

⁶⁴ Mark Smith, ‘Making Sense of Social History’, *Journal of Social History* 37, no. 1 Special Issue (2003): 166; Michael Seidman, ‘Social History and Antisocial History’, *Common Knowledge* 13, no. 1 (2007): 40.

⁶⁵ Smith, ‘Making Sense of Social History’, 165.

values and attitudes, and the forms...which are used to express them”, often drawing upon aspects of social anthropology to inform its standpoints.⁶⁶ Originally evolved from economic history forebears, social history also draws on other disciplines within the social sciences such as sociology for its analyses, with the understanding that all members of a society, no matter how seemingly insignificant, create or contribute to the wider whole in order to “retrieve the lives of people not necessarily connected to power.”⁶⁷ People inhabiting every level of social strata or ‘class’ are therefore of interest to a social historian, with historical voices worth hearing.

“Hence the boundaries of war are not fixed once and for all, because war is not a discrete entity, but something intricately lived, conceptualized, and imagined.”⁶⁸

A Note on Methodology

Broadly speaking, there is no set method to the practice of history, despite what appears to be a set formula of sourcing material, analysing the evidence, interpreting narratives and facts, and presenting it all in a new light. In reality, each historian develops their own way of going about finding the different types of primary sources that can be used: government archives; official publications (such as census records); newspaper reports and letters to editors; trade and academic journals; diaries; letters; business records; photographs and images; and oral interviews.⁶⁹ There are often, however, significant limitations to the amount of material that any historian may access. No historian can ever be fully informed on their topic of interest or research due to the difficulties in locating and retrieving material, and the format or media of primary sources can influence argument, analysis and subsequent interpretation of the research topic. Primary material can be held in closed or private collections, or collections that have been deemed to hold sensitive information and are therefore not available for public scrutiny. Conservation efforts by

⁶⁶ Peter Claus and John Marriott, *History: An Introduction to Theory, Method and Practice* (Harlow, U.K.: Pearson Education Ltd, 2012), 187–88. These forms of expression include literature, art, architecture and music, for example.

⁶⁷ Claus and Marriott, 183, 185–86; Roger Cooter, ‘After Death/After-’Life’: The Social History of Medicine in Post-Postmodernity’, *Social History of Medicine* 20, no. 3 (2007): 443.

⁶⁸ Winter and Prost, 6.

⁶⁹ Primary sources are records generated at the time of the event being investigated, while secondary sources are those pieces that are written later such as histories.

archivists of the original material can also mean that records are not made available if they are too fragile to be handled. Working within such constraints means that a historian's research is based solely on what material is available to them and where that material can then lead onto, which can substantially impact on their subsequent analysis and interpretation. History is not science with defined equations and physical parameters of nature; it is very much an art, open to interpretation, nuance and instinct. Furthermore, individual interpretation is influenced by many factors, including the historian's own personal life experiences. While we are trained to be aware of and to control for potential biases, nevertheless historians are just as flawed as our subjects, and these personal flaws and idiosyncrasies will have subconscious impact on our interpretations.

A key skill of historians is the ability to investigate beyond what is presented to them, and to look for that which is *not* evident. These gaps in archival and other source material can often tell us at least as much about how a marginalised group was treated within a society as when their experiences were directly recorded. As an example, government records rarely if ever documented the experiences of women, indigenous populations, the disabled, children, and those who were resident in institutions such as prisons and mental asylums at the beginning of the twentieth century. By their *lack* of presence in official and other records such as medical journals, military pharmacists during WWI as a cohort were significantly less visible, considered as less important, and were less respected than other health professions that served during the war. This is a key theme of this thesis.

There have been many challenges in sourcing material for this thesis, which can be broadly grouped into physical availability of archives, access to archives, and lack of resources. The source material for this thesis was highly fragmented, with no repository of records that dealt specifically with military pharmacy. As such, the main argument that I make in this thesis, that military pharmacy and pharmacists who served in the armed forces of New Zealand and Australia during WWI were marginalised, has been constructed from tantalising scraps and morsels of information from records that were woefully incomplete. Lack of archival material is due, in part, to previous institutional collection and records management policies and processes, determining the nature and extent of what records were available to me. The National Archive of Australia in previous decades regularly 'weeded' their material, destroying items that were not deemed important to keep (at the

time). Cover letters were kept, while the lists of items that the letter referred to (and which would be of the most interest to a researching historian) were removed and destroyed. This practice had a detrimental effect on the research for this thesis, as many items within the files that could have further and more fully described Australian military pharmacy practice had disappeared.

While I drew heavily on trade journals for this thesis, access to these was also problematic. As there are no holdings of either the *Chemist & Druggist of Australasia* or the *Australasian Pharmaceutical Notes & News* in New Zealand, I was required to travel to the New South Wales State Library in Sydney, Australia which held the most complete runs of both publications to access their records. Neither of these publications have been digitised. Digitisation of material through government archives or public libraries is on a purely ad-hoc basis, and dependent on availability of funding.

Photographs and images are another important potential primary source for a historian. In this thesis, however, very few photographs of ANZAC military pharmacy and pharmacists have been used, for the simple reason that very few were taken. Most of the images that I found were of Australian military pharmacy (nine in total), and there is only one photograph that has been found depicting a New Zealand military hospital pharmacy. Being a researcher based in Dunedin, geographic location has had a significant impact on obtaining access to material, and I am grateful for the financial support of the School of Pharmacy at the University of Otago and a research travel grant from the Australian Army History Unit, which facilitated domestic and international travel in order to do so.

Aim of the Thesis and Primary Sources

The aim of this thesis is to locate, examine, and analyse the role of pharmacists within New Zealand and Australian military contexts during WWI. In doing so, the thesis seeks to answer a number of research questions:

- What was the role and experience of military pharmacists in the ANZAC forces during WWI?
- How did pharmacists perceive themselves within the military context?
- What were the social and cultural factors involved that determined or impacted on their war experience?
- Were military pharmacists recognised as health professionals by the military authorities, and if not, why not?

Alongside analysis of the place and role of pharmacy within the military, this thesis will also document and recount for the first time the broader experience of New Zealand and Australian military pharmacists during the course of the war.

The main tool of a historian in any field is the process of critical thinking and analysis, with robust interrogation of both primary and secondary sources to determine their viability and relevance. It is this process that teases out the threads of lived experience of the ‘other’, the subaltern, and the otherwise voiceless.⁷⁰ This thesis uses qualitative methods of investigation, including evaluation, analysis and interpretation of primary narratives and texts, along with personal communications with pharmacists who have previously served in the armed forces. As the last veterans from WWI are now all deceased, it is of course impossible to speak to any pharmacists who served in this specific conflict.

⁷⁰ ‘Subaltern’ refers to a person or group who are considered to hold a socially inferior position due to gender, ethnicity, class, religion or other social or cultural difference, often considered prejudicial. Subaltern studies originated in the late 1970s-1980s by a group of South Asian scholars in the UK, as an evolution of postcolonial Orientalism studies.

While official records of pharmacy are sparse and fragmented, contemporary journals such as *Chemist and Druggist of Australasia (C&DA)*, *Australasian Journal of Pharmacy* (incomplete collection) (AJP), *Australasian Pharmaceutical Notes and News* (APNN), *New Zealand Medical Journal* (NZMJ), *Medical Journal of Australia* (MJA), and the *British Medical Journal* (BMJ) along with regional and local newspapers covered medical and pharmacy aspects of the war in detail. These publications are rich repositories for both pharmacists' own opinions and the broader concerns of the regulatory bodies. Surprisingly, these journals were relatively uncensored, and letters and photographs from pharmacists at the war which were sent to family members or pre-war employers were frequently published in their entirety. Price and availability of specific drugs and medicines from wholesale drug houses, advertisements from local and overseas manufacturers, and reports from the various pharmaceutical societies detailing their activities during the month prior to publication were also reported in the journals. These journals are thus valuable primary sources in revealing the thoughts and perceptions both of individual pharmacists, as well as official pharmaceutical agencies of the role and experience of military pharmacists. They have been extensively mined to discover the actual experiences of serving pharmacists, how they perceived their role within the military, and to inform the analysis in this thesis.

New Zealand did not have a national pharmacy journal during the period of the war. Established in 1892 as a national New Zealand pharmaceutical periodical, *Sharland's Journal* ceased publication in 1911, and its successor the *Pharmaceutical Journal of New Zealand* did not begin until 1928; the *Chemist and Druggist of Australasia*, *Australasian Journal of Pharmacy* and to a lesser extent the *Australasian Pharmaceutical Notes and News*, however, covered the interests of New Zealand as well as Australian pharmacists

during the period.⁷¹ Alongside the *C&DA*, *AJP* and *APNN*, minutes from monthly meetings and Annual Reports of the Pharmacy Board of New Zealand (PBNZ) have also been scrutinised to determine the efforts made by New Zealand's pharmacy regulatory body to obtain official recognition for pharmacists through the granting of officer commissions. Minutes of meetings, both monthly and annual, of the Council of Pharmaceutical Societies of Australasia (CPSA) chart the progression of the development of the military pharmacy role and expectations of the various pharmaceutical bodies throughout both New Zealand and Australia. The *New Zealand Gazette*, *New Zealand Official Year Book*, *Appendices to the Journal of the House of Representatives* (New Zealand), *Official Year Book of the Commonwealth of Australia*, and the *Commonwealth of Australia Gazette*, as well as national census data for both countries are other primary sources that provide information on high-level political decisions, demographics and legislation for the period, locating New Zealand and Australia military pharmacists' experiences within a political context.

Structure of the Thesis

A thematic approach has been taken, with the identification of a number of key areas of analysis. These include the economics of medicine supply during the war and the strong association of pharmacy with trade and business. The invisibility of military pharmacy and pharmacists and perceptions of professionalism and professionalism, education of health practitioners, and the role of social class also impacted on the drive of military pharmacists for status and recognition through the granting of commissioned rank.

⁷¹ Heydon and Duffull, 3; Pharmaceutical Society of New Zealand, "Pharmaceutical Journal of New Zealand, Vol.1, no.1," *ourheritage.ac.nz* / *OUR Heritage*, accessed April 18, 2017, <http://otago.ourheritage.ac.nz/items/show/7782>.

Chapter 1 details the experience of New Zealand military pharmacists during WWI, and also examines the social and professional contexts of the civilian pharmacy profession in the decades leading up to the conflict. While this chapter is written in a narrative format, it is necessary to recount the experience of pharmacy in the New Zealand military context in order to fully locate pharmacy within the military sphere, to understand what actually happened to military pharmacists during the war years, and to inform and underpin the analysis and discussion within the following chapters. New Zealand's military pharmacy experience was rigidly proscribed by the military authorities, with no possibility of improvement despite of regular lobbying by the Pharmacy Board of New Zealand (PBNZ). Pharmacists did, however, make a definite contribution to the war effort, although their day-to-day experiences are largely invisible. This chapter also includes a section on the social make-up of the pharmacists themselves, derived from a database established by the researcher for this thesis. This database is a unique and original demographic snapshot of those New Zealand pharmacists or pharmacy-trained men who served (see Appendix 1).

The experience of Australia's military pharmacists is set out in **Chapter 2** in a similar way to Chapter 1. While Australia and New Zealand's experiences at the start of the war were broadly similar, they nevertheless diverged significantly and as such, should be addressed separately. Unlike New Zealand, Australia's combined pharmacy regulatory bodies successfully lobbied the government to create a dedicated Army Pharmaceutical Service, developing for military pharmacists a niche role as specialist medical quartermasters. With this new service, and Australia's policy of extensive retention of WWI records, a rich repository of primary source material is available. This chapter thus draws on primary source material from the National Archives of Australia and the

Australian War Memorial, while both Chapters 1 and 2 use pharmaceutical trade journals extensively for insights into serving pharmacists' direct experiences and opinions.

War economics, business practices and 'being in trade' is the focus for **Chapter 3**. For Australian pharmacists, business acumen and practices were recognised as valuable to the military authorities as the cost of the war increased. The importance of cost and inventory control of medical commodities resulted in commissions being granted to Australian military pharmacists in recognition of their business-related skills, albeit honorary only. New Zealand pharmacists also played a part in their country's cost savings efforts; their role, however, was not reported on or valued by the New Zealand military authorities. This chapter thus expands on the procurement process and supply chain of pharmaceutical commodities and their place within military frameworks, charting also the place of pharmacists within the medical equipment supply chain.

Chapter 4 expands on the supply and procurement processes of medicines to the specific treatments for several diseases and conditions that were faced by both countries' militaries during the war. By providing an *indirect* account of the work of military pharmacists, this chapter provides an overview of the conditions that were being treated and how they were managed. The lack of representation of pharmacy and pharmacists is also charted, with the privileging of both the diseases and the treatments available in the archival record as well as subsequent historiography, rather than those who were responsible for the compounding and supply of those treatments. This chapter demonstrates the invisibility of military pharmacy and pharmacists by using as case studies commonly-used treatments that should have reasonably formed part of pharmacists'

established scope of practice, yet whose practices remained undocumented and therefore invisible.

The theme of invisibility of pharmacy from Chapter 4 continues with the perceptions of professionalism for military pharmacists in **Chapter 5**. Pharmacy practice in the field was highly simplistic, while in base or general hospitals, pharmacists worked in dispensaries that were out of sight. As a result of this invisibility, the practice of pharmacy was overlooked in official documents, resulting in subsequent invisibility in archival material and later historiography. Pharmacists and other health practitioners held divergent views of pharmacy as a profession, and these views were instrumental in shaping the subsequent experience of pharmacists in the military setting. Pharmacists considered themselves to be well-educated and connected health professionals, while other medical staff saw pharmacists primarily as ‘labourers’, performing a mainly manual function and with no direct contact with patients. This disconnect in viewpoint has its genesis in three main areas of education, class and rank, the analysis of which constitute the final chapter in the thesis.

The focus for **Chapter 6** is the cultural and social factors pertaining to the lack of professional recognition of military pharmacy. These include the evolution of medical education in the early twentieth century, where pharmacists considered their apprenticeship pathway and educational standing as being equivalent to the university degree that doctors and dentists were required to attain for registration. Registration was legally required in order to practice for all three occupations, yet pharmacists were the only occupation to have an apprenticeship as their educational pathway, due to the heavily manual nature and mercantile aspects of their work. Social class affected educational

opportunities, with the offspring of the wealthy or upper classes being sent to university for tertiary education, while those of the upper-working or middle classes were more likely to take an apprenticeship. Social class and class mobility also had a direct impact on the conferment or otherwise of commissioned rank on military pharmacists. As a hierarchical structure, the military had its own ‘class’ system, with strict demarcation between commissioned officer ranks and non-commissioned officers. Military structure at the time also precluded nearly everyone other than the upper classes of society for entry into commissioned officer ranks. Social assets were as, or more, important than merit and ability for progression through the ranks.⁷²

The themes developed in this thesis overlap to a degree, much like the practice of pharmacy and medicine and the relationship between pharmacists and doctors (general practitioners) in the civilian sphere during the early twentieth century. Consequently, the chapters in this thesis are divided in as logical a form as possible to permit analysis of each theme, yet interchange between each is essential in order to fully examine the complexities of ANZAC military pharmacy during WWI. Closely aligned with education, social class and status also played roles in the aspirations of pharmacists to be accorded professional recognition within the military context. As one of the markers of professionalisation discussed in Chapter 5, elevated social status was highly sought-after as validation of pharmacists’ occupation in the civilian sphere by the general public. Social class also impacted on educational opportunity; it was privileged classes who had the wherewithal to send their children to university for their education, while those of the lower to middle classes were more likely to pursue apprenticeships, which incurred a lower level of

⁷² In this thesis, other than in discussion about British social class, New Zealand and Australian class is determined as wealth-based, rather than social rank through birth. Neither New Zealand nor Australia had an established aristocracy, therefore class distinctions within the society came about through wealth generation.

financial outlay.⁷³ Educational pathways and social class were therefore strongly intertwined and overlapped. These concepts of social class, educational pathways and subsequent business practices, i.e. being ‘in trade’, are therefore the key factors that have combined to render the pharmacist and pharmacy practice invisible in the wider historiography of WWI.

This thesis examines an area of academic scholarship that has not been explored previously. As such, it makes a strong contribution to the existing body of knowledge in the areas of WWI studies, health history and pharmacy history. By resurrecting the experiences of ANZAC military pharmacists during WWI, the contribution to the war effort made by this little-known cohort has finally been acknowledged and recognised. With this recognition, this thesis fills in a gap in the broader understanding of the war and its impact. This understanding is one that is not predicated on remembrance of the noble sacrifice of those who did not return, or on the strategies and tactics involved, but of those who worked behind the scenes and whose experiences have been overlooked.

⁷³ Bonner, *Becoming a Physician: Medical Education in Britain, France, Germany, and the United States, 1750-1945*, 63. For this thesis, discussion of university education refers to medical fields only, i.e. medicine or dentistry, but does not include surgery.

Chapter 1: Military Pharmacy – New Zealand

*Medicamina discernendo, hominibus servire*¹

Introduction

At the outbreak of hostilities in August 1914, qualified and apprentice pharmacists in both New Zealand and Australia were, like many men in other professions or occupations, quick to volunteer to use their skills in service to their countries and the wider British Empire. Neither the New Zealand nor Australian military authorities, however, initially recognised formal qualifications and registration in the granting of commissioned officer rank to those who held civilian qualifications as pharmacists, unlike those accorded to doctors, veterinary surgeons, and dentists (although not at first). The British Imperial model of the military medical corps was used as the pattern for the Army medical services of both countries, as part of the wider post-Boer War (1899-1902) push by the British to make the Dominion's militaries compatible with the British Army.² Based on this model the highest rank that a qualified and registered pharmacist who was posted to serve *as a pharmacist* could attain was Staff-Sergeant, at the upper end of the non-commissioned officer (NCO) ranks.³ Nor did the military authorities differentiate between unqualified apprentices or assistants, and formally qualified and fully registered pharmacists. Either

¹ Reg Combes, *Pharmacy in New Zealand: Aspects and Reminiscences* (Auckland: Pharmaceutical Society of New Zealand, 1981), 214. This approximately translates as 'serving mankind by exercising care in dealing with medicines,' and is the motto of the New Zealand Hospital Pharmacists' Association.

² Douglas E. Delaney, 'Army Apostles: Imperial Officers on Loan and the Standardization of the Canadian, Australian and New Zealand Armies, 1904–1914', *War in History* 23, no. 2 (2016): 170, 172, 175, 186–89.

³ Combes, 188; Gregory Haines, *Pharmacy in Australia: The National Experience* (Sydney, N.S.W.: The Pharmaceutical Society of Australia, 1988), 190. Staff-Sergeant is only one rank below Sergeant-Major, or Warrant Officer Class 2 (WO2).

had as good a chance to serve as Sergeant-Dispenser or Sergeant-Compounder, with no preference for registered, qualified men to be promoted over unqualified.⁴

There was no opportunity for upwards progression into the commissioned officer ranks unless the pharmacist seeking promotion transferred away from the Medical Corps to an infantry, artillery or other front-line combatant unit. The pharmacist was therefore required to forego performing the role best suited to his qualifications and training, and focus on progression through martial and administrative skills in order to get ahead through the ranks.⁵ Pharmaceutical regulatory bodies in both Australia and New Zealand were highly critical of Britain's adherence to what they considered to be an outmoded Army Compounder system, and they were supported in their criticism and efforts to obtain commissions by leading members of the medical profession.⁶ The New Zealand government based its military Medical Service on this British model, which had not moved with the (legislative) times since at least the South African (Second Boer) War of 1899-1902.⁷

In New Zealand, this disparity in rank and status created concern for the Pharmacy Board of New Zealand (PBNZ), the national regulatory authority responsible for maintaining competency of practicing pharmacists by administering the pharmacy

⁴ See for example, W. Donnelly, 'Letter to New Zealand Pharmacy Board', 5 June 1916, Box 14 81-084-14, Alexander Turnbull Library, Wellington; 'Letter to Minister of Defence from Registrar Pharmacy Board of New Zealand', 17 October 1922, Box 14 81-084-14, Alexander Turnbull Library, Wellington.

⁵ Female pharmacists did not serve in New Zealand's armed forces during the war, and only one is included on the Honour Roll board for the Queensland Pharmaceutical Society. For this thesis, pharmacists will be referred to as male, as the gendered nature of the war precluded women serving in any capacity other than nurses or, in some exceptional cases, doctors.

⁶ 'Military Matters', *Australasian Pharmaceutical Notes and News*, 1 April 1916, 44.

⁷ At the time of the Boer War, neither New Zealand nor Australia were Dominions of the British Empire, but were still considered to be colonies, with a degree of self-governance. This meant that as British subjects, troops sent from New Zealand and Australia to fight in South Africa came under British command and discipline. See Denis Judd and Keith Surridge, *The Boer War* (London: John Murray Ltd, 2002), 76-77, 81; Peter Prime, *The History of the Medical and Hospital Services of the Anglo-Boer War, 1899 to 1902* (Cheshire, U.K.: Anglo-Boer War Philatelic Society, 1998).

examinations and maintaining registration records. Both the PBNZ and enlisted pharmacists expressed disappointment with the military authorities' insistence on adhering to the Imperial regulations regarding commissions. Similarly, the respective Pharmaceutical Societies of the Australian states were also dismayed at the lack of recognition shown to their professional qualifications by the Australian military authorities.⁸ Pharmacists in both countries had the not unreasonable expectation that their qualifications and registration would be respected or recognised by the Departments of Defence through being granted commissioned rank, and that by being granted commissions, their status as health professionals would be ratified or validated at a similar level to doctors and dentists. This, however, did not eventuate at the start of the war. The lack of recognition through the non-granting of commissions was to become the single dominant political issue facing military pharmacists in both countries throughout the war.

As a support function within the wider military structure, the role and experiences of New Zealand (and Australian) military pharmacists have received negligible attention or even awareness. Consequently, no analysis or scholarly work has been previously undertaken of the experience of military pharmacists, by military, pharmacy or medical historians; with four distinct exceptions, not one historical narrative on the war for New Zealand, Australia or Britain, either medical or operational, detail the experiences of military pharmacists or mention the pharmacy or dispensary other than as a passing comment.⁹ Those exceptions are chapters in Arthur Butler's *The Official History of the*

⁸ Although Australia and New Zealand were part of a combined Pharmaceutical Society of Australasia (PSA), Australia itself did not have a single, national governing pharmacy body at this time. Each state was responsible for its own pharmacy regulation. The states included New South Wales (NSW), Queensland (QLD), Victoria (VIC), South Australia (SA), Western Australia (WA) and Tasmania (TAS). The Australian experience will be examined in Chapter 2.

⁹ Although there are too many publications to list, some of representative texts for New Zealand and Australia are Andrew D. Carbery, *The New Zealand Medical Service in the Great War, 1914-1918* (Auckland: Whitcombe and Tombs, 1924); Jeffrey Grey, *A Military History of Australia* (Cambridge: Cambridge University Press, 1999); Jeffrey Grey, *The Australian Army* (Melbourne, Victoria, Australia:

Australian Army Medical Services in the War of 1914-1918, Reg Combes' *Pharmacy in New Zealand: Aspects and Reminiscences*, Gregory Haines' *Pharmacy in Australia: The National Experience*, and a section of a chapter in Anna Rogers recently published work *With Them Through Hell: New Zealand Medical Services in the First World War*.¹⁰ The 'story' of military pharmacists therefore requires recounting. In order to locate pharmacy and pharmacists within the wider structure of World War I (WWI) military and medical history, this chapter identifies, describes and discusses the experience of enlisted New Zealand pharmacists working within the military structure. Furthermore, the wider position of pharmacy within the New Zealand military framework will be explored, identifying where pharmacy practitioners 'fit' within a strict and well-defined stratified organisation which was based on the British military model, in the early years of the twentieth century. No WWI archival records remain that document the day-to-day detail of pharmacists' practice; the actual practice of military pharmacy is therefore unknown and can only be gleaned from fragmentary records or other sources such as letters to the editors of the pharmaceutical journals.

Oxford University Press, 2001); Jeffrey Grey, 'Writing about War and the Military in Australia', *Australian Historical Studies* 34, no. 122 (2003): 384–86; Joan Beaumont, *Broken Nation: Australians in the Great War* (Crows Nest, N.S.W.: Allen & Unwin, 2013); Michael Tyquin, *Gallipoli: The Medical War - the Australian Army Medical Services in the Dardanelles Campaign of 1915* (Kensington, NSW: NSW University Press, 1993); Kirsty Harris, *More Than Bombs and Bandages: Australian Army Nurses at Work in World War I* (Newport, NSW: Big Sky Publishing, 2011); Mark Harrison, *The Medical War: British Military Medicine in the First World War* (Oxford: Oxford University Press, 2010); Christopher Pugsley, *Fighting For Empire: New Zealand and the Great War of 1914-1918* (Auckland: Bateman, 2014); Christopher Pugsley, *Gallipoli: The New Zealand Story*, 5th ed. (Auckland: Libro International, 2014); Glyn Harper, *Johnny Enzed: The New Zealand Soldier in the First World War 1914-1918* (Auckland: Exisle Publishing, 2015); John Crawford and Ian McGibbon, eds., *New Zealand's Great War: New Zealand, the Allies and the First World War* (Auckland: Exisle Publishing, 2007); Peter Rees, *Anzac Girls: The Extraordinary Story of Our World War I Nurses* (Crows Nest, N.S.W.: Allen & Unwin, 2014); Emily R. Mayhew, *Wounded: From Battlefield to Blighty, 1914-1918* (London: The Bodley Head, 2013); Ana Carden-Coyne, *The Politics of Wounds: Military Patients and Medical Power in the First World War* (Oxford: Oxford University Press, 2014).

¹⁰ Arthur Graham Butler, *The Official History of the Australian Army Medical Services in the War of 1914-1918*, vol. III (Sydney, N.S.W.: Halstead Press, 1943); Combes, *Pharmacy in New Zealand: Aspects and Reminiscences*; Haines, *Pharmacy in Australia: The National Experience*; Anna Rogers, *With Them Through Hell: New Zealand Medical Services in the First World War* (Auckland: Massey University Press, 2018).

While pharmacy in New Zealand shared many elements in common with contemporary British and Australian practices, this chapter argues that the social place and professional function of pharmacy in the civilian world shaped how New Zealand military pharmacists were perceived within the rapidly evolving medical administrative hierarchies throughout WWI. Analysis and discussion of the professional development of pharmacy in New Zealand, as well as inter-professional tensions and conflicts that arose between other medical occupational groups and pharmacists will be signalled, but their consequences and impact will also be discussed in depth in Chapter 5. My focus in this chapter is to contextualise and examine the political background and environment that overshadowed the regulatory bodies' efforts to gain recognition for serving pharmacists.

As well as detailing pharmacists' place in the New Zealand Army, this chapter also examines the results of a database that was established as part of this research to examine the group in further depth. Demographic data taken from enlistment forms and personnel files were analysed to determine aspects of the social make-up of the cohort in order to more fully determine the human side of those who served, offering a snapshot of the enlistment age, marital status, country of origin, and age at and manner of death. This analysis is important for two reasons. First, it provides a unique profile of a cohort of pharmacists in New Zealand at the turn of the twentieth century, as no such collective depiction has ever been published.¹¹ Secondly, in the context of the transition from civilian to military pharmacy from 1914, it allows us to ask 'Who were these pharmacists who served?'

¹¹ No equivalent database of New Zealand military pharmacists has been developed. While the *C&DA* published names of both New Zealand and Australian serving pharmacists for a Roll of Honour intermittently throughout the war, no collation of this information and deriving demographic analysis has been previously conducted. Neither is there any similar work in any of the few histories of pharmacy published since the end of the war.

By recounting the experiences of New Zealand military pharmacists during WWI, this chapter depicts the political and professional environment of pharmacy in the New Zealand military during the early twentieth century, and the challenges of working under what was effectively a rigidly stratified British Imperial military system. This context underpins the analyses of military pharmacy which relate to the New Zealand experience in subsequent chapters.

Pharmacy in New Zealand – Earliest Days

European medicines arrived in New Zealand with Christian missionaries in the early years of the nineteenth century, who, equipped with a ship's medicine chest with a limited range of stock, provided rudimentary treatment to the sick and infirm, both European and Māori.¹² On 6 February 1840, New Zealand officially became a colony of the British Empire with the signing of the Treaty of Waitangi and formal colonisation began in earnest, bringing people with various skill sets including pharmacy to the new settlement. It is unclear who the first pharmacist in New Zealand was, but by 1850 Charles Decimus Barraud had established a business on Lambton Quay in Wellington, only retiring in 1887 when the building was destroyed by fire.¹³

Barraud was influential in establishing the Pharmaceutical Society of New Zealand (PSNZ) in 1879, and held the position of the first President of the PBNZ after its beginnings as a result of the *Pharmacy Act* of 1880.¹⁴ The main reasons for the Act and the official register it created was to tighten control over who could designate themselves as pharmacists or 'dispensing chemists', as well as to provide accountability for any

¹² Combes, 213.

¹³ *Ibid.*, 13–14. Fire was a particular hazard for dispensaries and pharmacies – it is generally accepted that the devastating fire that destroyed the central city district and increased the death toll in the Napier earthquake in 1931 began in a pharmacy.

¹⁴ *Ibid.*, 16, 20.

adulteration of medicines.¹⁵ In his pamphlet produced for the Golden Jubilee of the PSNZ in 1929, C. H. Farquharson noted that the first purpose for the Society was to “bring Pharmacy in New Zealand in conformity with other parts of the Empire.”¹⁶ Not only did the Society seek conformity with other parts of the British Empire, the “systematic” education of pharmacy apprentices including compulsory examinations, as well as the development and maintenance of a support network for all qualified pharmacists were two other key areas for the fledgling Society.¹⁷

Pharmacy as a profession in New Zealand continued to grow, consolidating its position both legally and socially within the community. The PSNZ, as the main professional association for pharmacists, continued to support and work on behalf of their members. With the outbreak of the Boer War in 1899, pharmacist volunteers signed up and some were granted commissions, albeit not for dispensing, but for serving in combatant units. Combes notes in his book that in 1902, the authorities directing this particular war effort were prepared to give preference to those pharmacists qualified by the PBNZ and appoint them as dispensers, but only holding an NCO rank, in alignment with the British army model for the Medical Corps.¹⁸ The Royal Army Medical Corps had been created in 1898 after a successful drive by medical officers (MOs) to be granted rank and status equivalent to that of their operational peers, who thought that men who held limited command responsibilities were undeserving of “proper military titles.”¹⁹ Precedent was thus set, and reflecting the role of pharmacists in the civilian world as subordinate to

¹⁵ *Ibid.*, 23.

¹⁶ C. H. Farquharson, ‘An Historical Outline of New Zealand Pharmacy’ (Pharmaceutical Society of New Zealand, 1929), 5.

¹⁷ Farquharson, 5.

¹⁸ Combes, 188.

¹⁹ Harrison, 5.

doctors, pharmacists were effectively ‘locked in’ to the lower-ranked position that they were assigned to during WWI.

New Zealand Military Pharmacists – Pre-war

The lack of commissions for pharmacists who signed up to serve in the New Zealand Reserves was of concern, and was debated well before the outbreak of WWI. After the Boer War of 1899-1902, pharmacy professional bodies formally requested that the New Zealand Army award commissions to serving pharmacists. This request was rejected as the country was then at peace and “a negative attitude was not unexpected”.²⁰ The reluctance of the military authorities to appoint pharmacists as commissioned officers continued even after compulsory military training was implemented with the 1909 *Defence Act*.²¹ Pharmacists did indeed hold commissioned rank within the reserve forces, but only as members of other units such as the Auckland Engineers and the Naval Reserve Volunteers, rather than performing the role of pharmacist in the Medical Corps.²² A file held in Archives New Zealand (Wellington) portrays the attempts made to gain commissions for pharmacists in the militia from 1911. Twenty-five-year-old James Staunton-Vere Burbery M.P.S. of Christchurch wrote to the Adjutant-General (AG), Colonel Alfred William Robin, on 23 October 1911 applying for “the position of Lieutenant-Compounder in the new Medical Corps in the Wellington district.”²³ Burbery had been to see Robin in person some six months prior to writing his letter, and had been referred to the Officer Commanding (OC) of the Canterbury district as this was his current

²⁰ Combes, 188.

²¹ *Defence Act 1909* (9 EDW VII 1909 No. 28), New Zealand, http://www.nzlii.org/nz/legis/hist_act/da19099ev1909n28149/ (9 May 2017).

²² Combes, *Pharmacy in New Zealand: Aspects and Reminiscences*, 188.

²³ Letter Burbery to AG, 23 October 1911. ‘Commissions - Honorary Commissions to Pharmacists’, n.d., Archives New Zealand, Wellington. M.P.S. was the acronym for Member of the Pharmaceutical Society, i.e. a qualified and registered pharmacist: Euan Galloway, personal communication, Dunedin, New Zealand, 4 October 2017.

region of residence, although Burberry was about to depart Christchurch for Wellington.²⁴ The letter of application was passed from Robin's office to Colonel James Robert Purdy, Director of Medical Services (DMS), on 26 October 1911 for consideration and advice. Purdy advised Robin that there was no such rank as Lieutenant-Compounder, who duly replied to Burberry on 1 November 1911 to advise him of this, and that only Sergeant Dispensers were "provided for on the establishment".²⁵

Where the idea that there was such a position as Lieutenant-Compounder in the New Zealand Armed Forces came from is unknown. It is likely, however, that Burberry may have been encouraged in his approaches by an article in the *Chemist and Druggist of Australasia* (C&DA) on 1 February 1911, which outlined the roles available to pharmacists in the Australian Army Medical Corps within Australia's own newly-created compulsory militia training scheme.²⁶ In this article, the un-named author stated that "under the standing orders of the Australian Army Medical Services, paragraph 230, duly qualified and registered members of the Pharmaceutical Society of Australasia...may on first appointment be recommended for the rank of honorary lieutenant."²⁷ With New Zealand enacting their own compulsory military training scheme in 1909, it is possible that Burberry may have considered that the two schemes had the same structure or were under the same aegis as both countries were Dominions of Imperial Britain. This supposition, however, proved to be incorrect.

²⁴ Letter from AG to DGMS, 26 October 1911. 'Commissions - Honorary Commissions to Pharmacists'.

²⁵ Letter from AG to Burberry, 1 November 1911. 'Commissions - Honorary Commissions to Pharmacists'. See Introduction (pp. 25-26) for definition of 'establishment'.

²⁶ 'The Pharmacist and the Defence Force', *Chemist and Druggist of Australasia* 26, no. 2 (1 February 1911): 4. A copy of this article was included in the Archives New Zealand file 'Commissions – Honorary Commission to Pharmacists', AAYS 8652 AD19/1 18/22.

²⁷ 'The Pharmacist and the Defence Force', 4.

Not to be discouraged, on 1 July 1912 Burberry wrote again to apply for the position of honorary Lieutenant-Compounder, this time further up the chain of command to Major General Sir Alexander Godley directly. This letter was in response to a “recent call for more instructors in this branch,” and within it, Burberry stated that he was applying under the “conditions which exist in the Australian Defence Scheme,” attaching a copy of the article from the 1911 edition of the *C&DA* to bolster his claim.²⁸ Burberry offered himself as a both a qualified pharmacist and trainer, continuing the educational requirements in the area of military sanitation as well as dispensing duties for those pharmacy apprentices who were undergoing compulsory military training. Expansion of the role of honorary Lieutenant-Compounder to all areas of the country was also pitched by Burberry to be of “mutual advantage if an appointment was made of a qualified pharmacist, say, for each centre who would have the training of territorials in dispensing and sanitary duties.”²⁹ To further strengthen his position, the experience of the Japanese military during their earlier war with Russia was cited as a prime example of the role of pharmacists holding commissions in the military, as according to Burberry, “the Japanese had provision for a qualified Pharmacist with every Sanitary corps, field division and base hospital.”³⁰ His letter was acknowledged by a reply from Colonel G. C. B. Wolfe, a different Adjutant-General, on 3 July 1912, reiterating to Burberry that there “is no vacancy for such an appointment in the New Zealand Forces.”³¹

The subject of commissions for pharmacists continued to be raised intermittently before the war, with Burberry as the principal antagonist. As Secretary of the Central

²⁸ Letter from Burberry to Sir Alexander Godley, 1 July 1912, ‘Commissions - Honorary Commissions to Pharmacists’.

²⁹ *Ibid.*

³⁰ *Ibid.* The Russo-Japanese war was waged between 1904 and 1905, ending with a Japanese victory. No material regarding the Japanese medical services of this war in English have been identified.

³¹ Letter from Wolfe to Burberry, 3 July 1912, ‘Commissions - Honorary Commissions to Pharmacists’.

Pharmaceutical Association of New Zealand (CPANZ) in Wellington, Burberry wrote to the Hon. James Allen, Minister of Defence, on 9 August 1913 restating his earlier request for the provision of honorary Lieutenant-Compounder commissioned positions. This time, Burberry did not make the request for himself, but on behalf of the members of both the CPANZ and “the qualified Pharmacists of New Zealand.”³² This letter was sent as the result of a resolution passed at a meeting by the Associated Pharmacists of New Zealand, stating “That the Chemist’s Federation should approach the Defence Authorities and ask if it was not possible – that Qualified Pharmacists should be given the rank of ‘Honorary-Lieutenant-Compounder’ – training camps having shown the necessity for ‘Qualified Dispensers.’”³³ After pressing his case in order to “safeguard the public interest” and for pharmacists to provide a service as a liaison with the MOs to prevent “the many cases of neglect” in the training camps that had allegedly been reported in the newspapers, Burberry went on to

point out that those assistants who are serving are not qualified to dispense, unless under our supervision – nor can they come under the heading of the English Army Compounders – which applies only to those men who have passed through certain examinations – which are compulsory in the “Standing Orders” of the R.A.M.C.³⁴

Prior to replying to Burberry’s letter, Allen directed it to DMS James Purdy for review and comment. Purdy’s hand-written response to Allen on 13 August 1913 was used as the basis for Allen’s subsequent reply to Burberry on 25 August 1913, definitively re-stating the position that there was no rank or position of Honorary Lieutenant-Compounder in the Defence Forces.³⁵ This letter not only cemented the rank of

³² Letter from Burberry to James Allen, 9 August 1913, ‘Commissions - Honorary Commissions to Pharmacists’.

³³ Ibid.

³⁴ Ibid. R.A.M.C. is the acronym for Royal Army Medical Corps (UK).

³⁵ James Allen to Burberry, 25 August 1913, ‘Commissions - Honorary Commissions to Pharmacists’.

pharmacists as NCOs, but dismissed the newspaper reports of neglect in training camps as being “highly coloured as was proved on investigation,” and countered the claim that Japanese pharmacists were commissioned officers.³⁶ While Allen acknowledged that Japanese apothecaries were indeed commissioned officers, they were in fact ‘scientific’ chemists that were “highly qualified and act as analytic chemists for the Army.”³⁷ This differentiated them from Compounders in the Japanese Army, who, similar to the French, Russian and Spanish forces, were non-commissioned. According to Allen, these commissioned Japanese apothecaries were “highly trained scientific chemists while the Compounders are non-commissioned.”³⁸

Not only did both Purdy and Allen differentiate between ‘scientific’ chemists (who “are not associated with Medical Officers”) and compounders, both also stated that “compounders could not possibly act for Medical Officers.”³⁹ With this assertion, Allen supported Purdy’s contention that pharmacists occupied a significantly lower professional stratum to doctors, and also indicated that the authorities considered there were two distinct levels of pharmacy education. Of these levels, one involved considerable skill and a higher education with a strong chemistry or laboratory foundation (‘scientific’), and the other as a fairly basic, relatively unskilled occupation (‘compounder’). While the professional distinction between pharmacists and doctors was reiterated, no claim had been made by Burbery in any of his correspondence that he was seeking a role as a commissioned officer in order to act *in place* of doctors or MOs, only suggesting that pharmacists could perform their duties alongside the MOs in a collaborative approach in order to ease the burden of work. These inter-professional tensions between the different

³⁶ Ibid.

³⁷ Ibid.

³⁸ Ibid. It is unclear where Allen’s information on the Japanese pharmacists came from.

³⁹ Letter Purdy to Allen, 13 August 1913, ‘Commissions - Honorary Commissions to Pharmacists’. James Purdy M.B., C.M. studied medicine at Aberdeen College in Scotland and gained his degrees in 1883.

health professions and their implications will be further discussed in Chapter 5, while differences between educational pathways for the professions will be considered in Chapter 6.

New Zealand Pharmacists – Wartime

“It is a matter of great regret to me that I cannot send you a large amount, but I am sending my only son and that I trust will equalize matters somewhat.”⁴⁰

Immediately on the declaration of war in 1914, Burberry, in his role of Secretary of CPANZ in Wellington, wrote to the editor of the *C&DA* on 14 August 1914, asking if the Australian authorities had granted commissioned rank for pharmacists in the Australian Defence Forces, stating that the New Zealand pharmacy authorities had resurrected the issue in New Zealand but without success.⁴¹ As noted above, it was the CPANZ (and specifically Burberry himself) who had previously attempted to obtain commissions for pharmacists in the Reserves, rather than New Zealand’s national pharmacy regulatory body, the PBNZ. Burberry also noted in his letter that “The English Territorial Army have made provision for qualified chemists, also Germany and Switzerland, and we think it is our right to have official recognition.”⁴² While the reference to commissions for pharmacists in the English Territorial Army was incorrect as the highest rank available under the British Imperial Army model for British pharmacists was Staff-Sergeant (non-commissioned officer rank), Burberry is, however, correct with regard to the ranks

⁴⁰ S. Bannister, ‘Letter to Pharmacy Board of New Zealand’, 4 June 1915. Box 14 81-084-14. Alexander Turnbull Library, Wellington.

⁴¹ J. C. Burberry, ‘Letter to Editor’, *Chemist and Druggist of Australasia* 29, no. 10 (1 September 1914): 337.

⁴² *Ibid.*

available to European military pharmacists who, as discussed in the Introduction, have had a long tradition of commissioned ranks for serving pharmacists.⁴³

The editor's reply, published with the CPANZ letter in the September 1914 edition of the *C&DA*, considered that concern with rank and status by pharmacists was unseemly and unproductive, and stated "To call the attention of the military authorities at the present time to this question would be useless and embarrassing. Their duty at the present time is to make the machine work – not to alter it."⁴⁴ Made at the very beginning of the war, the editor's attitude reflected the prevailing public belief that the war would be short-lived, and that it was more important to put aside issues of status and to do your patriotic duty, rather than create difficulties for the military authorities over what was then seen to be a relatively trifling matter.⁴⁵ The PBNZ, however, took up the challenge, with an approach to the Minister of Defence during 1915 to push for an improvement in the status of qualified pharmacists in the Army Medical Corps.⁴⁶ These representations were rejected summarily with the reply that "the Imperial regulations concluded the matter."⁴⁷ At this point, the PBNZ noted also in its Annual Report for 1915 that in concurrence with the Pharmaceutical Societies of Australasia (PSA), the combined Australasian regulatory bodies for pharmacy would approach the Pharmaceutical Society of Great Britain (PSGB),

⁴³ 'Appointments as Dispensers', *Chemist and Druggist* 85, no. 1803 (15 August 1914): 59; 'Pharmacists and Military Service', *Chemist and Druggist* 85, no. 1805 (29 August 1914): 63; 'Dispensers for the War', *Chemist and Druggist* 85, no. 1807 (12 September 1914): 34.

⁴⁴ Burbery, 'Letter to Editor', 337.

⁴⁵ The war was seen as a great opportunity for young men, and they enlisted enthusiastically for the opportunity to go overseas and have an adventure, with the public expectation that the war would be short and sharp. See, for example, 'Failure Recognised,' *Press* (Christchurch), 28 September 1914, 7; 'Short War Predicted,' *Waikato Argus* (Hamilton), 2 October 1914, 2; 'War Can't Last Long,' *Ohinemuri Gazette* (Paeroa), 2 October 1914, 2; 'Short War Possible: Lord Kitchener's Views,' *Terang Express* (Victoria), 2 October 1914, 3; 'Duration of the War: A Short or Long Campaign?,' *Daily Advertiser* (Wagga Wagga, NSW), 17 October 1914, 7; John Keegan, *The First World War* (London: Pimlico, 1999), 82; Harper, 19-25.

⁴⁶ C. W. Nielsen, 'Pharmacy Board of New Zealand Annual Report for Year 1915' (Wellington, 11 January 1916), 2.

⁴⁷ *Ibid.*

to request that the PSGB officially approach the British authorities on the same issue.⁴⁸ By this method, the PBNZ hoped to circumvent the New Zealand military by bringing about a change to British Imperial Army regulations through pressure brought to bear by Britain's own pharmaceutical regulatory body, in turn creating a 'trickle down' effect to the New Zealand military authorities.

Nevertheless, as both time and the war dragged on, it became abundantly clear that there would not be a quick resolution to the conflict in Europe. New Zealand pharmacists continued to volunteer for service or were conscripted after the passing of the *Military Service Act* on 1 August 1916.⁴⁹ The lack of commissioned rank continued to bother the PBNZ and regional New Zealand pharmaceutical associations.⁵⁰ On 28 March 1916, a deputation from the Board met with James Allen, the Minister of Defence, to advocate again for commissioned rank for serving pharmacists. The written response from the Minister was documented in the minutes of the monthly meeting of the PBNZ on 12 May 1916, and stated that the deputation's request for "granting of commissioned rank to pharmacists had been carefully considered, and could not be complied with, the rule being that soldiers holding civil qualifications in Pharmacy must qualify in all Corps [military] examinations before receiving promotions to non-commissioned rank."⁵¹ The letter continues to state that pharmacists had the ability to eventually attain the rank of quartermaster, but this was dependent on their skills as soldiers, and their abilities and merits within the corps as a unit.⁵² In other words, pharmacists needed to prove

⁴⁸ Ibid.

⁴⁹ *Military Service Act* 1916 (7 GEO V 1916 No. 8) (1916), New Zealand, http://www.nzlii.org/nz/legis/hist_act/msa19167gv1916n8266/. (28 September 2017).

⁵⁰ Regional New Zealand pharmaceutical associations included the Central Pharmaceutical Association, Otago Pharmaceutical Association, Hawkes Bay Chemist & Druggist Association of New Zealand, and Wairarapa Chemist and Druggist Association of New Zealand.

⁵¹ 'Minutes of Meeting Pharmacy Board of New Zealand', 12 May 1916, 65.

⁵² 'Commissions for Pharmacists in New Zealand - Pharmacists Enlisting', *Chemist and Druggist Australasia* 31, no. 7 (1 July 1916): 240.

themselves as soldiers first before being able to use their pharmaceutical training and qualifications for the benefit of the army. This meeting was also reported in the PBNZ Annual Report for 1916, where the correspondence throughout the previous year was summarised and the Minister of Defence's position that "Imperial Army regulations prevented the adoption of the course advocated so far as concerned the conferment of commissioned rank" was once again restated.⁵³ The Minister did not waver from this position for the entire duration of the war.

This stance from the Defence Department contrasts with the experiences for doctors, dentists, veterinary surgeons, and chaplains who were granted commissions immediately upon enlistment based on their civilian qualifications, and without any requirement to pass corps examinations or to have demonstrated military experience. The New Zealand Defence Department had stated that they were strictly following Imperial Army procedure; there was, however, no precedent in the Imperial regulations for dentists to receive commissions either.⁵⁴ Consequently, the PBNZ failed to understand "why qualified chemists fulfilling important functions should not be accorded at least the lowest commissioned rank."⁵⁵ The Defence Department was thus not consistent in its interpretation and application of Imperial Royal Army Medical Corps (RAMC) regulations. The Government was aware of this inconsistency, as questions were put to the Minister of Defence several times by Members of Parliament (MPs) during Parliamentary debates. The MP for Wellington South, Mr Alfred Hindmarsh, questioned Allen on 29 June 1916, as to whether the Minister of Defence would "consider the question of giving

⁵³ C. W. Nielsen, 'Pharmacy Board of New Zealand Annual Report for Year 1916' (Wellington, 11 January 1917), 2.

⁵⁴ W. Barrett and Leonard Bonnington, 'Letter to Members of Parliament', 1916, Box 14 81-084-14, Alexander Turnbull Library, Wellington; 'Letter to Minister of Defence from Registrar Pharmacy Board of New Zealand', 1922, Box 14 81-084-14, Alexander Turnbull Library, Wellington.

⁵⁵ 'Commissions for Pharmacists in New Zealand - Pharmacists Enlisting', 240. The lowest commissioned rank was 2nd Lieutenant.

commissions to chief dispensing chemists, so as to put them on an equality in regard to pay and status with dentists, nurses, doctors, and others applying special knowledge to army work, as is done in Canada, France, Japan, Italy, and other countries?”⁵⁶ Allen’s reply stated that the procedures of the Imperial Army were strictly followed, with

the rule being that soldiers holding civil qualifications in pharmacy must qualify in all corps examinations before receiving promotion to non-commissioned rank. Commissions in the New Zealand Medical Corps are granted to qualified medical men, the only exception being that the rank of honorary lieutenant and quartermaster and honorary captain and quartermaster is given by selection on account of merit and ability to non-commissioned officers who have passed all the corps examinations, which include the subject of pharmacy. As it is considered advisable to adhere strictly to the above rules it is not possible to grant commissions to chief dispensing chemists, as such.⁵⁷

On 5 July 1916, Dr Henry Thacker, MP for Christchurch East repeated the question, asking the Minister of Defence “Whether he will make it possible for a duly qualified pharmacist to obtain a commission in our Forces?” and noted that “Tunnellers [miners], dentists, and doctors can and do qualify.”⁵⁸ The Minister’s reply to this question in the House reiterated that the Defence Department did not intend to go outside the procedure as intimated by the regulations of the RAMC, “under which it is not possible for a qualified pharmacist to be granted a military commission as such.”⁵⁹

Not only were qualified pharmacists not granted commissions, but the army did not differentiate between qualified and registered pharmacists and those who were unqualified,

⁵⁶ *Parliamentary Debates*, vol. 176 (Wellington: Government Printer, 1916), 306. A letter-writing campaign by constituents to local Members of Parliament was organised by pharmacists in the Canterbury and Westland districts, W. Barrett and Leonard Bonnington (see footnote 54).

⁵⁷ *Ibid.*, 306–7.

⁵⁸ Legislative Council and House of Representatives, *Parliamentary Debates*, 176:483.

⁵⁹ *Ibid.*

but who worked as ‘chemist’s assistants’ in civilian life. These assistants were pharmacy apprentices who had done their indentured time, but had failed their final examinations for registration. This situation remained problematic for most of the war. Again, the *C&DA* of September 1916 noted that the New Zealand military were overlooking qualified men in favour of unqualified men in their selections for roles as dispensers.⁶⁰ By promoting unqualified men over the top of qualified and registered pharmacists, the New Zealand army sent a strong signal to the profession that it did not consider the role of pharmacist to be of high importance or value, and that the role as it stood could be done by anyone who had only a modicum of experience within the pharmacist’s trade. It is possible, however, that those who were promoted had a greater degree of *military* experience, or had served in the Reserves and were thus more familiar with the military organisation and structure. If this was indeed the case, it then becomes evident that the military authorities placed greater emphasis on martial skills rather than civilian function, and that experience in soldiering was accorded more value than technical knowledge and ability in the dispensary.

The PBNZ continued its efforts for recognition until at least late 1916, after which time it appears to have become resigned to its lack of success, and no further reporting of its endeavours was made. By this time, the Minister of Defence had passed the task of liaison with the PBNZ to the Minister of Munitions and Supplies, Mr Arthur Myers. A final attempt to obtain commissions was made by the PBNZ with a delegation to Mr Myers on 9 November 1916, who then made representations to the Minister of Defence on the PBNZ’s behalf. The outcome of this meeting was advised by Myers’ office and reported in the *C&DA* of 1 February 1917, who advised that “all men joining the NZMC

⁶⁰ ‘Pharmacists and Enlistment’, *Chemist and Druggist of Australasia* 31, no. 10 (1 September 1916): 336.

were taken as privates; that promotion was given in the corps by examination and merit...but if a vacancy occurred for the employment of a chemist, he was promoted without passing the corps examination.”⁶¹ The Minister then went on to advise that for promotion, “the fact that he was a chemist, masseur, chiropodist, or other specialist was taken into consideration.”⁶² Although waiving the requirement to pass corps examinations was a small concession to the PBNZ, the inclusion of pharmacists in this particular categorisation of minor or auxiliary health specialists gives insight into the positioning of the practice of pharmacy and the role of pharmacists within the military context by New Zealand military authorities.

Pharmacy’s Place in the New Zealand Army

That pharmacists were listed alongside masseurs and chiropodists indicates clearly how the military authorities viewed the legitimacy of pharmacy qualifications. By not including the occupation of pharmacy and pharmacists with their civilian qualifications on the same level as doctors or dentists, the New Zealand military deemed that the supply and dispensing of medicines was not a necessary or valued health profession. It is likely that the difference in educational pathways between doctors and dentists, who held university degrees, and pharmacists who were trained through an apprenticeship system, contributed significantly to this disparity.⁶³ This then effectively negated the civilian qualifications and increasing community status of the pharmacy profession through the perception of the medical service military authorities that pharmacy held a very minor role within the medical service, both in military and civilian spheres. This is also due in no small part to the New Zealand government’s strict adherence to the British Imperial Army regulations,

⁶¹ ‘Military Service and Promotion in New Zealand’, *Chemist and Druggist of Australasia* 32, no. 2 (1 February 1917): 42.

⁶² *Ibid.*

⁶³ Education of health professionals and their different pathways is discussed in further depth in Chapter 6.

which considered the role of an Army dispenser or compounder to be very basic. As such, no qualifications were required beyond a degree of literacy and numeracy, with no requirement for British Army dispensers to hold formal civilian pharmacy qualifications. The British Council of the Pharmaceutical Society recognised that this put qualified pharmacists at a distinct disadvantage, and that “the status of the Army compounders is an inferior one. The fundamental mistake is that Army dispensers are not required to be qualified pharmacists, and so long as dispensers are chosen from the ranks of the unqualified the case for improved pay and status is not a good one.”⁶⁴ By following the Imperial regulations, the New Zealand military authorities continued this position, downgrading both the status of the pharmacist and the place of pharmacy practice within the military medical services structure. Further examination and discussion of different educational pathways for health practitioners and their impact is the focus of Chapter 6.

All qualified pharmacists were required under New Zealand legislation to be paid-up members of the PSNZ (professional association) and hold registration from the PBNZ (regulatory body) in order to practice. This included hospital pharmacists as well as those serving the community in a retail environment. The *Pharmacy Act* 1880 not only set the requirement for registration, but also established the PBNZ, giving it the power to set examinations and to discipline and regulate pharmacists, as well as to maintain the register of qualified New Zealand pharmacists.⁶⁵ Section 19 of Part III of the *Act* sets out the specific requirements for both retail and hospital pharmacists to gain registration as

⁶⁴ ‘The Position of Pharmacists in the Army’, *Australasian Pharmaceutical Notes and News*, 1 August 1915, 32–33.

⁶⁵ *Pharmacy Act* 1880 (44 VICT 1880 No 26), New Zealand, http://www.nzlii.org/nz/legis/hist_act/pa188044v1880n26175/ (13 August 2017). Unlike in Australia, New Zealand’s *Sale of Poisons Acts* did not specifically name pharmacists as a ‘gatekeeper’ profession for the handling of toxic products. Anyone over the age of 17 was able to keep open shop for the sale of poisons, provided they were registered to do so, could store the products properly, keep a register of sales, and agree to the colouration of arsenic. See *Sale of Poisons Act* 1866 (30 Victoriae 1866 No. 13), accessed 16 April 2019; *Sale of Poisons Act* 1871 (35 Victoriae 1871 No. 53), accessed 16 April 2019.

pharmaceutical chemists in order to legally handle medicines and poisons, and for supplying the community's medication needs.⁶⁶ This legislation was enacted to eliminate the adulteration of medicines, and to legally remove from false or fake medicine-sellers the ability to use the titles of "pharmaceutical chemist, pharmacist [sic], chemist and druggist, dispensing chemist or other words of similar import, in any part of New Zealand."⁶⁷ Any person using these titles who was not on the PBNZ's register was liable for prosecution and a fine of £5.⁶⁸

By not requiring its own Army dispensers or compounders to be qualified or registered under the *Pharmacy Act*, however, the New Zealand government was essentially breaking its own law, affirming that pharmacy requirements of its military were held to a lesser standard than that mandated by law for the general public. Pharmacists who enlisted were concerned to realise that soldiers were expected to do without the minimum legal level of care that was required to be provided to the general public, and considered that the "[military] patient has as great a right to have his medicine compounded by a qualified dispenser as he has to be attended by a qualified medical practitioner."⁶⁹ It also begs the question – were those who were unqualified dispensers then able to be held legally accountable for any deaths or injuries due to drug handling errors? There is one example of an inquiry held into the death by drug handling error in the UK, that of a British flying cadet who had been given carbolic acid instead of quinine, which had been erroneously stored in a sauce bottle. Although two people were involved in the fatal error, the outcome was given as accidental death. Neither were qualified pharmacists and it is unknown what

⁶⁶ *Pharmacy Act* 1880 (44 VICT 1880 No. 26), 136.

⁶⁷ *Ibid.*, 137.

⁶⁸ *Ibid.*

⁶⁹ 'Pharmacists and the War', *Australasian Pharmaceutical Notes and News*, 1 December 1915, 29.

penalty or reprimand, if any, were given to the people involved.⁷⁰ Possible reasons for the lack of qualification or registration for army dispensers are, however, unable to be determined, other than that of precedence set by the British army model.

It is, however, possible that this lack of registration or qualification may have been an oversight on the government's part. As hospital dispensers did not have their own business and income stream but were paid a set salary, the government's inaction may have been borne from a desire to keep hospital subsidy costs to a minimum through paying an unqualified dispenser (one who had completed their training but failed their exams) a lower salary, rather than the higher rate of pay that a qualified pharmacist would demand.⁷¹ This fiscal position may have then had unintended down-stream consequences for those dispensers and pharmacists who enlisted in the armed forces.

That the New Zealand government did indeed employ unqualified and unregistered men in military dispensaries during at least the early part of the war is confirmed by evidence given by Dr Robert Stout at the Commission of Inquiry into the medical administration of Trentham Camp in 1915, established to investigate a severe outbreak of cerebrospinal meningitis within the camp.⁷² In his examination by the Commission, Dr Stout was asked where the camp dispensary was situated, and who was in charge of it. Dr Stout's answer was that the pharmacy was a marquee (tent), and that it was under the

⁷⁰ "Poisoned by the R.A.M.C." in Great Britain: Army Tragedies While Chemists Push Barrows', *Chemist and Druggist of Australasia* 33, no. 12 (1 November 1918): 368-369.

⁷¹ Public hospitals between 1910 and 1923 were administered through Hospital and Charitable Aid Boards, which were funded through a mix of levies (rates) on local bodies (local and regional councils), loans, donations, bequests, patient fees, and subsidies from central government. See, for example, John Angus, *A History of the Otago Hospital Board and Its Predecessors* (Dunedin: Otago Hospital Board, 1984), 132.

⁷² The outbreak killed 27 recruits and brought to light a medical service that was inadequate for the role. See Rogers, 12-13.

control of a “dispenser”.⁷³ The next question asked of Dr Stout was whether the dispenser was “a trained man,” the answer to which was “He was not a registered qualified chemist – not a M.P.S.”⁷⁴ There is, however, no evidence to suggest that the unnamed, unregistered and unqualified dispenser caused any injury to patients due to drug handling errors.

Internal politics and status issues within the pharmacy profession itself also impacted on the drive for recognition with commissioned rank. Hospital pharmacy was at the time held as a significantly lesser professional status than retail or community pharmacy. Retail pharmacy, therefore, held an ‘élite’ position within the profession. Salaries for hospital pharmacists were minimal, and there was little opportunity for advancement, particularly in comparison to retail pharmacists.⁷⁵ In New Zealand, hospital pharmacists were thought of as “drop-outs from retail pharmacy,” and they had no involvement with or specific representation on the Pharmacy Board.⁷⁶ This internal profession perception of the role of hospital pharmacists created tensions for enlisted pharmacists, as these were predominantly pharmacists with retail backgrounds. Retail or ‘élite’ pharmacists were thus being expected to do the job of a lower status hospital pharmacist on appointment to the position of Sergeant-Dispenser in the Medical Corps during the war, without the concession of a commissioned rank to recognise their already existing privileged standing within the profession. Class and status and their impact on military rank will be examined in greater depth in Chapter 6.

⁷³ ‘Trentham Camp Commission (Report of), Together With Minutes of Evidence’, in *Appendices to the Journals of the House of Representatives*, vol. 1915 I, H19B (Wellington: Government Printer, 1915), 321.

⁷⁴ *Ibid.* M.P.S. is the acronym for Member Pharmaceutical Society, a necessary requirement for registration.

⁷⁵ In 1923 hospital pharmacists were paid a salary of between £100 and £200 per annum, depending on the size of the hospital. An unqualified pharmacy retail assistant received £4 per week (£208 per annum), while a qualified assistant earned between £6 and £8 per week (£312-416 per annum). See Louise Shaw, ‘Prescription for Change? Dispensing With Men: A History of Women in New Zealand Pharmacy, 1881-1991’ (MA thesis, University of Otago, 1996), 35.

⁷⁶ Combes, 218. Also John Fraser, Professional Practice Fellow, School of Pharmacy, University of Otago, Dunedin. Personal communication, 7 September 2016.

Who Were They? The Database

Military pharmacists of WWI are invisible due to their very small number, the support function of their role or because they served in forward operational areas other than the Medical Service. In order to further examine this cohort and as part of the research into this project, a database was established of New Zealand pharmacists who enlisted during the period 5 August 1914 to 11 November 1918 (see Appendix 1). Historical research and writing traditionally takes a narrative approach, focusing on analysis and interpretation of texts, their frameworks and discourses. With increasing digitisation and corresponding ease of availability of archival material, however, the use of data to identify patterns, anomalies, and trends that can inform or strengthen a historian's interpretation is becoming more prevalent.⁷⁷ The rise of digital technologies and the development of large databases have resulted in new approaches to determining meaning within the historical record. Historians Fred Gibbs and Trevor Owens argue that, as with all historical analysis, context remains key, and that while data can be used as evidence by historians, "data are not necessarily evidence in themselves."⁷⁸ Context remains crucial, but data can be useful to the historian to underpin and reinforce traditional interpretations and arguments.

In history practice, the use of data is most valuable when quantitative methodologies interact with and complement qualitative methodologies. Uptake of quantitative methods has been slow by historians, however, with reluctance towards

⁷⁷ Fred Gibbs and Trevor Owens, 'The Hermeneutics of Data and Historical Writing', in *Writing History in the Digital Age*, ed. Jack Dougherty and Kristen Nawrotzki (Ann Arbor: University of Michigan Press, 2013), 159; Mark Finnane, Andy Kaladelfos, and Alana Piper, 'Sharing the Archive: Using Web Technologies for Accessing, Storing and Re-Using Historical Data', *Methodological Innovations* 11, no. 2 (2018): 2; R. J. Morris, 'Document to Database and Spreadsheet', in *Research Methods for History*, ed. Lucy Faire and Simon Gunn (Edinburgh: Edinburgh University Press, 2012), 155.

⁷⁸ Gibbs and Owens, 160.

including even simple graphs and tables in narratives.⁷⁹ Bob Nicholson attributes the reluctance of historians to engage with quantitative methods to the rise of postmodernism and the linguistic turn, with its strong emphasis on language and texts.⁸⁰ Unlike social scientists, who use data in complex mathematical and statistical ways to support their positions, data can be used by historians as exploratory tools to identify and develop research questions, and therefore “rigorous mathematics is not necessarily essential for using data efficiently and effectively,” nor do historians require data for hypothesis testing.⁸¹ One notable exception is David Noonan’s work on re-counting the casualties of WWI, where he uses extensive data analysis to great effect to challenge the accepted official Australian casualty figures for the conflict.⁸² Essentially, historians employ data in different ways than other, statistically-focused social scientists, yet its compilation can be equally heuristically valid.

In this thesis, data are used to chart key demographic parameters relating to the cohort of New Zealand pharmacists and those with a degree of pharmaceutical training who served in the New Zealand military during the war. As such, the unique database created specifically for this project by the candidate links names and personal details to individual practitioners who would be otherwise unknown. To accomplish this, a search was made of the Auckland War Memorial Museum online database *Cenotaph* through the ‘Occupation at Enlistment’ field in the custom search function, using keywords ‘pharmacist’, ‘pharmaceutist’, ‘pharmaceutical’, ‘chemist’, ‘dispenser’, and ‘compounder’. Filters were used to further limit the search to WWI. Resulting names and service

⁷⁹ Murray G. Phillips and Gary Osmond, ‘Australia’s Women Surfers: History, Methodology and the Digital Humanities’, *Australian Historical Studies* 46, no. 2 (2015): 287–88.

⁸⁰ Bob Nicholson, ‘Counting Culture; Or, How to Read Victorian Newspapers from a Distance’, *Journal of Victorian Culture* 17, no. 2 (2012): 238.

⁸¹ Gibbs and Owens, 161–62.

⁸² David Noonan, *Those We Forget: Recounting Australian Casualties of the First World War* (Carlton, VIC: Melbourne University Publishing, 2014).

numbers were entered manually into an Excel spreadsheet, then cross-referenced using the same occupational keywords with the database from the ‘NZEAF Project’, an Australian Defence Force Academy (ADFA) initiative, to ensure that all enlistees were identified.⁸³ A further 24 were included from the PBNZ Roll of Honour board. Seven additional New Zealand pharmacists were also identified who served with the armed forces of other countries, and as such, they have been omitted from the dataset. This resulted in a total database of 317 unique individuals.

This list was then checked against digitised military personnel files held in Archives New Zealand through their online search engine ‘Archway’. Removed at this point were 33 who, on detailed examination of their personnel records, listed their occupation on their enlistment forms as agricultural or analytical chemists, clerks, industrial chemists, chemistry laboratory assistants, or chemist shop assistants. Chemists who worked for wholesale drug houses Young’s Chemical Company in Wellington or Kempthorne Prosser (both Wellington and Dunedin branches) were also excluded as part of this group of 33 as these companies traded exclusively as medicine and therapeutic wholesaling houses, while those who worked for Auckland-based Sharland and Company remained in the dataset as Sharland’s operated retail pharmacies alongside their wholesale activities. There is, unfortunately, no way to be sure in which area of the business these employees worked.

The final figure of 284 consisted of those men enlisting in the New Zealand Army who were registered pharmacists, pharmacy assistants, or apprentices, which represented

⁸³ Peter Dennis, personal communication, 11 July 2018. Emeritus Professor Peter Dennis established the AIF and NZEF databases, taking information from the embarkation and nominal rolls, Roll of Honour circulars and the Office of War Graves records to track each serviceperson (as far as possible) who served in WWI. This was part of a wider project for the University of New South Wales, at the Australian Defence Force Academy based in Canberra. I was very graciously given permission by him to access these databases.

only 0.28 per cent of the 103,000 men who served in overseas operational areas, and 0.23 per cent of the total 124,000 who enlisted.⁸⁴ Assistants and apprentices have been included as it appeared to be relatively common for men with some degree of pharmaceutical training to be posted to the NZMC and who therefore may have worked as dispensers; however, personnel files are necessarily brief, and details of specific roles that individual soldiers performed are unfortunately few. It is not possible to consistently identify those who worked directly with medicines in dispensaries, those who worked as dispensers in the Field Ambulances, or those who performed other duties in the NZMC such as stretcher-bearers or orderlies.⁸⁵ Not all pharmacists who enlisted were posted to the NZMC; some were posted to infantry or artillery regiments either by their own request or by circumstance.

Limitations

This dataset is not intended to be a precise survey of serving New Zealand pharmacists. As the most comprehensive listing of their service so far assembled, however, it generates a broadly demographic snapshot of those who enlisted. As with any database, there are a number of limitations that must be accounted for. Age at enlistment cannot be verified, as there is evidence that some may have ‘adjusted’ their ages either upwards or downwards on enlistment. Murdoch Donald White, a chemist’s assistant for F. W. Reid of Whangarei, gave a birth year of 1892 on his enlistment form in 1917, stating

⁸⁴ Steven Loveridge, ‘Introduction’, in *New Zealand Society at War, 1914-1918*, ed. Steven Loveridge (Wellington: Victoria University Press, 2016), 26. The total NZEF contingent comprised approximately 10 per cent of New Zealand’s total population at that time. It is unknown what proportion of New Zealand’s general population were pharmacists or ‘chemists’ at this point. The 1911 Census does not specify ‘chemist’ or ‘pharmacist’ as a separate occupation, nor identify which category this occupation is part of. Class III, Order 7, Sub-order 3 includes those “Dealing in groceries, drinks, narcotics, and stimulants,” while Class V, Order 17, Sub-order 3 includes those involved in “Manufacturing groceries, drinks, narcotics, and stimulants.” It is unknown which Class pharmacists were part of.

⁸⁵ For ease of reading, for the remainder of this section I will refer to the entire cohort of qualified pharmacists, assistants and apprentices as ‘pharmacists’, as all will have had some level of pharmaceutical training or background.

his age as 25 years.⁸⁶ In a Department of Internal Affairs Births, Deaths and Marriages (BDM) online search of death records, however, his recorded year of death was 1951, with a stated age at death on the website of 54 years. If this is correct, his actual birth year would have been 1897, not 1892. Assuming the official BDM information is correct, White would have, in actuality, only been 20 years old on enlistment, not 25.

Similarly, James Vincent O'Connor of Hamilton stated his age at enlistment in 1916 as 43, with a birth year of 1873. Upon his medical examination, however, the MO noted that his apparent age was 50. Although the MO rejected him on grounds of his suspicion of advanced age, O'Connor did serve in the Army, but other than a single return voyage on a troopship, did not serve overseas, and spent the war working in the Awapuni (Palmerston North) and Narrow Neck (Auckland) military camps.⁸⁷ On the BDM website, O'Connor died in 1946, with an age at death of 89 years. If this is correct, his true birth year would have been 1857, making his age at enlistment 59.⁸⁸ Other than for O'Connor, the stated age at enlistment has been used in the database as there is no way to reliably verify if this is correct or otherwise.

Occupation at enlistment is also difficult to determine conclusively. Age of enlistee is a key indicator for apprentices, as in order to be registered as a pharmacist, an apprentice had to not only have passed his exams, but also have attained his majority, i.e. celebrated his 21st birthday. It is therefore reasonable to infer that all enlistees aged less than 21 in the dataset are likely to be apprentices. Self-identification of occupation can be problematic, as 'chemist's assistant' may have been shortened to 'chemist' either by the

⁸⁶ 'WHITE, Murdoch Donald - WW1 48813 - Army', 1918 1914, W5557/71 121531, Archives New Zealand, Wellington.

⁸⁷ 'O'CONNOR, James Vincent - WW1 3/2666 - Army', 1918 1914, W5549/92 87664, Archives New Zealand, Wellington.

⁸⁸ The upper age range cut off for enlistment was 55.

recruiting clerk completing the enlistment form, or by the enlistee himself. This also cannot be verified with accuracy.

At this time, it is not possible to conduct a comparative analysis between the New Zealand and Australian cohorts. This is due mainly to specific issues with the datasets for both countries. Peter Dennis and Jeffrey Grey, in their chapter on New Zealanders serving in the Australian Imperial Force (AIF), also identified that the database record on both sides is incomplete, with missing names, errors of fact arising either from the Recruitment Officer mishearing or the enlistee deliberately providing inaccurate information, or through accidental human error.⁸⁹ Data entry errors by those transcribing the original material into either the ADFA or Cenotaph databases may also have occurred.⁹⁰ Other issues also arise that prevent such an analysis at this time. These include the fact that the information collected at point of enlistment in each country is different, each country having different potential classification categories relating to their own enlistment forms. Of course, neither country at the time could have possibly foreseen that at some stage, researchers would be seeking to conduct an analysis of this information. Differing categories between the trans-Tasman nations is not, however, unusual, as Gordon Carmichael makes clear in his analysis of passenger cards for population movement between the two countries between 1947 and 1990, emphasising that limitations to these data can be influenced by “(1) source documents and conventions, definitions and classification concepts...and (2) changes in these areas over time.”⁹¹

⁸⁹ Peter Dennis and Jeffrey Grey, ‘New Zealanders in the AIF: An Introduction to the AIF Database Project’, in *New Zealand’s Great War: New Zealand, the Allies and the First World War*, ed. John Crawford and Ian McGibbon (Auckland: Exisle Publishing, 2007), 398.

⁹⁰ Five of the New Zealand pharmacists have additional service numbers, with numerical transposition at time of data entry being the main cause.

⁹¹ Gordon A. Carmichael, ‘Beware the Passenger Card! Australian and New Zealand Data on Population Movement between the Two Countries’, *The International Migration Review* 27, no. 4 (1993): 821.

Reasons for information collection also differ between different countries, depending on for what purpose the data is collected and what each country expects to get out of the information. Charlotte Macdonald and Rebecca Lenihan argue that military personnel files have a primary focus on financial or accounting liability of the soldier “as a resource to be tracked, to be supplied, to be transported and also to be expended”, and also constituted a disciplinary record.⁹² Although their paper discusses nineteenth century Imperial records, with New Zealand using the British model for their army structure, it is unlikely that much had changed in the type of information required to record and track individual men by the early twentieth century.

Specific differences between the data collected on enlistment forms between New Zealand and Australia during the war include the fact that New Zealand’s forms were standardised and nationally based, whereas Australia had six states that each collected information in slightly different ways, and were different again to that collected by New Zealand. Issue of New Zealand’s service numbers to enlistees followed a single national numbering protocol, while each state in Australia had their own numbering system, resulting in potential non-unique service numbers for each soldier. Not only was it possible for there to be, for example, up to six soldiers with the same service number, but some Australian states also re-used numbers if the original soldier was killed in action or died of wounds.⁹³ Another contributing limitation was length of service. Based on the review of personnel files for this database, service for New Zealand soldiers who enlisted as volunteers or who were conscripted after 1 August 1916 appeared to be continuous until either medically discharged or on their return to New Zealand at the end of the war.

⁹² Charlotte Macdonald and Rebecca Lenihan, ‘Paper Soldiers: The Life, Death and Reincarnation of Nineteenth-Century Military Files Across the British Empire’, *Rethinking History* 22, no. 3 (2018): 379, 382–83, 395–96.

⁹³ Peter Dennis, Personal communication, Canberra, 11 July 2018.

Australian soldiers could gain discharge at their own request, then re-enlist after some months, creating duplicate and sometimes even triplicate enlistment records.⁹⁴ Bearing these issues in mind, it is not to say that a comparative study cannot be attempted at all; rather, that such a study will require a significant degree of time and resources to be conducted, which is outside the scope of this thesis.

The Cohort

Of the dataset of 284, only 84 held PBNZ registration numbers. Those who were self-employed, presumably in their own pharmacy, numbered 40, but not all of these appeared to be registered, with seven not having registration numbers. By 1914, all pharmacists covered under the ‘grandfather’ clause of the *Pharmacy Act 1880* should have died, retired or otherwise been too old to enlist.⁹⁵ As a pharmacist was required to be registered in order to own his own pharmacy, it appears possible that the PBNZ records may have been incomplete.⁹⁶ The remaining 200 were employees or, in the case of four, were either of unknown employment (not stated on the enlistment form) or unemployed. Those who self-identified as assistants numbered 84, and of the 60 whose age at enlistment was below 21, only two definitively stated they were apprentices. Of the remainder, 13 held the occupation of dispenser (one specifically in a hospital), one was a chemist and dentist, and one was a chemist and surgeon.

⁹⁴ For example, see ‘Abraham Walter Hubert: SERN 20088: POB Sydney NSW: POE N/A: NOK W Abraham Marion’, 1914-1920, B2455, National Archives of Australia, Canberra. Walter Abraham first enlisted in Sydney, NSW on 17 March 1917, and re-enlisted for a second time on 27 April 1918.

⁹⁵ ‘*Pharmacy Act 1880* (44 VICT 1880 No. 26)’ (1881), New Zealand, http://www.nzlii.org/nz/legis/hist_act/pa188044v1880n26175/. (accessed 13 August 2017). The ‘grandfather’ clause permitted pharmacists who had completed their apprenticeships and who had been operating a pharmacy business prior to the enactment of the legislation to receive registration without examination (Fourth Schedule).

⁹⁶ Combes, 11, 31–34.

The average age of enlistment for the cohort was 26 years. This corresponds to the national average age at enlistment of 27 years for the total contingent of New Zealand WWI soldiers.⁹⁷ As to be expected, the majority of pharmacists who enlisted were young men aged between 21 and 29 years, with 154 (54 per cent) who stated their age falling within this band. Sixty (21 per cent) were younger than 21 years; a further 59 (21 per cent) were aged 30 to 39 years. Only nine were aged in the 40s band, while two were 50 years or older (including the aforementioned James O'Connor).

Most were New Zealanders by birth, with 230 (81 per cent) stating a place of birth within the country. Australian-born pharmacists numbered 15 (five per cent), while those born in England, Scotland and Ireland totalled 37 (13 per cent). One was born in Fiji, and another was born in India. Migration throughout the British Empire during the nineteenth and early twentieth centuries was fluid and easily accomplished, and this is reflected in the colonial birthplaces of the cohort. Until the 1940s, most migrants to New Zealand were categorised either as British (from Great Britain, Australia, Canada, South Africa, India and other nations of the Commonwealth), and foreign (from non-Commonwealth countries), and those who were white and of British (Commonwealth) descent “could enter and reside freely as New Zealanders.”⁹⁸ That no pharmacists came from continental Europe or the United States of America indicates the strength of social and cultural ties between Britain and its Dominions.

Correlating with the majority of enlistees being in their late teens or twenties, the majority also stated that they were single men. A total of 229 (81 per cent) were recorded

⁹⁷ Loveridge, ‘Introduction’, 30.

⁹⁸ Malcolm McKinnon, Barry Bradley, and Russell Kirkpatrick, eds., *Bateman New Zealand Historical Atlas: Ko Papatuanuku e Takoto Nei* (Auckland: David Bateman in Association with Historical Branch Dept of Internal Affairs, 1997), 76. Persons of colour of British descent were not permitted to reside freely in New Zealand, irrespective of their status as members of the British Commonwealth.

as unmarried at the time of enlistment, and while a very small number subsequently married during the course of the war, most of these remained unmarried until the war was over.⁹⁹ Only 43 (15 per cent) were married on enlistment, while two were divorced, one was a widower, and a further nine did not indicate any marital status at all. The youngest of those who were married was 22 years old with a further 17 in the 20 to 29 age band, while 19 were in their 30s, and six were aged 40 and upwards.

Enlistment by year indicates that the majority of pharmacists signed up during 1916 and 1917.¹⁰⁰ The war began for New Zealand on 5 August 1914, and by December of that year, 22 pharmacists had enlisted. Fifty-nine enlisted in 1915, while 1916 and 1917 were nearly identical with 98 and 100 enlistees, respectively. Conscription was introduced in New Zealand on 1 August 1916, but the majority of those enlisting after this date continued to be volunteers. Only five enlisted during the period 1 January to 11 November 1918, and all were volunteers. This is likely to be due in large part to the arrangement that the PBNZ came to with the Department of Defence which originated early in 1916, when the Minister for Munitions and Supplies, Mr Arthur Myers, first recognised that as a result of men volunteering to fight, a serious shortage of pharmacists within the community was evident.¹⁰¹

As a result, after conscription, the Department of Defence and the National Efficiency Board permitted the PBNZ to advocate on behalf of those pharmacists who had been called up in the conscription ballots on the grounds of public interest.¹⁰² Community

⁹⁹ Less than a dozen married during the term of their service.

¹⁰⁰ These correlate to calendar years, January to December.

¹⁰¹ Arthur Myers, 'Letter to Pharmacy Board of New Zealand Registrar', 24 March 1916, Box 14 81-084-14, Alexander Turnbull Library, Wellington.

¹⁰² The National Efficiency Board was established in 1917 to consider exemptions from conscription in order to ensure the continuity of essential services.

pharmacies were closing as a result of lack of registered pharmacists or enrolled pharmacy managers, and particularly for rural townships, this created problems as patients were unlikely to be able to obtain needed medicines.¹⁰³ Some pharmacists who were called up in the ballot were responsible for large rural areas, such as George Smith, who stated in his letter of 6 November 1917 to the PBNZ that he was the only remaining pharmacist in his district, which encompassed “Puketeraki [Karitane], part of Waikouaiti, Macraes, Green Valley and up the north line including Hampden,” in the North Otago district.¹⁰⁴ Smith advised that he had been working on his own for the past two years as his assistants had all enlisted, and that if he were to go into camp as ordered, it would be to the serious detriment of public interest and welfare.¹⁰⁵

Similarly, the President of the Christchurch Chemists’ Association wrote in September 1917 in support of an appeal application by Arthur Derbidge, a Sydenham, Christchurch, pharmacist, advising that if Derbidge were to go into camp, he would be required to close his business as there were no qualified men to take charge of it, which would reduce the number of pharmacists serving an area with a population of 20,000 to only two.¹⁰⁶ Although Myers, and later the Department of Defence and the National Efficiency Board, acknowledged the social role of pharmacists in the community through the issue of a shortage of pharmacists in the civilian sphere, corresponding recognition of the specialised role and legal requirements for pharmacists to be registered in order to keep open shop and practice did not, however, transfer to the military environment. Both Smith and Derbidge’s appeals were successful, and they did not serve in the NZEF.

¹⁰³ It was illegal to open a pharmacy for business without either a registered pharmacist or enrolled pharmacy manager present on the premises.

¹⁰⁴ George Smith, ‘Letter to Pharmacy Board of New Zealand’, 6 November 1917, Box 14 81-084-14, Alexander Turnbull Library, Wellington.

¹⁰⁵ *Ibid.*

¹⁰⁶ J. A. Coltart, ‘Letter to New Zealand Pharmaceutical Society’, 17 September 1918, Box 14 81-084-14, Alexander Turnbull Library, Wellington.

As far as can be identified from the personnel files, 165 were allocated an initial posting to the NZMC, including those who were attached to field ambulances or hospital ships, and mostly at the rank of private. Some did not stay there but later transferred away from the NZMC to pursue progression through the ranks in infantry or artillery units. While duties that pharmacists could be assigned to in the NZMC included field dispenser, stretcher-bearer, orderly, clerk or other non-commissioned support roles, pharmacists could also be posted to other specialist units. William Brosnahan, a 33 year old qualified pharmacist originally from a small rural town on the South Island's West Coast, was posted to the New Zealand Veterinary Corps, and served his time in the No. 2 New Zealand Camel Corps as part of the New Zealand Mobile Veterinary Section in Egypt, using his pharmacy training to provide treatment for the animals.¹⁰⁷

Of the 284 who enlisted in the NZEF, 33 (12 per cent) died while on active service between 1914 and 1918 (see Tables 3 and 4). This includes those who died from illness or accident, as well as those killed in action, died of wounds, or who were missing in action and presumed killed. In comparison, of the total 103,000 New Zealand soldiers who served overseas, 16,700 (16 per cent) did not return at the end of the war.¹⁰⁸ It is possible that the lower percentage of pharmacists who died may have reflected their increased prospects of being posted to hospital ships and stationary or base hospitals, and were therefore less likely to have come under fire or to have been placed in harm's way. The youngest, James Muir Cameron, was 19, and succumbed to pneumococcal meningitis

¹⁰⁷ 'BROSNAHAN, William Godfrey - WW1 17121 - Army', 1918-1914, W5530 1 18552, Archives New Zealand, Wellington; C. J. Reakes, 'New Zealand Veterinary Corps', in *The War Effort of New Zealand* (Auckland: Whitcombe and Tombs, 1923), 155–59. Pharmacists in rural or isolated areas were often the only person in the community with any health training, and became not just the pharmacist, but also the doctor, dentist, midwife and vet. See Combes, 19.

¹⁰⁸ Crawford and McGibbon, 16.

while serving on board the hospital ship *Maheno* on its first charter in 1915.¹⁰⁹ The two oldest were 38, Erdington Goodwin and William John Ingle, who died within a month of each other of wounds received in France in mid-1918.¹¹⁰ All but three of the deaths in the 19 to 29 age band were directly attributable to war service, along with 11 of the 18 who died in the 30 to 39 range. Immediately post-war, by 1922 a further two had died from illnesses contracted during their time with the NZEF, and one from an overdose of morphia a month after the end of the war.

Table 3: *Deaths of New Zealand Military Pharmacists during WWI*

	1914	1915	1916	1917	1918	Total
Deaths per year of war	1	6	3	10	13	33

Table 4: *Cause of Death Between 1914 and 1918*

Killed in action	Missing in Action	Died of wounds	Drowned	Accident	Illness
15	3	6	3	1	5

James Samuel Bird and Charles Victor Rhodes were drowned when the *Marquette* was torpedoed off Salonika in the Aegean Sea, while staff and equipment of No. 1 New Zealand Stationary Hospital were being transferred from Egypt to a new location in Salonika, Greece in October 1915.¹¹¹ As the *Marquette* was not a hospital ship and was also transporting war materiel such as mules, guns and ammunition, she was therefore not protected by the Geneva Convention against enemy aggression.¹¹²

¹⁰⁹ 'CAMERON, James Muir - WW1 3/761 - Army', 1915-1914, W5530 35 21956, Archives New Zealand, Wellington.

¹¹⁰ 'GOODWIN, Erdington - WW1 16/1326 - Army', 1918 1899, W5515 73 6326, Archives New Zealand, Wellington; 'INGLE, William John - WWI 3/2148 - Army', 1918 1914, W5541 44 58842, Archives New Zealand, Wellington.

¹¹¹ 'BIRD, James Samuel - WWI 3/564 - Army', 1914-1915, W5520 84 14846, Archives New Zealand, Wellington; 'RHODES, Charles Victor - WWI 3/622 - Army', 1914-1915, W5550 69 97373, Archives New Zealand, Wellington.

¹¹² Carbery, 121.

Suffering from a progressively worsening and long-standing mental illness that was not identified in his enlistment medical examination Daniel Bardsley, aged 25, committed suicide in April 1915 by throwing himself off the troopship *Tahiti* which was returning him to New Zealand from Egypt six days prior to arrival at Wellington.¹¹³ By 1932, a total of four pharmacists had died from self-inflicted means, one by drowning (above) and three by overdose of a self-administered drug. With the exception of Bardsley who had a pre-existing mental illness, their personnel files contain no information as to whether their actions were a result of war service, or if there were prior unresolved issues.

Influenza claimed Bertram Boock on 13 November 1918 in Featherston Camp, while meningitis was responsible for the deaths of James Cameron (above) and Bertram Onslow Stevenson, who died in 1918 while working in the Dental Section at No. 3 New Zealand General Hospital at Codford in England.¹¹⁴ Also within a week of the Armistice in November 1918, John (Jack) Trevor Peat died from malaria and was buried in Kantara War Memorial Cemetery in Port Said, Egypt.¹¹⁵ Ptomaine poisoning (food poisoning) was responsible for the death in October 1914 on board the troopship *Ruapehu* of ship's dispenser Jack Edward Gilchrist, part of the initial contingent sent overseas, and he was buried at sea while the convoy was in transit to Colombo.¹¹⁶

¹¹³ 'BARDSLEY, Dan - WW1 8/1186 - Army', 1914-1915, W5520 47 11156, Archives New Zealand, Wellington.

¹¹⁴ 'BOOCK, Bertram - WW1 3/2344 - Army', 1914-1918, W5520 98 16207, Archives New Zealand, Wellington; 'STEVENSON, Bertram Onslow - WW1 11587 - Army', 1914-1918, W5553 68 109203, Archives New Zealand, Wellington. Codford was the specialist hospital for New Zealand troops for dental services and also held the VD ward (see Chapter 4).

¹¹⁵ 'PEAT, John Trevor - WW1 3/829 - Army', 1914-1918, W5550 11 91584, Archives New Zealand, Wellington.

¹¹⁶ 'GILCHRIST, Jack - WW1 3/323 - Army', 1914, W5539 23 44719, Archives New Zealand, Wellington. See also the section on Typhoid and Vaccines in Chapter 4.

The single accidental death was that of Richard Henderson Fitzgerald, who died in April 1918 from accidental suffocation while intoxicated when stationed at the New Zealand Rifle Brigade Reserve Depot at Brocton Camp, close to the northern border between England and Wales. An inquest into his death determined that he had been found lying in a ditch outside the camp during the evening of 2 April, and was taken back into camp and laid face-down on a mattress in a hut to sleep it off. When he was found the next morning, it was discovered that he had vomited during his sleep and had inhaled it. Fitzgerald is buried in Cannock Chase Cemetery, Staffordshire.¹¹⁷

Of the 251 who survived the war, six died aged between 30 and 39 years. Nineteen died in their 40s (seven per cent), 26 in their 50s (nine per cent), 46 in their 60s (16 per cent), 67 in their 70s (24 per cent), 55 in their 80s (19 per cent), and seven in their 90s (two per cent). A further 21 were unable to be traced, and their death ages are therefore unknown. Although the majority of the cohort died during their 70s, the average age at death (excluding those whose age is unknown) was 64.¹¹⁸ The youngest was 19, and the oldest was 96 (see Table 5). It is possible that some of the 21 pharmacists who were unable to be traced may have also died during active service; this is, however, unlikely as their deaths would have been recorded in their personnel files, but this is unable to be verified conclusively at this point in time.

Table 5: Age at Death

19-29	30-39	40-49	50-59	60-69	70-79	80-89	90+	Unknown
25	18	19	26	46	67	55	7	21

¹¹⁷ ‘FITZGERALD, Richard Henderson - WW1 39040 - Army’, 1914-1918, W5537 99 40373, Archives New Zealand, Wellington.

¹¹⁸ It is unknown if this age corresponds to the total average of those serving in the NZEF, or if it is indicative of the average age at death for pharmacists born between 1875 and 1900. Handling chemicals without personal protective equipment or the use of fume hoods by early- to mid-twentieth century pharmacists may have impacted on the average life-span of this occupational group.

This cohort is typified by the war experience of Frederic James Newell, as many of his personal details match the median values for pharmacists who served. He was born in Auckland, New Zealand and was 26 years of age at enlistment on 8 January 1917. Although he does not appear on the 1910 list of registered pharmacists as he would have been only 19 at the time and thus underage, he was subsequently registered to practice as a pharmacist under registration number 949.¹¹⁹ At the time of his enlistment Newell did not own his own pharmacy, but worked for A. W. Le Quesne, and was living in Devonport, Auckland. Although single on the day of his enlistment, he married Bertha Eileen Mason on 30 January 1917 prior to entering training camp in March. Newell was posted to the NZMC at rank of private, and after several months of being transferred between the Featherston (Wairarapa) and Awapuni military camps, was sent overseas on the troopship *Tahiti* on 16 November. His son, James Frederick, was born two weeks later on 29 November. After arriving in the UK on 9 January 1918, he proceeded first to the NZMC and Field Ambulance Reserve Depot at Ewshot, then was sent to Étapes in France at the end of February as part of No. 2 New Zealand Field Ambulance. He returned to New Zealand on the *Athenic* in July 1919. Frederic Newell died in Auckland on 31 May 1954, aged 64.¹²⁰

By the Armistice in November 1918, nearly 300 New Zealand pharmacists or those who had a degree of pharmaceutical training (fully qualified and registered, as well as non-qualified assistants and apprentices) had voluntarily enlisted or, after 1 August 1916, had been conscripted. Although pharmacists made up an extremely small proportion of the total NZEF, they nevertheless immediately attempted to increase their range of prospects

¹¹⁹ 'Pharmaceutical Society of New Zealand Annual Report', 1910, MS-Group-1838 81-084-01, Alexander Turnbull Library, Wellington.

¹²⁰ 'NEWELL, Frederic James - WW1 3/3386 - Army', 1914-1918, W5549/75 85940, Archives New Zealand, Wellington.

beyond pre-war expectations and activities, yet continued to find themselves restricted in nearly every relevant military area, if they wished to use their training and serve as pharmacists.

Conclusion

In this chapter, the experience of New Zealand WWI military pharmacists has been identified and charted. Although there is a dearth of primary material that documents the everyday work practices in military dispensaries, personnel files go some way towards documenting and revealing the experiences of New Zealand military pharmacists. It is for this reason that the database was created; to generate a unique profile of a specific occupational sub-group of the cohort of New Zealand soldiers who served in WWI in order to understand more fully the nature of military pharmacy of the time. The creation and use of this type of demographic database as a tool for social historians and researchers of WWI can provide invaluable insights into the lived experience of specific occupational groups who served, such as doctors, dentists, nurses and for those who worked in other, non-health related areas such as engineers.

Sufficient sources remain to detail what had become the dominant political issue facing those pharmacists who enlisted for service, however. This issue was the lack of formal recognition for pharmacists' professional qualifications through the granting of commissioned rank. Precedence for retaining pharmacists at NCO rank began with the Boer War and resulted from the British Imperial model for military structure that New Zealand adopted for their own military. Martial (corps) skills were thus prioritised over occupational skills for pharmacists, although not for other healthcare practitioners. Although legislation had evolved for the regulation of pharmacists and their practice in the

civilian sphere by the early twentieth century, this legislative requirement did not carry over into the military purview. New Zealand military pharmacists were not recognised by the military authorities as professionals through the conferral of commissions throughout the course of the war, and were relegated to the otherwise invisible ‘Other Ranks’. This created consternation by the pharmaceutical regulatory bodies, who campaigned on behalf of their members to no avail, and the aspirations of New Zealand military pharmacists remained thwarted throughout the war.

New Zealand’s military pharmacists were marginalised in their country’s military environment. They were treated, not as health professionals with skills and specialised knowledge in the creation, storage and provision of medicines, but as labourers, undertaking the manual tasks of their profession under direction of the medical staff, but without recognition of their professional knowledge. Nor were their particular skills in the commercial world recognised by the New Zealand government. By focusing solely on martial requirements as specified by an out-dated British military structure, and not recognising pharmacists and their specialist skills in administering the supply chain of medical consumables while fully using their experience in inventory control, record-keeping and purchasing in roles such as medical quartermasters, the potential for significant cost saving as the war progressed was lost. That the government was also prepared to ignore its own legislative requirements for pharmacists to practice indicates the strong degree of deference by the Minister of Defence for the British Army military model.

In Chapter 2, the experience of Australian pharmacists is also recounted. A comparison between the two countries’ expectations and outcomes for military pharmacists indicates a significantly different political astuteness and willingness to go

against British Imperial authority by the Australian government in the administration and organisation of Australia's military.

Fig.3: Dispensary at No. 1 New Zealand General Hospital, Brockenhurst, UK, n.d.



Source: National Army Museum NZ (1992.750), Waiouru, New Zealand.

This is the only photograph of a WWI New Zealand military hospital dispensary. Rows of bottles are neatly labelled and stored, while crocks, jars and other containers sit at easy reach of the pharmacist or dispenser in a compact work space. Weights and scales for precise measuring of ingredients, a titration stand and a kettle suspended above what is possibly a Bunsen burner or Primus stove allude to the various ways of preparing medicines and remedies that pharmacists would have been routinely using. The orderliness and neatness of what was a working space for manual tasks indicates clearly the precision, careful habits and professional attributes required of the early twentieth century pharmacist.

Chapter 2: Military Pharmacy – Australia

Introduction

This chapter describes the experience of Australian military pharmacists during World War I (WWI). In the same way as for New Zealand in Chapter 1, Australian military pharmacy in the early twentieth century is absent from the historiography. As a result, this chapter is also primarily narrative in structure, telling the story of Australian military pharmacists and their role within the Australian military hierarchy in order to inform further analysis in the later chapters. Although Australian military pharmacists began the war on the same military footing as New Zealand military pharmacists, the Australian military pharmacy profession developed along an entirely different route. In order to understand why Australia's experience was so different to that of New Zealand, it is essential to first chart what actually occurred within military pharmacy for this country to create the divergence from the Imperial model of military structure that was rigidly followed in New Zealand. What this chapter will argue is that, unlike in New Zealand, Australian pharmacists were able to gain a degree of formal recognition for the value of a specific range of skills they possessed in the military medical environment. This was, however, of a limited scope. It is clear that their organisation and skills in stock handling, record-keeping and necessary administrative responsibilities attendant to these tasks were the factors that saw a limited number of Australian pharmacists achieve commissioned rank within the Australian Imperial Force (AIF), rather than through their professional training as health care providers with authority over both therapeutic and potentially poisonous remedies. This chapter thus charts the creation and progression of the Australian Army Pharmaceutical Service (AAPS), a division of the Australian Army Medical Corps (AAMC).

Although a full analysis of Australian military pharmacists through the establishment of a comprehensive database has not been attempted as for New Zealand (see Chapter 1), nevertheless some brief initial findings can be made as to the demographics of this cohort. Throughout the period of the war, some 417,000 Australian men enlisted, and of these, 330,000 served overseas.¹ An initial pass through the Australian Defence Force Academy (ADFA) database returned a total of 648 pharmacists, chemists, dispensers, dispensing and pharmaceutical chemists. Allowing for at least three with duplicated or triplicated records as discussed in Chapter 1, this equates to 0.20 per cent of the total overseas contingent for Australia, slightly less than for New Zealand. An average age at enlistment of 27 years was similar to that of New Zealand military pharmacists. Also similar to New Zealand, the majority were apparently unmarried, with 505 (78 per cent) stating that they were single on their enlistment forms. Although unable to verify conclusively at this stage, based on these initial broad similarities it can be reasonably inferred that there was parity between the cohorts of Australian and New Zealand military pharmacists.

Australian Pharmacy - Beginnings

As with New Zealand, few histories of Australian pharmacy have been written, with only one that addresses the development of pharmacy within the country as a national whole. Those remaining have been state-based, with all except one written by Gregory Haines, and cover the history of the pharmacy profession as it developed within each

¹ Bill Gammage, *The Broken Years: Australian Soldiers in the Great War* (Canberra: Australian National University Press, 1974), xvii; Joan Beaumont, *Broken Nation: Australians in the Great War* (Crows Nest, N.S.W.: Allen & Unwin, 2013), xv.

colony or state.² As a registered pharmacist who completed a doctorate in history in 1974, Haines has been uniquely placed to write about pharmacy history in Australia, with insights into the profession that would not be available to other historians. Pharmacy histories have not been written for all Australian states, however. Consequently, the literature for Australian pharmacy history is significantly limited, and this is reflected in the heavy dependence in this thesis on these various works of Haines, as well as the history of the Pharmacy Board of Victoria that has been produced by Janette Bomford and David Newgreen in 2005.

As with New Zealand, the European or Western medicine tradition arrived in Australia with the British. Unlike New Zealand, Australia was initially a penal colony for British criminals sentenced to transportation. It was the naval surgeons who accompanied the first penal fleet in 1787 under the command of Surgeon-General John White who first brought a limited range of European medicines into the country, when a convict settlement was established in what would become the city of Sydney in the state of New South Wales.³ Pharmacy in Australia during the early penal colony decades was, however, rudimentary, as with a very small, relatively young and healthy British population and no cash economy to speak of, there was little need for pharmacy or pharmacists.⁴ Pharmacy required economic and population growth to be established and this was only achieved with the arrival of free settlers in the early decades of the nineteenth century.⁵

² See Gregory Haines, *'The Grains and Threepenn'orths of Pharmacy': Pharmacy in N.S.W. 1788-1976* (Kilmore, VIC: Lowden Publishing Co., 1976); Gregory Haines, *Pharmacy in Australia: The National Experience* (Sydney, N.S.W.: The Pharmaceutical Society of Australia, 1988); Gregory Haines, *A History of Pharmacy in Victoria* (Melbourne: Australian Pharmaceutical Publishing Co. in association with the Pharmaceutical Society of Australia (Victorian Branch), 1994); Janette Bomford and David Newgreen, *The Pharmacy Board of Victoria: A History, 1877-2005* (Parkville, VIC: Pharmacy Board of Victoria, 2005).

³ Haines, *Pharmacy in Australia: The National Experience*, 15.

⁴ Haines, *'The Grains and Threepenn'orths of Pharmacy': Pharmacy in N.S.W. 1788-1976*, 8.

⁵ Haines, *Pharmacy in Australia: The National Experience*, 18.

Australia's first known qualified pharmacist or 'chemist' was John Tawell (albeit with somewhat 'irregular' qualifications). After arrival from Britain, he established a retail shop in Sydney in 1819, opening a business initially in Hunter Street, and later moving to a prime real estate location on Pitt Street.⁶ Tawell was a man of ambiguous integrity, however, and was executed in 1845 after murdering his mistress Sarah Hart with prussic acid when financial difficulties created problems in maintaining two separate households.⁷ Tasmania was the next colony to host a pharmacy business, with Michael Bates establishing the first shop in Launceston in 1825, after which John Wilkinson opened his pharmacy in Hobart in 1828.⁸ In Melbourne, Victoria, the first mention of a chemist shop came after the colony was established in the 1830s, and was thought to have been run by surgeon Dr Barry Cotter.⁹ Bomford and Newgreen note that this was not exceptional, as it was not uncommon in the early nineteenth century for medical practitioners to dispense medicines and fill their own prescriptions as well as provide medical consultations.¹⁰ As settlements were established, and the population grew, so too did the economy. This meant that business and trade for retail operations such as pharmacies could become sustainable, and thus economically viable.

During the late nineteenth and early part of the twentieth century, Australia and New Zealand pharmaceutical entities enjoyed close relationships. Trade and professional journals encompassed the interests of both countries, and although reciprocity of registration for qualified pharmacists on both sides of the Tasman Sea was not evident,

⁶ Haines, *'The Grains and Threepenn'orths of Pharmacy': Pharmacy in N.S.W. 1788-1976*, 14; Haines, *Pharmacy in Australia: The National Experience*, 22.

⁷ Haines, *'The Grains and Threepenn'orths of Pharmacy': Pharmacy in N.S.W. 1788-1976*, 17.

⁸ Haines, *Pharmacy in Australia: The National Experience*, 28–29.

⁹ Bomford and Newgreen, 3, 5.

¹⁰ Bomford and Newgreen, 7.

migration between the two Dominions was fluid and dynamic.¹¹ Internal reciprocity of individual Australian state qualifications also did not occur until WWI.¹² Close ties were maintained between Australia, New Zealand and British pharmaceutical bodies, and agreements of reciprocity of registration were made between the Dominions and the Pharmaceutical Society of Great Britain. Unlike New Zealand, however, Australia's regulatory bodies for pharmacy were state-based, and Australia did not create an overarching national body until 1977.¹³ Although each state oversaw regulation for its own pharmacists, there was recognition of strength in unity, with irregular meetings of state representatives of the wider pharmacy profession from 1886. These meetings also included representatives from New Zealand and became formalised as the Council of Pharmaceutical Societies of Australasia (CPSA), meetings became regular from 1907.¹⁴

From the database of New Zealand pharmacists, a small number of New Zealand-trained or registered pharmacists were identified who were resident in Australia at the outbreak of the war, and who joined the Australian Imperial Force (AIF). Four were born in New Zealand, while one was born in Bombay, India and one in Oxford, England (although his service record indicates he was born in Maffra, Victoria). Of the six, only one was posted to the AIF Army Medical Corps, while four joined infantry or artillery battalions, and the sixth entered the Australian Flying Corps. At the time of their enlistment, four were resident in New South Wales (three from Sydney; one from Orange), one in Victoria, and one in Tasmania. The average age for these six was, at 30 years, slightly older than that of the New Zealand cohort, with the youngest at 23 and the oldest at 41. Four were killed in action between 1916 and 1918, one died in Canterbury, New

¹¹ Haines, *Pharmacy in Australia: The National Experience*, 101–2.

¹² *Ibid.*, 79.

¹³ *Ibid.*, 368.

¹⁴ *Ibid.*, 35.

Zealand in 1960 at the age of 79, while the ultimate fate of the last one is unknown. As all stated 'Chemist' as their occupation at enlistment, it is reasonable to conclude that they were practicing pharmacists in their new country.¹⁵

Australian Military Pharmacists – Pre-war

In the same way as that of New Zealand, Australia also began preparations for potential conflict readiness by establishing a system of universal military training, with legislation for compulsory military training introduced to the House of Representatives on 29 September 1908.¹⁶ Under this proposal, enlistment in the cadets (aged 12 to 18) was compulsory, with the expectation that on turning 18, the cadet would then enrol in the Defence Force, with compulsory part-time military training continuing until the age of 26.¹⁷ The following year, the Australian government passed a modified version of the universal military training scheme, but as a mainly voluntary militia, to take effect from 1911.¹⁸ The Australian authorities permitted those pharmacists who signed up for part time military training in the Reserves to hold the rank of Honorary Lieutenant, in the same way as dentists.¹⁹ Once war commenced in 1914, however, pharmacists who then joined the AIF with a view to practicing their profession in the AAMC were required to enlist in

¹⁵ ALLEN, Cecil Tasman – Service Number – 13551, P107 M3955, National Archives of Australia, Sydney; Bonnington Louis: SERN 38319: POB Christchurch New Zealand: POE Sydney NSW: NOK M Bonnington Isabella, B2455, National Archives of Australia, Canberra; Conroy Charles William Gordon: SERN 4460: POB New Zealand: POE Orange NSW: NOK W Conroy Mary Jane, B2455, National Archives of Australia, Canberra; Dixon Wilfred John: SERN 497: POB Auckland New Zealand: POE Roseberry Park NSW: NOK F Dixon Joseph, B2455, National Archives of Australia, Canberra; GURR Albert Jackson: Service Number – Lieutenant: Place of Birth – Bombay India: Place of Enlistment – Liverpool NSW: Next of Kin – (Mother) GURR Mrs Eliza, B2455, National Archives of Australia, Canberra; MATHESON Harry Mackay: Service Number – 306: Place of Birth – Maffra VIC: Place of Enlistment – Broadmeadows VIC: Next of Kin – (N/A) MATHESON Angus Kenneth, B2455, National Archives of Australia, Canberra.

¹⁶ John Mordike, *An Army for a Nation: A History of Australian Military Developments, 1880-1914* (North Sydney, N.S.W.: Unwin and Allen (Directorate of Army Studies, Department of Defence), 1992), 197. The Australian authorities were mainly concerned about a potential threat from Japan at this time.

¹⁷ Mordike, 197.; Jeffrey Grey, *A Military History of Australia* (Cambridge: Cambridge University Press, 1999), 74.

¹⁸ Mordike, 219.

¹⁹ 'Pharmacists and the War', *Australasian Pharmaceutical Notes and News*, 1 December 1915, 26. Also 'The Pharmacist and the Defence Force', *Chemist and Druggist of Australasia*, 1 February 1911, 4.

the regular force at the rank of private, with a chance to transfer to the Medical Service if a position was available at the rank of Sergeant or Staff-Sergeant.²⁰ Whether positions were available or not was dependent on the establishment of the unit within the Service.

The role and status of Australian military pharmacists was debated as early as the Boer War (1899-1902), earlier than for New Zealand military pharmacists who only began to question the issue of military rank from the beginning of their compulsory military training scheme from 1910.²¹ As with the New Zealand pharmacists, Australian pharmacists enlisted into the army as privates, rising through the ranks to Corporal, Sergeant and eventually Warrant Officer (WO), the highest ranked non-commissioned officer (NCO). Army dispensers or compounders, however, could only aspire to the rank of Staff-Sergeant, a rank situated between Sergeant and WO. They also could not be promoted higher unless they transferred to a front-line unit with corps or military progression. The thrust for professional recognition and commissioned rank by Australian pharmacists began with Mr J. C. Pickford, a member of the CPSA, who served as a volunteer dispenser in the AAMC during the Boer War. At the annual meeting of the Council on 23 March 1915, Pickford stated that his experience of military pharmacy during the Boer War “confirmed his opinion that the chemist was not treated as he should be – he was being kept down.”²² Pickford offered no concrete evidence to back up this assertion. It was, however, accepted readily at the meeting, without challenge or further clarification as to his meaning being sought by the attendees. It is thus reasonable to infer that it was well known within the profession that the position of pharmacists within the Australian Medical Corps was considered to be inferior with regard to status and rank, and

²⁰ ‘Pharmacists and the War’, *APNN*, (1 December 1915), 26.

²¹ James P. Staunton-Vere Burbery, ‘Letter to Adjutant-General’, 23 October 1911, AAYS 8652 AD19/1 18/22, Archives New Zealand, Wellington.

²² ‘Army Commissions’, *Council of Pharmaceutical Societies of Australasia Annual Meeting Minutes*, MS9601 Y Box 23 (23 March 1915): 170–71.

that this may have been deliberately constructed by both the military as well as health profession hierarchies.²³

In his address, Pickford went on to consider that the solution to the issue was for the pharmacists themselves to bring about change to the status quo, building on a growing recognition of the role pharmacists played by the military authorities, with support for the role of the pharmacist in a military context by medical officers (MOs).²⁴ Pickford reiterated the undesirable circumstance that the person holding the higher military rank of WO may have been, in civilian life, a labourer or of unskilled employment, while the pharmacist over whom the WO held authority was thought to be superior “in education and knowledge, and very likely capacity.”²⁵ It was considered to be up to pharmacists, therefore, to be the masters of their own (military) fates.

Australian Pharmacists – Wartime

As early as November 1914, Australian Pharmaceutical Societies were registering their protests that qualified and registered pharmacists who enlisted in the AIF were being overlooked either for promotion or to receive commissions. In particular, the Queensland Pharmaceutical Society (QPS) was highly vocal, sending a strong protest to the Minister of Defence, Senator George Foster Pearce, and also to Senator Thomas Givens and Mr William Finlayson who represented Brisbane in the House of Representatives, that qualified pharmacists were being relegated or overlooked.²⁶ Instigated by the appointment to the position of Quartermaster-General (QMG) of the Army Medical Corps of an

²³ T. S. Pensabene, *The Rise of the Medical Practitioner in Victoria* (Canberra: Australian National University, 1980), 4–5.

²⁴ ‘Army Commissions’, *CPSA*, 1915, 171.

²⁵ *Ibid.*

²⁶ ‘Pharmacists and Their Military Rank in the Expeditionary Forces’, *Chemist and Druggist of Australasia* 29, no. 12 (2 November 1914): 398. Thomas Givens’ name is misspelt as ‘Gibbons’ in the primary material.

honorary Lieutenant in the Army Service Corps, this complaint specifically concerned the supposed ability to perform the role of the appointee who, in civilian life, was employed as a grocer's assistant, and therefore would not have the necessary medical or pharmacy trade experience required. The QPS had expected that a pharmacist, with their broad experience of trade within the medical supply field, would have been chosen for such a key position within the Medical Service. In their letter of protest dated 15 October 1914, the QPS stated "As there are several pharmacists available who have proved their competency in private life by their training and examination and have had military experience my Council consider the appointment of an untrained person unfair and a reflection on their whole craft."²⁷ Continuing in this vein, the letter goes on to point out that the issue of status for pharmacists in the Commonwealth Military forces had been raised with the Department of Defence some months prior, and the QPS re-asserted "that pharmacists are equally as entitled to commissions as dentists and veterinary surgeons, whose training received recognition by the Commonwealth Military Authorities."²⁸

Protests about lack of commissioned ranks for serving pharmacists continued throughout most of 1915, with both the *Chemist and Druggists of Australasia* (C&DA) and the *Australasian Pharmaceutical Notes and News* (APNN) reporting on both 'push' from the pharmaceutical societies and 'push-back' from the government. Early in 1915, the APNN reported that pharmacists would receive "no distinction on enlisting", and that "Doctors, dentists, veterinarians and automobile drivers are given commissioned rank, but not pharmacists."²⁹ While this unfavourable comparison of status with other health professionals (human or animal) based on professional training created consternation

²⁷ Ibid.

²⁸ Ibid. As Sen. Pearce assumed the role of Minister for Defence on 17 September 1914, it is possible that he was unaware of the previous requests for recognition of pharmacists.

²⁹ 'Commissions for Pharmacists', *Australasian Pharmaceutical Notes and News*, 1 January 1915, 28.

within the Pharmaceutical Societies, it was also acknowledged that pharmacists working in a rearward base or general hospital performed duties different to those who worked as field dispensers in a front line regiment. The pharmacist in the regiment needed only to know how to pack and unpack the medical panniers, and to dispense from pre-numbered stock pills and mixtures.³⁰ This, essentially, was the primary role expected of pharmacists by the British model, and justified the authorities' stance that a Quartermaster position or supply role did not require specialist pharmaceutical knowledge.

The Defence Department's reply to the QPS' letter was received and forwarded to the *C&DA* for inclusion in their February 1915 edition. In this letter, the Hon. Thomas Givens indicated that:

There is a Reserve for Chemists in the Australian Army Medical Corps. Should it be necessary at any time to establish hospitals on lines of communication **in Australia**, members of the reserve would be called up and given rank of Lieutenant. The Australian Imperial Force, being raised for service abroad in conjunction with the British Forces. [sic] It is necessary that the organisation should be the same. The Imperial regulations do not provide for a higher rank than Non-commissioned Officer for dispensers. The work these dispensers have to do is of a very simple character, nearly all medicines being carried as pills or tablets. Very little dispensing is done with field forces.³¹

This concession to pharmacists was for those who would not serve offshore, but who would be working in newly-established Australian military hospitals in the homeland. These hospitals would care for wounded or sick returned servicemen, and those who had become ill or were injured before leaving for overseas service. No concession at this stage

³⁰ 'Military Pharmacists and the Desire for Commissions', *Chemist and Druggist of Australasia* 30, no. 1 (1 January 1915): 8.

³¹ 'Rank for Military Pharmacist', *Chemist and Druggist of Australasia* 30, no. 2 (1 February 1915): 41. Emphasis mine.

was made for those pharmacists who were already serving in base or stationary hospitals in overseas posts as it was considered that the offshore AIF personnel structure needed to be the same as that of the British Expeditionary Force (BEF), permitting a seamless merging of the two forces if operationally required.

Commissions for enlisted pharmacists were on the agenda at the annual CPSA meeting held on 23 March 1915, and elicited much discussion by the members. In Pickford's address to the Council, he noted that a "pharmacist as a specialist was as much entitled to commissioned rank as any other specialist or professional man," and that doctors, "even if they had only just passed from the stage of students, on joining the Army Medical Service, were at once made captains."³² Pickford then moved that a letter be sent to the Pharmaceutical Society of Great Britain (PSGB) to encourage them to advocate for commissions for pharmacists to the British military authorities. As with the Pharmacy Board of New Zealand (PBNZ), the intention was for the British Pharmaceutical Society to put pressure on the British Imperial military authorities, in the hope that a 'trickle down' effect into the Dominions' militaries on the status of military pharmacists would eventuate.

It was also observed that by holding commissions as lieutenants (2nd Lieutenant was the lowest commissioned officer rank – see Appendix 2), pharmacists would not outrank doctors who entered the military as captains, thus preserving the internal professional hierarchy within the health care discipline.³³ Doctors did not give military or operational orders in the field, strictly limiting themselves to medical directives only. As such, pharmacists holding commissioned rank would be neither higher nor lower than doctors in a military sense, yet by holding a lower military rank within the commission

³² 'Army Commissions', *CPSA*, 171.

³³ *Ibid.*, 170.

strata, would preserve the outward stratification of professional standing. By holding the NCO rank of Sergeant or Staff-Sergeant, however, the pharmacist was at a distinct professional disadvantage of not being able to liaise directly with a doctor who held a commissioned officer rank, as separation between NCO and commissioned officer was well defined in the military hierarchy and strictly adhered to.

Although pharmacists were able to hold the rank of Honorary Lieutenant in the AAMC Reserves prior to the outbreak of war, when they came to volunteer for overseas service, they were placed as privates in both combatant units as well as the AAMC, where they had previously held commissioned officer rank.³⁴ Doctors, dentists and veterinarians also held honorary commissioned rank in the Reserves, and were immediately granted commissioned rank when they enlisted in the AIF for off-shore service. In the December 1915 edition of the *APNN*, the article on ‘Pharmacists and the War’ stated the expectation that “where a honorary lieutenant takes service as a dispenser in the AAMC he has a right to the rank conferred upon him before he took active service.”³⁵ That is, if a pharmacist held an honorary commissioned rank in the Reserves, it was expected that this rank should then be directly transferred to active service. Later in this publication, the issue of unqualified men being promoted over qualified and registered pharmacists was raised again, as well as men who were qualified but holding no Reserve rank being appointed to the role of Sergeant-Compounder over qualified pharmacists who had held an honorary Lieutenant’s commission in the Reserves.³⁶ The unnamed author of the article also pointed out the apparent double standard practiced by doctors in their acceptance of an unqualified dispenser in the military, considering that “the astonishing part of the business is that members of the medical profession, who would scorn contact with an unqualified

³⁴ ‘Pharmacists and the War’, *APNN*, (1 December 1915), 26.

³⁵ *Ibid.*

³⁶ *Ibid.*, 29.

practitioner, seem to think it no harm to appoint an unqualified dispenser.”³⁷ This indicates that the role of a pharmacist in the Australian army was considered by both the military as well as the medical profession to be less that of a health professional but more of a manual or mechanical role, relegated to merely counting pills or measuring potions under the direction or oversight of the MO.

By early 1916, the long-standing issue of unqualified men holding positions as dispensers or compounders was beginning to be addressed by the military. Resistance was still, however, to be found in older military medical personnel, such as Surgeon-General Richard Fetherston, Director-General of Medical Services (DGMS) for the AIF, based in Melbourne. Fetherston met with the President of CPSA, Mr A. R. Bailey, in early 1916, and gave Bailey an overview of the dispensing work done in Egypt. Pharmacists did not, in Fetherston’s opinion at least, warrant commissioned rank for the type of dispensing work that was being performed.³⁸ This would infer that Fetherston was referring to field dispensing, which was a basic task of counting pills and measuring potions (see Chapter 5). The concerns of the CPSA regarding dispensers who were practicing without formal qualifications were also raised at this meeting, eliciting an assurance that no future dispensers would be unqualified men, and that no lower rank than Staff-Sergeant would be given to registered pharmacists who were working as dispensers.³⁹ While this concession was welcomed, it nevertheless failed to address the issue of professional recognition of civilian qualifications through the granting of commissioned rank to serving pharmacists, either at home or abroad.

³⁷ Ibid.

³⁸ ‘Military Pharmacy’, *Council of Pharmaceutical Societies of Australasia* Monthly Meeting Minutes, no. MS9601 Y Box 23 (February 1916): 230–31. Fetherston was a doctor and surgeon (Ob/Gyn) by civilian training.

³⁹ Ibid., 231. See also ‘Pharmacists and the Defence Department’, *Chemist and Druggist of Australasia*, 30 no. 13, 1 December 1915, 454.

Australian Army Pharmaceutical Service - Divergence

While Australia entered the war with the same British Imperial Army directives for pharmacists that framed the experience of military pharmacy in New Zealand, by early 1916 Australia had forged its own path by establishing the AAPS. By diverging from the British model, Australia's military pharmacists carved out their own niche role in their military structure, that of medical quartermaster. This section charts the underpinning professional efforts for official recognition of pharmacists and their qualifications, and the resulting outcome of those efforts.

The role of the military pharmacist and provision of commissions were discussed at length at the CPSA Annual Meeting in March 1915. Although it was acknowledged that “while it would be impossible to give commissioned rank to men doing the present compounder’s duties,” Mr Edmund White, the Vice-President of the PSGB, also stated at the meeting that “the services of qualified pharmacists could only be utilised in army medical administration advantageously by giving them a commission combined with administrative and advisory duties.”⁴⁰ It was therefore recognised that in order to warrant the granting of a commission, pharmacists would need to take on extra levels of responsibility to justify the leadership facets that a commission entailed. Holding civilian qualifications on their own was not sufficient; pharmacists needed to demonstrate added value in other areas. An expanded range of duties alongside dispensing that were performed by French pharmacists (who held commissioned officer rank in their own armed forces) were put forward as examples for potentially adding value to the role and thus justifying the commission that these additional duties should attract. These included

⁴⁰ ‘Commissioned Rank for Army Pharmacists’, *Chemist and Druggist of Australasia* 30, no. 4 (1 April 1915): 114.

bacteriology services, such as water analysis and urine testing, thus utilising the pharmacist's skill base and in-depth training in chemistry.⁴¹ It was also at this meeting that a statement that had been made previously by an unnamed retired officer of high rank in the Royal Army Medical Corps (RAMC) (and thus very experienced in the military way of thinking) was tabled. This statement contained a list of seven suggested actions that the Australian Pharmaceutical Societies could take in order to further their cause:

1. It is important that pharmacists and the War Office should come to an agreement. The Pharmaceutical Society should have a permanent Pharmaceutical Service Committee to carry out negotiations with the Admiralty and the War Office.
2. On the question of status, the first problem is to get pay: this is always the first step.
3. The Pharmaceutical Society should estimate what is the value of pharmaceutical service, and address the State to have that determined and fixed. [This implies a full definition of the service.]
4. That once agreed upon, a new fight for status should begin. For this the Pharmaceutical Society should grade its members into first, second, and third grade, and not ask at first for titles of a military character, but get relative status: letting the senior grade have relative rank – say, second-lieutenant – the junior as warrant officers, and students or partially-trained men as N.C.O.s.
5. Only a person completely equipped with knowledge of the professions could grade it.
6. Begin quietly: don't ask too much; get money, and rank will follow. But there should be complete agreement between pharmacists and the War Office.
7. Once on the ladder of pay, status surely comes. Officers of the R.A.M.C. took generations to achieve their present status.⁴²

⁴¹ Ibid. Although outside the general scope of practice for pharmacists, bacteriology was contemplated by Australian pharmacists as a result from the report on military pharmacy submitted to the International Congress of Pharmacy in 1913 by a French pharmacist (see footnote 31). Bacteriology services such as instrument and dressing sterilisation, along with water analysis and sterilisation, were conducted by French military pharmacists. It is on this basis that Australian military pharmacists were wishing to increase their scope of practice to that of the French, and to also include urine testing.

⁴² Ibid. Sentence in square brackets is part of the original quotation. The RAMC was formed in 1898 in England; see Michael Tyquin, "Sir William 'Mo' Williams, KCMG, CB, KStJ, creator of Australia's Army

This list of steps to be taken to secure status for pharmacists as well as insight into how to approach the military authorities was taken up enthusiastically with particular focus on item 3, defining the value and role of pharmacy in the military. A detailed draft plan for a proposed Pharmaceutical Service was quickly developed in response. Mr T. M. Young, the Acting Registrar of the Pharmacy Board of South Australia published in the *C&DA* the proposed list of duties and potential structure on 1 May 1915, a scant two months later and less than a week after the landing of ANZAC forces on the Gallipoli peninsula.⁴³ As well as Pickford, Young had also previously served as a Sergeant-Compounder for Australia in the Boer War, and as such was well-placed to assess what aspects of pharmacy practice were “practicable and serviceable” at a higher level in a military context.⁴⁴ In this draft plan, while the business and administration aspects of the pharmacy trade were identified as holding the best claim to commissioned rank alongside a high degree of pharmaceutical knowledge, the requirement for specialised experience and training within the military environment was also acknowledged.⁴⁵

Young’s draft plan revolved around three main areas: providing assistance to the MO by performing minor duties and procedures and thus freeing the MO to focus on more serious issues; reducing the administrative costs of the Medical Service; and increasing the efficiency of the Service. Eight core responsibilities were identified as able to provide assistance to the MO, including stock control of drugs and medical stores, and assisting with triage and minor ailments at sick parades. Administrative duties such as taking full control of the dispensary and contents, full responsibility for dispensing, sterilisation of

Medical Services – maligned or misunderstood?” *Journal of the Royal Australian Historical Society* 84, no. 1 (1998): 70.

⁴³ ‘Commissioned Rank for Army Pharmacists’, *Chemist and Druggist of Australasia* 30, no. 5 (1 May 1915): 167–70.

⁴⁴ *Ibid.*, 167.

⁴⁵ *Ibid.*

instruments, responsibility for the hospital in a Field Ambulance situation, and all paperwork related to returns, forms, and recording proceedings of medical boards were also included.⁴⁶ Additional duties were also considered as suitable for inclusion in the Lieutenant Pharmacist role. Bacteriology services such as urine testing and analysis, taking swabs for testing, and water analysis were again suggested. Quality control of drugs and supplies and ensuring that supply contracts were being upheld would also come within the scope of duties.⁴⁷ The responsibilities that would therefore be shouldered were considered well within the scope and rank of a Lieutenant Pharmacist, and would then leave the MO free to focus on his own professional work. This multi-disciplinary approach would be complementary and with doctor and pharmacist working together as health professionals yet within the boundaries of a set division of labour, the efficiency of the Medical Service would be increased.

Along with the list of possible duties, the report also detailed a comprehensive structure for the proposed Service, with defined duties and division of labour for the Lieutenant Pharmacist and Sergeant-Dispenser/Compounder roles, in both hospital and field ambulance environments. Savings in the control of and ability to source medicines as well as economies that were able to be made by increasing efficiency of the Medical Service were identified, indicating that measurable monetary performance factors could be achieved.⁴⁸

By December 1915, the medical support issues that plagued the disastrous Dardanelles campaign were known to the authorities and the evacuation of personnel from the peninsula was imminent. The presentation of the plan developed by the

⁴⁶ Ibid.

⁴⁷ Ibid., 167–68.

⁴⁸ Ibid., 169–70.

pharmaceutical associations to the Australian government at around the same time as the evacuation was therefore timely, and had its culmination in the acquiescence of the Australian Commonwealth government. A proposal for a new establishment was put forward by Colonel Arthur Edmund Shepherd, the Deputy Director-General of Medical Services (DDGMS), to the Adjutant-General, Colonel Victor Sellheim.⁴⁹ This was then submitted to the Military Board and duly accepted, with the result that the AAPS was gazetted as Military Order 6 on 11 January 1916.⁵⁰ The new establishment set out the staffing requirements for the freshly-minted Service for both the AIF (serving abroad) and also the Reserves (serving at home) (see Tables 6 and 7).⁵¹

Table 6: New Pharmaceutical Service Establishment for AIF

Unit	Present			Proposed	
	Hon. Lt	Staff-Sgt	Cpl	Hon. Lt	Staff-Sgt
Light Horse Field Ambulance	-	2	-	-	2
Field Ambulance	-	3	-	-	3
Casualty Clearing Hospital	-	1	1	1	1
Stationary Hospital	-	1	1	1	1
General Hospital, 520 beds	-	2	-	1	1
General Hospital, 1,040 beds	1	1	-	1	2
Ambulance Train	-	1	-	-	1
Hospital Ship	-	1	1	-	2
Advanced Depot of Medical Stores	-	1	-	-	1
Base Depot of Medical Stores	1*	1	-	1	1

* Home Service

Source: The Official History of the Australian Army Medical Services in the War of 1914-1918 vol. III, 521.

⁴⁹ Shepherd was standing in for Fetherston, who was overseas at the time.

⁵⁰ Arthur Graham Butler, *The Official History of the Australian Army Medical Services in the War of 1914-1918*, vol. III (Sydney, N.S.W.: Halstead Press, 1943), 521.

⁵¹ *Ibid.*

Table 7: New Pharmaceutical Service Establishment for Reserves⁵²

District	Hon. Captain	Hon. Lieutenant
1 st Military District	1	8
2 nd Military District	1	15
3 rd Military District	1	15
4 th Military District	1	8
5 th Military District	1	5
6 th Military District	1	5
Totals	6	56

Source: *The Official History of the Australian Army Medical Services in the War of 1914-1918* vol. III, 522.

While the proposed establishment for the Reserves was implemented as envisioned in Military Order 6, the establishment for the AIF was subject to resistance by the Director of Medical Services (DMS), Surgeon-General Neville Howse, who did not see any value in removing the incumbent Quartermaster of the Base Depot of Medical Stores, Captain C. S. Price. Price had been a businessman in civilian life, but was neither a pharmacist nor had any pharmacy exposure.⁵³ In his *Official History of the Australian Army Medical Services*, Butler acknowledges and gives credit to the efficient and effective work done by Captain Price, and notes that Howse's continuance of placing control of stores with a non-professional did indeed have precedence in the traditions of both the Australian and British militaries of the time.⁵⁴

A significant part of the problem with pharmacists not receiving commissions on enlisting to serve in the AAMC appeared to lie with the pharmacists themselves. While they had the opportunity to join the Reserve forces as Honorary Lieutenants during the time of peace preceding the war, very few of them did so, although there was full

⁵² *Ibid.*, 522; "A.A.M.C. Pharmacists," Military Order 6 in *Military Orders* (1 to 300), (Melbourne: Government Printer, 1916), 7. The Military Districts were based along state lines: 1st – Queensland (included Northern Territory); 2nd – New South Wales; 3rd – Victoria; 4th – South Australia; 5th – Western Australia; 6th – Tasmania.

⁵³ Butler, 522–25.

⁵⁴ *Ibid.*, 524–25.

provision in the regulations for honorary rank to be conferred on them.⁵⁵ This was the position that Shepherd took when interviewed by the South Australian Pharmaceutical Society President and Secretary for an article published in the *C&DA* in December 1915. In this article, Shepherd also explained that when there were no pharmacists available in the Reserves, the work of dispensing was then done (presumably effectively) by others, and consequently could not simply be handed over when war broke out.⁵⁶ His position was that pharmacists “had not made themselves ready to undertake the work.”⁵⁷ It is likely that this statement referred to a lack of military experience or corps knowledge by pharmacists who expected to simply enlist and immediately be granted commissioned rank on the outbreak of war, yet had not completed sufficient military leadership training. Had they joined the Reserve force in their professional capacity, they would have been granted honorary commissioned rank as provision had been made for them.

Shepherd was supportive of the attempts to establish a Pharmaceutical Service, nevertheless. A case was made to the Minister for Defence, Senator George Foster Pearce, whose approval to establish the Service “on a somewhat similar basis to the dental service,” was reported in the *Daily Telegraph* in Launceston, Tasmania, on 21 December 1915.⁵⁸ Shepherd also recommended that, “as a first step towards the establishment of a pharmaceutical corps, on the same lines as the dental corps, pharmacists should enrol as lieutenants in the Army Reserve. They should apply to the Principal Medical Officer...and they should then undergo such a course of training as would render them more capable of

⁵⁵ ‘Position of Pharmacists in Army Medical Corps’, *Chemist and Druggist of Australasia* 30, no. 13 (1 December 1915): 482.

⁵⁶ *Ibid.*

⁵⁷ *Ibid.* Although Shepherd was an experienced GP and honorary surgeon, he was also served in the Army Medical Corps from its beginnings in 1902.

⁵⁸ ‘Pharmaceutical Service’, *Daily Telegraph* (Launceston), 21 December 1915, 6. See also ‘Pharmacists Corps – Organisation Begun’, *Argus*, 21 December 1915, 7; ‘Pharmaceutical Corps’, *Daily Telegraph* (Sydney), 29 January 1916, 10.

undertaking military duties.”⁵⁹ The priority of military training over professional qualifications for pharmacists was again reiterated. The efforts of the QPS and CPSA were particularly noted by Shepherd, and he agreed that by not utilising pharmacists to their full capacity, it “was a waste of material for pharmacists who had given years to study to go in the ranks and fight in the trenches, when they could give more efficacious and valuable help to the medical officers in looking after the health of the regiment.”⁶⁰ This support for the position of military pharmacists from a high-level officer of the Medical Corps was a key factor in the establishment of the AAPS.

The implementation of the new establishment for the Reserves was reported in the *C&DA* on 1 December 1915, with the publication of the appointments of the first four commissioned rank pharmacy roles. Nominations were requested from the main state Pharmaceutical Societies for suitable men who could serve as Senior Pharmacists for each military district. Mr R. Owen Fox, previous President of the Pharmaceutical Society of South Australia (PSSA), was appointed as “Quartermaster in charge of Medical Supplies in South Australia, with rank of Lieutenant,” while Mr Arthur James Henderson was appointed in the same capacity for the “base depot of medical stores, 2nd Military District [New South Wales].”⁶¹ Appointees as Lieutenant Quartermaster in Queensland and Victoria were Mr G. P. Doyle, and Mr W. D. Williams, respectively.⁶² These roles were based on Australian soil, with responsibility for the procurement and onward distribution of medical supplies “for hospitals, transports, and other units.”⁶³

⁵⁹ ‘Position of Pharmacists in Army Medical Corps’, *C&DA*, (1 December 1915), 482.

⁶⁰ *Ibid.*

⁶¹ ‘Commissions for Military Pharmacists’, *Chemist and Druggist of Australasia* 30, no. 13 (1 December 1915): 452.

⁶² *Ibid.*

⁶³ *Ibid.*

Australian Army Pharmaceutical Service

With the gazetting of the new establishments for military pharmacists serving in Australia in the Military Orders, the foundations for the AAPS were laid.⁶⁴ The first Senior Pharmacists were nominated by Pharmaceutical Societies for the four principal states (Queensland (QLD), New South Wales (NSW), Victoria (VIC) and South Australia (SA)) and were appointed with the rank of honorary Captain early in 1916, while David Alexander Cossar from Victoria was promoted to the rank of Major to head the newly-formed AAPS in August 1916.⁶⁵ One year after the CPSA annual meeting where the role of military pharmacists was discussed and a draft proposal was initially outlined, the combined pharmaceutical bodies of Australia reported that they had achieved a degree of success in their endeavours to obtain professional recognition of pharmacy qualifications and pharmacists. At the annual meeting on 28 March 1916, Major Cossar acknowledged the successes, but stated that while pharmacists were proud of the work that they did, this pride did not extend to their position within the military sphere.⁶⁶ Cossar also noted that in his opinion, pharmacists had contributed to the untenable position they had found themselves in, by having “held themselves too cheaply in the past. They applied in such numbers at the start that the military people must have thought they grew on mulberry bushes.”⁶⁷ By making this observation, Cossar emphasised the view that pharmacists and pharmacy bodies needed to develop a more cohesive organisation, with a stronger, united political voice in order to progress further in the military context. In short, pharmacists needed to put aside their customary trade competitiveness and work together as a cohesive whole to ensure that their profession was recognised within the military structure.

⁶⁴ *Military Orders (1 to 300)*, M.O. 6, 7.

⁶⁵ ‘Pharmacists and the Military Service - Major Cossar on the Present Position’, *Chemist and Druggist of Australasia* 32, no. 7 (2 July 1917): 232.

⁶⁶ ‘Military Matters’, *Council of Pharmaceutical Societies of Australasia Annual Meeting Minutes*, no. 18 (28 March 1916): 242. Cossar had become the CPSA President at this time.

⁶⁷ *Ibid.* Australia relied on volunteers to enlist as they did not introduce conscription.

Political support for changes within the military structure was both highly valuable and effective. At the monthly CPSA meeting in June 1916, Pickford stated that “A leading dentist had told him that strong political influence achieved for the dentists all the reforms they asked for.”⁶⁸ There is no doubt that active support from the DDGMS, Colonel Arthur Shepherd, contributed significantly to the formation of the AAPS, and that without this high-level advocacy from within the military arena, the AAPS would not have come into existence.

By early 1916 the AAPS was well-established and functioning fairly smoothly. In an article published in the *C&DA* of 1 February 1916, T. M. Young, Secretary of the PSSA, contended that pharmacists were best placed to act as medical quartermasters, as they had more experience through their trading practices with the negotiation of prices and assessing drug quality than medical officers, and medical staff should be more appropriately focused on care and treatment of the sick and wounded than on administrative tasks.⁶⁹ The effectiveness of pharmacists taking over the business of ordering (indenting), supply, and quality control of medicines was recognised by the Defence Department with the appointment of Lieutenant Fox, Senior Pharmacist for the 4th Military District (South Australia), to the position of Quartermaster of the AAMC in South Australia with a promotion to Captain.⁷⁰ The provision of commissions to pharmacists was considered to be the greatest compliment ever paid to the profession to this point, and Australia was well ahead of the other British Dominions in its recognition of pharmacy

⁶⁸ ‘Monthly Meeting Minutes’, *Council of Pharmaceutical Societies of Australasia*, no. MS9601 Y Box 23 (June 1916): 267.

⁶⁹ T. M. Young, ‘Relationship of the Pharmacist to the Defence Department’, *Chemist and Druggist of Australasia* 31, no. 2 (1 February 1916): 46.

⁷⁰ *Ibid.*

qualifications within a military structure.⁷¹ By being granted rank of Lieutenant or higher, even as an Honorary commissioned officer the military pharmacist was now able to liaise with medical officers on a more or less equal footing, thus raising the profile of the profession and being of “greater help than the medical officers might care to admit” in the provision of treatment for minor ailments.⁷² With their experience gained in treating minor ailments in the civilian sphere, the assistance rendered by commissioned pharmacists enabled the medical officer to focus on the more serious cases, thus increasing the efficiency of the medical service.

Development of the AAPS

With the AAPS established, events moved quickly to consolidate the advantage of having four Senior Pharmacists installed and the service established. All appointments of pharmacists (Lieutenants) and dispensers (Staff-Sergeants) were to be made by each state’s Senior Pharmacist.⁷³ By March 1916, although holding rank of Staff-Sergeant as a minimum, all dispensers on board troop transports carrying more than 500 men were required to be qualified pharmacists, and no unqualified men were to perform the role.⁷⁴ Similarly, in base depots, the officer in charge of purchases and supplies (medical) was to be a qualified pharmacist holding the rank of Lieutenant-Quartermaster.⁷⁵ Pharmaceutical bodies of each state liaised directly with the Senior Pharmacists, rather than with the Department of Defence. It is likely that the concerted efforts of the Pharmaceutical Societies resulted in the Department of Defence coming to realise that pharmacy and dispensing were of a sufficient technical skill level that issues to do with medicines, medicine supply, and dispensing needed to be handled by those qualified to do so, and the

⁷¹ Canada was the only other British Dominion to grant commissions to pharmacists, after Australia.

⁷² Young, *C&DA*, (1 February 1916), 47.

⁷³ ‘Pharmacists in the Army’, *Australasian Pharmaceutical Notes and News*, 1 May 1916, 32.

⁷⁴ ‘Military Pharmacists’, *Chemist and Druggist of Australasia* 31, no. 3 (1 March 1916): 82.

⁷⁵ *Ibid.*

Department then handed off full responsibility for the AAPS to the Senior Pharmacists and Major Cossar. Needless to say, pharmacists embraced the new AAPS with vigour and enthusiasm, and a number of suggestions were put forward for ways in which the AAPS could make valuable contributions or be of real assistance to the MOs.

Pharmacists serving as dispensers on hospital ships were quickly promoted to commissioned rank. In the *C&DA* of 1 September 1916, it was reported that “Mr O. D. Ward has been promoted to the rank of first lieutenant, and was shortly leaving with the No. 14 Hospital as lieut. [sic] dispenser, A.M.C.”⁷⁶ The following month, a short entry advised the readership that Staff-Sergeant G. C. Bennett had received his commission and was serving on No. 2 Australian Hospital Ship “Kanowna.”⁷⁷ Medical officers themselves were becoming supportive of pharmacists gaining rank and recognition, and were more aware that the benefit that qualified pharmacists could bring to the troops was a “much more valuable service than could ever be supplied by the British Army Compounder, who was the unfortunate precedent that prevented the immediate grant of commissioned rank to pharmacists doing pharmaceutical duties.”⁷⁸ The efforts of the various state-based Pharmaceutical Societies of Australia to seek recognition of civilian pharmacy qualifications had well and truly paid off.

As with New Zealand, however, there were not enough positions available in the establishment to provide every serving pharmacist with a position commensurate with a commission. Nevertheless, by early 1917, the different Australian Pharmaceutical Society regulatory bodies were reasonably satisfied with how events were progressing. The role of

⁷⁶ ‘Lieutenant Pharmacists on Hospital Ships’, *Chemist and Druggist of Australasia* 31, no. 10 (1 September 1916): 335.

⁷⁷ ‘New South Wales’, *Chemist and Druggist of Australasia* 31, no. 11 (2 October 1916): 375.

⁷⁸ ‘Experiences of a Pharmacist’, *Chemist and Druggist of Australasia* 31, no. 12 (1 November 1916): 409–10.

the AAPS was proving its worth and new establishments for AAMC units operating in Australia were put forward by Fetherston in mid-1917, recognising the rank of pharmacists. The new establishment outlined the numbers and ranks of staff for military hospitals of various sizes, and included pharmacists and dispensers (see Table 8).⁷⁹

Table 8: *Establishment of General Hospitals for Home Service*

Detail	720 beds	620 beds	520 beds	420 beds	320 beds	220 beds	120 beds
Lieut.-Colonel-in-charge	1	1	1	1	1	1	1
Lieut.-Colonel	2	2	2	2	-	-	-
Majors	6	6	6	4	4	4	2
Captains	14	12	10	8	6	4	2
Quartermaster	1	1	1	1	1	1	-
Pharmacist, Hon. Lieut.	1	1	1	1	1	1	-
Warrant Officers	1	1	1	1	1	1	1
Staff-Sergeants -							
Clerks	1	1	1	1	1	1	-
Nursing	1	1	1	1	1	1	1
Stewards	1	1	1	1	1	1	-
Dispenser	2	2	1	1	1	1	1

Source: *Administration Staff and Establishments, Tait Collection, Australian War Memorial, Canberra.*

Major Cossar acted as the liaison between civilian pharmaceutical entities and the military milieu, giving regular talks to update the profession on what was occurring within the AAPS (as far as he was permitted by military constraints). In a talk given to the North Melbourne and Essendon Section of the Metropolitan Chemists' Association in mid-1917, Cossar outlined the achievements that the AAPS had made. These included economies made by Base Depots, saving the Commonwealth of Australia "thousands of pounds per month."⁸⁰ Not only were financial savings being made, but military hospitals of over 200 beds were required to have a Lieutenant pharmacist as dispenser; all hospital ships were

⁷⁹ 'Administration Staff and Establishments' (Tait Collection, 1917), AWM32-3, Australian War Memorial, Canberra, Australia. Emphasis mine.

⁸⁰ 'Pharmacists and the Military Service - Major Cossar on the Present Position', *C&DA*, (2 July 1917), 232. Australia has two political systems – at state level, and at national or Federal level. At the time, Federal government was called the Commonwealth.

required to have a pharmacist holding Lieutenant rank as dispenser; every transport carrying more than 500 men “must have a registered pharmacist in charge of the dispensary”; and that every registered pharmacist serving as a dispenser “is secured the position of Staff Sergeant.”⁸¹ Cossar also stated that in future, there should be no requirement for Army trained Sergeant Compounders as was previously allowed for in the British military structure.⁸² By ensuring that only registered and qualified pharmacists were handling medicines and drugs, the integrity of both the profession and its practitioners was maintained.

Ensuring the integrity and safety of drug handling by preventing unqualified men from potentially dispensing incorrect medicines was not, however, the sole reason for the military authorities recognising the unique skills and qualifications of pharmacists. As noted succinctly in a letter to the *C&DA* editor published in the 1 August 1917 issue, the reason for having Senior Pharmacists appointed was not merely to reduce fatalities caused by incorrect medicine dispensing, but rather the “efficiency [sic] business side is almost the only ground the military authorities will consider for granting commissioned rank. Any Senior Pharmacist will tell you he is in his job to see that expenses are kept down to a minimum...and the only pharmacists who are concerned with the handling of stores are those with commissioned rank.” This perception that rank was given to pharmacists for their business acumen was realistic, with the understanding that pharmacists were more valued by the military authorities for the business skills and trading practices that they brought to the role than for their technical or scientific training. By fully utilising men experienced in liaising and negotiating with wholesale drug houses and who understood how the medicine supply system worked, the Australian government recognised that there

⁸¹ Ibid.

⁸² Ibid.

were some significant financial savings to be made. Cossar had already indicated in his earlier talk that this was in the region of thousands of pounds per month, for each state's Base Depot. Not only could savings be made through shrewd tactical buying practices, but also through in-house bulk manufacturing of stock mixtures or tablets for supply to the AAMC.

That commissioned pharmacists were handling the administration and business side of their roles successfully and with sound judgment was borne out by the favourable report of the Royal Commission that was appointed by the Commonwealth government of Australia to investigate the business practices of the Department of Defence.⁸³ The Victorian correspondent for the *APNN* advised the readership on 1 March 1918 that although the Royal Commission had been quite scathing on other branches of the Department of Defence, they had "reported favourably on the work carried out by the A.A.M.C., particularly in regard to the Base Depots for medical supplies."⁸⁴ In this article, the correspondent felt that the position taken by the Pharmaceutical Societies in pushing for commissioned rank for pharmacists was justified, and that Cossar and the Senior Pharmacists were vindicated in the use of sound business practices for the purchase and supply of medicines.⁸⁵ Further analysis of the business and trade practices of medicine supply and war economies for Australia and New Zealand is the focus of Chapter 3.

Towards the end of the war, dissatisfaction with the lack of commissions or professional recognition for *all* pharmacists began to increase again within Australia's Pharmaceutical Societies. While there were far fewer roles available in the establishment

⁸³ This was, in essence, an audit of the Department's expenditure. A fuller discussion of the Royal Commission and its reason for convening can be found in Chapter 3.

⁸⁴ 'Military News', *Australasian Pharmaceutical Notes and News*, 1 March 1918, 36.

⁸⁵ *Ibid.*

than there were pharmacists able to fill them, nevertheless the pharmaceutical bodies felt that pharmacist education and training was poorly recognised compared to other occupations. In August 1918, a letter supported by the Pharmaceutical Society of New South Wales (PSNSW) was sent to the Minister of Defence, reiterating the claim that *all* dispensers should be qualified pharmacists, and that all qualified pharmacists should hold commissioned rank.⁸⁶ In the article published in the *C&DA* outlining this move, the correspondent “contrasted the position of veterinary surgeons and dentists with that of pharmacists,” and that the pharmacists were decidedly worse off in terms of promotion prospects and pay rates.⁸⁷ With the emphasis that all dispensers should be qualified pharmacists, it is reasonable to infer that there remained some instances whereby unqualified Army-trained Compounders continued to perform dispensing duties. The action taken by PSNSW was supported by the other state pharmaceutical societies.

Following the publication of this article, at the monthly meeting of the CPSA in October 1918, a letter from the Queensland Pharmaceutical Society (QPS) was tabled, requesting that the Council send a deputation to the Minister of Defence, further pressing the claims of all serving pharmacists to receive commissioned rank.⁸⁸ In these minutes, it was recorded that “considerable dissatisfaction prevailed in respect to the position occupied by the pharmaceutical chemists acting as dispensers in the A.I.F., and the anomalous position in which they were placed in view of their special training legally imposed in order to obtain registration.”⁸⁹ As with New Zealand, Australian pharmacists were legally required to pass qualifying examinations and to register with their respective

⁸⁶ ‘Commissions for All Pharmacists in the Army’, *Chemist and Druggist of Australasia* 33, no. 9 (1 August 1918): 241.

⁸⁷ *Ibid.*

⁸⁸ ‘Military Pharmacy’, *Council of Pharmaceutical Societies of Australasia Monthly Meeting Minutes*, no. MS9601 Y Box 23 (October 1918): 424.

⁸⁹ *Ibid.*

state Society in order to be allowed to practice.⁹⁰ Also as with New Zealand, by permitting unregistered (and therefore unqualified) men to perform the role of dispenser in the manner of the British model, the Australian government was effectively breaking its own law. It was considered that the educational level and training that pharmacists were required to attain was not being recognised within military circles, and the CPSA felt that pharmacists' "special educational training entitled to higher rank than they received at present."⁹¹ While dissatisfaction with the position of pharmacists in the Army continued into early 1919, with the end of the war in November 1918 the urgency for change dissipated.

Conclusion

Although there were similarities in the experiences of both New Zealand and Australian military pharmacists during the early part of the war, by the beginning of 1916 Australian military pharmacy had become a specialised role, that of medical quartermaster. This role recognised the particular training and business skills that pharmacists could bring to the Army, including a degree of medical knowledge that allowed them to contribute meaningfully to the AAMC, but without requiring the medical skills of doctors. Doctors were far better utilised in the practice of their own profession, treating the sick and wounded than in administrative and business tasks that pharmacists could more appropriately take on. The pharmacists' business skills in particular were valued by the Australian military authorities, perhaps more so than their technical training in chemistry.

⁹⁰ 'Pharmacy Act 1876 (40 Victoriae Reginae No. 558)' (VIC) (1877), http://www7.austlii.edu.au/au/legis/vic/hist_act/pa187698.pdf (6 June 2019); 'Pharmacy Act (No. 509 of 54 and 55 Vic, 1891)' (SA) (1891), http://www.austlii.edu.au/cgi-bin/viewdb/au/legis/sa/num_act/pa509o54a55v1891191/ (6 June 2019); 'Pharmacy Act 1897 No. 7' (NSW) (1897), http://www.austlii.edu.au/cgi-bin/viewdb/au/legis/nsw/num_act/pa1897n7125/ (6 June 2019); 'Pharmacy Act 1917 (8 Geo V, No. 11)' (QLD) (1917), http://www.austlii.edu.au/cgi-bin/viewdb/au/legis/qld/hist_act/pao19178gyn11189/ (6 June 2019). Although Tasmania had a *Pharmacy Act* from 1908, this has not been digitised on the AustLII site.

⁹¹ 'Military Pharmacy', *CPSA*, October 1918, 424.

War is an expensive undertaking, and the Australian government would have seen an opportunity to make some fiscally sound rationalisations. The establishment of the AAPS, therefore, served both pharmacists and the government equally; pharmacists were given the recognition of their qualifications and training, and the government, even with the increase in personnel salaries for newly-created officers, were able to make significant savings in medical supplies.

Differences between the New Zealand experience and that of the Australian military pharmacist throughout the duration of the war are marked. The Australian government eventually recognised the particular skills of those pharmacists who had enlisted, and granted them professional recognition through the establishment of the Pharmaceutical Service and the conferral of commissioned ranks, albeit reluctantly. This then paid off for the Australian military authorities in significant monetary savings in medical consumables. Australian military pharmacists were also marginalised, however, by their newly-conferred ranks being of an honorary nature only, rather than substantive, and which were begrudgingly given. Irrespective of how much money was saved through their efforts, Australian military pharmacists were still considered to be the wrong social class for full professional recognition through the granting of permanent or substantive commissions. Their professional position, however, remained significantly better than that of their New Zealand counterparts. Not only did they achieve a status (albeit honorary only) better than the pharmacists in the New Zealand military, but through their determined political agitation, Australian pharmacists achieved a higher level of professional recognition within the military than many of the other Allied combatants.

With their focus on the economics of the war at the forefront of the Australian government's concerns, medical consumables were economically purchased and supply chains organised. Chapter 3 examines the processes of government procurement and supply of medical commodities, alongside the role that military pharmacists, both Australian and New Zealand, performed in these areas to keep costs to a minimum.

Fig. 4: *Dispensary of No. 1 Australian General Hospital, Rouen, France 1918*



Source: *E03425. Australian War Memorial, Canberra. Public domain.*

Although an obviously staged image taken by a professional photographer, this photograph shows a distinctly different dispensary to that of the No. 1 New Zealand General Hospital at Brockenhurst, UK in Chapter 1. The subjects are carefully arranged to indicate their work roles and have been identified as (from left to right) Staff-Sergeant Baker, Private Pitt (seated) and Staff-Sergeant Hall. Private Pitt is working as the dispensary clerk, while Staff-Sergeant Hall is preparing to begin work on compounding a medicine or therapeutic remedy. Not only is the dispensary room significantly larger than the New Zealand hospital dispensary in the image in Chapter 1, but the greatly increased size and number of neatly labelled and stored bottles, jars, crocks and equipment in comparison to the stock holdings in the New Zealand hospital dispensary indicates that this Australian dispensary was producing medicines in bulk. The increased responsibility of the Australian pharmacist as a medical quartermaster is also clearly indicated in the image, with a number of what appears to be Thomas splints, possibly crutches, and other medical hardware stored in the shelving at the back of the room.

Chapter 3: Medicines Trade and War Economics

Introduction

Medicines are commodities.¹ As such, they are physical objects to be traded, bought or sold, in either a wholesale or retail setting, and have both a use-value and an exchange-value.² In Marxian philosophy, use-value relates to the perceived usefulness of the object, while exchange-value equates to what that object is worth relative to or in exchange for another commodity, i.e. money.³ A medicine's use-value lies in its function as a treatment to help the body to heal, or to relieve the patient's suffering. Its exchange-value is determined by what price can be obtained for it on the open market.⁴ It is exchange-value of medicines during World War I (WWI) that will be discussed in this chapter, as pharmacy has a strong traditional association with 'trade', particularly as retail operations with the necessary acts of cash handling or monetary transaction, including the keeping of customers' accounts. Pharmacists in the Dominions' militaries were hampered in their aspirations for social status through this strong traditional association with 'trade'.

As discussed in Chapter 1, perceptions of the degree of professionalism of pharmacy by the medical and military establishments, along with education and qualifications, class and status, all contributed to the outright refusal of the New Zealand authorities to grant commissions to serving pharmacists. These same factors were also

¹ Although medical anthropology and other social sciences deem medicines to have social and cultural values and power, for this thesis medicines are considered solely as medical commodities, without any implication of social and cultural phenomena ascribed to them. See, for example, Susan Reynolds Whyte, Sjaak van der Geest and Anita Hardon, *Social Lives of Medicines* (Cambridge: Cambridge University Press), 2002.

² Wholesale drug merchants bought bulk quantities of products from manufacturers and repackaged them into smaller units for on-sale to pharmacists. By buying in bulk, they could purchase quantities cheaply then add a margin onto their resale price. Wholesalers also acted as agents or factors, where they would act as the intermediary to source specialised products but were able to keep costs lower due to their bulk buying capacity.

³ Karl Marx, *Capital: An Abridged Edition*, ed. David McLellan (Oxford: Oxford University Press, 2008), 13–15, 22; Steve Keen, 'Use-Value, Exchange-Value, and the Demise of Marx's Labor Theory of Value', *Journal of the History of Economic Thought* 15, no. 1 (1993): 111–12.

⁴ Marx, 23.

strongly influential in the Australian military, and although pharmacists in the Australian Imperial Force (AIF) were eventually granted commissions, the rank conferred was neither permanent nor substantive, but honorary only as detailed in Chapter 2. Underpinning all these elements, however, is the irrevocable reality that pharmacy was predominantly a retail operation and as such was (and to a degree, continues to be) considered to be a trade. Pharmacists were perceived first and foremost as businessmen selling medicines as commodities for profit, not as health professionals providing clinical services.

This chapter argues that while the association with the “debased occupation” of trade or business was a strong contributing factor to the lack of social and professional acceptance of military pharmacists in the Australian and New Zealand Army Corps (ANZAC) forces, this attitude was nevertheless contradictory.⁵ On one hand, their connection with trade, along with the government’s supposedly strict adherence to the British military model, completely tainted the occupation for New Zealand military pharmacists, which resulted in serving pharmacists being denied commissions for the entire duration of the war in spite of determined lobbying by the national Pharmacy Board. New Zealand military pharmacists were effectively treated as skilled labourers, and were only required to perform, under direction, the manual tasks of compounding and bulk dispensing of a limited range of stock medicines to the wider New Zealand Army Medical Service. Skills, such as those involved in running a successful business such as a community pharmacy, were not recognised by the military, and those pharmacists working in dispensaries or base medical depots were relegated solely to the manual tasks of the occupation. Unlike Australia, their skills in inventory control and record keeping did not appear to be utilised or officially recognised.

⁵ Charles Newman, *The Evolution of Medical Education in the Nineteenth Century* (London: Oxford University Press, 1957), 3.

On the other side of the ledger, Australian pharmacists had a very different experience. The business acumen and skills of the serving Australian pharmacists were eventually recognised as valuable to the military authorities, particularly as the war dragged on and costs increased. Honorary commission ranks were conferred in early 1916 with the establishment of the Australian Army Pharmaceutical Service (AAPS) as part of the required hierarchy of command necessary in a newly established section of the armed forces, but this increased status was also validated through recognition of business skills by the Australian Commonwealth government.⁶ Substantive or permanent commissions continued to remain out of reach to pharmacists, however, mainly through their association with those very same business or trade practices. As shop-owning businessmen with a strong manual labour aspect to their occupation, pharmacists were considered to be the wrong social class for permanent elevation to the commissioned ranks, a consequence of their connection with retail trade, manual labour, and subsequent perceived lack of professionalism.⁷

WWI Medicine Supply – An Overview

This chapter examines in depth the social and economic aspects of business and trade for military pharmacists, and how these factors influenced the experience and recognition of serving pharmacists. Although New Zealand military pharmacists did not receive commissioned rank, they nevertheless played a small part in the economic area of medical commodity provision, particularly during the latter part of the war. Reductions in

⁶ See Glossary for definition of ‘Commonwealth of Australia’.

⁷ Arthur Graham Butler, *The Official History of the Australian Army Medical Services in the War of 1914-1918*, vol. III (Sydney, N.S.W.: Halstead Press, 1943), 490; Gregory Haines, *Pharmacy in Australia: The National Experience* (Sydney, N.S.W.: The Pharmaceutical Society of Australia, 1988), 4; Reg Combes, *Pharmacy in New Zealand: Aspects and Reminiscences* (Auckland: Pharmaceutical Society of New Zealand, 1981), 10; Nathan Wise, ‘The Myth of Classlessness in the Australian Imperial Force’, *Australian Historical Studies* 43, no. 2 (2012): 289–90.

medical supply expenses were made, and although the New Zealand military pharmacists did not have the same impact on the Medical Service as their Australian counterparts, the resultant cost savings were not insignificant. The Australian Commonwealth government also realised after the establishment of the AAPS that significant monetary savings could be made by utilising fully those who could bring trade contacts and business acuity from civilian life. Consistent quality control of medicines, in-house bulk manufacturing in the Medical Stores Base Depots in the main Military Districts in Australia, and efficiencies in logistics and transportation of those medicines were key areas of cost saving for the AAPS, all of which resulted from the specialised knowledge, business skills, organisation, and industry contacts of serving pharmacists. Accurate stock control, immaculate record keeping and economical purchasing practices became points of pride for Australian pharmacists in charge of Base Depots of Medical Stores.

In order to place the role of military pharmacists as traders in context, it is also necessary to examine the procurement processes, supply chain, and logistics of medicine and medical supply provisioning to the Dominions during the conflict. As part of the medical commodity supply chain, along with other medical equipment, medicines needed to be sourced and purchased, and a preferably uninterrupted continuity of supply maintained during the entire period of the conflict. Few studies of military supply chains of WWI exist. As noted in the biography of Quartermaster-General Sir John Cowans, this may be due to the mundane nature of the army's day-to-day existence either not being sufficiently glamorous or interesting enough to have been included as part of the official

records, or that histories of supply and demand fall into the realm of the economic or business historian, rather than military.⁸

Prior to the outbreak of hostilities in 1914, the majority of the world's supply of synthetic medicines and pharmaceuticals were sourced from large German chemical manufacturers as by-products of the aniline dye-stuff industries. F. Bayer and Co. had successfully developed and marketed the analgesics phenacetin (acetophenetidin) in 1888 and Aspirin (acetylsalicylic acid) from 1898, while Hoechst produced the chemotherapeutic anti-syphilitic Salvarsan (arsphenamine) in 1910.⁹ The outbreak of the war brought to a sudden halt the supply of these products to the countries of the Allied forces, and severely affected the ability of the Allied nations to source raw components and chemicals for in-house manufacturing into medicines. Britain's large-scale medicine production capability was almost non-existent at the outbreak of the war, with very few major research laboratories, pharmaceutical or chemical factories in operation.¹⁰ Of these, it was Burroughs, Wellcome & Co. which had sufficient capacity in both research and operational capability to increase production of items such as chloroform, flavine (an antiseptic), hydroquinone (an antiseptic skin preparation), cocaine, emetine and bismuth iodide (a treatment for amoebic dysentery), and also developed under licence their products Kharsivan and Neo-Kharsivan, substitutes for German-produced anti-syphilitics Salvarsan and Neo-Salvarsan.¹¹ Initially developed in their research laboratory, antitoxic sera for diphtheria, gonococcus, meningococcus, tetanus and dysentery, and 'tabloids'

⁸ Desmond Chapman-Huston and Owen Rutter, *General Sir John Cowans, G.C.B., G.C.M. G: The Quartermaster of the Great War*, vol. 1 (London: Hutchinson & Co., 1924), 273. Also Rob Nash, *Medical Stores* (Canberra: R. W. Nash), 1980.

⁹ Lea Doughty and Susan Heydon, 'Medicine Supply during the First World War: Overcoming Shortages in New Zealand', *Health and History* 17, no. 2 (2015): 39.

¹⁰ Jonathan Liebenau, 'The Twentieth-Century British Pharmaceutical Industry in International Context', in *Pill Peddlers: Essays on the History of the Pharmaceutical Industry*, ed. Gregory Higby, Jonathan Liebenau, and Elaine Stroud (Madison: American Institute of the History of Pharmacy, 1990), 124.

¹¹ E. M. Tansey, 'Medicines and Men: Burroughs, Wellcome & Co, and the British Drug Industry before the Second World War', *Journal of the Royal Society of Medicine* 95 (2002): 414.

were, however, the company's main products supplied to the British Expeditionary Force (BEF) and allies.¹² While other British companies such as May & Baker (licenced through Poulenc Frères to produce a Salvarsan alternative), and Allan & Hanburys Ltd (who mainly produced surgical and medical panniers including instruments) also saw business growth throughout the war, this was not on the scale of Burroughs, Wellcome & Company.¹³

During the four-year duration of hostilities, although manufacturing capability increased rapidly, the British also relied on obtaining stock from neutral countries such as the United States of America (USA).¹⁴ Britain's Dominions were also a key source of raw materials for the drug industry.¹⁵ Not only were supply chains and contracts with what became enemy nations necessarily broken, but many imported components used in the production of medicines were also in demand as part of war materiel. Glycerine, sodium perchlorate, acetone, cresol, sodium chlorate and other pharmaceutical products used in the production of medicines were also used in the manufacture of munitions. These products were quickly placed on Allied governments' absolutely prohibited contraband schedules, and existing supplies were requisitioned for the war effort in both countries.¹⁶ Glycerine in

¹² Ibid. 'Tabloid' was Burroughs, Wellcome & Company's patented name for compressed tablets, and were particularly useful for inclusion in medical panniers due to their convenience and reduction in the amount of space needed to transport medicines. See Ryan Johnson, "Tabloid Brand Medicine Chests: Selling Health and Hygiene for the British Tropical Colonies," *Science as Culture* 17, no. 3 (2008): 250.

¹³ Judy Slinn, *A History of May & Baker, 1834-1984*, (Cambridge: Hobsons Ltd, 1984), 79, 89-90; Geoffrey Tweedale, *At the Sign of the Plough: 275 Years of Allan & Hanburys and the British Pharmaceutical Industry, 1715-1990*, (London: John Murray Ltd, 1990), 103, 116-118.

¹⁴ Jonathan Liebenau, 'The Rise of the British Pharmaceutical Industry', *British Medical Journal* 301, no. 6754 (1990): 726. The USA remained neutral until its entry into the war in April 1917.

¹⁵ 'Drugs, Medical Stores', 1919, A11803, 1919/89/534, National Archives of Australia, Canberra, Australia.

¹⁶ Doughty and Heydon, 46; 'Contraband of War', *Commonwealth of Australia Gazette*, no. 105 (31 December 1914): 2831.

particular was in such short supply due to war requisitioning that glucose and treacle were used to make substitutes for medicinal preparations.¹⁷

Medicine Manufacturing – New Zealand and Australia

As a small country of just over one million people in the early twentieth century, New Zealand's medicine manufacturing capability was significantly limited.¹⁸ Not only was the population too small to sustain a viable commercial medicinal industry, but its remote geographical location meant that all raw materials for production needed to be imported from considerable distances. Kempthorne Prosser Ltd, with a head office located in Dunedin, was New Zealand's largest pharmaceutical wholesaler at the time of the war. The company purchased medicinal products in bulk from overseas companies and repacked them into smaller units for resale to community and hospital pharmacies.¹⁹ In Auckland, Sharland and Company added a wholesale section to their retail operation in 1870 and also directly imported medicinal products for sale and distribution, gradually growing this side of their business and establishing branches throughout the country by the early twentieth century.²⁰ The new synthetic drugs, produced as they were through large industrial chemical laboratories and as by-products of the aniline dye industry, were not manufactured in New Zealand. As a result, these 'modern' medicines and medicinal preparations were imported, with the majority of products arriving into the country from the United Kingdom (UK) and Australia (see Table 9).²¹

¹⁷ William Grant Macpherson, *History of the Great War: Medical Services, General*, vol. 1 (London: His Majesty's Stationery Office, 1921), 178.

¹⁸ *Results of a Census of the Dominion of New Zealand Taken 15 October 1916* (Wellington: Government Printer, 1920), 11.

¹⁹ Simon Shield Wilson, 'From Eau de Cologne to Rat Poison: Kempthorne Prosser and Co.'s New Zealand Drug Company Limited, 1869-1918' (MA thesis, University of Otago, 2011), 41; Doughty and Heydon, 48.

²⁰ Combes, 177.

²¹ *New Zealand Official Year Book* (Wellington: Government Printer, 1918); *New Zealand Official Year Book* (Wellington: Government Printer, 1919). These figures are for Principal Imports by Country, Class XXIIA Items 765 Medicinal Preparations n.o.e. and XXII Items 791 Drugs, other.

Table 9: Annual New Zealand Imports of Medicinal Preparations, 1913-1918

	1913	1914	1915	1916	1917	1918
United Kingdom	£99,164	£104,505	£90,134	£137,042	£98,962	£123,621
Australia	£56,904	£79,008	£77,079	£85,772	£92,444	£54,383
United States	£20,551	£22,057	£15,709	£27,453	£22,393	£50,840
Japan	-	£2,269	£2,662	£5,628	£3,131	£10,723
Total	£176,619	£207,839	£185,584	£255,895	£216,930	£239,567

Source: *New Zealand Official Year Book 1918-1919*

Although Kempthorne Prosser had a pharmaceutical manufacturing facility in Dunedin, this was almost entirely given over to contract manufacturing of proprietary galenical (plant-based) medicines on behalf of institutions and businesses such as hospitals, veterinary practices, and smaller community or retail pharmacies. Two of their contract-manufacturing works order ledgers remain, covering the period from 1901 through to 1955. Of the two, one documents a single order for the Defence Department throughout the duration of the war, which was manufactured on 15 September 1914, shortly after the outbreak of hostilities. This order was for a ‘Dr Howard’ at the Tahuna Military Camp in Dunedin, and was a veterinary product given to horses to inhibit urination.²² Dr Howard was Captain E. C. Howard, a qualified veterinarian and officer in the New Zealand Veterinary Corps.²³ This product was likely to have been used on board the troopships for ease of mucking out in transit while transporting the horses of the Otago Mounted Rifles to Egypt in October 1914. Inability to dispose of urine from ship’s holds could contribute to the deaths of horses in transit. None of the histories of the Veterinary Service for both New Zealand and Australia, however, detail specific processes used for

²² Kempthorne Prosser, ‘Prescription Record Book 1901-1955’, 15 September 1914, AG120-117, Hocken Library, University of Otago, Dunedin; John Fraser, Personal communication, 7 September 2016.

²³ C. J Reakes, ‘New Zealand Veterinary Corps’, in *The War Effort of New Zealand* (Auckland: Whitcome and Tombs, 1923), 151.

animal transport to any extent.²⁴ No further information regarding supply contracts or orders for the Defence Department are contained in Kempthorne Prosser's archival materials. As only two ledgers remain, and it is unknown whether these ledgers were the only ones in existence at the time, it cannot be shown definitively that Kempthorne Prosser did not hold any Government contracts to supply the Defence Department with medicinal products manufactured by them in any quantity.

In contrast, Australia had a well-established pharmaceutical manufacturing industry by the beginning of the twentieth century, although as with New Zealand, this was producing galenical or plant-based pharmaceuticals rather than synthetic drugs as Australia also did not have a dye manufacturing industry. The most well-known of these companies included: Felton, Grimwade and Company (Melbourne); Elliott Brothers Limited (Sydney); Duerdin and Sainsbury (Melbourne); Rocke, Tomsitt and Company (Melbourne); F. H. Faulding and Co. (South Australia); and Australian Drug Company Limited (Sydney), all of which advertised their wares heavily in pharmaceutical trade journals. A number of smaller local companies and wholesale drug houses were also in business, and sales offices for large British and American pharmaceutical companies such as Burroughs Wellcome and Company (UK) and Parke, Davis and Company (USA) were well-established in Sydney and Melbourne.²⁵ With a population of nearly four and a half million people, three times larger than that of New Zealand, Australia's pharmaceutical

²⁴ Ian M. Parsonson, *Vets at War* (Canberra: Australian Military History Publications), 2005; Michael Tyquin, *Forgotten Men: The Australian Army Veterinary Corps 1909-1946* (Newport, N.S.W.: Big Sky Publishing), 2011, 47-50, 60.

²⁵ Lists of overseas sales offices were often included on letterheads of the main office. For example, see letter from Burroughs Wellcome and Company to Captain Gibbs of the New Zealand Defence Force in Wellington dated 18 September 1918. The letterhead lists offices in New York, Montreal, Sydney, Cape Town, Milan, Shanghai, Buenos Aires, and Bombay alongside the main office of London. See 'Letter from Burroughs Wellcome and Company to Captain Gibbs,' AAYS 8696 AD80/3 111/1, Archives New Zealand, Wellington.

manufacturing industry had a viable commercial basis.²⁶ It was the business contacts and relationships that serving Australian pharmacists had developed with the sales staff of these manufacturing and wholesale companies through their normal civilian business activities that eventually became valuable to the Australian government.

Medicines and drugs were both imported as well as exported by Australia. Significantly more quantities were imported than were exported; for example, medicines and other drugs valued at £901,617 arrived into the Commonwealth of Australia from the UK alone during the 1917-18 year, which constituted 28 per cent of the annual imported total of £3,217,933.²⁷ In comparison, the total chemical exports for the same year were only £733,874 (see Table 10).²⁸ It is unfortunate that the import/export classification does not, however, permit further detailed analysis other than gross value, and these figures include not only medicines and drugs, but other industrial chemicals and fertilisers.

Table 10: Annual Australian Imports and Exports of Classification XXIII Drugs, Chemicals and Fertilisers Throughout the Commonwealth, 1913-1918

	1913	1914-15	1915-16	1916-17	1917-18
Imports	£2,493,192	£2,425,689	£3,000,984	£3,130,397	£3,217,933
Exports	£269,387	£313,860	£477,832	£436,413	£733,874
Net Variance (imports)	£2,223,805	£2,111,829	£2,523,152	£2,693,984	£2,484,059

Source: Official Year Book of the Commonwealth of Australia, No. 11 - 1918

²⁶ Census Bureau, *Census of the Commonwealth of Australia, Taken for the Night Between the 2nd and 3rd April, 1911*, Vol. I (Melbourne: McCarron, Bird and Co., 1917), 85.

²⁷ *Official Year Book of the Commonwealth of Australia 1901-1918*, vol. 12 (Melbourne: Commonwealth Bureau of Census and Statistics, 1919), 566–67, 583. The Commonwealth of Australia refers to Australia as the post-Federation national entity (from 1901), rather than by individual state.

²⁸ *Ibid.*, 584.

Procurement Processes

Bulk supplies for the governments of both New Zealand and Australia were usually purchased using a tender process. This involved placing advertisements in newspapers, calling for companies to present their proposed pricing for various quantities of products, to be supplied over specified periods of time. The company with the lowest price may not necessarily become the successful tenderer, as guarantees for continuity of supply and product quality may have also been factored into the decision to award the contract. Once the contract was awarded to the supplier, they were then contractually bound to supply the quantities required at the price stated in their tender submission, for the specific period of the contract. Variations to the contract may have been acceptable, however, provided both parties agreed in writing to the new price, quantity, and delivery schedule, or the substitution of another, equivalent product.

New Zealand

In New Zealand, this process for the purchase of medicines for the main New Zealand Expeditionary Force (NZEF) appears to have happened only once. Advertisements were placed in the main newspapers in the largest cities for the provision of medicines, dressings, surgical instruments and medical ‘comforts’ by Brigadier-General Alfred W. Robin, then Quartermaster-General (QMG), during December 1915.²⁹ The required provision of medical supplies was initially for the period of three months from January to March 1916; however, the proviso was included that the contract could be possibly extended to six months. These advertisements followed others inserted in early

²⁹ ‘Tenders for Supply of Drugs, Dressings, Medical Comforts, Surgical Instruments, Etc’, *New Zealand Herald*, 9 December 1915, 10. Also *Dominion*, 8 December 1915, 3; *New Zealand Times*, 11 December 1915, 12; *Sun*, 11 December 1915, 15; *Evening Star*, 11 December 1915, 1; *Evening Post*, 11 December 1915, 10; *Otago Daily Times*, 11 December 1915, 11. Medical comforts were items that were not essential to the provision of treatment such as instruments and medicines, but provided recovering wounded with a degree of comfort and dignity, e.g. toothbrushes, tooth glasses for dentures, and pyjamas. New Zealand did not (and still does not) have a national newspaper, only regional or local community publications.

November 1915 in the main Wellington newspapers, calling for tenders for the provision of medical supplies for the second hospital ship, *Marama*.³⁰ This proposed contract was for the initial outfitting of the ship and its dispensary, and did not include any obvious provision for ongoing replenishment of stocks. It is also possible that the successful tenderer may have expected the opportunity to extend their contract to include replacement stock as part of the terms and conditions of the tender. This did not occur, however.

In his report to the New Zealand House of Representatives on 16 June 1916, Arthur H. Myers, Minister in Charge of Munitions and Supplies, wrote that the expenditure for the calendar year of 1916 on “Drugs for medical, dental, and veterinary services” was expected to be approximately £23,500.³¹ Written well after the call for tenders for the provision of medicines from January to June 1916, Myers also stated in his report that the “Department purchased quantities likely to be required during this period, and vendors were bound to hold same, covered by insurance, to the order of properly authorized officers, payment being made as goods were delivered.”³² It is, however, unknown who the successful tenderers were. All successful tenders for Government contracts were normally published in the *New Zealand Gazette*; however, this was not the case for any contracts placed for the Department of Defence during the period of the war. Not only contracts for medical supplies, but other successful contracts for uniforms, forage, hardware and other items necessary to the Department (with the exception of ammunition)

³⁰ ‘Surgical Instructions, Dressings, Drugs, and Medical Requisites for the Hospital Ship Marama’, *Dominion*, 3 November 1915, 7. Also *New Zealand Times*, 3 November 1915, 10; *Evening Post*, 3 November 1915, 12. The dispensary of the first hospital ship, *Maheno*, was provisioned through monetary donations by New Zealand pharmacists – see Letter from Pharmaceutical Society of New Zealand to Members, 29 May 1915, Pharmacy Board Correspondence 1913-1916, 81-084-14 Box 14, Alexander Turnbull Library, Wellington; Combes, 189. Archival records for the outfitting of the *Marama* do not record specific information on what medicines and drugs were requested or received, unfortunately. See ‘Transport – Hospital ship – No. 2 – Charter and fitting of “Marama” (ship), 1915, AAYS 8638 AD1/793/25/133, Archives New Zealand, Wellington.

³¹ Arthur H. Myers, ‘Military Supplies and Munitions’, *Appendices to the Journals of the House of Representatives* H-24 (Wellington: Government Printer, 16 June 1916), 3.

³² *Ibid.*, 7.

were also not published in the journal. It is generally accepted, however, that the government did not progress the usual process for tendering and contracting for materiel for the main NZEF overseas body in New Zealand, but that this was done on the Dominion's behalf by the British, and coordinated through the office of the New Zealand High Commissioner in London, Sir Thomas Mackenzie.³³ It would be a logical step, as shipping costs and turnaround times would be minimised if materiel were sourced in Britain and then transported for further distribution to Base Depots in Egypt and the UK, rather than from New Zealand. No archival material has been located in New Zealand to confirm that medicines and medical supplies were purchased through the High Commissioner's office, however. It is likely that should this evidence survive, it will be held in the National Archives in Kew, London.³⁴

In correspondence to QMG Robin in October 1915, Myers proposed that a register of suppliers be developed to keep control of centralised purchasing. Robin agreed, and an advertisement for insertion in the main newspapers was drafted, advising manufacturers and suppliers that "The Minister in charge of Munitions and Supplies desires that in the acquisition of articles under this head all members of the commercial community should be given a direct opportunity to secure such contracts or orders as the Department has from time to time. To attain this object it is proposed to establish, as from 15th November 1915, a Register of manufacturers, merchants and others who desire to make quotations for any

³³ Ian McGibbon, General Editor (War History) Ministry for Culture and Heritage (retired), personal communication (email), Dunedin, 11 October 2017.

³⁴ Upon enquiry, the Remote Enquiries Duty Officer at National Archives (Kew) advised that this material would form part of the Colonial Office records if existing; upon searching this series in the database, records of correspondence held from the New Zealand High Commissioner's office start at 1954. Chris Day, Personal communication, 28 February 2019. Similarly, Robert McIntosh, Curator of the Museum of Military Medicine in Aldershot, UK has also advised that their archive and library also do not contain any material relating to the supply of medicines and drugs to the New Zealand Army from British suppliers, although he suspects this was likely practice. Robert McIntosh, Personal communication, 10 May 2019.

business the Department has to offer.”³⁵ This advertisement was then published widely throughout New Zealand during the latter part of December 1915, including in small local publications such as the *Manawatu Standard*, the *Wanganui Herald*, and the *Southland Times*, as well as the main newspapers in the city centres.³⁶

As the Government was spending public money and was liable for audit, it was essential that control of expenditure was maintained.³⁷ By establishing a register of what would essentially become preferred suppliers, the Department of Defence sought to rationalise their spending, increase efficiency and ensure the best value for money. As John Crawford noted in his chapter on the performance of the Department of Defence during the war, the Department was “run parsimoniously” and was equally careful to fully account for public funds and property.³⁸ A list of required medical supplies was developed as part of an extended Schedule of Articles that were deemed necessities for ensuring continuity of supply. Therapeutics and other ready-made consumable items for medical application such as eucalyptus and menthol pastilles for sore throats were requested alongside bed pans, earthenware urinals, towels, bandages, safety pins, and plaster of Paris. This list also included brandy, whisky, port wine and stout as medicinal preparations.³⁹ Alcohol as a medicinal product has a long history, with whisky, and particularly brandy, used as both stimulants and as sedatives.⁴⁰

³⁵ ‘Supplies - Register of Suppliers’, 1915-1921, AAYS 8638 AD1/993, Archives New Zealand, Wellington.

³⁶ *Manawatu Standard*, 10 December 1915, 8; *Wanganui Herald*, 31 December 1915, 1; *Southland Times*, 16 December 1915, 6.

³⁷ Under the provisions of Section 84(1) of the *Public Revenues Act* 1910, annual financial accounts prepared by Treasury were audited by the Controller and Auditor-General and published as Section B-01 of the *Appendices to the Journals of the House of Representatives*, including statement of public debt of the Dominion.

³⁸ John Crawford, “‘Duty Well Done’: The Defence Department at War: 1914-1918”, in *New Zealand Society at War, 1914-1918*, ed. Steven Loveridge (Wellington: Victoria University Press, 2016), 38–39.

³⁹ ‘Supplies - Register of Suppliers’.

⁴⁰ Henry Guly, ‘Medicinal Brandy’, *Resuscitation* 82 (2011): 951–54. Brandy, as *Spiritus Vini Gallici*, was listed in the British Pharmacopoeia.

While domestic suppliers of medicines were not listed in the Register and formal tender processes were not conducted, quotations for local supply of products were obtained through direct request from manufacturers and agents in New Zealand from October 1915. Companies such as Kempthorne Prosser Ltd (both Dunedin and Wellington offices), Sharland and Company of Auckland, H. F. Stevens of Christchurch, and Young's Chemical Company in Wellington were either invited by mail to furnish their prices for specific products as required, or quotations were sought by telephone if required urgently.⁴¹ All suppliers were required to advise their prices or whether they were unable to supply the products requested by return mail. Decisions on competitive quotations appear to be made on price, with the supplier quoting the lowest price being awarded the order.⁴² As one example, between 19 February and 1 March 1918, Sharland and Co. Limited and Young's Chemical Company were both asked to furnish their price for the conversion of 20 gallons of cod liver oil into emulsion. Sharland and Co. advised that they could do the work for a nett cost of 13 shillings per gallon of emulsion, while the price quoted by Young's Chemical Company was 10 shillings per gallon. On 9 March, the recommendation was made to accept the tender of Young's Chemical Company.⁴³ Medicines and chemicals were to be delivered to Defence Medical Stores, in Buckle Street, Wellington for distribution as needed to New Zealand-based Army camp hospitals and for the resupply of hospital ships *Maheno* and *Marama* for each new charter.⁴⁴ Although formal public advertising of tenders did not occur beyond late 1915 with the initial outfitting of the *Marama*, it is evident that local suppliers were nevertheless

⁴¹ 'Quotation No. 331', 20 June 1918, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington.

⁴² In the case where only one supplier could provide the product, the contract was awarded to them by default. Competitive quotations are where more than one supplier was able to provide the requested item(s), in which case the lowest priced quotation was successful.

⁴³ 'Young's Chemical Company Quotation', 19 February 1918, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington; 'Sharland and Co. Limited Quotation', 1 March 1918, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington; 'Memo to Chief Executive Officer Munitions and Supplies Dept', 9 March 1918, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington. Nett cost means that delivery was an extra charge.

⁴⁴ 'Memo to Chief Clerk', 25 January 1918, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington.

importing therapeutics and medical consumables and offering them to the Department of Defence as requested by them (for example of quotation request, see Fig. 5).

Fig. 5: Example of Letter Seeking Quotations from New Zealand Suppliers, 1918.

20 June 1918

QUOTATION NO. 331

The minister in Charge will be obliged if you will let me have at this office, on or before noon tomorrow, 21st June, your quotation for the supply and delivery to the Medical Stores, Buckle Street, Wellington, of the following items:-

1. 14 lbs. Creta Call Pulv.
2. 2 lbs. Inf Rosae Acid
3. 4 lbs. Past Menthol
4. 4 lbs. Past Eucalyptus
5. 1000 Tabs Mastone Dr.1
6. 500 " (Phenactein Et Quin Co.)
7. 1000 " Naso- Pharyngeal Co.
8. 1 gross 8oz Bottles Vial
9. 1 gross 4oz Chip boxes
10. 6 lbs. Wool Capsicum and Methly Salicyl
11. ½ lb. Nitric Acid
12. 2 lbs. Sodium Sulphite Anhydrous
13. 2 lbs. Con Sennae
14. 50 lbs. Acid Acetic Glac.
15. 50 lbs. Cocoanut Oil
16. 112 lbs. Creta Call Pulv.
17. 3 packets Metol Quinel Tabs B W
18. 3 packets Sepia Toner Tabs B W
19. 1 lb. Hydro quinone
20. ½ lb. Metol
21. ½ lb. Amidol
22. 2 doz. Plates Ilford X Ray 8½ x 6
23. 2 packets Suanic Bromide Paper W & W
24. 2 " " " " 10x8
25. 26 lbs. Hypo
26. 10 lbs. Aqua Distillate

Yours faithfully
Chief Executive Officer

Sent to:-
11555 Youngs Chemical Co., Egmont St., Wgton.
11556 Sharland & Co. Box 388 Wgton.
11557 Kempthorne Prosser & Co. Box 1495 Wgton.

Source: 'Quotation No. 331', 20 June 1918, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington.

Items 17 to 26 are used in the production of x-ray film (developers hydroquinone, metol and amidol; paper and plates), the remainder of the quotation is for items used in compounding or packaging, along with treatments for sore throats (menthol and eucalyptus pastilles), antiseptics (sodium sulphite anhydrous), laxatives (confection of senna), and skin treatments (glacial acetic acid).⁴⁵

Medicines thus continued to be sourced with little disruption to the supply chain and payment for them was made. The following year, another report was tabled by Myers to the House. His forecast for the calendar year 1917 for the purchase of drugs was reduced to £17,460, however only £2,584 of expected orders had been placed at the date of the report in June.⁴⁶ Again, the supplier (or suppliers) was not named in the report. A further reduction in the cost of medicines was forecast for the period July 1917 to 30 September 1918, with Myers' anticipating a projected expenditure of £11,081.⁴⁷ This reduction may be explained by the report tabled to the House by (now) Major-General A. W. Robin, General Officer Commanding (GOC) on 22 October 1918 covering the period 31 May 1917 to 1 July 1918, which noted that the supply of drugs had continued throughout the year "with little difficulty, taking into consideration the shortage of supplies on the market."⁴⁸ Robin also stated that fiscal savings had been made "due to having good stocks on hand at the termination of the last period, and also to obtaining supplies from the United Kingdom and not being wholly dependent upon the local market."⁴⁹ This comment is the clearest indicator in the absence of definitive archival material that medicines for the overseas contingent were indeed being sourced from Britain, as well as through local suppliers.

⁴⁵ Peter Wyatt Squire, *Squire's Pocket Companion to the British Pharmacopoeia* (London: J. & A. Churchill, 1904), 590–91, 564–67, 7–8.

⁴⁶ Arthur H. Myers, 'Munitions and Supplies Department', *Appendices to the Journals of the House of Representatives* H-24, (Wellington: Government Printer, 16 June 1917), 1–2.

⁴⁷ Arthur H. Myers, 'Munitions and Supplies Department - Report by the Minister in Charge', *Appendices to the Journals of the House of Representatives* H-24 (Wellington: Government Printer, 30 September 1918), 2.

⁴⁸ Alfred W. Robin, 'Defence Forces of New Zealand - Report of the General Officer Commanding the Forces, for the Period from 31st May, 1917, to 1st July, 1918' *Appendices to the Journals of the House of Representatives* H-19 (Wellington: Government Printer, 22 October 1918), 9.

⁴⁹ *Ibid.*

Notwithstanding this, it is evident that some medical supplies were purchased by the New Zealand Military Forces from Australia, although it is not clear if these purchases were from the Australian Government or directly from Australian manufacturers. A memo dated 29 November 1917 from the Officer in Charge of Medical Stores to the Chief Executive Officer of Munitions and Supply requested that a number of medical commodities be obtained from Australia, including a number of pharmaceutical lines such as five lbs of cocaine hydrochloride (painkiller), 112 lbs of potassium citrate (for kidney stones), 100 gallons of Lysol (antiseptic), and 560 lbs of glycerine.⁵⁰ New Zealand and British forces in Egypt also on occasion drew on medical stores issued from the Australian advanced Depot of Medical Stores at Tel-el-Kabir, with costs recovered through AIF Headquarters at Tidworth, UK.⁵¹ No further evidence of quantities, actualised costs, or itemisation of products, however, has been retained in the archival material.

For the period 1916-1917, £18,764 worth of drugs were purchased, while medicines and equipment issued or used amounted to £16,764, with the unused balance carried forward into the next financial year.⁵² During the following 1917-1918 year, the amount purchased was nearly halved at £10,184, while issues were less than half those of the previous year at £7,576.⁵³ This reduction in cost may be due to bringing the compounding of pharmaceuticals and medicines in-house, under control of the central Medical Stores themselves. Further into the report, Robin detailed a list of various unguents, tinctures, suppositories and other medications that had been produced in the Store, itemised with associated costs, and compared with corresponding prices from local

⁵⁰ 'Memo to Chief Executive Officer Munitions and Supplies Dept', 29 November 1917, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington.

⁵¹ 'Memo to D.M.S. A.I.F. Headquarters', 1916, AWM15 7975, Australian War Memorial, Canberra.

⁵² Robin, *AtoJHR*, 22 October 1918, 9.

⁵³ *Ibid.*

wholesale drug houses.⁵⁴ This comparison indicated a total cost saving of £120 13s 11d, with the single greatest saving of over £80 on the in-house manufacture of 638 lbs of Tincture Iodine (Tinct. Iodi.); this item cost the Medical Stores £21 3s 9d to make, while the quoted price to supply the product from a local drug wholesaler was £103 13s 6d.⁵⁵ By making use of serving pharmacists or Army-trained dispensers and keeping the compounding or other manufacture of medicines under the control of the Army's central Medical Store located in Buckle Street, Wellington, rather than buying in already-prepared supplies from external manufacturers, the Department of Defence made a significant saving in the cost of medicines for this later period.

In-house manufacture of therapeutics was underway by mid-1916. This was possibly a result of learning from the Australian example, with the establishment of the AAPS earlier in the year. Director of Medical Services (DMS), Colonel James R. Purdy wrote to the Officer in Charge of the Military Supplies Purchase Board on 7 September 1916, requesting the purchase of a number of small-size scales and weights from a Messrs Harringtons of Wellington, along with a 12-suppository mould from the Wellington branch of Sharland & Co., with the acknowledgement that it would "be a saving and an advantage to make our own."⁵⁶ These are, however, the only indications that New Zealand pharmacists or compounders may have been in a position to use their occupational skills to make a tangible financial contribution to the war effort.

⁵⁴ *Ibid.*, 10.

⁵⁵ *Ibid.* Tincture of iodine is a weak solution of iodine dissolved in a mixture of ethanol (alcohol) and water and used as a topical antiseptic.

⁵⁶ 'Memo to Officer in Charge Military Supplies Purchase Board', 7 September 1916, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington.

By November 1917, the ongoing cost of the war to the New Zealand government had reached almost £2,000,000 per month.⁵⁷ Cost savings in all areas were being actively pursued, and although therapeutics and medical commodities made up only an extremely small portion of the overall expenditure, nevertheless any savings that could be made in medicine supply were welcomed. Pharmacists were not alone, however, in utilising their skills to save the New Zealand government money on medicines for the troops. During the period of the war, supplies of medicines including painkillers and anaesthetics were difficult to obtain regularly. Suppliers were often out of stock of specific lines such as potassium citrate (for the treatment of kidney stones) and sodium bromide (used as a sedative), and replacement stock was difficult to obtain with irregular shipping schedules.⁵⁸ Frequent and regular supply of therapeutics to control extreme pain was, of course, a critical priority. With the entry of Turkey into the war in October 1914, the supply of medical-grade opium for the manufacture of morphine either ceased or was severely restricted.⁵⁹ With any possibility of trade with enemy nations strictly prohibited, innovative methods were sought to make up the short-fall in supplies. A regular supply of morphine in particular was a high priority for the military authorities, who were quick to avail themselves of specialist skills that were offered to produce this medication.

Contraband Opium into Morphine

Thomas Easterfield, Professor of Chemistry at Victoria University College in Wellington, New Zealand, recognised early on the potential issues that could occur

⁵⁷ 'Letter George S. Richardson - War Economy', 22 November 1917, WA1/23[25] Part 1, Archives New Zealand, Wellington. Total trade for New Zealand for the year 1917 was £51,602,418 excluding gold specie and bullion, comprising £20,919,259 in imports, and £30,683,159 in exports. Gross Domestic Product (GDP) was not used as an accounting measure at this time. See Section XIII, Sub-section A – Total Trade in *New Zealand Official Year Book* (Wellington: Government Printer), 1918.

⁵⁸ 'H. F Stevens Quotation', 16 October 1917, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington; 'H. F. Stevens Quotation', 13 October 1917, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington.

⁵⁹ Doughty and Heydon, 40–41.

through the lack of strong painkillers, and also a way for him to utilise his unique skills to do his part for the war effort. On 26 May 1915, in conjunction with George Dempsey, the Works Manager of Young's Chemical Company, Professor Easterfield wrote to the Minister for Defence, Mr James Allen, in Wellington. In this letter, Easterfield offered his services to extract morphine from seized contraband opium held by the Customs Department for the use of the two hospital ships or military base hospitals.⁶⁰ Costs for the chemicals used to extract the active drug from the confiscated opium were requested from the Department of Defence, but the process itself was offered at no charge for Easterfield's time or labour. In his initial letter, Easterfield stated that he was aware that the Customs Department was holding approximately 250 lbs of opium, and that "The morphia in this opium will amount to at least 5% of its weight and its value at present prices would not be less than £200."⁶¹ Needless to say, the Department of Defence were very pleased with this offer, and it was quickly accepted. Easterfield's letter was forwarded by DMS Purdy to GOC Robin on 28 May, with the annotation "It would be a great help if the above was done. Morphia is of course indispensable and this could be a good way to get a fair supply at little or no cost."⁶² Minimising the cost incurred in supplying the product had as great an importance to the military authorities as actually obtaining the stock.

The Minister of Defence then wrote to the Minister of Customs on 4 June 1915, officially requesting the release of the confiscated opium to Easterfield for the extraction of morphia for production into morphine.⁶³ This request was received and acted upon, and on 12 June the Comptroller of Customs advised the DMS that a quantity of opium and

⁶⁰ Thomas Easterfield to Minister for Defence, 26 May 1915, AD1 922, 46/250, Archives New Zealand, Wellington.

⁶¹ *Ibid.* 250lb equates to around 113kg.

⁶² *Ibid.*

⁶³ Minister of Defence to Minister of Customs, 4 June 1915, AD1 922, 46/250, Archives New Zealand, Wellington.

tincture of opium was ready for transfer to Easterfield. The DMS replied on 23 June, advising that “the jars and winchesters [2.5 litre bottles] of opium and also the morphia will be invaluable. Please send these drugs to the Defence Stores, Buckle Street, Wellington, addressed to the Director of Medical Services.”⁶⁴ This was duly done, and the contraband opium was received at Defence Stores on 28 June for storage until needed.

In November of that year, Easterfield once more wrote to the Minister of Defence, with an apology for taking so long to do the extraction of the drug owing to being short-staffed as his laboratory assistants were volunteering for the NZEF. At this point, Easterfield advised that he had been successful in extracting 120 ounces of morphia, with an approximate value of £150.⁶⁵ Easterfield also suggested that a one-ounce sample of the morphine that had been produced in the laboratory should be sent for testing in a military hospital before the bulk of the material was forwarded.⁶⁶ This suggestion was promptly accepted by Robin on 26 November 1915.⁶⁷ The sample of morphine hydrochloride was duly sent to the QMG at Defence Medical Stores, Buckle Street, Wellington, on 1 December 1915, with an undertaking by Easterfield that “if found satisfactory I will pack the [remaining] material and forward to you.”⁶⁸

The military wasted no time in having the morphine sample tested. Within the week after receipt at Defence Stores in early December, the sample was sent by Purdy to

⁶⁴ Comptroller of Customs to Director of Medical Services, 12 & 23 June 1915, AD1 922, 46/250, Archives New Zealand, Wellington. ‘Winchester Quart’ bottles originated in the UK during the nineteenth century, with a capacity of two Imperial quarts.

⁶⁵ Thomas Easterfield to Minister for Defence, 20 November 1915, AD1 922, 46/250, Archives New Zealand, Wellington.

⁶⁶ *Ibid.*

⁶⁷ A. W. Robin to Thomas Easterfield, 26 November 1915, AD1 922, 46/250, Archives New Zealand, Wellington.

⁶⁸ Thomas Easterfield, 1 December 1915, AD1 922, 46/250, Archives New Zealand, Wellington.

Lieutenant-Colonel Charles G. Morice of the Medical Corps for his report on its efficacy.⁶⁹ Testing was completed and the results reported back to Purdy in the New Year, with Purdy advising Easterfield on 18 February 1916 that the “sample of Morphia supplied by you some time ago for testing purposes has proved in every way satisfactory,” and that he would “be pleased if you could send us the bulk supply you have so patriotically provided.”⁷⁰

There is no further indication that Easterfield repeated the exercise or produced any further morphine from his Wellington laboratory. In November 1916, however, the Comptroller of Customs (under direction from the Minister) advised the DGMS that the Customs Department were in further possession of “45 lbs of tincture of opium in nine 5 lb bottles,” and that it “is proposed that this laudanum be handed over to one of the hospital ships for the use of our troops abroad.”⁷¹ He goes on to state that “the tincture has been under the control of a private individual since March last and that although it is believed to be of B.P. [*British Pharmacopeia*] strength it would be advisable to have it standardised before being used.”⁷² The name of this private individual is unfortunately not recorded in the file. Again, the DMS was quick to accept the offer, and advised on 21 November 1916 that “it would be a much better course if the Tincture was sent to the Medical Store in Buckle Street to be issued from there for the use of our soldiers.”⁷³

⁶⁹ Minute James Purdy, 11 December 1915, AD1 922, 46/250, Archives New Zealand, Wellington.

⁷⁰ James Purdy to Thomas Easterfield, 18 February 1916, AD1 922, 46/250, Archives New Zealand, Wellington.

⁷¹ Comptroller of Customs to DGMS, 15 November 1916, AD1 922, 46/250, Archives New Zealand, Wellington. Pharmacists and chemists were experienced in using both metric and imperial weights and measures. This may be due to the origin of some materials being from Europe which used metric, while others came from Great Britain or the United States of America, which used imperial measures.

⁷² Comptroller of Customs to DGMS, 15 November 1916, AD1 922, 46/250, Archives New Zealand, Wellington. The *British Pharmacopeia* was the standard used for determining the purity and guarantee of active ingredient present in a medicine.

⁷³ J. R. Purdy to Controller of Customers, 21 November 1916, AD1 922, 46/250, Archives New Zealand, Wellington. Although the person who held the tincture of opium is unknown to us, we do know that this batch of opium tincture supplied by the Customs Department originated in Dunedin, and that two cases

It would appear that the Customs Department was under standing orders to advise the Defence Department of any contraband opium that it seized in the course of its normal operations. On 3 March 1917, the Comptroller of Customs again wrote to the DMS, advising that the Customs Department was in possession of “33 tins, each containing about 8 ozs. Opium,” which was to be handed over to the Medical Service for use of the troops.⁷⁴ A sample tin had been sent to the Dominion Analyst “to ascertain whether it could be converted into Extractum Opii B.P. containing 20% of Morphine,” who duly advised that the opium was of low strength containing “10-11% Morphine only.”⁷⁵ The suggestion was then made that it could be made into either “Tincture Opii B.P. or into Extractum Opii Liquidum B.P.”⁷⁶ This suggestion was accepted by the DMS on 9 March 1917.⁷⁷ Extracting the morphine from the opium and manufacturing it into Tincture of Opium B. P. was done in this instance by the Dominion Analyst in the Dominion Laboratory, under the control of the Department of Internal Affairs in Wellington, with the processes and expenses incurred kept within direct Government control.⁷⁸

On 12 April 1917, the Analyst advised the DMS that he had “standardised 10 litres of Tincture of Opium which now awaits delivery,” and that the rest would be done “in due

containing 9 five lb. bottles were sent to Wellington on the *SS Tarawera*, arriving at Defence Stores on 11 December 1916. See J. R. Purdy to Controller of Customers, 11 December 1916, AD1 922, 46/250, Archives New Zealand, Wellington.

⁷⁴ Comptroller of Customs to DGMS, 3 March 1917, AD1 922, 46/250, Archives New Zealand, Wellington.

⁷⁵ Ibid.

⁷⁶ Ibid. A tincture is usually an alcoholic extract with an ethanol range of 25-60%. “B.P.” indicates that the product quality adheres to the *British Pharmacopeia* standard. New Zealand did not have its own formulary until 2012, but used the *BP* and *Squire’s Companion* as standard. See Combes, 77.

⁷⁷ DGMS to Comptroller of Customs, 9 March 1917, AD1 922, 46/250, Archives New Zealand, Wellington. Extractum Opii Liquidum is a weaker variant of Extractum Opii, used as a sedative and as pain relief, particularly for neuralgia (nerve pain) and abdominal pain.

⁷⁸ Comptroller of Customs to DGMS, 22 March 1917, AD1 922, 46/250, Archives New Zealand, Wellington. A Government-run laboratory has been in operation since 1865, originally known as the Colonial Laboratory and initially attached to the Colonial Museum. It conducted testing for food and drug alteration, Customs and Police Department work, mineral testing and public health endeavours. A name change occurred on New Zealand becoming a Dominion of the British Empire in 1907.

course.”⁷⁹ These initial 10 litres were collected from the laboratory on 17 April 1917, with the remainder ready to be picked up by 11 July.⁸⁰ With what would be a further sixteen months of the war’s duration ahead, no further information is on file as to the ongoing supply of any further morphine from seized contraband opium. It is, however, highly likely that these supplies of locally-manufactured morphine contributed to Robin’s report to the House on the reduction in purchases of medicines in the 1917-1918 year.

Although the war had an immediate effect on restricting the supply of synthetic and other medicines to New Zealand, it did not however have a long-term impact. Medicines continued to be purchased from overseas companies and shipped to wholesale drug houses such as Sharland and Company and Kempthorne Prosser for onward sale. Steady profits were made, as evidenced by the Annual Customer Sales ledger of Kempthorne Prosser in Dunedin. Between the 1914 and 1919, the company’s annual recorded sales rose from £416,982 to £658,976, an increase of £241,994 or 58 per cent, with a respectable net profit on 1919 sales alone of 4.5 per cent.⁸¹ It is evident that while there may have been some disruption to Kempthorne Prosser’s business during the course of the war, it was not enough to have a significant negative impact on the company’s commercial operations or balance sheet. In turn, local community pharmacies would have also had little disruption to the supply of medicines from wholesale drug houses to their businesses.

⁷⁹ Dominion Analyst to DGMS, 12 April 1917, AD1 922, 46/250, Archives New Zealand, Wellington.

⁸⁰ ‘Miscellaneous - Morphia for Military Hospitals’; J. R. Purdy to Dominion Analyst, 17 July 1917, AD1 922, 46/250, Archives New Zealand, Wellington.

⁸¹ ‘Kempthorne Prosser Annual Summary of Customer Sales, 1914-1919’, n.d., AG-120/130, Hocken Library, University of Otago, Dunedin; Doughty and Heydon, 48. Sales were recorded for calendar year, January to December.

Australia

Unlike New Zealand, the Commonwealth Government of Australia published its successful tenders for military contracts, including awardee, items and quantities contracted for, and also the agreed prices for those products in the *Commonwealth of Australia Gazette* (CAG). In the CAG of 10 August 1916, for example, contracts for the supply of medicines and pharmaceutical chemicals were awarded to The Australian Drug Company (Sydney), Donald Ross and Company (Sydney – for a small number of bottles of chloroform drops), and a large contract for both medicines and medical supplies was awarded to Duerdin and Sainsbury (Melbourne).⁸² Elliott Brothers Ltd in Queensland were also successful in their tender for various items, but the largest contract was awarded to their head office in Sydney. Not only did Elliott Brothers supply medicines and therapeutics, they were also awarded contracts for medical consumables such as gauze, dressings, bandages, tubing, bottles, bungs, and glass rods.⁸³ One month later, Melbourne's Felton Grimwade were successful in securing a large Commonwealth Government supply contract for the provision of medicines, bandages, eye baths, catheters, mackintosh sheeting, and microscopic slides (see Fig. 6).⁸⁴ By not concentrating all their purchasing requirements with one supplier, the Department of Defence would have ensured a continuity of supply thus reducing the possibility of losing access to vital medicines and medical equipment, and spreading the associated financial and operational risks. The use of several suppliers or shipping companies to spread risk and ensure continuity of supply was both good business and strategic military sense. Britain also did this with its supply of imported frozen meat, negotiating separate contracts with Argentina,

⁸² 'Contracts (Military) Accepted', *Commonwealth of Australia Gazette*, no. 100 (10 August 1916): 1762.

⁸³ *Ibid.*

⁸⁴ 'Contracts (Military) Accepted', *Commonwealth of Australia Gazette*, no. 129 (20 September 1916): 2632.

Uruguay, Australia and New Zealand to “secure the regular delivery of all Government supplies’ without relying on a single source of supply.”⁸⁵

Fig. 6 Commonwealth of Australia Gazette Contracts (Military) Accepted 20 September 1916

Department of Defence,
20th September, 1916.
CONTRACTS (MILITARY) ACCEPTED.—Series
1915-16.)

Felton, Grimwade, & Coy., Flinders-lane, Melbourne.
Reg. No. 8676. Expeditionary Force. 15th June,
1916.

3182.	50 gals. hydrogen peroxide liq., in 1-gal. jars, 7s. per gal.
3183.	50 jars, 2s. 6d. per gal.
3184.	10 cbys. hydrogen peroxide liq., in carboys of 12 gals. each, 78s. each.
3185.	10 carboys, 7s. 6d. each.
3186.	468 lbs. acid acetic fort, 11d. per lb.
3187.	6 lbs. acid gallic, 7s. 3d. per lb.
3188.	14 lbs. acid, oxalic comp., in 1-oz. bottles, 1s. 6d. per lb.
3189.	20½ lbs. acid, salicylis, in 1-lb. bottles, 21s. 6d. per lb.
3190.	98 lbs. acid, salicylis, tannic, in 1-lb. bottles, 6s. 6d. per lb.
3191.	30 lbs. acid, salicylis, hydrosus, in 1-lb. tins, “Adeps Lanol,” 2s. 6d. per lb.
3192.	30 lbs. acid, salicylis, Adeps Lanae, in 1-lb. tins, B.P., 3s. per lb.
3193.	12 ozs. ammon. iodide, 1s. 10d. per oz.
3194.	58 tubes atropina sulph., 15 gr. tubes, 6s. per tube.
3195.	12 ozs. acid, lactic, 75 per cent., 9d. per oz.
3196.	24 ozs. acid, soda phosp., 2½d. per oz.
3197.	35 boxes acid, amyl. nit. capsuls, 1s. 6d. per box.
3198.	14 lbs. bal. peru. 26s. 6d. per lb.
3199.	12 ozs. calcium iodide, 1s. 11d. per oz.
3200.	8 lbs. calcium lactate, 18s. per lb.
3201.	24 ozs. calcium phosphate, 1d. per oz.
3202.	16 yds. emplastrum belladonna on calico, 1s. 11d. per yd.
3203.	6 ozs. ext. colo. co. pulv., 6d. per oz.
3204.	12 ozs. ext. gentian, 2d. per oz.
3205.	6 ozs. ferri iodium, 1s. 9d. per oz.
3206.	14 lbs. ferri sulph. granulata, pure, 4d. per lb.
3207.	7 lbs. ferri carb. sacch., 1s. per lb.
3208.	9 doz. formalin tablets for disinfecting (100 in tin), 30s. per doz.
3209.	3 lbs. gum scammon resin pulv., 5s. per lb.
3210.	6 ozs. hydrarg. iodid., rubrum, 1s. 3d. per oz.
3211.	6 ozs. hydrarg. oxide flav., 7d. per oz.
3212.	14 lbs. hydrarg. subschloridum, 7s. 6d. per lb.
3213.	12 ozs. iodothymol, 3s. per oz.
3214.	14 gals. liq. paraffin, 15s. 3d. per gal.
3215.	28 lbs. magnesium carbonas. 1s. per lb.

Source: Commonwealth of Australia Gazette, 20 September 1916, 2632.

⁸⁵ John Connor, *Someone Else's War: Fighting for the British Empire in World War I* (London: I. B. Tauris, 2019), 38-39.

This list is the first page of the accepted contract for medical commodities between Felton, Grimwade and Company of Melbourne and the Australian Commonwealth government. An extensive list of items for supply, the final line number was 3366 (184 lines in total), and the supply contract included hardware such as bandages, catheters, funnels, ligatures, spatulas, splints, plaster and other medical equipment as well as a substantial series of medicines, chemicals and other therapeutics.⁸⁶ Containers for bulk liquid products were often charged for separately (see line numbers 3183 and 3185 for jars and carboys, respectively).

Quality of pharmaceuticals and other medicinal products also became problematic, particularly of those sourced from Australian manufacturers. Michael Tyquin, in his work on the Australian Army Medical Services during the Dardanelles campaign, notes that military contract stipulations for quality standards were often ignored, and that profiteering was common.⁸⁷ Manufacturers and wholesale drug houses were quick to take advantage of the difficult supply situation, and speculative trading resulting in rapid increases in commodity prices was commonplace in many countries, including those who remained neutral.⁸⁸ In cases where pharmaceuticals or medicines were defective, suppliers were expected to make good the deficiency. As an example, in August 1918, a contract awarded to Elliott Bros. Ltd. of Sydney was published in the *CAG* for the re-supply of a quantity of a local anaesthetic, cocaine hydrochloride.⁸⁹ This was to replace “defective supplies delivered on account of Authority Req. No. 10154. The firm refunded to the Department the monetary value of the defective supplies.”⁹⁰ By requiring the supplier to refund the value of the original goods and then be re-contracted through the established public tender process to supply the short-fall, the Department of Defence signalled that quality was as important as price, substandard products were not acceptable, and that manufacturers who did not supply products as contracted would be held publicly

⁸⁶ ‘Contracts (Military) Accepted’, 20 September 1916.

⁸⁷ Michael Tyquin, *Gallipoli: The Medical War - the Australian Army Medical Services in the Dardanelles Campaign of 1915* (Kensington, NSW: NSW University Press, 1993), 54, 137.

⁸⁸ Doughty and Heydon, 42.

⁸⁹ ‘Contracts Accepted’, *Commonwealth of Australia Gazette*, no. 121 (8 August 1918): 1667.

⁹⁰ *Ibid.*

accountable. It is, however, unknown in what way the original order was not fit for purpose.

As a result of reports of profiteering, mismanagement of supplies, and the accusation of misappropriation of funds to the value of £67,000 by Lieutenant David Howell-Price, the Army paymaster at Victoria Barracks in Sydney, an Australian Royal Commission on Navy and Defence Administration was initiated under the *War Precautions Act 1914-1916*.⁹¹ Chaired by William George McBeath, a well-known businessman from Melbourne and principal business advisor to the Department of Defence, the purpose of the Commission was to investigate the Army's accounting functions and possible price gouging by suppliers, including the disregard of military standing orders for the procurement of medical equipment. The Commission's brief was to specifically investigate "(a) Business administration generally, including contracts and supplies; (b) Accounting and paying systems; (c) Industrial establishments; [and] (d) Relations with the Department of the Treasury and the Auditor-General."⁹² The first progress report of the Commission, published in November 1917, identified a number of areas of inefficiency during the early part of the war, where the "system of purchasing military supplies was most unbusinesslike [sic]", resulting in considerable unnecessary and wasteful expenditure.⁹³

Nearly all sections of the supply and administration functions were examined and found wanting, with the sole exception of hospital administration and medical stores. The Commission considered that these specific areas of supply and stores, including the stores

⁹¹ Tyquin, 137; Peter Stanley, *Bad Characters: Sex, Crime, Mutiny, Murder and the Australian Imperial Force* (Sydney, N.S.W.: Murdoch Books, 2010), 120–22.

⁹² 'Navy and Defence Administration - Royal Commission: First Progress Report' (Melbourne: Government of the Commonwealth of Australia, 13 November 1917), 2.

⁹³ *Ibid.*, 7.

for the Dental Section, were managed to a “high standard of efficiency”, and the “issue and control of medical stores, clothing and rations is conducted on economical lines.”⁹⁴ The AAPS was well-established by this time, and military pharmacists were in control of medical supplies and stores. Stock control processes, accurate record-keeping, and indent systems were well set up, and although there is little concrete evidence, it is not unreasonable to assume that it was the familiarity with these processes in the civilian sphere that enabled pharmacists to ensure a high level of efficiency and administrative control in the military application.

Australian pharmacists and pharmaceutical companies were also involved in innovative solutions for the supply of difficult to obtain medicines. As one example, Nicholas International Ltd was established in 1915 by Australian pharmacists George Nicholas and Harry Shmith to develop, manufacture and market Aspro (acetylsalicylic acid) after Federal Attorney-General William (Billy) Hughes granted them a licence, when they proved they could do so to established *British Pharmacopeia* standards.⁹⁵ This effectively circumvented the legal issues around the suspended (but not cancelled) German trademark for Aspirin in Australia.⁹⁶ Opportunities for expansion of pharmaceutical manufacturing facilities also presented themselves during the war through the relaxing of patents and the need to find alternatives to German-produced medicines and therapeutics. South Australian company, F. H. Faulding & Co. Limited, took the opportunity during the war to increase its manufacturing capacity, by purchasing new property beside the Torrens River and establishing a plant to produce industrial quantities of Epsom Salts, previously

⁹⁴ *Ibid.*, 8.

⁹⁵ ‘House of Representatives - Enemy Trademarks’, *The Week*, 5 November 1915; Doughty and Heydon, 44.

⁹⁶ Aspirin is the German brand or tradename for the generic acetylsalicylic acid.

imported from Germany.⁹⁷ Epsom Salts, or magnesium sulphate, was used for a variety of illnesses but mainly both as a mild and safe laxative for chronic constipation, and also indicated for the treatment of bacillary dysentery, both conditions which were prevalent in the front-line troops during the war.⁹⁸

Mindful of the amount of money expended on drugs, and with an eye to potential profit-making, the Australian Commonwealth government considered seriously the possibility of manufacturing their own synthetic medicines. In August 1917, the Director-General of the Australian Army Medical Service (DGMS), Major-General Richard Fetherston produced a minute paper for the Minister of Defence enquiring “whether the Commonwealth would consider the question of manufacture as a Government monopoly of certain drugs, which prior to the War, have been absolutely in the hands of Germans.”⁹⁹ The medicines of interest were Aspirin (already being manufactured in Australia as Aspro by Nicholas International Ltd), phenacetin, saccharine, Veronal (German trade name for barbitone, a barbiturate used as a long-acting sedative), and also included a number of others which were coal tar derivatives. Fetherston noted that there were potential financial gains for the government to be made with local production, and that “A large profit can be made by this manufacture.”¹⁰⁰ Major David Cossar, the head of the AAPS, was about to embark on an extensive world tour to investigate medicine logistics and supply issues in various Australian overseas operational areas and to ascertain how other Allied nations were handling medicine supply. With this in mind, Fetherston was seeking permission

⁹⁷ Peter Donovan and Ed Tweddell, *The Faulding Formula: A History of F. H. Faulding & Co. Limited* (Kent Town, S.A.: Wakefield Press, 1995), 34–35.

⁹⁸ Peter Wyatt Squire, *Squire's Companion to the Latest Edition of the British Pharmacopoeia: Comparing the Strength of Its Various Preparations with Those of the United States and Other Foreign Pharmacopoeias to Which Are Added Not Official Preparations and Practical Hints on Prescribing*, 19th ed. (London: J. & A. Churchill, 1916), 859–62.

⁹⁹ Richard Fetherston, ‘Manufacture of Drugs’, 7 August 1917, MP367/1 612/33/21, National Archives of Australia, Melbourne.

¹⁰⁰ *Ibid.*

from the Minister for Cossar to also make enquiries into the viability of local manufacture of these medicines under government aegis, as well as to ascertain best practice in medical equipment supply.

Major Cossar's Report

At the end of August and shortly after Fetherston's minute to the Minister of Defence, Cossar departed Australia for his tour. On his return to Australia some months later, he wrote a detailed 19-page report of his findings to Fetherston. In it, he addressed issues such as inefficiencies in shipping and logistics, and considered that lack of proactive thinking contributed materially to unnecessary and excessive expenditure. As one example, in his review of the medical stores at Abbassia in Cairo, "100 Winchester Quarts of distilled water had been sent across from England. The price of the containers alone would have bought a still that would have distilled all the water required for the A.I.F. in Egypt. The wastage in shipping space on this one line would be considerable, for as soon as these bottles were empty, they were packed up and returned to England to be refilled and sent back to Egypt."¹⁰¹ Cossar estimated that there would be the potential for a 50 per cent reduction in costs if this inefficient method that was being used by the British was changed to a bulk supply and decant-as-needed system as used by the Australians.¹⁰²

A similar review was conducted at the main Australian Base Depot of Medical Stores in Tidworth, Salisbury, in the UK. Cossar was disappointed in what he found there, and stated that at this depot he "found a most unsatisfactory state of affairs", where no bulk manufacturing was being done, and all medicines were being purchased from

¹⁰¹ David Cossar, 'Supply of Medical Surgical Stores Report - Major Cossar', 1918, 2, MP367/1 612/33/413, National Archives of Australia, Melbourne.

¹⁰² *Ibid*, 2.

wholesale chemists, adding to unnecessarily increased costs.¹⁰³ Several recommendations were made, principally: that the Base Depot of Medical Stores needed to be moved to London and into larger accommodation; that all Australian Medical Corps units were to draw their supplies from this central depot rather than purchasing independently; and that manufacturing of non-complex pharmaceutical products should be performed in-house.¹⁰⁴ War is an expensive undertaking; where savings and efficiencies could be made, it was imperative that they should be made.

Other areas of concern in Cossar's report included the problem of excise duty on alcohol (used to make tinctures) in the UK, supply of medical stores to various operational areas of the AIF, careless packing and shipping of surgical instruments resulting in damage, the role of pharmacists and the Pharmaceutical Service in the AIF, and a comparison of the Australian AAPS with pharmaceutical services in the British Army. Cossar also visited Canada and made enquiries as to their pharmaceutical service and practices, concluding that the Canadian's "system of handling stores is practically the same as in Australia."¹⁰⁵

When forwarding this report to the Minister of Defence in June 1918, a number of notes were made by the Deputy Director-General of the Medical Service (DDGMS), Major-General (later Sir) George Cuseaden. A highly conservative approach was taken, and although acknowledging that expenditure on medical supplies sent to the AIF depot in Egypt had likely been excessive, it was recommended that "further action by this Department would not appear advisable as Depot is under control of the Imperial

¹⁰³ Ibid., 4.

¹⁰⁴ Ibid., 5.

¹⁰⁵ Ibid., 16.

Authorities.”¹⁰⁶ Not only this, but the DDGMS strongly urged that no change to the process for ordering medical “supplies for Australia through [the] High Commissioner” be made, in spite of Cossar’s condemnation of the existing method of procurement.¹⁰⁷ Reasons for Cuseaden’s reluctance to change the process are unclear; however, it may have been considered that as the practice had been in place for some time by 1918 and was well-established, that there was no value in changing something that had been working relatively well. It may have also been considered politic to not attempt to interfere as the depot was under control of the Imperial authorities.

Cossar’s report throughout was both highly detailed and critical of the British practices being used for purchasing and shipping, considering them to be wasteful of both material and financial outlay. Yet the Australian Commonwealth government was hesitant to either raise the issue with the British or to make changes to the system being used. As noted above, it may have been considered prudent to not attempt to change a system that was well-established but not under Australian control, hence the reluctance of the Australian government.

Scientific fact-finding tours were not uncommon. After esteemed British bacteriologist William James Penfold accepted the position as head of the newly-created Commonwealth Serum Laboratories (CSL) that had been established in early 1916 in response to shortages of vaccines and sera earlier in the war, he also embarked on a tour of serum facilities in various countries on his way from Britain to take up his new position in Melbourne. This was to ensure that the new Australian operation was fully up to date with

¹⁰⁶ Minute George Cusadean to Defence Minister, ‘Supply of Medical Surgical Stores Report - Major Cossar’, 21 June 1918, MP367/1 612/33/413, National Archives of Australia, Melbourne.

¹⁰⁷ Ibid.

best practice and technique as well as equipment and infrastructure.¹⁰⁸ Penfold took a circuitous route through the Wellcome Research Laboratory and Hendon Vaccine Lymph Lab in the UK, to the Pasteur Institute in Paris, and then on to several serum laboratories in the USA, including the Vaccine Laboratory of the United States Army in Washington. He finally arrived in Australia to commence his duties in November 1916.¹⁰⁹ Supply of typhoid, cholera and other vaccine and diphtheria and tetanus anti-toxins from CSL for the war effort was, however, not forthcoming in any great quantities due to the building of the laboratory being in progress during the war itself. The first large-scale manufacture of product by CSL was the influenza vaccine, in order to mitigate the 1918-1919 Spanish ‘flu pandemic.¹¹⁰

Pharmacy, Rank and Trade

Pharmacists serving in the AAPS were well aware of the links between business and administrative practices and their improved status with commissioned rank. Although pharmaceutical regulatory bodies had pushed for commissions on the basis of the qualifications, registration and professionalism, business skills were recognised by the pharmacists themselves as having at least as much value to the Australian Commonwealth government. A letter to the editor of the *Chemist and Druggist of Australasia* (C&DA) in August 1917 indicated the unnamed writer was well aware of the connection, stating that “The pharmacist is entitled to commissioned rank on account of his professional knowledge of the lines handled and his business instinct to buy the lines he is perfectly familiar with in every-day life.”¹¹¹ For this particular pharmacist, it was the business side

¹⁰⁸ A. H. Brogan, *Committed to Saving Lives: A History of the Commonwealth Serum Laboratories* (Melbourne: Hyland House, 1990), 4–5.

¹⁰⁹ *Ibid.*, 5–6.

¹¹⁰ Butler, 785.

¹¹¹ ‘Future Military Rank for Pharmacists’, *Chemist and Druggist of Australasia* 32, no. 9 (1 August 1917): 307.

of pharmacy practice that appeared to be of most value to the military authorities. The writer of the letter considered that the push for commissions on the basis that pharmacists were health professionals was a weak argument, and that commissions were granted not so much to use the pharmacist's occupation-specific skills to reduce dispensing mistakes, but for economies of stores when he stated:

To my mind the more important phase is not that of errors by non-pharmacists in hospitals or on the field, as the military do not worry greatly about a man or two extra being killed by ignorance, but give more weight to the economy of money with regard to supplies. The efficiency [sic] business side is almost the only ground the military authorities will consider for granting commissioned rank. Any Senior Pharmacist will tell you he is in his job to see that expenses are kept down to a minimum, and the only pharmacists – outside hospital ships and a few hospitals – who are concerned with the handling of stores are those with commissioned rank.¹¹²

This insight into the reality of the role of serving pharmacists clearly illustrates the perception that the Australian Commonwealth government privileged the business skills that pharmacists were able to contribute. Accurate dispensing and clinical pharmacy practice to ensure the best health outcome for patients were neither valued nor required. It was thus the side of pharmacy that pharmacists were trying to distance themselves from that was most valued by the Australian Commonwealth government – the mercantile skills that were developed through being 'in trade'. Pharmacists' business acuity was, however, valued by the military authorities, and it was recognised that "they have saved us thousands and thousands of pounds and have been as loyal as loyal can be."¹¹³ Yet it was precisely the commercial aspect to the occupation that contributed significantly to the

¹¹² Ibid.

¹¹³ 'Extracts from DG to DMS, AIF - Rank and Service of Pharmacists (Nov 1916-May 1917)', 1916-1917, AWM27 375/84, Australian War Memorial, Canberra.

social stigmatisation that prevented pharmacists from attaining permanent commissions and consequent social acceptance within the military sphere.

Conclusion

War is an expensive undertaking, and the economics of war can be problematic with shortages of needed items and severe disruption to the supply chain. Supply of medicines and therapeutics also became problematic at the outbreak of WWI, as many synthetic drugs were produced by Germany and her allies, and were therefore immediately unavailable. While Britain did have some manufacturing capability, this was initially limited mainly to galenical products and antitoxin sera. New Zealand, as a country with a very small population, had no ability to manufacture synthetic or complex medicines from raw materials, but relied solely on importation of bulk medicines for repackaging and resale. Although Australia had a number of manufacturers of medicines and therapeutical chemicals, none of them had the capacity to produce synthetic drugs. As a result, they also imported the majority of their medical supplies from Europe. Procurement processes for both governments were complex, and the supply of medicines constituted a small but necessary component of the much larger economic scale of war.

New Zealand military pharmacists had little direct involvement in the purchasing and business aspects of medicine supply to the NZEF. Although it is likely that a number were working at Defence Medical Stores in Wellington, and contributed to reductions in the costs of drugs, their efforts were not acknowledged, and their experience remained invisible in the archival record. Australian military authorities eventually recognised the value of their pharmacists' business acuity, which resulted in the establishment of the AAPS. Substantial savings to the Australian Commonwealth government were made in

the area of medical stores and equipment as a result. Perceptions of pharmacists as businessmen by the military authorities of both countries, however, ensured that pharmacists did not fully attain the elevated social status of health professionals while serving during WWI. Yet these were paradoxical attitudes – on one hand, being ‘in trade’ was to be a social outsider; on the other, it was precisely the same skills used in business practice that were valued to a greater or lesser degree by the military authorities for keeping medical commodity expenses reduced.

Serving pharmacists themselves were fully cognisant of their value to the Australian Commonwealth government in maintaining economies of medical stores. They were well aware that the push for commissioned rank based on their skills as health professionals was futile and based on a weak position, and that commissions were mainly granted only to those serving pharmacists who held fiscal responsibility for stock and stores. Pharmacists wanted the social status and recognition that a commission would provide them, but they wanted to be first and foremost recognised as health professionals. Commissions were, however, granted for the very aspect of pharmacy that pharmacists were trying hardest to move away from – the commerciality of pharmacy practice. That pharmacists in the AIF did not quite attain full recognition through conferment of commissions is evident by their newly acquired rank being only honorary, rather than permanent or substantive. Unlike in New Zealand, trade and business skills were valued by the Australian Commonwealth government and therefore rewarded, but pharmacists in both countries remained the wrong social class for full social and professional acceptance precisely *because* of trade and business.

Why the military were purchasing or sourcing medicines and therapeutics is the subject of Chapter 4, examining which main diseases or conditions were being treated, and how treatment was provided. It will also explore the role pharmacists played in the handling of medicines and the treatment of patients, and the archival invisibility of both pharmacy and pharmacists.

Chapter 4: Military Diseases and Treatments

Introduction

In the previous chapters, I have described the experiences of military pharmacists serving in the respective armed forces of New Zealand and Australia during World War I (WWI), and the contrast between the two countries. Although New Zealand and Australia were both Dominions of the British Empire at the time, military pharmacists were given better recognition in Australia, whereas the military authorities in New Zealand strictly adhered to the more conservative British Army attitude towards pharmacists in uniform. I have also described how the profession of pharmacy itself was perceived in civilian practice compared to the military sphere, and the inconsistencies where in one environment the pharmacist was a well-respected citizen in the community, and in another was treated as a mere technician. The role of the pharmacist was grossly undervalued by the New Zealand armed forces during WWI to the point where it is extremely difficult to source literature on what pharmacists provided for military personnel beyond compounding and stock taking.

The fundamental role of military pharmacy is to support military operational medical staff and surgical services, providing medicines and remedies for various illnesses and ailments. While physical wounds caused by accident or combat trauma were treated through surgical intervention, disease and illness were also present in the various operational theatres of WWI. Injuries from gunshot wounds, fragments (shrapnel) and gas attack only accounted for approximately 15 per cent of conditions treated by British Army personnel during the war, while the remaining 85 per cent of conditions were medical ailments such as scabies, lung infections, sexually transmitted infections, and rheumatism,

for example.¹ Although these conditions were seen by medical and nursing staff, it was the military pharmacist who would have been instrumental in providing the actual medications for treatment and yet, very little is written about this important aspect of care for soldiers. Following on from Chapter 3 and the business functions of pharmaceutical supply, this chapter discusses why these medications were being purchased in the context of having to make medicines and compounds prescribed by medical staff, and what if any role pharmacists played in their preparation or administration. A number of treatments and medicines used in the care of specific illnesses or diseases that commonly occurred or were prevalent in the New Zealand and Australian forces during the war will be examined.

Archival material relating to medications and treatments provided to cure the sick or relieve pain and discomfort omit any mention of military pharmacists and their practices. As a result, the role of pharmacists has been rendered invisible, and medicines were provided to patients or discussed by doctors in medical journals without any reference to or acknowledgement of those who were instrumental in their preparation or supply. Essentially then, pharmacists performed ‘invisible work’, with the result that at a first reading of the archival material, it could be construed that pharmacists had nothing whatsoever to do with the provision of medicines. In this chapter, I argue and demonstrate that the archival invisibility of both pharmacists and pharmacy has contributed to their being overlooked in subsequent historiography, while the actors of disease and conditions suffered by the fighting forces have held a privileged position within medical histories of war and conflict. By not acknowledging the experiences of those who directly contributed to the treatment of the troops through the compounding and dispensing of therapeutics for

¹ “British soldiers’ WW1 trench battles with STDs, rheumatism and wasp stings,” *Telegraph*, 8 October 2014. <https://www.telegraph.co.uk/history/world-war-one/11148580/British-soldiers-WW1-trench-battles-with-STDs-rheumatism-and-wasp-stings.html>. Accessed 26 January 2020.

those diseases and conditions, and subsequently rendering those who prepared the treatments invisible in the historiography, military pharmacy and its practitioners indeed remained ‘silent’.

This chapter provides a necessary overview of some of the more prevalent diseases and conditions that afflicted soldiers during WWI. It is not possible for all diseases and conditions that had been suffered by the troops to be examined. It will, however, explore some of the diseases and conditions that could be treated directly through the use of medicines and therapeutics, the preparation and administration of which could have reasonably been expected for pharmacists to have managed. These include antiseptics for wound healing, treatments for venereal disease (VD), dysentery and constipation, and typhoid and paratyphoid vaccines. The treatments for these particular conditions are representative of the most commonly used or those which created debates over efficacy. Consequently, this chapter will not examine treatments for mental illness including neurasthenia or ‘shell shock’ and its physically manifested expressions, such as disordered action of the heart or tremors.² Similarly, the influenza virus will also not be covered, along with those illnesses such as pneumonia and measles that could only be treated at the time with bed rest and good nursing care rather than with medicines. More specifically, the 1918-1919 Spanish ‘flu outbreak will not be examined, as this pandemic falls outside the scope of this thesis and should be studied independently as a separate global event. This chapter provides an *indirect* account of the work of pharmacists, not through ledgers or lists of *materia medica*, but through an overview of the conditions themselves and how they were managed.

² J. A. Venning, ‘The Etiology of Disordered Action of the Heart’, *British Medical Journal* 2, no. 3063 (1919): 339; Millais Culpin, ‘Disordered Action of the Heart’, *British Medical Journal* 2, no. 3064 (1919): 394–95; Michael Tyquin, *Gallipoli: The Medical War - the Australian Army Medical Services in the Dardanelles Campaign of 1915* (Kensington, NSW: NSW University Press, 1993), 116.

In order to identify these treatments, primary sources such as international and national medical journals have been reviewed. Although specific diseases and conditions are often discussed, the identification of treatment method or supply of the medications and therapeutics used to treat them is rarely, if ever, attempted in contemporary military medical historiography.³ Case studies published in medical journals, however, provide specific detail on the products used in treatment of these cases. How and why these medicines were used during the war will also be explained, as some products that were commonly used at that time for specific treatments are today used in different ways or to treat other illnesses. As one example, quinine is widely known both in the past as well as today as an anti-malarial treatment; however, quinine hydrochloride (with urea) was also used in 1913 as a local anaesthetic for both wound closure and during amputation surgery to prevent post-surgical pain in the stump, as well as during fracture surgery.⁴

Antiseptics and Wound Care

Wounds incurred by artillery shrapnel or by gunshot were mainly treated with surgical intervention, repairing broken bones and shredded tissues, debridement of the

³ A recent exception is a chapter on treating wounds and sickness in Anna Rogers, *With Them Through Hell: New Zealand Medical Services in the First World War* (Auckland: Massey University Press), 2018, 361-385. Michael Tyquin in his work on the AIF medical services on Gallipoli touches very briefly on treatments for those men who were wounded rather than those who were sick – see Tyquin, 51-73. Peter Hobbins also notes that study of combat wounds, ballistics and surgery have been privileged over diseases, hygiene and internal medicine within the military medicine historical subgenre. See Peter Hobbins, 'The Whole Country is Poisoned: Framing Disease Mortality in the Historiography of the South African War', *War & Society* 28, no. 1 (2009): 37. As with pharmaceutical trade journals, it appears that medical journals that were published during the war were also relatively uncensored.

⁴ Drs Julian, Stewart, and White, 'Quinine Hydrochloride and Urea as a Local Anaesthetic', *New Zealand Medical Journal* 12 (1913): 327-29; Peter Wyatt Squire, *Squire's Companion to the Latest Edition of the British Pharmacopoeia: Comparing the Strength of Its Various Preparations with Those of the United States and Other Foreign Pharmacopoeias to Which Are Added Not Official Preparations and Practical Hints on Prescribing*, 19th ed. (London: J. & A. Churchill, 1916), 1138-41, 1144-45; Lea Doughty and Susan Heydon, 'Medicine Supply during the First World War: Overcoming Shortages in New Zealand', *Health and History* 17, no. 2 (2015): 42. Retrospective analyses based on today's understanding of medicines and their use against the effectiveness of the treatments of the time is not attempted.

wound, or the amputation of hopelessly damaged limbs.⁵ Once surgery had been performed, it was then essential that the wound was kept clean. Preparation of antiseptic solutions and provision of chemicals to inhibit bacterial action in wounds for surgical use should therefore have been a natural part of the military pharmacist's role. This, however, does not appear to have been the case. Lists of surgical and medical stores received by the Australian Auxiliary Hospital at Harefield in Middlesex, United Kingdom (UK) between 1916 and 1917 include regular quantities of Tincture of Iodine and hydrogen peroxide, but do not include the specific antiseptics that were used during surgery.⁶ In a time when antibiotics did not yet exist, antiseptics were used to reduce the likelihood of both aerobic and anaerobic infection (including gas gangrene), tissue necrosis, and to promote wound healing.⁷ Antiseptics therefore assumed a role of high importance, and their continuity of supply was critical (see Chapter 3).

Several different antiseptics with strong antibacterial properties were used during the war, with greater or lesser effectiveness. By 1915, a method of antiseptic treatment which was particularly effective in the healing of complex gunshot and shrapnel wounds was developed by French doctor Alexis Carrel and British chemist Henry Drysdale Dakin, subsequently known as the Carrel-Dakin Method.⁸ This involved intermittent deep tissue irrigation of complex wounds over a period of time with a simple dilute solution of between 0.4 to 0.5 per cent of sodium hypochlorite, using a system of rubber tubes with

⁵ 'Debridement' is the surgical removal of foreign objects, cutting away of damaged tissues, and cleaning of the wound, usually done under anaesthetic.

⁶ 'Weekly Lists of All Medical and Surgical Stores Received at Australian Auxiliary Hospital, Harefield, Middlesex, U.K.', 1916-1917, AWM25 483/15, Australian War Memorial, Canberra.

⁷ M. Weinberg, 'Gas Gangrene in the Present War: Being the "James Finlayson Lecture" Delivered Before the Royal Faculty of Physicians and Surgeons of Glasgow on 29 February 1916', *Glasgow Medical Journal* 85, no. 4 (1916): 241-58; Thomas D. M. Stout, *War Surgery and Medicine* (Wellington: Historical Publications Branch, 1954), 129. Gas gangrene is caused by the *Clostridium perfringens* bacterium.

⁸ Mark Harrison, *The Medical War: British Military Medicine in the First World War* (Oxford: Oxford University Press, 2010), 31. A 'complex' wound involved damage to multiple structures within the body, including musculo-skeletal structures and organs.

regularly-spaced holes to deliver the solution deep into the wound, with minimal or no irritation to the skin or tissues.⁹ In 1916, Marcel Daufresne substituted milder sodium carbonate as a buffering agent for the stronger boric acid that had initially been used by Dakin, which improved the formula of the solution. This substitution increased the level of available chlorine (the antiseptic agent) to 0.22 per cent, while maintaining a negligible level of irritation of the tissues and skin.¹⁰ With rapid results, improved wound healing, and made from easy to obtain chemicals, the Carrel-Dakin method was both efficient and cheap to implement in a hospital setting.¹¹ While it is possible and even likely that pharmacists were held responsible for preparing the solution used in the Carrel-Dakin method, this has not been recorded and so cannot be definitively proved.

Opinions of the medical staff varied as to the best or most effective antiseptics for wound care. While the Carrel-Dakin method was recognised as a successful and effective method, it was not a system that could be easily used in Casualty Clearing Stations (CCS) or Field Ambulances (FA). It was also not suitable for a fast-moving environment while under fire during military action, requiring as it did the application of tubing and solution to the wounds and long, time-consuming periods of regular monitoring while in use.¹² Flavine (diamino-methyl-acridinium chloride) was another popular antiseptic for wound care, but received mixed reviews from military surgical staff. In January 1917, a report to the Medical Research Committee by members of the Bland-Sutton Institute of Pathology at Middlesex Hospital in London was published in the *British Medical Journal* (BMJ),

⁹ Basil Hughes and H. Stanley Banks, *War Surgery: From Firing-Line to Base* (London: Bailliere Tindall and Cox, 1918), 224. By the nature of their action and alkalinity, antiseptics in a strong concentration could irritate or damage healthy tissue, rather than assisting healing.

¹⁰ *Ibid.*, 284.

¹¹ *Ibid.*, 236.

¹² Jan Bassett, *Guns and Brooches: Australian Army Nursing from the Boer War to the Gulf War* (Oxford: Oxford University Press, 1992), 56–57; Anna Rogers, *With Them Through Hell: New Zealand Medical Services in the First World War* (Auckland: Massey University Press, 2018), 362–63.

detailing the results of comparative experiments to determine the efficacy of “an ideal antiseptic”.¹³ This study investigated the relative antiseptic properties and level of toxicity of a number of commonly-used antiseptic chemicals, comparing chloramine-T, Eusol, Dakin’s solution, chlorine water, carbolic acid, mercury perchloride, iodine, brilliant green sulphate, brilliant green oxalate, malachite green (both oxalate and sulphate), crystal violet, ethylhydrocuprein hydrochloride, and flavine.¹⁴ The authors of the study concluded that “A substance belonging to the acridine group, *flavine*, has been found to possess extremely powerful bactericidal and antiseptic properties, which are enhanced rather than diminished by admixture with serum. In this respect flavine differs from all the powerful antiseptics in common use.”¹⁵ In comparison with another common antiseptic, brilliant green, Browning *et al.* determined that flavine was more effective against pyogenic or pus-producing organisms such as *Bacterium coli* (*B. coli*; also known as *E. coli*), against which brilliant green was shown to be completely ineffective.¹⁶

In response to this report, in September 1917 Alexander Fleming submitted to *The Lancet* a paper directly addressing and refuting the results of the *BMJ*’s January paper by Browning *et al.* Fleming claimed that the results of the earlier paper were “based on fallacious experiments”, that the results could be changed by even slightly altering the conditions under which the experiments were conducted, and that flavine, rather than being low toxicity and non-irritant to tissues and skin, in fact had an “action...on living tissues (as exemplified by leucocytes) is [sic] far in excess of its lethal action on

¹³ C. H. Browning et al., ‘Flavine and Brilliant Green, Powerful Antiseptics with Low Toxicity to the Tissues: Their Use in the Treatment of Infected Wounds’, *British Medical Journal* 1, no. 2925 (1917): 73–78.

¹⁴ *Ibid.*, 74. Eusol is the acronym for Edinburgh University Solution of Lime, a mixture of boric acid and chloride of lime, where it was originally developed.

¹⁵ *Ibid.*, 76. Emphasis in the original quote.

¹⁶ *Ibid.*, 78.

bacteria.”¹⁷ In his summary, Fleming identified 15 specific points that directly refuted the Browning *et al.* paper. These were the results of Fleming’s own laboratory experiments, indicating that flavine had a “very destructive action on leucocytes...far in excess of its bactericidal action”; that in a 1 in 8000 solution, flavine appeared to “aid the growth of *B. proteus*”; and that carbolic acid had “a coefficient 10 times better than flavine when the antiseptic acts on the microbes in serum and 250 times better when the bactericidal action is estimated in pus.”¹⁸ With his highly detailed and scientifically robust paper, Fleming called Browning and his colleagues’ results into question, and refuted the supposed efficacy of flavine as a suitable antiseptic for wound care.

This refutation by Fleming began a brisk discussion in *The Lancet* by a number of medical officers who had used flavine in a clinical setting, operating on war wounds in stationary and base hospitals, rather than as tested under laboratory conditions. Surgeon-General of the British Army Medical Services, Sir Anthony Bowlby, wrote in an introduction to a paper published in October 1917 that while he agreed with Fleming that flavine did not have full antiseptic effects on all types of bacteria present in recent wounds, and “that it does not bear out some of the claims made for flavine as a bactericidal agent or as to its harmlessness to the tissue cells,” nevertheless there was a notable absence of inflammation of the surrounding tissues, and no evidence of gas gangrene developing in those wounds treated with flavine.¹⁹ Bowlby also asserted that it appeared to be “a useful application in the form of gauze soaked in the solution when used as a first dressing to large open wounds, and it seems to limit the power for harm of the pathogenic bacteria and

¹⁷ Alexander Fleming, ‘The Physiological and Antiseptic Action of Flavine (With Some Observations of the Testing of Antiseptics)’, *The Lancet* 190, no. 4905 (1917): 341. Leucocytes are the white blood cells of the immune system, and protect the body against infectious disease and foreign invaders such as bacteria.

¹⁸ *Ibid.*, 345. *B. proteus* is *Bacterium proteus*, found in decomposing animal flesh, manured soil, and human and animal faeces.

¹⁹ Hamilton Drummond and J. W. McNee, ‘On the Treatment of a Series of Recently Inflicted War Wounds with Flavine’, *The Lancet* 190, no. 4913 (1917): 640.

to prevent the inflammation of the tissues.”²⁰ Flavine, according to the authors of the October paper, was determined to be a successful antiseptic as an immediate primary or pre-suppurative treatment, rather than for later, infected stages of war wounds, with the recommendation that once the danger of gas gangrene was past, the use of flavine should be ceased and another antiseptic used.²¹ It would appear that flavine’s value lay in its observed ability to suspend bacterial action in the wound, until such time as the patient was removed to a hospital and was able to receive more extensive medical care.

Not to be outdone, in November of that year, Browning and another colleague from the Middlesex Hospital, David Ligat, wrote a letter to the Editor of *The Lancet*, to both justify their earlier position and respond to Fleming’s refutation. Browning and Ligat defended the January paper, and reiterated to the readership that initial wound care in a FA or along the lines of communication to a CCS needed to be simple, rapid and effective. They noted that a “primary dressing (i.e. gauze packing soaked in 1:1000 flavine solution) need not be changed for two or three days and is then easily and painlessly removed...this may be of great advantage during severe fighting where rapid evacuation of wounded from front to base is required without unnecessary dressing of the wounds.”²² With this statement, they reinforced Drummond and McNee’s opinion that as a *primary* antiseptic, flavine was an effective option, and while not having 100 per cent bactericidal action, nevertheless wounds treated with flavine in the first instance proceeded to heal well with little sepsis or tissue necrosis. Flavine does not appear to be a product that was handled by military pharmacists, however, nor does it appear on any lists of medical stores.

²⁰ Ibid.

²¹ Ibid., 643.

²² C. H. Browning and David Ligat, ‘The Use of Flavine Antiseptics in Wounds’, *The Lancet* 190, no. 4916 (1917): 766.

Around the same time as the debate on the efficacy of flavine as an antiseptic in 1917, a surgeon in the Royal Army Medical Corps (RAMC), Captain Wilson H. Hey published a recipe for a paste to facilitate early closure of gunshot wounds in the *BMJ*. Brilliant green, with a similar action and

Fig. 7: Captain Hey's Wound Paste

Boric Acid	11 oz
French chalk	1 oz
Liquid paraffin	8 fl. Oz
Brilliant green	17.5 gr

The boric acid and French chalk must first be intimately mixed in a mortar, then the liquid paraffin worked in, and finally the brilliant green dissolved in rectified spirit.

effectiveness as flavine, was the preferred antibacterial agent for Capt. Hey, combined with boric acid (itself a strong but non-irritant antiseptic) and mixed to a paste with French chalk and liquid paraffin (see Figure 7).²³ Hey considered that antiseptics applied in a paste form “would adhere to the freshly cut tissues in the presence of blood and effusion,” prolonging exposure of the affected surface area to bactericidal action, and promoting wound healing.²⁴

Rapid healing of gunshot wounds was important to the military. The sooner a soldier's wounds healed, the sooner he could be sent back to the front line to continue fighting. Antiseptic pastes such as a mixture of bismuth, iodoform and paraffin paste commonly known by its acronym BIPP (or bipp), also received mixed opinions by medical staff as to its efficacy.²⁵ Major George Home, a surgeon in the New Zealand Expeditionary Force (NZEF), wrote an article for the *New Zealand Medical Journal* (NZMJ) in 1918 in support of the use of bipp, and described how he used the paste in his own surgical work. Not only did he rub a thin film of bipp into the tissues of the cleaned wound during

²³ Wilson H. Hey, ‘A Method of Early Closure of Recent Gunshot Wounds’, *British Medical Journal* 2, no. 2962 (1917): 446; Hughes and Banks, 233–34.

²⁴ Hey, 446.

²⁵ Hughes and Banks, 235.

surgery, he also closed the wound using bipp-coated silk to keep the suture track clean.²⁶ Home considered bipp to be an ideal antiseptic that would hold “bacterial activity in subjection long enough for the tissue fluids to be able to overcome the infection,” and that it could “quell sepsis of any kind,” although he acknowledged that bipp, like flavine, was also most efficacious if used on fresh pre-suppurated or recent wounds.²⁷

Unlike *The Lancet* or the *British Medical Journal*, the *Medical Journal of Australia* (MJA) did not debate the positives or negatives of various antiseptics. Reports were published by surgeons and medical officers discussing which antiseptics were found to be most efficacious in their own particular circumstances. As with other medical journals, however, all case reports and articles published in the *MJA* did not include mention of the personnel who were responsible for making up the recipes and formulations for the wound treatments they used. Prior to the development of flavine, Eusol appeared to be widely regarded by Australian surgeons as an effective antiseptic by mid-1917, for both gunshot and shrapnel wounds. Writing on treatment of various types of wounds at the front line in France in 1916, Lieutenant-Colonel C. MacLaurin of the Australian Army Medical Corps (AAMC) declared that Eusol was the antiseptic of choice for Australian military surgeons, and that “it was almost the only antiseptic used at the front.”²⁸ Bismuth, iodoform and paraffin paste (bipp) was also used, in a formulation of 1 part by weight of bismuth

²⁶ George Home, ‘Bipp Technique in a Base Hospital’, *New Zealand Medical Journal* 17, no. 80 (August 1918): 118–19; Rogers, *With Them Through Hell: New Zealand Medical Services in the First World War*, 363.

²⁷ Home, 119–20. Bipp continues to be used today to assist healing in surgery for bony cavities. Darryl Tong, Professor of Oral and Maxillofacial Surgery, University of Otago, personal communication, 24 April 2019.

²⁸ C. MacLaurin, ‘War Surgery at the Front: The Treatment of Wounds’, *Medical Journal of Australia* 1 4th year, no. 17 (28 April 1917): 351; Harold S. Stacey, ‘No. 2 Australian Casualty Clearing Station in France’, *Medical Journal of Australia* 1 4th Year, no. 22 (2 June 1917): 457.

subnitrate, 2 parts by weight of iodoform subnitrate, with sufficient soft white paraffin (petroleum jelly) to make into a stiff paste.²⁹

Although Captain Hey's wound paste which consisted of boric acid, French chalk (talc) and liquid paraffin, and the ingredients for bipp were common pharmaceutical products and readily available in dispensaries, neither brilliant green nor flavine were included in the *Squire's Companion to the British Pharmacopoeia* that was in use in New Zealand and Australia at the time.³⁰ First published in 1902, the third edition of the *Australasian Pharmaceutical Formulary* released in 1921 also does not include brilliant green or flavine.³¹ Nor are these specific chemicals included in lists of therapeutics or medicines that were quoted for supply to either countries' governments. Although pharmacists did not appear to be directly involved in their preparation based on their archival invisibility, there is also no evidence of who may have done so if not military pharmacists. It is possible that these particular antiseptic solutions and pastes were developed by chemists working in industrial pharmaceutical laboratories and sold through chemical suppliers as finished-product commodities rather than compounded by pharmacists in dispensaries for use in operating theatres, as their main components were not normally used by pharmacists, either civilian or military. It is, however, not evident how supplies of these products were procured other than through supply chain channels already discussed in Chapter 3.³²

²⁹ Stacey, 458.

³⁰ Peter Wyatt Squire, *Squire's Pocket Companion to the British Pharmacopoeia* (London: J. & A. Churchill, 1904), 13–16, 460; Squire, *Squire's Companion to the Latest Edition of the British Pharmacopoeia...*, 32–35, 982–84, 1372–73.

³¹ Australasian Pharmaceutical Conference, *Australasian Pharmaceutical Formulary* (Brisbane, QLD; Nichols, Larwill & Butler), 1921. Although titled 'Australasian', this publication was not used in New Zealand; rather, the *BP* and *Squire's* were the main pharmaceutical handbooks for New Zealand pharmacists. See Combes, 102.

³² Flavine was manufactured by Burroughs Wellcome & Company, but it is unknown how this product was delivered to the front line.

Venereal Disease

Venereal disease is the outdated collective name for sexually transmitted infections (STIs), and denoted in particular the bacterial infections of gonorrhoea and syphilis. The term VD was in common usage in English-speaking societies, until modern usage from the late twentieth century changed to the less morally-charged STI.³³ As such, for this section I will use the older term 'VD' as this was accepted terminology for the period of the war, and is also the term used in original archival material.

Other than a New Zealand pharmacist being posted to the VD ward at No. 3 New Zealand General Hospital at Codford in Wiltshire, England to work as a dispenser, there is little evidence that pharmacists were directly involved in the preparation of medicines or treatment of VD cases in military hospitals. Supplies of arsenic- and mercury-based compounds for treatment of these diseases were, however, being ordered by both New Zealand and Australian governments, and as medical stores commodities, these products were likely to have been held in the dispensary until required for use.³⁴ Both New Zealand and Australian pharmacists were accustomed to handling poisons or toxic chemicals as part of their civilian roles, and for Australia, both New South Wales and Victoria's state governments had enacted legislation specifically naming pharmacists as the only occupational group able to do so.³⁵ Treatment of VD, however, did not form part of the civilian pharmacists' scope of practice. Gregory Haines notes that because Salvarsan (an

³³ Ian Howie-Willis, 'The Australian Army's Two "Traditional" Diseases: Gonorrhoea and Syphilis - A Military-Medical History During the Twentieth Century', *Journal of Military and Veterans' Health* 27, no. 1 (2019): 11.

³⁴ Not only were quotations for various silver proteinate and arsenic compounds requested by the New Zealand Government, the weekly lists of medical stores received at Australian Auxiliary Hospital in Harefield, UK include 4 ounces of Argyrol on 24 January 1917, a treatment for gonorrhoea. See "Record of Medical Stores Received to our Indents, for the Week Ending January 20th, 1917," 1917. AWM25 483/15, Australian War Memorial, Canberra.

³⁵ 'Poisons Act 1890 54 VICT No. 1125 (VIC)' (1890), http://www.austlii.edu.au/cgi-bin/viewdb//au/legis/vic/hist_act/pa1890121/ (accessed 26 April 2019); 'Poisons Act 1902 No. 65 (NSW)' (1902), http://www.austlii.edu.au/cgi-bin/viewdb//au/legis/nsw/num_act/pa1902n65148/ (accessed 26 April 2019).

arsenic-based treatment) was administered by injection rather than ingested in tablet or powder form, it “was a remedy which few pharmacists were willing to prescribe and administer.”³⁶ Community pharmacies were often the first place a VD sufferer approached for assistance, however, and Haines notes that by 1912 this was recognised by the wider medical profession, which developed literature and information on the disease for distribution by pharmacists to those who needed it. This literature had a two-fold purpose: “to impress upon chemists that no matter how strongly pressed, they should not attempt to treat venereal disease, and to help them to inform their customers of the seriousness of these complaints.”³⁷

As containing the spread of VD infection into the general population was a public health issue, legislation was passed by Australian state governments in the early twentieth century to prevent the treatment of VD by anyone other than a qualified doctor and to ensure that the drugs used in the treatment of these diseases could only be supplied on a doctor’s prescription and not sold separately by the pharmacist as over-the-counter medications.³⁸ Consequently, although the level of interaction that pharmacists had with these medicines during WWI is unrecorded, it is likely that pharmacists working in the VD wards of military hospitals were mainly involved in the preparation of simple antiseptic solutions for urethral irrigations for the treatment of gonorrhoea, rather than preparing the highly complex and dangerous arsenic-based compounds used for syphilis. As the process

³⁶ Gregory Haines, *The Grains and Threepenn’orths of Pharmacy: Pharmacy in N.S.W. 1788-1976* (Kilmore, VIC: Lowden Publishing Co., 1976), 106. In the context of early twentieth-century pharmacy, Haines use of the term ‘prescribe’ indicates recommendation and sale of over-the-counter products, as commonly done for the treatment of minor ailments.

³⁷ *Ibid.*

³⁸ ‘Venereal Diseases Act 1916 7 GEO V No. 2858 (VIC)’, § 5 (1916), http://www.austlii.edu.au/cgi-bin/viewdb/au/legis/vic/hist_act/vda1916168/ (accessed 26 April 2019); ‘Venereal Diseases Act 1918 GEO V No. 46 (NSW)’, § 3 (1918), http://www.austlii.edu.au/cgi-bin/viewdb/au/legis/nsw/num_act/vda1918n46195/ (accessed 26 April 2019); ‘Venereal Diseases Act 1920 GEO V No. 1442 (SA)’, § 4 (1920), http://www.austlii.edu.au/cgi-bin/viewdb/au/legis/sa/num_act/vda1442o1920214/ (accessed 26 April 2019); Haines, *The Grains and Threepenn’orths of Pharmacy: Pharmacy in N.S.W. 1788-1976*, 108–9.

for medical staff to access and administer these complex remedies has not been recorded, it is therefore unable to be definitively stated who held ultimate responsibility for the storage, handling, and dispensing of treatments for VD.

The venereal diseases that were most commonly recognised in the New Zealand Expeditionary Force (NZEAF) and Australian Imperial Force (AIF) were syphilis ('the pox') and gonorrhoea ('the clap'). Both are intractable bacterial infections, and until the advent of antibiotics, could be treated only with great difficulty.³⁹ These diseases were concerning for the military authorities as VD was considered to be a morally-deficient self-inflicted illness and a distraction for medical officers whose focus should have been on treating war injuries and legitimate sickness. There was also the fear that returning soldiers could take the infection to their home countries and spread it throughout the wider community.⁴⁰ As a self-inflicted illness, infected soldiers could face court martial and a sentence of imprisonment, and their pay and subsequent family allotments were suspended for the period that they were undergoing treatment.⁴¹ Not only this, but contracting a case of VD (either gonorrhoea or syphilis) rendered the soldier unfit for duty and away from the front line for a significant period of time, as the treatment for both diseases could take up to six weeks, and sometimes longer if the infection was deep-seated and resistant to therapy. As an example of the effect of VD on fighting strength, Ian Howie-Willis asserts that out of 417,000 soldiers of the AIF, 63,350 or one in seven contracted VD during their

³⁹ Howie-Willis, 12.

⁴⁰ Ibid.

⁴¹ Edward H. Beardsley, 'Allied Against Sin: American and British Responses to Venereal Disease in World War I', *Medical History* 20, no. 2 (1976): 196–97; Raden Dunbar, *The Secrets of the Anzacs: The Untold Story of Venereal Disease in the Australian Army, 1914-1919* (Melbourne: Scribe Publications, 2014), 2–3, 22–23; Raden Dunbar, 'Venereal Infections: From Moralising to Medical Care', in *Compassion and Courage: Australian Doctors and Dentists in the Great War*, ed. Jacqueline Healy (Melbourne: Medical History Museum, University of Melbourne, 2015), 59–60. Having to explain to their family member (wife or parent) why their allotment was cut off for a time was extremely shameful and embarrassing for the soldier.

service, which was equivalent to three full infantry divisions being rendered unfit to fight for at least six weeks.⁴²

Venereal disease treatments were complex and time-consuming. Recurring treatment regimens were not uncommon, as many soldiers became infected more than once and were re-admitted several times to the VD hospitals over the course of the war. From the New Zealand pharmacist database, while there was at least one who was posted to work at the VD ward at Codford (noted above), a number were identified who spent time as in-patients in the ward, including several who had more than one episode of VD. As one example, 23-year-old Herbert Cecil Gilpin enlisted in May 1916, and was first admitted to Codford's VD section in September 1917. He was discharged from hospital in December, but was re-admitted, again to the VD section, in May 1918 until July of that year. His third admission to the VD section of Codford was shortly afterwards in September, and he was discharged to the convalescent ward then deployed to the supply section of Codford in December 1918, after the Armistice.⁴³ It is unknown which of the venereal diseases Gilpin was suffering from for each admission as this level of detail was not noted in his personnel file.

Gonorrhoea, caused by the gonococcus bacteria *Neisseria gonorrhoeae*, infected the soft, moist membranes of both male and female genital areas, throat and eyes, and usually spread along the genital and urinary tracts.⁴⁴ A discharge of pus from the urethra

⁴² Dunbar, *The Secrets of the Anzacs: The Untold Story of Venereal Disease in the Australian Army, 1914-1919*, 32; Dunbar, 'Venereal Infections: From Moralising to Medical Care', 57; Howie-Willis, 14.

⁴³ 'GILPIN, Herbert Cecil - WWI 24635, WWII 2665,5/1/146 - Army', 1914-1945, W5922/27 0045042, Archives New Zealand, Wellington. The General Hospitals had specialist units attached, and Codford held the VD ward for New Zealand soldiers.

⁴⁴ Howie-Willis, 12.

or affected area was the most visible symptom, along with pain in the groin.⁴⁵ Treatment for gonorrhoea consisted of twice-daily urethral irrigations of a solution of strong antiseptics including potassium permanganate, iodoform, and boric acid which had to be retained in the bladder for a number of uncomfortable hours before elimination (see Figure 8).⁴⁶

Gonorrhoea could also be treated through urethral irrigation with preparations of colloidal silver, in particular argonin, itrol (silver citrate), and argyrol (silver nitrate).⁴⁷ Protargol, the trade-name for a German-manufactured silver proteinate product, was also an effective and powerful antiseptic often used for the treatment of gonorrhoea, and was administered both as an injection and as a local application (i.e. urethral irrigation).⁴⁸ In July 1917, Kempthorne Prosser of Dunedin replied to a request for quotation by the Chief Executive Officer of the New Zealand Munitions and Supplies Department, advising them that Protargol was no longer available as it was a product of enemy origin, but supply of one-ounce bottles of an equivalent English-made proteinate of silver could be made for the price of 3s 6d per ounce nett, delivered into Wellington.⁴⁹ The name of the English manufacturer is, however, not included in the archival material.

⁴⁵ Ibid.; Harrison, 158.

⁴⁶ Howie-Willis, 12; Squire, *Squire's Pocket Companion to the British Pharmacopoeia*, 706.

⁴⁷ Squire, *Squire's Pocket Companion to the British Pharmacopoeia*, 103; Dunbar, *The Secrets of the Anzacs: The Untold Story of Venereal Disease in the Australian Army, 1914-1919*, 171.

⁴⁸ Squire, *Squire's Pocket Companion to the British Pharmacopoeia*, 103–4.

⁴⁹ 'Kempthorne Prosser & Company Quotation', 14 July 1917, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington.

Fig. 8: *Metal Syringe, with Metal Urethral Tube and Bone Rectal Tube*



Source: *Wellcome Images, Wellcome Collection, public domain.*

Although undated, this image of a metal syringe and urethral catheter is likely to be the same or similar to those used in the VD wards to treat WWI soldiers. As the catheter is metal, it would have required full sterilisation in between each use. Gonorrhoea could infect any genital area, the mouth and eyes, therefore the rectal tube would have been used to deliver antiseptic solution to the rectum to treat any indication of infection present there.

Syphilis was particularly difficult to cure, as it could have a long period of latency between the secondary and tertiary phases of the disease, during which no symptoms were evident to indicate that the carrier suffered from a venereal infection. Resulting from infection by the spirochaete (spiral-shaped) bacteria *Treponema pallidum*, syphilis had an incubation period of around three weeks, when no symptoms were evident. After this, a chancre or ulcer that was usually painless would form at the infection site, which eventually disappeared if left untreated; this stage is known as primary syphilis.⁵⁰ Following a further two to four months post-infection, secondary syphilis manifested as a whole-body rash as the bacteria multiplied and dispersed throughout the body. This rash

⁵⁰ Howie-Willis, 13.

would eventually heal after a period of some weeks, when the disease then entered a dormant phase which could last for years and sometimes decades.⁵¹ Syphilis does not progress to its tertiary phase in all sufferers, however; Howie-Willis states that between 30-40 per cent of untreated cases resolve into tertiary syphilis, where the spirochaetes reactivate and “irreversibly damage and eat away the parts of the body they attack...The result is often gross disfigurement, insanity and then death.”⁵²

Before 1910, treatment for syphilis involved use of a mercury compound, resulting in fever and a high likelihood of death from mercury poisoning for the patient. In use since the late fifteenth and early sixteenth centuries to treat syphilis, mercury in the form of calomel was either injected or taken orally, and the treatment was considered by doctors of the period to be worse than the disease itself.⁵³ The premise was that mercury would create an intense fever with the intention of ‘burning’ the infection from the body, and it was often administered in rooms that were overheated to encourage excessive sweating.⁵⁴ Treatment regimens could continue for a number of years, leading to the maxim “two minutes with Venus, a lifetime of Mercury.”⁵⁵ Even after the development of arsenic-based drugs, however, mercury continued to be used to treat syphilis during the period of the war. Grey Oil (oleum cinereum), an injectable solution containing 40 per cent mercury, was widely used, with Kempthorne Prosser and Company of Dunedin providing

⁵¹ Ibid.

⁵² Molly K. Zuckerman, ‘More Harm than Healing? Investigating the Iatrogenic Effects of Mercury Treatment on Acquired Syphilis in Post-Medieval London’, *Open Archaeology* 2, no. 1 (2016): 43–44; Howie-Willis, 13.

⁵³ Zuckerman, 43–44.

⁵⁴ Ibid., 44.

⁵⁵ Adriane Gelpi and Joseph D. Tucker, ‘After Venus, Mercury: Syphilis Treatment in the UK Before Salvarsan’, *Sexually Transmitted Infections* 91, no. 1 (2015): 68; Zuckerman, 44. Several versions of this maxim are known; for example, “an afternoon of Bacchus, an evening of Venus, and a lifetime of Mercury.”

a quotation of 7s 6½d per lb for two lbs of the product in late 1917, to be supplied to one of the hospital ships while undergoing refitting at Port Chalmers.⁵⁶

Australian medical staff also continued to use mercury compounds as treatments for syphilis throughout the course of the war. On admission to a VD ward or compound with syphilis, the patient was dosed orally twice daily with two tablespoons of *Mistura Z Coy [Company]*, a mixture of potassium iodide, sodium iodide, potassium citrate, sodium citrate, glycerine, syrup amantii, and aquam (water), then injected intramuscularly on a weekly basis with Grey Oil.⁵⁷ Exactly what syrup amantii consists of is unknown as it does not appear in the *Squire's Companion to the British Pharmacopoeia*, 1916. It is possible that it may be another heavy metal such as mercury, or a compound similar to arsenobenzol or Salvarsan. It could also simply be a flavouring to make the mixture palatable. Although the formulae or recipes for both *Mistura Z Coy* and Grey Oil are detailed in the article, how, where and by whom these formulations were made up for use are not mentioned.

In 1910, German scientist and Nobel laureate Paul Ehrlich announced the world's first chemotherapy medicine, Salvarsan, which was developed to specifically target the syphilis bacteria. Rather than being based on mercury, Salvarsan was arsphenamine, an arsenic-based compound.⁵⁸ Although administration of Salvarsan was easier than of mercury products, the process remained difficult as the product was not easily soluble and

⁵⁶ 'Kempthorne Prosser & Company Quotation', 3 December 1917, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington; Squire, *Squire's Pocket Companion to the British Pharmacopoeia*, 333. It is unknown which of the ships this relates to.

⁵⁷ H. Hunter Griffith, 'The Clinical Treatment of Syphilis in the Australian Army', *Medical Journal of Australia* 2 4th year, no. 10 (8 September 1917): 199. 'Z Coy' was the designation given to all syphilis patients in the ward, while sufferers of other venereal diseases were allocated their own company letter while they were incarcerated in the hospital, to differentiate between them for their respective treatment regimens.

⁵⁸ Patricia Spain Ward, 'The American Reception of Salvarsan', *Journal of the History of Medicine and Allied Sciences* 36, no. 1 (1981): 44; Gelpi and Tucker, 68. Chemotherapy or 'magic bullets' are drugs designed to target a single specific disease.

administering doctors were inexperienced in the direct venous injection required instead of intramuscular, often resulting in fever, along with abscesses and tissue necrosis at the injection site.⁵⁹ Within a year of Ehrlich's announcement, however, some 65,000 doses of Salvarsan had been distributed for the treatment of the disease.⁶⁰ Manufactured by Hoechst, the production laboratory was, however, based in Germany, and at the outbreak of the war, all supplies of Salvarsan to the Allied countries immediately ended.

Development of a substitute for Salvarsan quickly became imperative, particularly with the global mobilisation of large cohorts of men away from their communities and normal social prohibitions. With the suspension of German trademarks, by early 1916 British pharmaceutical company Burroughs Wellcome & Company, along with Paris-based Société Anonyme des Etablissements Poulenc Frères through their British agents May and Baker, were granted licences by the British government to develop a substitute, known by a new tradename Kharsivan.⁶¹ Other countries also worked to develop their own arsenic-based treatments for syphilis. In April 1917, the American Department of Dermatological Research of Philadelphia had formulated arsenobenzol, "a product chemically and therapeutically similar to salvarsan."⁶² In Europe, a French-manufactured arsenobenzol-equivalent was known by the tradename Galyl, and although the manufacturer's name is unknown, it is likely that this is the product developed by Poulenc Frères.⁶³ On 3 April 1918, the Chief Executive Officer of the Supply Department of the New Zealand armed forces advised the Director-General Medical Services (DGMS) that

⁵⁹ Ward, 51–53.

⁶⁰ *Ibid.*, 46; Gelpi and Tucker, 68.

⁶¹ 'Manufacture of Salvarsan Products in England and France', *British Medical Journal* 1, no. 2832 (1915): 649.

⁶² 'German Salvarsan and the American Product Arsenobenzol', *California State Journal of Medicine* 15, no. 4 (1917): 101. As America was at that stage neutral, permission had been granted for the development of the product by German trade agents. The announcement of their success was made at around the same time that America formally entered the war in April 1917.

⁶³ 'The Manufacture of Salvarsan Products in England and France', *The Lancet* 188, no. 4857 (1916): 623. Few laboratories had the capability to develop these types of drugs.

an order for Galyl had been placed with Kempthorne Prosser and Company in Dunedin, on order number 9377.⁶⁴ The treatment of syphilis in the troops was clearly an ongoing concern for the military authorities.

Arsenic-based treatments were not without risk, however, as like mercury, arsenic is also a heavy metal and was thus highly toxic and required careful handling. Regularly reported side effects of Salvarsan or its substitutions included pain in the injection site, faintness, and an increased pulse rate, often after the second treatment with the drug rather than the first.⁶⁵ J. S. Batchelor, in his report to the *New Zealand Medical Journal* (NZMJ), attributed these adverse reactions to an over-strong initial dose, and advised that once diluted, subsequent doses caused no further trouble to the patient.⁶⁶ Although arsphenamine and arsenobenzol were seen to be a scientific leap forward in the successful treatment of a deadly disease, nevertheless deaths from the actual treatment continued to occur.

Salvarsan was implicated in patient deaths from shortly after the product became available. In 1912, a short report in the *BMJ* detailed the death of a 23 year old man, who had developed symptoms after his second intravenous dose of 0.6 gram Salvarsan, one week after the first.⁶⁷ The report stated that the patient had developed fever within 48 hours after receiving the second injection, followed by delirium, excessive sweating, and began suffering repeated epileptiform seizures, followed by death from respiratory failure.⁶⁸ McDonnell does not give an opinion as to why the patient suffered an adverse

⁶⁴ 'Memo from Chief Executive Officer to DGMS', 3 April 1918, AAYS 8696 AD80/2 111, Archives New Zealand, Wellington.

⁶⁵ J. S. Batchelor, 'Use of Galyl', *New Zealand Medical Journal* 15, no. 65 (1916): 18.

⁶⁶ *Ibid.*

⁶⁷ W. Campbell McDonnell, 'Death After Salvarsan', *British Medical Journal* 1, no. 2681 (1912): 1126.

⁶⁸ *Ibid.*

reaction to the second dose, but the implication is that, even after a 48 hour delay from treatment to adverse reaction, he considered the Salvarsan injection to be the cause of death.

During the course of the war, further deaths from Salvarsan treatment were reported. Maneck Wadia, a Captain in the Indian Medical Service, also wrote to the *BMJ* of his experiences in 1917 with sepoys treated with Salvarsan, which resulted in the death of one of his patients.⁶⁹ After successful treatment of the primary syphilis chancre, a 23 year old patient was given a dose of 0.5 gram Salvarsan intravenously.⁷⁰ Vomiting and diarrhoea then began, along with a rapid but weak pulse. The patient then became “deeply jaundiced; the stools contained bile; the urine contained traces of bile and albumin.”⁷¹ After becoming progressively worse, with a liver that was enlarged and tender and a pulse rate that was feeble, the patient collapsed and died a week after treatment.⁷² Using the same batch of Salvarsan, Wadia gave two 0.5 gram doses to another sepoy with an interval of three weeks between each injection. Vomiting, diarrhoea and a feeble pulse rate were also experienced by the second patient for two days after the first dose of Salvarsan, but no reaction occurred after the second.⁷³ Wadia’s opinion was that different outcomes for the patients were due to the longer period between each injection in the second case, and that the fatal case succumbed to “a storage of arsenic in the liver, giving rise in all probability to acute fatty degenerative changes in the cells.”⁷⁴

⁶⁹ A sepoy is an Indian infantry soldier serving under British or European officers. Although by 1917 the German-made product was unobtainable, the report identified the treatment used as Salvarsan. Whether this was stockpiled German product or a substitute incorrectly named as Salvarsan by the article’s author is not known.

⁷⁰ Maneck D. Wadia, ‘Death After Salvarsan’, *British Medical Journal* 1, no. 2923 (1917): 13.

⁷¹ *Ibid.*, 13–14.

⁷² *Ibid.*, 14.

⁷³ *Ibid.*

⁷⁴ *Ibid.*

English-manufactured Kharsivan was named as the contributing factor in the deaths of two patients at Guy's Hospital in England, a 27 year old female, and a 40 year old male, who both died from arsenical poisoning after treatment with the compound.⁷⁵ Although the writer of this article did not go into detail of the symptoms suffered by the patients, he stated that as a result of his unfavourable experiences with the English product, he then began to use the French-manufactured Galyl, "with most satisfactory results."⁷⁶

Galyl, however, was not without risk either. An article in the *Medical Journal of Australia* (MJA) outlined the death of a 30 year old male at the Royal Prince Alfred Hospital, in Sydney. He had developed a syphilitic chancre that had appeared approximately 10 days before presentation for treatment at the hospital on 30 August 1915.⁷⁷ On 15 September, he was given an initial intravenous injection of Galyl, which was equivalent to 0.9 gram of Neo-Salvarsan, without any adverse reaction. The same dose was repeated at the hospital a week later on 22 September, with an almost immediate reaction including development of a high temperature, profuse cold sweating and convulsions. After rapid deterioration and unsuccessful treatment in the hospital's Emergency Department, the patient died at 8.30 am the following day.⁷⁸ The unnamed writer of the article noted that Galyl was an arsenobenzol drug, rather than an arsphenamine product, and that death was not a common reaction to treatment with Galyl.

⁷⁵ 'The Manufacture of Salvarsan Products in England and France', *The Lancet*, 623.

⁷⁶ *Ibid.*

⁷⁷ 'A Case of Death Following an Intravenous Injection of Galyl', *Medical Journal of Australia* 2 2nd year, no. 23 (4 December 1915): 536.

⁷⁸ *Ibid.*

Dysentery and Constipation

While different gastrointestinal illnesses prevalent during the war have been discussed in period medical journals as well as subsequent medical military historiography, none have indicated where, how or who prepared the treatments that were administered to treat these illnesses or conditions. Pharmacy and pharmacists in the military context, even in areas that are clearly within their sphere of influence, thus remain ‘silent’.

With the lack of a regular supply of nutritious, fresh food and adequate quantities of safe drinking water, gastric illnesses were endemic within the soldiery throughout the war. In a similar way as pharmacy, studies of food, water and nutrition for the troops are often overlooked in WWI historiography. As Alison Wishart describes, however, access to adequate food and water constitute one of the three basic necessities of life along with clothing and shelter, while the lack of an adequate diet had severe consequences for both physical and mental fitness of soldiers.⁷⁹ A study by Nick Wilson *et al.* attempted a nutritional analysis of the rations that New Zealand soldiers on Gallipoli could access, and concluded that the lack of nutrients in a diet provided as a result of inadequate planning and consisting primarily of bully beef, hard biscuits, jam and tea led to severe vitamin deficiencies with direct effect on gastrointestinal health.⁸⁰ This is in direct contradiction to a paper by Graham Wilson in 2000, which states that the AIF did not in fact have an

⁷⁹ Alison Wishart, “‘As Fit as Fiddles’ and ‘As Weak as Kittens’: The Importance of Food, Water and Diet to the Anzac Campaign at Gallipoli”, *First World War Studies* 7, no. 2 (2016): 132.

⁸⁰ Nick Wilson et al., ‘A Nutritional Analysis of New Zealand Military Food Rations at Gallipoli in 1915: Likely Contribution to Scurvy and Other Nutrient Deficiency Disorders’, *New Zealand Medical Journal* 126, no. 1373 (2013): 12, 22–23.

unvaried diet, leading to health issues.⁸¹ Yet even Wilson (Graham) conceded that the monotonous diet of the troops at Gallipoli was nutritionally inadequate, and although provision was made through the ration scales for a regular supply of fresh vegetables, meat and bread, this did not in reality actuate as these rations were often unavailable or were subject to theft.⁸² Gastrointestinal complaints were also compounded by extremely poor sanitary arrangements which attracted flies and facilitated the spread of disease, leading to outbreaks of diarrhoea and dysentery.⁸³ With a lack of safe drinking water, dysentery could be a life-threatening condition through dehydration.

Dysentery and diarrhoea are different conditions. Diarrhoea is a symptom of gastroenteritis or caused by bacteria associated with food poisoning, while dysentery is a potentially deadly inflammatory disease of the colon, leading to symptoms including severe diarrhoea with the presence of blood or mucus.⁸⁴ Although dysentery and diarrhoea were present in all theatres of war, these conditions were particularly prevalent in the Mediterranean theatre and Gallipoli. In his extensive report to the *NZMJ* in 1916, Dr Daniel Colquhoun of the University of Otago noted that both constipation and diarrhoea were common complaints, and he considered that gastric problems were caused by undercooked food alongside inadequate food handling and poor sanitation practices, including inadequate interment of human and animal remains and poor refuse disposal.⁸⁵ Colquhoun also reported that diarrhoeal diseases were at first ignored by the military

⁸¹ Graham Wilson, “‘Everything on Its Belly’: Feeding the First AIF Problems and Solutions of Australian Army Rationing and Catering in the First World War”, *Sabretache* 41, no. 3 (2000): 14.

⁸² Wilson, “‘Everything on Its Belly’”, 25–26. Ration scales are the expected quantity and types of food expressed as daily or weekly allowances that were provided to each soldier in the army to maintain optimal fitness. They also assisted to facilitate purchasing for bulk catering operations.

⁸³ Gary Sheffield, ‘Shaping British and Anzac Soldiers’ Experience of Gallipoli: Environmental and Medical Factors, and the Development of Trench Warfare’, *British Journal for Military History* 4, no. 1 (2017): 31.

⁸⁴ Steve Flint, Glyn Harper, and Nick Wilson, ‘The Gallipoli Gallop: Dealing with Dysentery on the “Fringes of Hell”’, *Microbiology Australia*, (September 2014): 141.

⁸⁵ Daniel Colquhoun, ‘New Zealand Students at the Front’, *New Zealand Medical Journal* 15, no. 67 (1916): 114–15; Tyquin, 111–15; Flint, Harper, and Wilson, 142; Milton J. Lewis and Stephen R. Leeder, ‘Public Health at Anzac Cove’, *Medical Journal of Australia* 202, no. 7 (2015): 385; Sheffield, 30–32.

authorities until the problem finally became too widespread, and determined that these diseases were caused primarily by inferior food, poor latrine and sanitation practices, and the prevalence of flies acting as carriers of bacteria.⁸⁶ Flies were the main cause of the spread of both types of dysentery, amoebic and bacillary.⁸⁷ Colquhoun also noted that the medicine mostly frequently used to treat diarrhoea was a mixture of bismuth and soda, which was effective if administered in the early stages, but aggravated the illness if used in the later stage.⁸⁸ It is notable, however, that as with other contemporary reports to medical journals, Dr Colquhoun makes no mention of the dispenser who would have been responsible for the compounding of the mixture to treat sufferers.

Although not technically an illness caused by a bacteria or pathogen, constipation was also a problem for the troops. This was primarily caused by the poor and unvarying diet with little or no access to fibre in the form of vegetables or fruit, either fresh or tinned, combined with grossly inadequate supplies of safe drinking water. Castor oil (*oleum ricini*), magnesium sulphate, cascara, and senna were all used in the treatment of constipation.⁸⁹ In the field, medicine chests contained pre-numbered vials of tablets to treat common minor ailments, including both diarrhoea and constipation, and were handed out by a field dispenser, who may not necessarily have been a pharmacist (see Chapter 5). To treat constipation, a 'Number 9' pill was given to the sufferer. This was a strong and quick-acting laxative, consisting of colocynth (bitter apple or bitter cucumber), extract of rhubarb and calomel as its active ingredients.⁹⁰ Although used genuinely to treat constipation, the 'Number 9' could also be dispensed for headache, malingering,

⁸⁶ Colquhoun, 121, 123. See Vincent J. Cirillo, "'Winged Sponges': Houseflies as Carriers of Typhoid Fever in 19th- and Early 20th-century Military Camps," *Perspectives in Biology and Medicine* 49, no. 1 (2006): 52-63.

⁸⁷ Tyquin, 117; Harrison, 131. Flies were also responsible for the spread of typhoid. Cirillo, 52-63.

⁸⁸ Colquhoun, 128.

⁸⁹ *Ibid.*, 129; Tyquin, 143.

⁹⁰ Colquhoun, 114; Rogers, 310.

heartache, cuts, laziness, and all manner of other time-wasting ills that the medical officer considered worthy of a trip to the latrine.⁹¹

Typhoid, Paratyphoid and Vaccination

Vaccines were another product that was not handled by pharmacists. This may be due to vaccines being part of a wider public health activity that originated in compulsory smallpox vaccination legislation in New Zealand, and therefore were not medicines that were prescribed by a doctor or for sale over the counter in a pharmacy. Similarly, the vaccines produced in Australia by the Commonwealth Serum Laboratories (CSL) were also government-controlled, at both State and Commonwealth level.⁹² Reflecting precedents that dated to the mid-nineteenth century, smallpox vaccinations in New Zealand were handled by government-appointed Public Vaccinators who were often doctors, and who received both monetary payment and a supply of free lymph for their services.⁹³ Vaccination to prevent the incidence of smallpox became a government concern in the late nineteenth century, in the face of strong public opposition to compulsory vaccination.⁹⁴ As preventive therapies provided by the government, vaccines had little to no commercial value to pharmacists in the same way as treatments for VD (another public health issue), as they could not be sold in retail settings. Subsequently, with the outbreak of the war, military pharmacists would have had no experience in the handling of vaccines. Consequently, there is no evidence to suggest that vaccines became part of military pharmacists' sphere of influence or scope of practice during the war, nor were vaccines and their administration included in the plan that Australian pharmacists put

⁹¹ Rogers, 310.

⁹² A. H. Brogan, *Committed to Saving Lives: A History of the Commonwealth Serum Laboratories* (Melbourne: Hyland House, 1990), 12–17.

⁹³ Derek Dow, *Safeguarding the Public Health: A History of the New Zealand Department of Health* (Wellington: Victoria University Press, 1995), 29.

⁹⁴ *Ibid.*, 29–30, 73.

forward to the authorities in their drive for the establishment of the Australian Army Pharmaceutical Service (AAPS) in 1916.⁹⁵ As with VD treatments, the administration of vaccines involved injection, a physically invasive procedure. Unlike doctors or dentists, however, pharmacists did not take any direct action upon the body of the patient, instead leaving such measures in the realm of medically-trained personnel. It is likely that this accepted lack of clinical practice or intervention in the civilian environment by pharmacists contributed to their inability to include vaccines handling and administration in their projected sphere of influence in a military context.

Although tuberculosis was the leading cause of death by disease in nineteenth century Britain, typhoid also had a relatively high mortality rate, albeit in decline from the 1870s.⁹⁶ Nevertheless, typhoid was a particularly worrisome infection for military authorities; this disease was responsible for two-thirds of the British casualties in the South African or Second Boer War of 1899-1902, with approximately 13,000 deaths from typhoid compared to around 8,000 deaths from battlefield trauma.⁹⁷ While a vaccine for typhoid had been developed by Sir Almroth Wright, Professor of Pathology at the British Army Medical College in 1896, the injection was painful and unpopular, and uptake of the vaccine on a voluntary basis was not widespread amongst the British Imperial troops during the Boer War, with only around five percent undergoing the procedure.⁹⁸

⁹⁵ 'Commissioned Rank for Army Pharmacists', *Chemist and Druggist of Australasia* 30, no. 5 (1 May 1915): 167-70.

⁹⁶ Keir Waddington, *An Introduction to the Social History of Medicine: Europe Since 1500* (London: Palgrave Macmillan, 2011), 242; Romola Jane Davenport, Max Satchell, and Leigh Matthew W. Shaw-Taylor, 'Cholera as a "Sanitary Test" of British Cities, 1831-1866', *The History of the Family* 24, no. 2 (2019): 410. Typhoid was also known by its older name, 'enteric fever'.

⁹⁷ Kelvin Brown, *Fighting Fit: Health, Medicine and War in the Twentieth Century* (Stroud, U.K.: The History Press Ltd, 2008), 17; Hobbins, 35; Harrison, 6.

⁹⁸ John W. Warren and Richard B. Hornick, 'Immunization Against Typhoid Fever', *Annual Review of Medicine* 301, no. 1 (1979): 462; Brown, *Fighting Fit*, 22-23; Hobbins, 35; Harrison, 143; Philippe Sansonetti, 'Vaccination Against Typhoid Fever: A Century of Research. End of the Beginning or Beginning of the End?', in *History of Vaccine Development*, ed. Stanley A. Plotkin (New York: Springer, 2011), 67.

Vaccination in the British Expeditionary Force (BEF) at the outbreak of WWI was voluntary, and it has been argued that vaccination for Dominion forces who served under British control was also voluntary, taking their direction on the issue from the British authorities.⁹⁹ This was, however, not the case in relation to the armed forces of both New Zealand and Australia, even though the structure and functions of the Dominions' armies were otherwise modelled on the British military model.¹⁰⁰ Although not mandated by law for the general population, vaccination or inoculation against various diseases such as typhoid, paratyphoid (both known as enteric fever), diphtheria and tetanus in the New Zealand and Australian armies became compulsory. While not originally included on Australian enlistment forms at the beginning of the war, by 1915 the question of consent to vaccination or inoculation had been added, with acceptance dependent on consent being received.¹⁰¹ For any soldier who had already enlisted and was serving in the AIF but refused vaccination or inoculation, strongly punitive measures were implemented. Pay was withheld, the soldier was ordered to submit to the procedure in the presence of witnesses, and if he continued to refuse, was then subject to court-martial and discharge from the AIF after serving his sentence.¹⁰² For British soldiers during WWI, vaccination was entirely voluntary, although strongly advocated, and remained this way for the duration of the war in spite of strong opposition from bacteriologists and physicians such as Sir William Osler, Sir Almroth Wright, and medical officers in the Royal Army Medical

⁹⁹ Harrison, 147; G. Dennis Shanks, 'How World War 1 Changed Global Attitudes to War and Infectious Diseases', *The Lancet* 384, no. 9955 (2014): 1701.

¹⁰⁰ Colin Richardson, 'General Sir Alexander John Godley: The Last Imperial Commander', in *Born to Lead: Portraits of New Zealand Commanders*, ed. Glyn Harper and Joel Hayward (Auckland: Exisle Publishing, 2003), 45.

¹⁰¹ 'Naval and Military News', *Medical Journal of Australia* 1 2nd year, no. 10 (6 March 1915): 219.

¹⁰² *Ibid.*

Corps.¹⁰³ As a result of this advocacy, however, uptake of the typhoid vaccine by British troops was near-universal by the end of 1915.¹⁰⁴

The typhoid vaccination consisted of two injections of a killed (attenuated) bacteria carried in calf lymph, approximately ten days apart, administered either into the upper arm, the abdominal wall, or the top of the chest.¹⁰⁵ Although the method of administration for the typhoid vaccine was relatively benign, nonetheless the injection itself was painful, and resulted in the person receiving the injection being at less than optimal fitness for up to two days. Medical officers varied in their perceptions of how the vaccine affected the troops. Captain T. F. Brown of the AIF considered that the vaccine caused only slight pain for around six hours after the injection, which then increased for the next six with localised inflammation of the injection site, but it was ultimately an easy procedure for both medical staff and patients.¹⁰⁶ Conversely, Captain John Shaw, a New Zealand doctor serving on the Western Front with the 14th Battalion, Northumberland Fusiliers, advised in his letter to the Adjutant on 15 September 1915 that he had “11 named men inoculated from D. Coy [Company] against typhoid – excused from all duty for 48hrs from inoculation.”¹⁰⁷ Similarly, Captain William Aitken of the New Zealand Mounted Field Ambulance at Gallipoli wrote in his diary for 1 October 1915 that he had been re-inoculated along with “No. 1 Company with anti-typhoid vaccine at New Zealand Field Ambulance...by evening had a very sore arm, tender and stiff,” while a brief entry for the following day stated that

¹⁰³ Warren and Hornick, 462; Michael Bliss, *William Osler: A Life in Medicine* (Oxford: Oxford University Press, 1999), 406; Harrison, 143–45; Shanks, 1701.

¹⁰⁴ Warren and Hornick, 462; Harrison, 147. Pressure on those who refused vaccination came from their peers, and refusers often had leave curtailed or rejected, ostensibly due to the risk to their unit mates if they returned with disease.

¹⁰⁵ Andrew D. Carbery, *The New Zealand Medical Service in the Great War, 1914-1918* (Auckland: Whitcombe and Tombs, 1924), 154; T. F. Brown, ‘The Vaccination of Troops on a Troopship’, *Medical Journal of Australia* 1 2nd year, no. 18 (1 May 1915): 405.

¹⁰⁶ Brown, ‘The Vaccination of Troops on a Troopship’, 405.

¹⁰⁷ John Patrick Shaw, ‘Letter to the Adjutant’, 15 September 1915, MS-0759, Hocken Library, University of Otago, Dunedin.

he was “off colour all day, arm still stiff.”¹⁰⁸ Although Brown minimised the side-effects of the vaccination in his article in the *MJA*, a report to the *Chemist and Druggist of Australasia* (C&DA) from H. M. Matheson, an AIF pharmacist serving as the dispenser on the troopship *Orviato* described the effects of the typhoid vaccine as being “very severe for the first twenty-four hours”, with troops complaining about very sore arms and some men fainting from the pain.¹⁰⁹

While in transit during October 1914, members of the first overseas contingent of New Zealand soldiers to be sent to fight in the European theatre of WWI presented to the medical staff on the troopship *Ruapehu* for the first round of what the medical officers were calling ‘typhoid inoculation’ injections. On 25 October, during the ten-day interim period before the second scheduled round of injections, Lance Corporal Jack Gilchrist of the Ambulance Corps, Otago Infantry Battalion, an unregistered pharmacist who was serving as dispenser on the ship, died from ptomaine (food) poisoning and was buried at sea.¹¹⁰ Although the injection did not contribute to his untimely death, rumours nevertheless flew around the remainder of the troops on the ship that the typhoid injection was a contributing factor. Most of the 31 officers and 785 men of the Otago Mounted Rifles and Otago Infantry Battalion on board then refused to submit to the second round of injections, asserting that they had not actually agreed to inoculation, but only vaccination as stated on the attestation form that each man had signed on enlistment.¹¹¹

¹⁰⁸ William Aitken, ‘Diary’, 1 October 1915, Misc-MS-1971, Hocken Library, University of Otago, Dunedin.

¹⁰⁹ ‘First Week on a Troopship’, *Chemist and Druggist of Australasia* 30, no. 2 (1915): 46.

¹¹⁰ ‘Buried at Sea’, *Chemist and Druggist of Australasia*, 1 December 1914, 421; Glyn Harper, *Johnny Enzed: The New Zealand Soldier in the First World War, 1914-1918* (Auckland: Exisle Publishing, 2015), 99.

¹¹¹ ‘New Zealand Transports of the Main Body.’ <http://www.nzmr.org/lists/transport1914.html> (accessed 9 June 2017).

The imprecise wording of this particular question caused by the use of non-standard terminology created a quasi-legal problem for the New Zealand Defence Department. Although the terms ‘inoculation’ and ‘vaccination’ were used interchangeably by both medical and army personnel for the process of immunisation, only the term ‘vaccination’ was included on the contractually-binding attestation form in late 1914.¹¹² The perception of the difference between the processes of inoculation and vaccination is a key point in the refusal by the men of the *Ruapehu*, with its genesis in the processes around the compulsory vaccination of the general population against smallpox. At this time, the term ‘inoculation’ was associated with the use of live smallpox virus in order to produce an episode of the actual disease and for the patient to possibly gain immunity if they survived, while vaccination was understood to be safe, by using either a less virulent substitute such as the much milder cowpox. Strong legal and financial penalties were applied to anyone who performed inoculation by using matter from actual smallpox blisters.¹¹³

By the time the ship docked in Egypt, the remaining troops on board with the exception of 35 stalwarts had been persuaded to accept the second injection. These 35 men were returned directly to New Zealand and discharged immediately from the Army.¹¹⁴ It is obvious that the New Zealand military authorities under-estimated the degree of vaccination resistance in its newly-formed and partially-trained citizen volunteer force, unaccustomed to the discipline and obedience that was required of it. The government initially relied too heavily on both the contractual nature of the attestation form at

¹¹² For example, see Douglas Goddard Personnel File, 24 December 1914 W5539 29 0045394, Archives New Zealand, Wellington. The attestation form was effectively the employment agreement between the recruit and the government.

¹¹³ ‘*Vaccination Act 1871 (35 Victoriae 1871 No. 51)*’ (NZ) (1871), http://www.nzlii.org/cgi-bin/download.cgi/cgi-bin/download.cgi/download/nz/legis/hist_act/va187135v1871n51241.pdf. (accessed 26 April 2019).

¹¹⁴ Christopher Pugsley, *Gallipoli; The New Zealand Story*, 5th ed. (Auckland: Libro International, 2014), 71.

enlistment and the not unreasonable expectation that the orders given by ranking medical officers would be followed immediately to enforce compliance.¹¹⁵ As a result of this under-estimation, the mass refusal by the men of the *Ruapehu* ultimately led to the identification of a legal ambiguity, exposing the inability of the military authorities to compel submission. Consequently, the New Zealand government added a clause compelling vaccination or inoculation as part of the *Military Service Act 1916*, which legislated for conscription.¹¹⁶

It is possible that much of the misunderstanding around the compulsory or otherwise nature of vaccination for New Zealand soldiers may have arisen indirectly from the British military itself and the nature of New Zealand's relationship to the Imperial Government. Although a self-governing Dominion of the British Empire since 1907, New Zealand was nevertheless still expected to take direction from the British Imperial Army on matters to do with the war, and it was well known to the general public that vaccination or inoculation in the BEF was voluntary. With the British Imperial Army having direct oversight of the NZEF during the course of the war, an assumption may have been made by both recruits and enlistment officers that British military regulations took precedence over local military directives. A letter to the editor of the *Otago Daily Times* on 12 June 1920 indeed indicates that this was considered to be the case.¹¹⁷ In this letter, the author, D. Wishart, wrote in support of the men who refused the typhoid vaccination, and condemned the decision made by the Returned Servicemen's Association that the refusers were ineligible for benefits under the *Discharged Soldier's Settlement Act 1915* for being

¹¹⁵ *Ibid.*, 66.

¹¹⁶ 'Military Service Act 1916 (7 GEO V 1916 No. 8)' (NZ) (1916), http://www.nzlii.org/nz/legis/hist_act/msa19167gv1916n8266/. (accessed 28 September 2017).

¹¹⁷ 'Unvaccinated Soldiers', *Otago Daily Times*, 12 June 1920, 13.

returned to New Zealand and discharged.¹¹⁸ The author's view was that those who refused the vaccination should not be punished as they were "men that were bold enough to refuse vaccination and were returned to New Zealand, because, on the authority of Lord Kitchener, at the time the men refused vaccination it was voluntary in the army and our New Zealand troops were but a unit of the British army of occupation in Egypt."¹¹⁹

Lawfulness (or not) of compelling soldiers to submit to vaccination was not the only problem for the commanders of the NZEF, as the quality and efficacy of the New Zealand-issued typhoid vaccine itself was called into question several times between 1915 and 1916. On 4 January 1916, a letter was sent from the office of the Prime Minister in Wellington to the Commandant of the NZEF, Major-General Sir Alexander Godley, containing a partial transcription of a cable from the High Commissioner in London at the end of December 1915, advising that:

Colonel [Heaton] Rhodes reports that typhoid vaccine employed for inoculation of our troops before leaving New Zealand has not been efficacious. The disease has been of a severer type than amongst the Imperial troops and the mortality has been considerably higher in fact more than double. War Office now recommends that all troops should be inoculated against typhoid and paratyphoid owing to prevalence [of the] latter disease in Egypt Mudros and Gallipoli.¹²⁰

¹¹⁸ 'Discharged Soldiers Settlement Act 1915 (6 GEO V 1915 No. 45)' (NZ) (1915),

http://www.nzlii.org/cgi-bin/download.cgi/cgi-bin/download.cgi/download/nz/legis/hist_act/dssa19156gv1915n45377.pdf. (Accessed 1 April 2019)

¹¹⁹ 'Unvaccinated Soldiers', 13.

¹²⁰ 'Letter to Commandant', 4 January 1916, AAYS 8638 AD1/962 49/83, Archives New Zealand, Wellington. The date of the letter is incorrect in the archival material, the letter being dated 1915, not 1916. The mortality figures referred to actually relate to paratyphoid, which was not included as part of the New Zealand-supplied typhoid vaccine at this point in time. Paratyphoid was mostly found in countries with poor sanitation and unsafe drinking water, so was unknown to the New Zealand authorities prior to the war.

The letter also advised that a polyvalent or combined typhoid and paratyphoid vaccine would be supplied to New Zealand forces from Britain from 1 January 1916.¹²¹ Typhoid (*S. typhi*) and paratyphoid A and B (*S. enterica*) have very similar symptoms and onset, but are caused by different strains of the *Salmonella* bacteria.¹²² The cable sent in December was the beginning of a series of correspondence to the New Zealand government regarding the inability of the vaccine supplied to the NZEF troops by the New Zealand Bacteriological Laboratory to prevent typhoid-like illness. Prior to this cable, in August 1915 a report on the efficacy of the New Zealand anti-typhoid vaccine at Cairo was prepared by the Advisory Committee for Prevention of Epidemic Diseases, which stated that “up to the end of 1915 neither the N.Z. Vaccine nor the R.A.M.C. Vaccine afforded any protection against Paratyphoid, and that the very fact that less than 10% of the ‘Enterica’ was Typhoid is the best evidence of the protection afforded by the vaccines against Typhoid.”¹²³

While stationed on the island of Lemnos off the Gallipoli peninsula, Charles James Martin, a British physiologist serving with the Australian Army Medical Corps, identified that the majority of ‘enteric fever’ cases were actually paratyphoid A and B, with only a few cases of actual typhoid. He then recommended to the Australian authorities that although the typhoid vaccine was proving to be effective, they should also vaccinate the Australian troops against the two strains of paratyphoid.¹²⁴ Martin’s familiarity with and

¹²¹Ibid. Although the origin of these supplies was not stated, they are likely to have come from the Royal Army Medical College, which was manufacturing polyvalent typhoid vaccine for the British Army.

¹²² John Walton, Paul Beeson, and Ronald Bodley Scott, eds., *The Oxford Companion to Medicine*, vol. II N-Z (Oxford: Oxford University Press, 1986), 1009, 1402.

¹²³ ‘Notes on the Efficacy of the N.Z. Anti-Typhoid Vaccine of 1914-1915’, 1915, AAYS 8638 AD1/962 49/83, Archives New Zealand, Wellington. This was a Medical Advisory Committee, established in May 1915 by the British War Office to improve outcomes on the prevention of infectious diseases at the front, and consisted of Colonel W. Hunter (Australian Army Medical Service), and Lieutenants-Colonel G. S. Buchanan and L. S. Dudgeon (Royal Army Medical Corps).

¹²⁴ Harriette Chick, ‘Charles James Martin. 1866-1955’, *Biographical Memoirs of Fellows of the Royal Society* 2 (November 1956): 180.

ability to identify paratyphoid A and B infection at Gallipoli was due to an experiment in 1904 that Martin had conducted on Indian Army troops to test the efficacy of anti-typhoid vaccination.¹²⁵

It is clear that the New Zealand vaccine also worked well against *S. typhi*, but not *S. enterica*. The Committee was nevertheless critical of the perceived ‘virulence’ of the vaccine, and considered the New Zealand-made product to have “lost all its virulence, even for animals.”¹²⁶ A follow-up report in October of the same year by the Advisory Committee stated that they had been informed that the “inoculations had been made with a vaccine prepared from a culture obtained from a bone abscess of some 14 years duration (i.e. an enfeebled strain of organism) and had given rise to little or no reaction.”¹²⁷ Where this information came from or who the person was who made this statement to the Committee is not recorded in the archival material. It would appear, however, that the assertion that vaccines of poor quality were being produced in New Zealand was unfounded, as an order for vaccines was placed on the Government Bacteriologist’s office by Colonel James Purdy, Director of Medical Services (DMS), on 26 October 1916. This order was for the supply of a range of vaccines for a troopship, and included a request for a number of tubes of “anti-typhoid-paratyphoid” vaccine, which indicated that any quality issues had been resolved.¹²⁸

¹²⁵ Martin Gibbs, *Charles Martin: His Life and Letters* (London: Martin Gibbs, 2011), 66–67.

¹²⁶ ‘Notes on the Efficacy of the N.Z. Anti-Typhoid Vaccine of 1914-1915’.

¹²⁷ ‘Advisory Committee for Prevention of Epidemic Diseases, Report to Surgeon-General Babbie’, 1915, AAYS 8638 AD1/962 49/83, Archives New Zealand, Wellington.

¹²⁸ ‘J. R. Purdy, Order to Government Bacteriologist’, 26 October 1916, AAYS 8638 AD1/962 49/83, Archives New Zealand, Wellington.

Australia imported vaccines until 1916 when the Commonwealth Serum Laboratories were established in Melbourne.¹²⁹ In 1913, the import value of vaccines, sera and anti-toxins into Australia was approximately £15,300, while the total annual cost to run the laboratory was estimated to be £3,000.¹³⁰ The decision to establish CSL was in part due to the shortages of vaccines experienced within the first year of the outbreak of war, but also in response to increasing independence with Federation in 1901, as well as significant advances in both science and medicine.¹³¹

Conclusion

Medicines and therapeutics were used to treat a range of diseases and conditions that were endemic in the armies of WWI. Archival material in both New Zealand and Australia, however, do not provide any detail of who was preparing the medicines for use, how they were being prepared, or where they were being prepared. Antiseptics, vaccines and treatments for syphilis did not appear to be handled by military pharmacists at all, possibly due to their specialised handling requirements or prior histories as public health preventive treatments. Pharmacists in the civilian sphere would have had little, if any, exposure to these treatments and medicines, and therefore would have been unfamiliar with them. There is evidence in the form of posting notes on personnel files that military pharmacists may have been involved in the preparation of treatments for gonorrhoea in the VD wards of military hospitals, but this is not definitive. Not only was the work of military pharmacists rendered invisible, but any record of those who may have held responsibility for the handling and subsequent dispensing of these complex remedies in place of military pharmacists has also been omitted from the archival material. Military

¹²⁹ These imported products are likely to have come from Burroughs, Wellcome and Company, in the United Kingdom.

¹³⁰ 'Vaccines, Serums and Anti-Toxins', *Chemist and Druggist of Australasia* 30, no. 12 (1915): 411; Brogan, 1–2.

¹³¹ Brogan, 1–2.

pharmacists are therefore ‘silenced’ in the archival record, as their day-to-day practices have not been recorded.

Treatments for dysentery, diarrhoea and constipation were most likely to have been prepared by military pharmacists in base and general hospitals, or dispensed from field medicine chests. Again, other than weekly lists of medicines or components received at general hospitals, there is no indication of what military pharmacists were doing with the therapeutics that were coming into stores or were under their control. Military pharmacy and pharmacists were thus ‘invisible’ in the records kept after and possibly during the war, and as a result of this ‘invisibility’, subsequent historians have overlooked the role and experience of military pharmacists, while the diseases and illnesses themselves have been privileged in military medical histories. This state of ‘invisibility’ of military pharmacy and its practitioners and why they were overlooked will be further examined in Chapter 5.

Chapter 5: Pharmacy Invisibility and Professionalism

Introduction

This chapter investigates further the archival and historiographic invisibility of military pharmacists, and specifically the reasons why military pharmacists may have been omitted from the archival record. In particular, this chapter argues that this invisibility of military pharmacy is a direct consequence of perceptions by the military authorities of both countries of the nature of the work performed by military pharmacists during the war, as well as perceptions of the professionalism of pharmacy as a health occupation within a military context. While Chapter 4 examined a number of specific diseases and conditions that beset Australian and New Zealand soldiers during the war, and demonstrated that although these diseases and conditions were studied by doctors of the time as well as later military and medical historians, the role that military pharmacists played in providing medicines and treatments for them was effectively ‘silenced’ in the archival record, with little to no documentation of their experiences and practice documented in existing official government records. This ‘silencing’ has resulted in military pharmacists and their profession becoming largely ‘invisible’ to both contemporary and later historians, and consequently omitted from a large portion of the historiography of World War I (WWI) military medicine.

The first two chapters described and discussed the experiences of New Zealand and Australian pharmacists as serving members in their respective armed forces, both in the period before the war, and for the four-year duration of the war itself. Although both countries began their war efforts in a similar fashion, Australian pharmacists were successful in developing a specific role for themselves within the Australian Army Medical Corps (AAMC) as medical quartermasters, while New Zealand military

pharmacists finished the war on the same occupational pathway that they began in 1914.¹ This was in spite of numerous attempts to improve their situation. In this chapter, I discuss and analyse the professional standing and, in particular, the *perception* of professionalism of pharmacy practice in the civilian world by both medical practitioners and pharmacists, and how this then transferred into the role of pharmacists in the New Zealand and Australian armed forces during WWI. I argue that, amongst other reasons, pharmacists perceived their apprenticeship, regulatory body examinations and legal registration requirements to carry as much educational and therefore professional weight as a university degree. There is, however, a significant disconnection between how pharmacists in the armed forces of both New Zealand and Australia saw their role and occupation, and how other occupational groups within both the health sector and the military itself perceived pharmacists and their work in return. It is this self-perception of professionalism by New Zealand and Australian pharmacists that led them to develop the expectation of being granted commissioned rank within the armed forces at the outbreak of the war, while the drive for professional recognition underpinned and influenced their entire wartime experience.

Interwoven throughout Chapters 1 and 2, this self-perception by pharmacists as health professionals is a common theme. By considering themselves to be professionals, pharmacists in both countries were perplexed that there was no recognition of their professionalism by military authorities, which did not equate to a corresponding social recognition or status in the military structure.² That pharmacists held themselves to be on a similar professional level as doctors and dentists, yet failed to attract commissioned rank upon enlistment, was a development of long-standing inter-professional tensions in the

¹ See Glossary for definition of 'quartermaster'.

² Certainly for both countries at the beginning of the war, but from January 1916 only for New Zealand military pharmacists.

civilian sphere that carried over into the armed forces. On what basis did pharmacists consider themselves to be, if not equal in responsibility, at least of a sufficient professional parity to doctors and dentists in order to justify their continued drive for commissioned rank during the war?

The intention of this chapter is not to examine in depth the development of specific health professions in the early twentieth century; rather, the development of professions as a broad concept along with their link to educational standards is examined as a key factor in understanding how military pharmacists perceived their professional worth in comparison to other medical staff, and vice versa. By framing military pharmacists' experiences within discourses of professions and professionalism, I examine the differing *perceptions* and understandings of professionalism within the health sector in the civilian sphere, and how these different perceptions consequently impacted on the role of military pharmacists in the Australian and New Zealand Army Corps (ANZAC) forces, and their consequent archival and historiographical invisibility. Although professionalism, education, and social class and status are intrinsically linked with a degree of overlap, this section of the chapter will examine professionalism as a key factor relating to the development of ANZAC WWI military pharmacy. Further discussion on the role of education and social class and their effect on military rank will be the topic of Chapter 6.

The Invisibility of Military Pharmacy

As discussed previously, military pharmacy is similar to hospital pharmacy in that it takes place in an environment that is not open to the public. In this respect, military pharmacy does not have much, if any, public profile, and its work goes unnoticed. In histories of the medical services during WWI, the dispensary and those who worked within

it are frequently overlooked, or mentioned only in passing.³ As an example, Glyn Harper, in his work on the New Zealand soldier during WWI, mentions ‘drugs’ once, in relation to illegal recreational use by soldiers on leave in London, with no mention of medicines even in the medical context.⁴ Similarly, while Mark Harrison in his book on British military medicine during WWI makes brief reference to several specific drugs or therapeutics such as antiseptics, chloroform, vaccines, iodine, and quinine, he also does not include any information or detail on who prepared the treatments or where they came from.⁵ One partial exception is the medical history of the Gallipoli campaign published by Michael Tyquin in 1993. Although he does discuss particular treatments used for specific diseases and wound types in greater depth than Harrison, he also does not identify where the therapeutics, anaesthetics and antiseptics that were used were prepared, who prepared them, or where supplies of medicines were sourced.⁶ Military pharmacy and its practitioners remained invisible.

With this historiographical invisibility, other scholars have attempted to fill the vacuum by making inaccurate connections between pharmacy practice and other health practitioners. Kirsty Harris has attempted one such connection in her *Pharm. History Australia* article in 2008, where she argues that Australian Army Nursing Services (AANS) nurses were in charge of both the dispensary and dispensing, particularly on

³ While too many to list see, for example, Michael Tyquin, *Gallipoli: The Medical War - the Australian Army Medical Services in the Dardanelles Campaign of 1915* (Kensington, NSW: NSW University Press, 1993); Mark Harrison, *The Medical War: British Military Medicine in the First World War* (Oxford: Oxford University Press), 2010; Kirsty Harris, *More than Bombs and Bandages: Australian Army Nurses at Work in World War I* (Newport, N.S.W.: Big Sky Publishing), 2011; Peter Rees, *Anzac Girls: The Extraordinary Story of Our World War I Nurses* (Crow's Nest, N.S.W.: Allen and Unwin), 2014; Ana Carden-Coyne, *The Politics of Wounds: Military Patients and Medical Power in the First World War* (Oxford: Oxford University Press), 2014.

⁴ Glyn Harper, *Johnny Enzed: The New Zealand Soldier in the First World War 1914-1918* (Auckland: Exisle Publishing, 2015), 546.

⁵ Harrison, 333, 335, 345, 340, 343.

⁶ Tyquin, *Gallipoli: The Medical War - the Australian Army Medical Services in the Dardanelles Campaign of 1915*, 51–73. Tyquin also focuses his work mainly on the treatment of those who were injured, rather than those who suffered from sickness.

hospital ships. She defines ‘dispensing’ as being “likely that it meant compounding drugs and handing them out, not the services of a fully trained pharmacist.”⁷ Compounding of drugs, however, was the specific professional skill of qualified pharmacists, and comprised almost completely the services of a fully trained pharmacist. What tasks Harris considers to be part of the work of the “services of a fully trained pharmacist” is not, however, made clear.⁸ Her further assertion that nurses could be employed in ship dispensaries and that this was a natural development as nurses were in charge of the dispensary stock on hospital ships from 1917 is also incorrect.⁹ By this point in time, Australian hospital ship dispensaries were required to be under the control of a fully qualified and registered pharmacist, holding the rank of Lieutenant.¹⁰ One of the sources Harris has misinterpreted to bolster her argument clearly states that “The Sister was responsible...for **requisitions** for diets and dispensary stock,” indicating that the nursing sister’s responsibility for pharmaceutical items was limited to only obtaining from the dispensary the necessary medicines to stock the ward drug cupboard for her patients, and that she did not hold responsibility for the stock in the dispensary as Harris asserted.¹¹ It is likely that nurses did indeed assist in dispensaries and medicine preparation; however, Harris assigns to the nursing staff an inflated level of responsibility for therapeutics and their preparation that is both misinformed and incorrect. In the absence of any historiography on military pharmacy, however, Harris’s assertions have not been previously challenged.

⁷ Kirsty Harris, ‘Sister Dispensers: Australian Trained Nurses in Pharmacy’, *Pharm. History Australia* 4, no. 34 (2008): 3.

⁸ *Ibid.*

⁹ *Ibid.*, 8.

¹⁰ ‘Lieutenant Pharmacists on Hospital Ships’, *Chemist and Druggist of Australasia* 31, no. 10 (1 September 1916): 335; ‘New South Wales’, *Chemist and Druggist of Australasia* 31, no. 11 (2 October 1916): 375; ‘Extracts from DG to DMS, AIF - Rank and Service of Pharmacists (Nov 1916-May 1917)’, 1916-1917, AWM27 375/84, Australian War Memorial, Canberra.

¹¹ Arthur Graham Butler, *The Official History of the Australian Army Medical Services in the War of 1914-1918*, vol. III (Sydney, N.S.W.: Halstead Press, 1943), 693. Emphasis mine.

Similarly, the difference between the visible practice of dispensing that occurred in the field in forward operational areas, and the invisible work of bulk stock compounding that occurred in large dispensaries in rearward general hospitals or medical base depots may have also contributed to the perception of the military medical authorities that pharmacy was not a true health profession. Field dispensing necessarily was a basic exercise, issuing tablets or quantities of pre-made medicinal products at the medical officer's (MO's) direction to troops reporting for sick parade, with only a very limited amount of compounding or mixing that could be done under field conditions. These medicines were part of field medical panniers, and contained small quantities of the medicines most likely to be required by troops in the field to provide immediate basic first aid and to treat minor ailments (for medicines contained in medical panniers and the field dispensing environment, see Fig. 9 and 10).¹² It was essential that these panniers contained only basic medicines that were simple to dispense as, should the field dispenser be killed, wounded or otherwise incapacitated, someone else would be able to easily step in to continue their work while requiring little or no technical knowledge of medicines. Field panniers also had to be lightweight to be easily packed up and moved at very short notice with the advance or retreat of the front line.¹³

The items contained in the field panniers were mainly used to treat common minor ailments that might occur to troops in the field, such as dysentery and diarrhoea (argenti nitras), constipation (ipecacuanha and the 'Number 9 Pill'), analgesics and painkillers (opium extract and tincture of opium; morphine), anaesthetics (chloroform; chloral hydras), antiseptics or disinfectants (iodoform; boric and carbolic acid; potassium

¹² Tyquin, 221–22. Many of the medicines in the panniers were supplied as ready-to-use, requiring little specialised input from a pharmacist, and contributing to the denigration of pharmacists' skills in the field.

¹³ 'Military Pharmacists and the Desire for Commissions', *Chemist and Druggist of Australasia* 30, no. 1 (1 January 1915): 8.

permanganas), fever (antipyrine; quinine sulphate), and skin treatments and muscle rubs (tincture of aconite, an anti-inflammatory).¹⁴ Any soldier who contracted an illness that required a level of treatment over and above that which could be provided from the stock of the field pannier was sent to a Casualty Clearing Station (CCS) and then further rearward to a stationary hospital, eventually moving onto a general hospital in Britain if his illness was severe enough to warrant it.

¹⁴ Peter Wyatt Squire, *Squire's Pocket Companion to the British Pharmacopoeia* (London: J. & A. Churchill, 1904), 52–53, 377, 445–51, 422–30, 192–93, 366–67, 13–24, 512–14, 469–72, 532–34, 52–54; Tyquin, 221–22.

Fig. 9: Contents of a Pair of Field Medical Panniers (1898 pattern; weight approx. 41.3kg)

MEDICINES	
Acid. Boric - ounces	2
" Carbolic (crystals), in 2 bottles - ounces	8
" Gallic, 5 gr. tablets - doz.	9
Ammon: Carb:, 3 gr. tablets - doz.....	16
Antipyrin, 5 gr. tablets - doz.....	10
Argent: Nit: - ounces.....	1
Brandy, in 2 oz. bottles - ounces.....	16
Chloral Hydras:, 5 gr. tablets - doz.....	16
Chloroform: in 2 oz. bottles - ounces.....	16
Ext: Opii liq: - ounces.....	4
Hydrarg: Perchlor:, soloids - doz.....	12
Ipecac: Pulv: sine Emetine, 5 gr. tablets in 2 oz. bottles - doz.....	34
Iodoform: in vulcanite dredger with screw cap - ounces.....	3
Mistura pro Diarrhoea - ounces.....	4
Oleum Menth: Pip: - ounces	1
" Olivae - ounces	8
" Ricini, in 2 bottles	16
" Terebinth: - ounces	4
Pil: Blaud:, gr. 4 - doz.....	4
Pill and tablet tin [containing a variety of tablets].....	1
Potass: Bicarb:, 10 gr. tablets - doz	8½
" Bromid:, 5 gr. tablets - doz	8
" Permanganas:, 2 gr. tablets - doz	16
Pulv.: Ipecac: Co:, 5 gr. tablets - doz.....	21
Quininae Acid: Sulph:, 2 gr. tablets in 4 bottles - doz.....	92
" " Sulph:, 5 gr. " " " ".....	33
Sodii Bicarb:, 10 gr. tablets - doz.....	9
" Salicylas, 5 gr. tablets - doz	19
Spirit Ammon: Arom: - ounces.....	8
Tinct: Aconiti, 5 minim tablets - doz	17
" Chlorof: et Morphinae - ounces	3
" Opii - ounces	4
Zinci Sulph:, 5 gr. tablets - doz.....	8
Scissor - pair	1
Spare Bottle	1
INSTRUMENTS, ETC.	
[Various articles of stationery]	
Specification Tallies and pencil-book.....	1
Spoons, tea - No.....	2
Stethoscope, aluminium, - No.	1
Tongue Depressor - No.....	1
[Hypodermic syringes, needles and tablets for same]	
[Ophthalmic tablets - various]	
[Measures, test tubes, rubber tubing, spirit lamp]	
[Bandages, catgut, scissors, thread, needles]	
Instruments, tooth, small pouch of - pouch.....	1
Tape, pieces of - No.....	12
Tourniquet, screw - No.....	6
Wool, boric, in 2 oz. packets - oz.....	6
Bandages, triangular - No.....	12
Bovril, invalid (in 4 oz. tins) - lb.....	1
Knife, for opening tins - No.....	1
Meat, extract of (in 4 oz. tins) - lb.....	1
Warmers, food (spirit lamp) - No.....	1
Wool, double cyanide (in 4 oz. packets) - lb.....	1
[Adhesive plaster, gauze, basins]	

Source: *Gallipoli: The Medical War – the Australian Army Medical Services in the Dardanelles Campaign of 1915*, pp. 221-222.

Fig. 10: 4th Australian Field Ambulance Dispenser (Sgt Owen L. Sargent) Checking Supplies in Dispensary Tent, Gallipoli, 1915



Source: P01116.031. Australian War Memorial. Canberra. Public Domain.

The temporary nature of a Field Ambulance is clearly depicted by the siting of this Australian dispensary within a tent at Gallipoli. An open field medicine chest with ready-to-use therapeutics is clearly shown in this photograph, while rows of medicines in bottles and a set of scales are stored on the shelf behind the field dispenser. Although unable to identify clearly, fastened to the inside of the chest's lid is likely to be a list of its contents, along with an advertisement and address details for the supplier. Wicker field medical panniers are stored below the shelf, ready to be packed up in short notice as required. Stocked with ready-to-use medicines, the field medicine kits further degraded the visibility of pharmacists, reducing the professional skills and knowledge of those pharmacists working in the field to negligible.

In contrast, bulk manufacturing of stock done in hospital dispensaries or base depots of medical supplies occurred in rearward areas as part of support functions. As such, dispensing in these environments rendered the pharmacy and pharmacist or dispenser effectively invisible, with little or no awareness by those further elevated in the chain of command of the technical aspects of pharmacy practice. Day-to-day documentation detailing what products and what quantities were produced no longer form part of the

archival record; however, lists of medical stores indents (requisitions) such as those placed by quartermasters at the No. 1 Australian Auxiliary Hospital at Harefield, Middlesex, UK indicate the nature and usage of particular medical supplies.¹⁵ While these lists do not tell us exactly what military pharmacists were making or doing on a day-to-day basis, they can provide insights as to what types of conditions were being treated, what medicines were being used, and where stores were being sourced from.¹⁶

As to be expected, medicines and medical consumables ordered for hospitals which had the facilities to compound their own finished products consisted of a far greater range and quantity than those included in field pannier stocks. As part of medical stores, it is evident that medicines and drugs were classed in the same category as medical equipment and other consumable items. Australian hospitals in the UK could order or indent directly on an as-needed basis from Advanced Base Depots of Medical Stores, which were warehouses holding supplies purchased in bulk by the Army, but they could also order directly from local suppliers any items that the Base Depot was unable to provide. As an example, for the week ended 3 February 1917, quartermasters at No. 1 Australian Auxiliary Hospital in Harefield recorded the receipt of a number of medicines or therapeutics from Burgoyne Burbidges, Baird and Tatlock, S. Maw Son and Sons, and Parke Davis.¹⁷ These requisitions included medical commodities such as six dozen three-inch crepe bandages, six two-inch watch glasses (flat bottomed), three plain centrifuge tubes, and twenty four naso swabs, as well as a range of therapeutics including two lbs of oil of eucalyptus, half a lb of hydrargyri perchloride (mercuric chloride), twenty gallons of

¹⁵ No. 1 Australian Auxiliary Hospital at Harefield was a convalescent hospital and rest home for recovering wounded soldiers. It had become a specialist hospital for eye, ear, nose and throat diseases by 1918.

¹⁶ 'Record of Medical Stores Received to Indents for the Week Ending February 3rd, 1917', 6 February 1917, AWM25 483/15, Australian War Memorial, Canberra.

¹⁷ *Ibid.*

hydrogen peroxide, and one lb of liquid extract of ipecacuanha.¹⁸ Oil of eucalyptus was used as an antiseptic and an inhalation for treating coughs caused by bronchitis, phthisis (tuberculosis), and influenza, and could also be used as one of the components of a urethral suppository for gonorrhoea.¹⁹ Hydrargyri perchloride was used as a strong antiseptic for surgical operations, and could also be used in very small doses as a topical treatment for primary syphilis chancres due to its mercury content, as well as other skin conditions.²⁰ Hydrogen peroxide is well-known for its antiseptic properties, while ipecacuanha was used as an expectorant, a treatment for amoebic dysentery, and as an emetic to cause vomiting.²¹

Both Directors of Medical Services Richard Fetherston (Australia) and James Purdy (New Zealand) would have been more familiar with the simplistic practice of field dispensing rather than with bulk compounding and manufacturing. This would have been due to the obvious visibility of field dispensing rather than the relative invisibility of the hospital and base depot dispensaries, and although there is no direct evidence, it is reasonable to infer that this familiarity and visibility influenced their perception of pharmacy as a non-professional occupation. It is, therefore, not an unreasonable position that both Directors perceived field dispensing as not being sufficiently skilled or holding sufficient professional weight to require commissioned rank. Pharmacy in hospital dispensaries and base depots of medical stores, however, used a far greater technical skill-set than field dispensing, with a correspondingly higher associated risk of potentially fatal drug errors. This was, nevertheless, not recognised by both countries' Directors of Medical Services, and it was only with the establishment of the AAPS in 1916 that Australian pharmacists received recognition for their profession.

¹⁸ Ibid.

¹⁹ Squire, *Squire's Pocket Companion to the British Pharmacopoeia*, 264–66.

²⁰ Ibid., 343–47.

²¹ Ibid., 375–80.

What is Professionalism?

Profession *n.* occupation (not mechanical, agricultural, etc.), to which one devotes himself; the collective body of persons engaged in a calling.

Trade *n.* Act or business of exchanging commodities by barter; business of buying and selling for money; commerce; traffic; business which a person has learned, and which he carries on or at which he works: esp., mechanical employment; occupation; handicraft; instruments of any occupation; custom; habit; a company of men engaged in the same occupation.

Vocation *n.* Call; summons; esp., designation to a particular state or profession; destined or appropriate employment; calling; trade; profession; occupation; designation; destination.²²

At what point does an occupation become a profession? Professionalisation of occupational groups is a characteristic of a developing society; its specialisation is part of a defined division of labour caused by the process of industrialisation and urbanisation of the population.²³ The concept of professionalism has been debated from at least the 1930s, yet a conclusive definition of the concept remains elusive into the twenty-first century, particularly for pharmacy.²⁴ The growth or evolution of an occupation or vocation into a profession is partly contingent on the practitioners of that occupation holding a specialised body of institutionalised knowledge. Some occupations became established as professions relatively early, while others took a period of time and several attempts to eventually be recognised by both their peers and the wider public as being professionalised. Within the discipline of history, analysis of work practices as ‘professions’ did not begin until the

²² Noah Webster, Dorsey Gardner, and Noah Porter, *Webster’s Practical Dictionary: A Practical Dictionary of the English Language Giving the Correct Spelling, Pronunciation and Definitions of Words Based on the Unabridged Dictionary of Noah Webster* (Chicago: Reilly & Britton Co., 1910), 317, 458, 492.

²³ John C. Burnham, *How the Idea of Profession Changed the Writing of Medical History* (London: Wellcome Institute for the History of Medicine, 1998), 79–80.

²⁴ Dana Purkerson Hammer, ‘Professional Attitudes and Behaviors: The “A’s and B’s” of Professionalism’, *American Journal of Pharmaceutical Education* 64, no. 4 (2000): 456.

development of the New History movement, in the interwar years.²⁵ It was, however, the academic discipline of sociology that began to work with the idea of professionalism as an organising concept, considering professions either as specific occupations, or with specific degrees of social and occupational status.²⁶ This section seeks to identify and define what constitutes ‘professionalism’ and what this means to various occupations within the health sector.

In 1933, British sociologists Alexander Carr-Saunders and Paul Wilson published the first work on the development of professions. This monograph represents an early attempt at the definition of various professions, as identified by the authors, which were practised in England and Wales up to the interwar period. Carr-Saunders and Wilson considered that a number of occupations were inherently deemed to be professions, mainly those in the fields of the church, the law and medicine, while others gradually evolved.²⁷ In this work, they attempt to define the nature of professions, recognising that certain occupations or vocations contain a number of specific characteristics or similarities, developed to a greater or lesser degree than other occupations, and evolving at different speeds.²⁸ These characteristics are not defined in general terms, but are examined in relation to each of the professions investigated by Carr-Saunders and Wilson.

Similarly, John Burnham in his later work on how the development of the concept of professionalism impacted on the writing of medical history, details the characteristics of professions from early study by sociologists as being the “desire for higher status;

²⁵ Burnham, 61.

²⁶ Ibid., 69, 75.

²⁷ Alexander Carr-Saunders and Paul Wilson, *The Professions* (Oxford: Clarendon Press, 1933), 3; Chantal Stebbings, *Tax, Medicines and the Law: From Quackery to Pharmacy* (Cambridge: Cambridge University Press, 2018), 97.

²⁸ Carr-Saunders and Wilson, 4.

autonomous control of conditions of work; [and] control of the market in the interest of higher rewards.”²⁹ Burnham also notes that the sociologists working in the field in the first half of the twentieth century considered professions as having either occupational differentiation, or status differentiation, which evolved into a universal phenomenon of developed occupational societies.³⁰ In his monograph, Burnham referred to a 1958 paper on social work written by Ernest Greenwood, who again made an attempt to define professionalism by identifying a number of specific attributes that “all professions seem to possess: (1) systematic theory, (2) authority, (3) community sanction, (4) ethical codes, and (5) a culture.”³¹ Although Greenwood notes that a systematic body of theory (specialised body of knowledge) generally descends from formalised education or from university-affiliated professional schools, recognition by the state of this level of education was essential for the perception of professionalism within the health sector.³² This element of state recognition for an official, higher-education qualification, i.e. a bachelor’s degree gained at a university, is one of the fundamental aspects to the lack of acceptance of pharmacy in New Zealand and Australia as a *bona fide* profession from the early twentieth century until the 1960s.

In his work on qualifying associations, Geoffrey Millerson has also attempted to define the steps or requirements for professionalisation.³³ Similar to Greenwood, Millerson also identified “five primary functions of a professional organisation: 1) to

²⁹ Burnham, 73.

³⁰ *Ibid.*, 75, 77.

³¹ Ernest Greenwood, ‘Attributes of a Profession’, *Social Work* 2, no. 3 (1957): 45.

³² *Ibid.*, 47.

³³ Qualifying associations are organisations that members of a specific profession or occupation belong to, and which hold the right to determine (usually through examination) if a student can qualify and register as a member of that profession or occupation. For example, it is only through passing the Pharmacy Council of New Zealand’s own internal examination at the end of an internship year which is completed after graduating with a BPharm. degree, that today’s pharmacy students can apply to be registered and begin to practice. The internship year is, however, conducted by the Pharmaceutical Society of New Zealand, who has been accredited by the Council to do so.

organise; 2) to qualify; 3) to further study and disseminate information; 4) registration of competent practitioners; 5) promote high standard of professional behaviour.”³⁴ He also identified six secondary functions, which include: to raise professional status; to control entry into the profession (exclusivity); to protect the profession and the public; to act as a lobby group for members (support); to encourage socialisation and co-operation between members; and to provide welfare benefits (benevolent funds).³⁵ While Millerson’s definitions of profession with primary and secondary functions of the required qualifying association are more in-depth and structured, they remain in essence the same as other authors’ general definitions.³⁶

As with all social science disciplines, sociology and its theories has evolved over time and with increase in knowledge. Early studies of the professions were primarily functionalist until the 1970s, attempting to define professionalism through occupational function, rather than the process undertaken to attain professionalism. As discussed by Pauline Norris in her doctoral thesis examining the evolution of community pharmacy in New Zealand between 1930 and 1990, functionalist approaches to the study of professionalism have been “severely criticised”, as it has been found that there is no homogenous or linear process to professionalisation.³⁷ Alongside this assertion by Norris, however, Gordon Boyce argues that both historians and sociologists now use professions rather than class for defining groups, “as a basis for interaction with other constituents...in

³⁴ Geoffrey Millerson, *The Qualifying Associations* (London: Routledge & Kegan Paul, 1964), 28–30.

Professional behaviour includes personal behaviour (demonstration of integrity) towards clients/patients, as well as ethical behaviour in business dealings.

³⁵ *Ibid.*, 30–32.

³⁶ A number of scholars have studied the development of professions, both sociologists and historians. All of them identify the same general principles for an occupational group developing into a profession. See, for example, Margaret Pelling, “Medical Practice in Early Modern England,” *The Professions in Early Modern England*, edited by Wilfrid Prest, (Beckenham, Kent: Croom Helm, 1987), 90-128; Gordon Boyce, “A Professional Association as Network and Communicating Node: The Pharmaceutical Society of Australasia, 1857-1918”, *Australian Economic History Review* 39, no. 3 (1999): 258-283.

³⁷ Pauline Norris, ‘The Negotiation and Re-Negotiation of Occupational Control: A Study of Retail Pharmacy in New Zealand 1930-1990’ (PhD thesis, Victoria University of Wellington, 1993), 20–21.

pursuit of wealth, status, and power,” resulting from an increasingly complex world which requires the specialised body of knowledge inherent in professions in order to function.³⁸ Thus it is not the occupational functions that are used to define the professions; rather, it is the process of the profession’s use of specialised knowledge that defines the world of today. As this is not a sociological study of military pharmacy, however, for this thesis definitions of professionalism by early sociologists are appropriate, as these were the theories that were prevalent close to the time of the war, and by which pharmacy was historically measured as being either a full profession or a quasi- or partial professional occupational group up until the mid-twentieth century. These include: organisation of members; the ability to grant qualifications; to promote and support further study; to register, regulate and professionally discipline practitioners; and to set expected standards of professional and ethical behaviours.

Development of Medical Professions – Doctors and Dentists

Broadly speaking, the development of general practitioner as a profession in the British context began with the initial split between apothecaries and chemists and druggists in the early nineteenth century. When apothecaries moved into the area of medical practitioners, and particularly as general practitioners or family doctors, chemists and druggists then stepped into the space vacated by the apothecaries and took over the function of the supply and sale of drugs and medicines.³⁹ This division of labour in health occupations was formalised with the *Apothecaries Act* of 1815, giving chemists and druggists formal and legal control over their occupational sphere.⁴⁰ The delineation of

³⁸ Boyce, 258–59.

³⁹ Christopher Lawrence, *Medicine in the Making of Modern Britain, 1700-1920* (London: Routledge, 1994), 69; Stebbings, 95. Those who practiced medicine were generally referred to as ‘doctors’, whether they were specialist hospital consultants or family doctors, and it was only from the early nineteenth century that family doctors began to be known as ‘General Practitioners’.

⁴⁰ Stebbings, 95.

roles set the scene and began the process for the further refinement of chemists and druggists into pharmacists or pharmaceutical chemists of the early twentieth century.⁴¹

The rise of the sciences during and after the period of the Enlightenment beginning in the early eighteenth century and subsequent impact on medical innovation in nineteenth century Britain contributed to the increased social standing and therefore moral authority of doctors.⁴² This increase in the cultural value of science thus elevated those who worked in these areas to a pinnacle of public regard, one of the key factors for developing the professionalism of a vocational group. Hospital work in particular gained in prestige with the development of laboratory and medical science, with an exponential increase in the social standing of consultants and hospital physicians.⁴³ Steve Sturdy and Roger Cooter also align the rise in authority of medical doctors and the practice of medicine as a direct consequence of the development of the medical laboratory sciences, with the perception in the public's mind that this created "improvements in the power of medicine to diagnose, treat and prevent illness."⁴⁴ Doctors were thus held in high social esteem in response to their access to highly specialised and technical medical innovations for the treatment of sickness. Added to this, doctors were required to hold a university-level educational qualification, reflective of the increasingly specialised body of knowledge that was required to practice, which is another key requirement for professionalism as discussed in the section above. As a result, doctors were recognised by the community relatively early

⁴¹ Refer to the Introduction (p. 5) for definition of the terms 'chemist and druggist' and 'pharmacist'.

⁴² T. S. Pensabene, *The Rise of the Medical Practitioner in Victoria* (Canberra: Australian National University, 1980), 33.

⁴³ Christopher Lawrence, 'A Tale of Two Sciences: Bedside and Bench in Twentieth-Century Britain', *Medical History* 43, no. 4 (1999): 421, 428–31, 433–34; W. F. Bynum, 'The Rise of Science in Medicine, 1850-1913', in *The Western Medicine Tradition, 1800 to 2000*, ed. W. F. Bynum et al. (Cambridge: Cambridge University Press, 2006), 111–13, 135–36, 150–60.

⁴⁴ Steve Sturdy and Roger Cooter, 'Science, scientific management, and the transformation of medicine in Britain c. 1870-1950', *History of Science* 36, no. 4 (1998): 421. See also Lawrence, "A Tale of Two Sciences: Bedside and Bench in Twentieth-Century Britain," 421-449.

as being part of a well-respected profession and in the upper echelons of society, with significant social currency.

Little attention has been paid to the history of dentistry in New Zealand and Australia, with a scant handful of books and articles charting the development of the profession in the region. As with doctors, dentists in the late nineteenth and early twentieth centuries also achieved professionalism through the rise of science and their willingness to embrace scientific innovation in their treatment of patients. Dentistry training in Britain retained the apprenticeship system until the early twentieth century, while “dentistry in the US developed within the university system,” incorporating scientific innovations such as the use of nitrous oxide gas for pain relief, and establishing “dentistry as a scientific and independent medical profession.”⁴⁵ Dentists in the late nineteenth century also began their occupational education as apprentices and dentistry was considered as a trade in the same way as pharmacy.⁴⁶ Within New Zealand, the path to full professionalisation of the occupation took a period of approximately 60 years, from the passing of the *Dentists Act* in 1880 to the establishment of the Dental Council of New Zealand in 1937.⁴⁷ As Tom Brooking states in his official history of dentistry in New Zealand, this slow change from a trade to a full profession “did not occur in a vacuum”, but rather in response to technical and social developments happening within the occupation in other areas of the world.⁴⁸ Dental practitioners’ original method of treatment was simply to pull out teeth, a ‘skill’ which required only manual dexterity and

⁴⁵ Tamson Pietsch, ‘Universities, War and the Professionalization of Dentistry’, *History of Education Review* 45, no. 2 (2016): 170.

⁴⁶ *Ibid.*, 168; Tom Brooking, *A History of Dentistry in New Zealand* (Dunedin: New Zealand Dental Association Inc., 1980), 21.

⁴⁷ ‘*Dentists Act* 1880 (44 VICT 1880 No 34)’ (NZ) (1880), http://www.nzlii.org/nz/legis/hist_act/da188044v1880n34200/ (accessed 29 June 2018); Brooking, 21; Peter Davis, ‘Jurisdictional Disputes in New Zealand Dentistry: Controlling Access to the Mouth and Entry to the Market’, in *A Healthy Country: Essays on the Social History of Medicine in New Zealand*, ed. Linda Bryder (Wellington: Bridget Williams Books, 1991), 25.

⁴⁸ Brooking, 21.

physical strength. The advent of innovative clinical technology which allowed teeth to be effectively treated, however, allowed dentistry to begin the transition from a trade which focused almost exclusively on removing teeth, to a profession dedicated to saving teeth.⁴⁹ This also meant that dentists were also now required to hold a tertiary-level qualification through “replacing apprenticeship with an elaborate university-level training programme,” achieved with the opening of the Dental School at the University of Otago in 1908.⁵⁰ With increased clinical skills and a focus on clinically beneficial outcomes came increased esteem by the public, which subsequently led to increased income and profit. Dentistry in New Zealand could now distance itself from its origins as a relatively unskilled manual labour occupation, and move to a fee-for-service clinical model.

In Australia, dentistry followed a similar pattern towards professionalism. Dentistry became a university-level qualification in Australia when the University of Sydney (NSW) established the first degree-level course in 1901.⁵¹ Until then, apprenticeships were also the main method of training Australian dentists, although some students had access to sufficient means to go to the United States of America for a formal qualification. As Tamson Pietsch notes in her article examining the development of dentistry as a profession in New South Wales, “dental education was not a feature of British universities” in the late nineteenth century, whereas in America Harvard University was the first to establish a formal Dental School in 1867, followed by the Universities of Michigan and Pennsylvania.⁵² With early adoption of scientific and technological innovation, American

⁴⁹ Although dentists began to use anaesthetics such as Novocaine and a limited range of medicines, drugs and other materials in their practice as they became available, there is no evidence that this usage specifically contributed to the evolution of dentistry to professionalism. Rather, these therapeutics may have simply been part of the range of innovative and new technologies used by dentists to foster the transition.

⁵⁰ Brooking, 21; Michael Belgrave, ‘Medicine and the Rise of the Health Professions in New Zealand, 1860-1939’, in *A Healthy Country: Essays on the Social History of Medicine in New Zealand*, ed. Linda Bryder (Wellington: Bridget Williams Books, 1991), 18–20.

⁵¹ Pietsch, 169.

⁵² *Ibid.*, 170.

universities quickly “established dentistry as a scientific and independent medical profession.”⁵³ Further analysis of the links between education and status, their ties to professionalism for all three occupational groups and how these contributed to the conferral of commissioned officer rank of Captain for dentists during the early part of the war will be the subject of Chapter 6.

Nursing

While women were able to complete apprenticeships, pass the qualifying examinations prior to registration, and enter business as pharmacists from the nineteenth century, New Zealand and Australian military pharmacists were, with one exception, male.⁵⁴ The sole exception to this highly gendered division of labour was Mary North, a Queensland pharmacist, who was overseas at the outbreak of the war. She enlisted in Britain and worked in England and France in a casualty clearing station before returning to Queensland.⁵⁵ Mary’s war service is acknowledged on the Roll of Honour for the Queensland Pharmaceutical Society (QPS), which has been restored and is now situated at the Pharmaceutical Society of Australia office, in the Pharmacy School at the University of Queensland. War in the early twentieth century was highly gendered and masculinised, and although a number of exceptional women did serve as doctors and administrators, a woman’s role in the medical field was primarily restricted to nursing.⁵⁶

⁵³ Ibid.

⁵⁴ Reg Combes, *Pharmacy in New Zealand: Aspects and Reminiscences* (Auckland: Pharmaceutical Society of New Zealand, 1981), 206–10; Gregory Haines, *Pharmacy in Australia: The National Experience* (Sydney, N.S.W.: The Pharmaceutical Society of Australia, 1988), 40, 88, 167–68, 188; Louise Shaw, ‘Prescription for Change? Dispensing With Men: A History of Women in New Zealand Pharmacy, 1881-1991’ (MA thesis, University of Otago, 1996), 108.

⁵⁵ William Kelly, personal communication, email, 1 November 2017.

⁵⁶ Jane Tolerton, *Make Her Praises Heard Afar: New Zealand Women Overseas in World War One* (Wellington: Booklovers Books, 2017). Several female surgeons are discussed in Jacqueline Healy, ed. *Compassion and Courage: Australian Doctors and Dentists in the Great War* (Melbourne: Medical History Museum, University of Melbourne), 2015. For an example of how gendered assumptions of medicine in the medical history field are being challenged, see Louella McCarthy, ‘Idealists or Pragmatists? Progressives

Nursing had traditionally been viewed as a vocation or calling, with hospital-based training similar to an apprenticeship and a strong element of sacrifice and service. This began to change in the nineteenth century, when certificated training through hospitals was introduced. New Zealand was the first country in the world to pass legislation requiring nurses to be registered.⁵⁷ As in the case of nearly all initial legislation relating to regulation and registration of health sector workers, the *New Zealand Nurses Registration Act 1901* also contained ‘grandfather clauses’ to assist the transition of those nurses with prior work experience into the registry.⁵⁸ While an attempt to standardise nursing training (within the limitations of the hospital the training was undertaken in) was therefore a significant factor in the regulation of nurses and their education, for Hester Maclean, the Department of Hospitals and Charitable Aid’s Assistant Inspector of Hospitals and Matron-in-Chief of the New Zealand Nursing Service during WWI, it was just as important to control who was permitted to enter into the nursing occupation.⁵⁹ Both the three-year training programme and the requirement for formal registration was seen by her as a valuable screening system, to prevent “the evil of women of low repute adopting a nursing uniform and posing as nurses.”⁶⁰ Good character was valued as much, if not more, than clinical skill (see Chapter 6). Based on the early characteristics determined by early- to mid-twentieth century sociologists, it was not until nursing in New Zealand became a university-level degree course in the 1970s that the vocation completed its transition to an established profession.

and Separatists Among Australian Medical Women, 1900-1940”, *Social History of Medicine* 16, no. 2 (2003): 263-282.

⁵⁷ Lucy Ridgely Seymer, *A General History of Nursing*, 4th ed. (London: Faber, 1957), 262–63.

⁵⁸ ‘*Nurses Registration Act 1901* (1 EDW VII No. 12)’ (NZ) (1901), http://www.nzlii.org/cgi-bin/download.cgi/cgi-bin/download.cgi/download/nz/legis/hist_act/nra19011ev1901n12347.pdf. (accessed 16 September 2018).

⁵⁹ Hester Maclean, *Nursing in New Zealand: History and Reminiscences* (Wellington: Tolan, 1932), 74, 84.

⁶⁰ *Ibid.*, 24.

Social status of nurses in the wider Australian community began to increase in the mid-nineteenth century when Lucy Osburn and five English nursing sisters arrived in Sydney in 1868, bringing with them the attributes, standards and expectations of the Nightingale nursing school they had been trained in. As with Hester Maclean and her New Zealand nurses, the Nightingale system transplanted into Australia was “dependent on the employment of women of ‘high moral character’”, beginning the movement of the image of the nurse as a drunken, slovenly, uncaring and unskilled older woman into an occupation that was seen as professional.⁶¹ Both Richard Trembath (in conjunction with Donna Hellier) and Joan Durdin in their studies of nursing history in Victoria and South Australia respectively, acknowledged the importance and role that official training of nurses had in changing the public’s perception of nurses from domestic servants to members of an at least semi-professional occupation in the late nineteenth century.⁶² Nursing thus began to differentiate itself as an acceptable occupation for respectable women within New Zealand and Australia. As with pharmacy, nursing in Australia also followed a state-based system, with initial registration legislation for Queensland enacted in 1912 and in South Australia in 1919.⁶³ Victoria did not legislate for registration of trained nurses until 1923 although an established Trained Nurses’ Association had been operational from 1901, while New South Wales followed a year later in 1924.⁶⁴

⁶¹ Richard Trembath and Donna Hellier, *All Care and Responsibility: A History of Nursing in Victoria* (Victoria, Australia: The Florence Nightingale Committee, Victorian Branch, 1987), 4, 8.

⁶² Trembath and Hellier, 13, 22; Joan Durdin, *They Became Nurses: A History of Nursing in South Australia 1836-1980* (North Sydney, N.S.W.: Allen & Unwin, 1991), 38.

⁶³ Seymer, 262–63.

⁶⁴ ‘Nurses Registration Act 1923 (14 Geo V, No 3307)’ (VIC) (1923), http://www.austlii.edu.au/cgi-bin/viewdb//au/legis/vic/hist_act/nra1923262/; ‘Nurses’ Registration Act 1924 (Geo V, No 37) (NSW)’ (1924), http://www.austlii.edu.au/cgi-bin/viewdb//au/legis/nsw/num_act/nra1924n37281/ (accessed 24 June 2019); Trembath and Hellier, 1.

Pharmacy as a Profession

*“The position of the pharmacist in the Army advances or recedes...as his civilian counterpart is occupied predominantly with science or with ‘trading.’”*⁶⁵

Although the practice of using medicines or drugs to cure illness has an incredibly long history, the point at which the occupation of pharmacist became a profession is unclear.⁶⁶ While legislation was passed in Britain in the form of the *Apothecaries Act* 1815 to formalise a division of labour between and to confirm the responsibilities of physicians (who arose from the apothecaries) and chemists and druggists, there remained areas of overlap between the two occupations.⁶⁷ Doctors frequently had dispensaries attached to their surgeries and did their own dispensing.⁶⁸ Those holding Certificates of Dispensing from the Apothecaries’ Hall were also employed by doctors to do the dispensing for them, although they were considered neither pharmacists nor chemists and druggists.⁶⁹ Further blurring of commercial and professional boundaries occurred with other retail outlets such as tobacconists also permitted to legally sell medicinal preparations in the form of over-the-counter proprietary (patent) medicines.⁷⁰ Not only did pharmacists fill scripts written by doctors for their patients, but with their specialised training and knowledge of therapeutics, they often were the first choice of health practitioner for those of limited financial means. Unlike doctors, pharmacists were not permitted to charge for advice (fee-for-service), but could only ask for payment for any

⁶⁵ Butler, 519. See also Haines, *Pharmacy in Australia: The National Experience*, 314.

⁶⁶ This relates to the development of British pharmacy, rather than of European or American, which took different pathways. This is because both Australian and New Zealand pharmacy professional practice are directly derived from the British model.

⁶⁷ Belgrave, 10; Stebbings, 23.

⁶⁸ John A. Hunt, ‘The Evolution of Pharmacy in Britain (1428-1913)’, *Pharmacy in History* 48, no. 1 (2006): 39.

⁶⁹ W. S. C. Copeman, *The Worshipful Society of Apothecaries of London: A History 1617-1967* (Oxford: Pergamon Press Ltd, 1967), 70; S. W. F. Holloway, *Royal Society of Great Britain 1841-1991: A Political and Social History* (London: The Pharmaceutical Press, 1991), 266.

⁷⁰ Stebbings, 94. Patent medicines sold over-the-counter could contribute to fatalities if used inappropriately or incorrectly. See, for example, Lynette Finch, ‘Soothing Syrups and Teething Powders: Regulating Proprietary Drugs in Australia, 1860-1910’, *Medical History* 43 (1999): 74-94.

product or medicine supplied (fee-for-product).⁷¹ Generally, civilian doctors were accepting of pharmacists advising on and treating minor health complaints for those who could not afford consultation fees, “provided pharmacists recognised their limitations,” and were happy to pass on the financial risk of potential bad debt to an occupation who had at least a chance to recover non-payment of medicines through profit on sales of over-the-counter preparations or other items sold in the retail shop.⁷² This acceptance of minor ailment treatment by pharmacists did not, however, transfer to the military sphere. Once there was no longer any financial risk to consider, doctors reasserted their professional authority and social status became the determining factor of professional hierarchy between the two occupations.

In 1829 the General Association of Chemists and Druggists of Great Britain was established. This was the second attempt to organise chemists and druggists as a distinct occupational group, and as argued by Chantal Stebbings in her history of the British medicines stamp duty tax, developed to collectively oppose the excessively heavy-handed prosecutions of pharmacists for minor tax infringements by the revenue authorities.⁷³ Stamp duty had been applied to patent medicines in an effort to restrict or reduce the number of sellers of supposedly therapeutic treatments of somewhat dubious quality and exaggerated claims of cures for all types of infirmity in 1873, remaining unchanged in its legislative form until its eventual repeal in 1941.⁷⁴ Stebbings argues that the stamp duty was one of several contributing factors in the evolution of pharmacy from a loose gathering of members of an occupational group into a nascent profession in the early- to mid-nineteenth century. This was achieved by causing the collective practitioners of

⁷¹ Roy Porter and Dorothy Porter, ‘The Rise of the English Drugs Industry: The Role of Thomas Corbyn’, *Medical History* 33 (1989): 280.

⁷² Combes, 43.

⁷³ Stebbings, 130.

⁷⁴ *Ibid.*, 1–2.

pharmacy to form an occupational association, which is one of the required conditions for professional status, through organised protest against the tax.⁷⁵ This second attempt at organisation was, like the first, also ultimately short-lived, and as such, it would appear that although Stebbings links its formation with an early form of occupational organisation, the appetite amongst pharmacists for a collective professional society was lacking.

Nevertheless, by 1842 the concept of professional organisation had solidified with the founding of the Pharmaceutical Society of Great Britain (PSGB).⁷⁶ The following year, the PSGB received a royal charter, which determined that, while all chemists and druggists practicing prior to 1843 were eligible for Society membership (through a ‘grandfather’ clause), new members from after the charter’s incorporation were required to pass an examination set by the Society in order to join.⁷⁷ Two of the key concerns that underpinned the formation of the PSGB at this point were “low standards and shortage of qualified personnel,” resulting from inconsistent quality of training during apprenticeships.⁷⁸ Standardised educational criteria and a minimal level of competence as measured by formal examination thus became the first steps on the journey to professionalism for pharmacists.

With the colonisation of New Zealand and Australia as part of the British Empire, British pharmacy and its practices were introduced when pharmacists (or ‘chemists’) migrated to the new countries. Consequently, both New Zealand and Australia followed the British model in occupational ideology and requirements. Although New Zealand

⁷⁵ *Ibid.*, 4.

⁷⁶ Carr-Saunders and Wilson, 133.

⁷⁷ *Ibid.*

⁷⁸ Millerson, 12.

established a national occupational association with the formation in 1879 of the Pharmaceutical Society of New Zealand (PSNZ), state recognition of its professional status did not occur until after legislation was passed in 1881 to establish the national regulatory body, the Pharmacy Board of New Zealand (PBNZ).⁷⁹ The *Pharmacy Act 1880* which tightened control of the sale of medicines and poisons, was primarily designed to give protection to genuine pharmacists and the public by preventing those who were unqualified to use the titles of ‘pharmacist’, ‘pharmaceutist’, ‘pharmaceutical scientist’, or ‘chemist and druggist’ and thus misrepresenting themselves as such. It also aimed to prevent the adulteration or selling of adulterated medicines through the imposition of stiff financial penalties.⁸⁰ This government-level support for pharmacists, which also included the requirement for all pharmacists to be registered and for the Board to self-regulate its members, thus allowed pharmacy to meet several of the requirements, although not all, for the definition of ‘profession’.

Australia, however, did not have a nationalised body for pharmacists until the establishment in 1973 of the Pharmaceutical Society of Australia (PSA National). Prior to this point, each state had its own Pharmaceutical Society responsible for registering and regulating its members. The colony of Victoria (VIC) was the first to create a legal entity in the form of the Pharmaceutical Society of Victoria (PSV) to regulate the practice of pharmacy within its borders in 1857, followed in 1876 by the colony of New South Wales (NSW), and would subsequently take the lead as the ‘senior’ society in matters pharmaceutical as other boards and societies were formed.⁸¹ In the same way as New

⁷⁹ Combes, 20–21.

⁸⁰ *Pharmacy Act 1880* (44 VICT 1880 No. 26) (NZ) (1880), http://www.nzlii.org/nz/legis/hist_act/pa188044v1880n26175/ (accessed 16 June 2018); Combes, 23.

⁸¹ Gregory Haines, ‘*The Grains and Threepenn’orths of Pharmacy*’: *Pharmacy in N.S.W. 1788-1976* (Kilmore, VIC: Lowden Publishing Co., 1976), 57–61; Haines, *Pharmacy in Australia: The National Experience*, 13; Gregory Haines, *A History of Pharmacy in Victoria* (Melbourne: Australian Pharmaceutical

Zealand's *Pharmacy Act*, each state's respective legislation was designed primarily around control of poisons and the regulation of who could practice as pharmacists, although as Gregory Haines determined, "No one colony [state] was prepared to pass poisons and pharmacy laws identical with those of any other, although all their laws were similar."⁸² Although separate Poisons Acts had been passed in each colony between 1862 and 1888, separate legislation for the registration of pharmacists was introduced later for each colony or state, ranging from 1876 (Victoria) to 1908 (Tasmania).⁸³ Legal requirements for civilian pharmacist registration were thus in place for all states at the outbreak of war in 1914. As this thesis demonstrates, however, these civilian requirements were not reflected in Commonwealth military medical structures.

Pharmacy has been considered to have not attained full professionalisation from its beginnings as a formal occupational group in the mid-nineteenth century, but has been thought of as an incomplete or quasi-profession.⁸⁴ This is due to several factors, one of which is its strong commercial, rather than service, aspect. This focus on pharmacy as a transaction-based commercial operation has subsequently concealed its early attempts at professionalism. Norman Denzin and Curtis Mettlin argue that one of the main characteristics of a profession is that "you do not advertise", which is diametrically opposed to the retail requirements of a pharmacy.⁸⁵ As a retail outlet, advertising is

Publishing Co. in association with the Pharmaceutical Society of Australia (Victorian Branch), 1994), 56; Janette Bomford and David Newgreen, *The Pharmacy Board of Victoria: A History, 1877-2005* (Parkville, VIC: Pharmacy Board of Victoria, 2005), 9–10.

⁸² Haines, *Pharmacy in Australia: The National Experience*, 35.

⁸³ *Ibid.*, 79. Pharmacy Acts were introduced in 1876 (VIC), 1884 (QLD), 1891 (SA), 1894 (WA), 1897 (NSW) and 1908 (TAS). Until Federation in 1901, each state of Australia was an independent colony.

⁸⁴ Norman K. Denzin and Curtis J. Mettlin, 'Incomplete Professionalization: The Case of Pharmacy', *Social Forces* 46, no. 3 (1968): 376–77; Hammer, 456; Kevin F. Williams, 'Re-Examining "professionalism" in Pharmacy: A South African Perspective', *Social Science and Medicine* 64 (2007): 1286–87; Jason Altilio, 'The Pharmacist's Obligations to Patients: Dependent or Independent of the Physician's Obligations?', *Journal of Law, Medicine and Ethics* 37, no. 2 (2009): 361–62.

⁸⁵ Denzin and Mettlin, 376. Advertising can be both internal within the premises of the pharmacy, and external in the form of newspaper advertisements or flyer drops.

essential to bring customers into your shop to buy goods and products, and ensure business continuity and survival. While neither hospital nor military pharmacy has any requirement or ability to advertise, their *modus operandi* effectively remains the same as that of retail pharmacists; that of agents for medicine supply. Gregory Haines, although taking the assumption of pharmacy as a profession as an accepted fact in his history of the nationalisation of Australian pharmacy, also notes that focus on the commercial side of pharmacy detracts from its professionalisation, and that “Every time pharmacy has opted for the commercial solution, it has effectively given up on its professionalism.”⁸⁶

Pharmacy practice of today has changed significantly from that of the nineteenth and early twentieth centuries. Modern pharmacy, according to Denzin and Mettlin, no longer controls the “social object which justified the existence of its professional qualities in the first place” – the medicines themselves.⁸⁷ These are decided on and prescribed by treatment providers, and the pharmacist is the agent for supply only, rather than “an individual who makes some service contribution.”⁸⁸ This is in direct contradiction to pharmacy practice of the early twentieth century, as pharmacists of the time had the ability to advise on minor ailments and manufacture their own in-house remedies for them, and were thus more in control of the ‘social object’ of their profession.⁸⁹ Prior to the rise of pharmaceutical science and synthetic medicines in the 1950s with its focus on biochemistry, drug formulation and delivery systems which changed the form and nature of pharmacy practice, pharmacists manufactured galenical or organic medicines by compounding or making up formulae according to an established standardised recipe and

⁸⁶ Haines, *Pharmacy in Australia: The National Experience*, 163.

⁸⁷ Denzin and Mettlin, 378.

⁸⁸ *Ibid.* This has changed in recent years with the development of clinical pharmacy, whereby patients are counselled on the use of their medicines. Pharmacists now seek to increase their patients’ health literacy by medicine education.

⁸⁹ Haines, ‘*The Grains and Threepenn’orths of Pharmacy*’: *Pharmacy in N.S.W. 1788-1976*, 100–101.

then dispensing the product they had made to the customer/patient. Scientific advancement therefore came late to pharmacy, well after medical and dental innovation.⁹⁰ As a result of changing technical and scientific developments and the advent of pre-made medicines, modern pharmacy practice as a specialised body of knowledge has become effectively invisible to the public, who only see the pharmacist as a medicine supplier, with “little service being provided.”⁹¹ By not compounding or mixing medicines for patients, the artisanal nature of pharmacy no longer exists. As noted in the section above, one of the requirements for becoming an established profession is public esteem or community sanction. Although Haines considers that the core of pharmacy’s authority in the eyes of the public is the control of pain through means of supply of therapeutics, by not providing a service that emphasises their specialised body of knowledge of drug action and effect, the perception of pharmacy as a retail trade is thus reinforced.⁹² Community pharmacists by the nature of their interaction with their customers and the wider populace, however, have greater visibility than hospital pharmacists, who are almost completely unknown to the public.

Intra-Professional Issues – Community vs Hospital Pharmacists

Before the introduction of modern clinical pharmacy practice in the early 1990s, pharmacists who worked in the hospital environment rarely (if ever) saw the patient, did not sell other products or have a commercial focus, did not have overheads such as rent or lease, power, wage and other business expenses, and their income stream was a fixed salary set by their employer, usually the government.⁹³ Hospital pharmacists neither

⁹⁰ Sulfonamides or sulfa drugs, the pre-cursors to antibiotics, were developed in the 1920s, while penicillin was developed for commercial use during WWII (although discovered by Alexander Fleming in 1928).

⁹¹ Denzin and Mettlin, 378.

⁹² Haines, *Pharmacy in Australia: The National Experience*, 2.

⁹³ Susan Heydon and Stephen Duffull, *Pharmacy at Otago: The First 50 Years - The School, The Profession and The People* (Dunedin: New Zealand’s National School of Pharmacy, 2013), 38–39. This is now

worked for themselves, nor had the capacity to increase their income through growing their businesses. In a similar way, military pharmacists work in a closed setting which is not open to the public, do not sell any products including over-the-counter medicines, and also have their salaries determined by their employer, the Defence Force (government agency), based on rank. By being (usually) successful businessmen and with their personal interaction with members of the public and consequent societal recognition, by the time of the war community pharmacists were considered to be elite practitioners, while hospital pharmacists were deemed to be of significantly lower professional status within the profession itself (see Chapter 1).

For New Zealand, while the original legislation passed in 1880 which formed the national regulatory body and required pharmacists to be both examined and registered included those working in a hospital environment, hospital pharmacists had no representation or voice on the governing Board until 1962.⁹⁴ Until this point, the Board was solely comprised of community (retail) pharmacists, and the legislation was also framed in such a way that community pharmacists were its focus. Hospital pharmacists were, however, considered to be more ‘academic’ than their community counterparts by their pharmacy peers, and were also identified as ‘pharmaceutists’, a combination of the words ‘pharmaceutical scientist’. In response to the continued lack of representation at Board level, hospital pharmacists organised themselves as a sub-association of pharmacy in 1952. At a conference of the New Zealand Hospital Pharmacists’ Association (NZHPA) in October 1981, past-President and founding member of the Association (1952-

changing with the development of clinical pharmacy – hospital pharmacists now visit patients in the wards close to discharge to explain their medication regimes and answer any questions the patient may have about their medicines. Pharmacists working in private hospitals or NGOs may have some ability to negotiate their salary. In this thesis, the term ‘hospital pharmacist’ refers to those who work in publicly funded hospitals, and are/were government/Charitable Aid Board employees.

⁹⁴ Combes, 219.

1960) Mr Jo Peel gave an address which detailed the history of the Association. In it, he states that “The general opinion of those days was best expressed by the then Registrar of the Pharmacy Board who considered hospital pharmacists to be the dregs of pharmacy, just drop-outs who could not make a do [sic] of retail pharmacy and had seeked [sic] the protection of a hospital. As a hospital pharmacist I was an outsider – we all were.”⁹⁵ As such, hospital pharmacy was considered by community pharmacists to be a distinctly second-class occupation within the wider pharmacy profession.

A similar situation occurred in Australia. Hospital pharmacists there were also paid a fixed salary and were thus free of the economic stress of needing to make a profit on sales to pay their overheads.⁹⁶ Although very little has been written about the status of nineteenth and early twentieth century hospital pharmacy and pharmacists, the most prolific writer on Australian pharmacy and its practitioners, Gregory Haines, identified that with the focus on trade in order to make a suitable living from pharmacy, health advice had to be built into the cost of the product that was sold, as community pharmacists were restricted to charging for the medicine only, not the consultation as doctors did.⁹⁷ This did not apply to hospital pharmacists, as they were salaried staff, thus reducing the stress of needing to recoup costs through the sale of other commodities. Intra-professional perceptions of the status of hospital pharmacists are not, however, covered in any of Haines’ work.

⁹⁵ Jo Peel, ‘The Birth of Our Association’ (Conference of the New Zealand Hospital Pharmacists’ Association, 1981); Combes, 218.

⁹⁶ Haines, *Pharmacy in Australia: The National Experience*, 8.

⁹⁷ *Ibid.*

Professional Territorial Boundaries and Overlaps

The professionalism of both doctors and dentists is directly linked to their mode of education, and also their perceived social authority or status within the community. These links with education and social status to professionalism will be analysed in further depth in Chapter 6. Unlike pharmacists who are shop-based, doctors and dentists work in clinical practices. That is, it is their clinical reasoning and skills that are offered for sale with a direct action taken upon the physical being of the consumer (patient). Pharmacists have no direct physical interaction in a clinical setting with the patient, but provide a product which is self-administered by the consumer, usually at a later time and place of the patient's choosing. In the private sector, doctors and dentists are paid by fee-for-service, while pharmacists are paid by fee-for-product. By holding tertiary-level state-recognised qualifications, doctors and dentists strongly signal that both are exclusive occupational groups holding highly specialised bodies of knowledge, with commensurate moral and social authority conferred on them as a collective by the community.

Alongside clinical skills, doctors and dentists also have direct interaction with the patient, while for pharmacists the patient is also a retail customer. Community pharmacists do, however, have opportunities to interact with the customer as a patient in the treatment of minor ailments, and the provision of over-the-counter medicines. Hospital and military pharmacists, particularly before the development of clinical pharmacy practice in the late twentieth century, were totally removed from the patient, providing medicines only at a distance as directed by the treatment prescriber. These medicines were normally then administered by nurses, at a time and place determined by hospital routines and under the doctor's direction, while the patient had little to no agency in the process.

As discussed in Chapters 1 and 2, professional territorial boundaries were thought to be under threat from pharmacists by medical staff during WWI. Both New Zealand and Australian MOs initially considered that pharmacists should not be given commissions or treated as equals to doctors to discourage any thought that they could step into and perform the role of the medical professionals. Pharmacists themselves, however, did not expect to step into the role of MOs – while they were fully cognisant that they were not physicians, they considered their experience in providing treatment in the community directly to customer-patients for minor ailments to be valuable to the medical staff, as they could free the MO to then focus on treating cases of a more serious nature, which required their more specialised knowledge.

The nature of pharmacists' extensive training in organic chemistry also provided the potential for the military pharmacist to take other onerous tasks away from the responsibility of the MOs, including urine sampling and testing, water quality testing and sterilisation, and other bacteriological functions.⁹⁸ No further information is available as to exactly what bacteriological functions Australian pharmacists considered to be within their scope of practice when putting forward their proposed plan. Specific tasks were not elucidated, but it is possible that pharmacists considered their education in organic chemistry to have been of value in this area. They were also modelling their burgeoning Pharmaceutical Service on the French system, as French military pharmacists handled water testing, sterilisation, the taking of swabs for bacteriological testing, and urine collection and testing.⁹⁹ Administrative functions of maintaining stock control for medicines and medical stores, and the completion of a myriad of forms and other types of

⁹⁸ 'Commissioned Rank for Army Pharmacists', *Chemist and Druggist of Australasia* 30, no. 5 (1 May 1915): 167–68.

⁹⁹ 'Commissioned Rank for Army Pharmacists', *Chemist and Druggist of Australasia* 30, no. 4 (1 April 1915): 114.

paperwork were also areas that pharmacists identified as being more suited to their particular qualifications.¹⁰⁰ This potential for pharmacists to extend their range of pre-war activities was not realised, however.

Differences in Perceptions of Professionalism

Although pharmacists' treatment of minor ailments had been largely accepted by doctors within the community context, this level of tolerance was very different within the armed forces. The provision of commissioned rank to doctors and dentists, both of whom held university qualifications and who directly interacted with their patients, emphasised a level of status and social differentiation between the occupational groups that may have been unspoken in the civilian sphere. Pharmacists, by nature of their apprenticeship and by being 'in trade', were not perceived by both the military and other health occupational groups as being fully professionalised. This is illustrated by the refusal of the New Zealand military authorities (and Australian in the beginning of the war) to promote pharmacists by stating that there was no precedent in the British structure for pharmacists as lieutenants. Yet neither was there precedence for a dental service or dentists, who were immediately given the rank of captain on enlistment.¹⁰¹ By being inconsistent in their reasoning as to which occupations received commissions, the government was tacit in its agreement with the MOs that pharmacists did not perform a sufficiently specialised role to justify being granted commissioned rank.

¹⁰⁰ 'Commissioned Rank for Army Pharmacists', *C&DA*, (1 May 1915), 167.

¹⁰¹ 'Letter, J. Macalister to Pharmacy Board of New Zealand', 25 November 1915, Box 14 81-084-14, Alexander Turnbull Library, Wellington; 'Pharmacists and the Army Medical Corps', *Chemist and Druggist of Australasia* 31, no. 2 (1 February 1916): 53; 'Military Status of Pharmacists, New Zealand', *Chemist and Druggist of Australasia* 31, no. 5 (1 May 1916): 166; 'Position of Pharmacists in the A.M.C.', *Chemist and Druggist of Australasia* 31, no. 7 (1 July 1916): 239. Strong political influence was considered to have been the key factor in the establishment of the Dental Service and conferral of commissioned rank on dentists for both countries.

Pharmacists themselves, however, considered the rigour of their examinations and formal qualifications with a legal registration requirement to practice to carry sufficient professional gravitas to consider themselves on the same professional level as that of doctors and dentists, notwithstanding their pathway to qualification or method of business. Not only this, but the pre-war military training schemes enacted by both New Zealand and Australia contained provision for pharmacists to enter their training at an honorary lieutenant rank, although the British military model did not contain a similar provision for pharmacists to hold commissioned rank in the regular forces. This provision thus set up the expectation within pharmacy that this rank would carry over into the regular force should a conflict arise. The differing perceptions of professionalism between MOs, dentists and pharmacists thus arise directly from perceived differences in educational pathways and social standing.

Conclusion

Military pharmacists and their professional practice were rendered invisible in the archival record, and as a consequence, in later historiography. This was due largely to pharmacists holding non-commissioned officer rank and thus becoming invisible to those in authority. Field dispensing was the most visible form of military pharmacy, and by its nature, was simplistic and very basic. This form of dispensing was, however, likely to have been the most visible to senior medical staff rather than hospital dispensing or bulk compounding. As a result, there developed a deep disconnection between the perceptions of professionalism between pharmacists and other medical personnel which underpinned the war experience of serving ANZAC military pharmacists.

Recognition and the drive for professional validation was the overriding political focus for serving pharmacists during WWI. Pharmacists considered their apprenticeship, qualifications and legal requirement to register in order to practice to have parity with the university-level degree and registration that doctors and dentists were required to hold, but this perception was not mutual. Although Australia was eventually successful in establishing a dedicated Army Pharmaceutical Service, with an attendant rank structure including commissioned officers, this did not occur until after the first full year of the war (1916), and was predicated on the business skills of pharmacists. New Zealand did not waiver from the British Imperial model, and commissions for its serving pharmacists did not eventuate. New Zealand and Australian military pharmacists had very different outcomes to their war efforts.

Based on the inconsistent application of the regulations between serving pharmacists and dentists, the denial to grant commissions to pharmacists based on the British military structure can only therefore be viewed as a convenient standpoint, and factors other than Imperial regulations are the most likely causes underpinning the relegation of military pharmacists. Military authorities in both New Zealand and Australia considered pharmacy as an insufficiently professionalised occupation to permit commissions, although pharmacists themselves took the view that they were health professionals as they required examination and legal registration to practice. This disconnect between perceptions of professionalism has, at its foundation, differences in educational pathway and associated class and social status between doctors, dentists and pharmacists. Chapter 6 examines the links between education, class and rank, and how these social factors contributed to the invisibility of WWI military pharmacists.

Fig. 11: *Soldier Receiving Dental Treatment, Egypt, ca. 1915.*



Source: *H83.103/149, State Library Victoria, Melbourne. Public Domain.*

Fig. 12: *Dispensary for 2nd Australian Light Horse Field Ambulance, Sinai, 1916*



Source: *J02900. Australian War Memorial, Canberra. Public Domain.*

Although these two photographs are almost certainly posed or staged, they indicate both the temporary nature and reduced conditions prevalent in the field or in staging camps. A tent has replaced a permanent structure, while the dentist performs his work in the open, in bright sunlight and in full view of the rest of the camp. The dispensary has been constructed from palm leaves, and while more robust than the dentist's tent, is nevertheless a temporary structure. As a comparison, these images illustrate the disparity between the two professions. The dentist practices his clinical skills in public with an audience, performing an operation upon a patient (likely to be an extraction, if the reaction is any indication). In contrast, the dispenser or pharmacist stands alone beside his temporary dispensary, without any patients lined up for medicines after sick parade. The dentist is fully visible to the rest of the camp with his 'clinic' surrounded by other tents. Although difficult to tell conclusively from the photograph, the pharmacist's work space is separated from other structures and appears to be on the fringes of the camp with nothing apparently behind the dispensary except desert, creating invisibility of work practice. Differences in professionalism are also clearly indicated, with the dentist providing a specific and skilled service for the patient, unlike the dispenser who provides only a product.

Chapter 6: Education, Class, and Rank

Introduction

The focus of this chapter is the fluid interchanges between rank, social class and status, and educational achievement as they relate to commissioned rank among specialist personnel granted (or not) in the New Zealand and Australian militaries. In this chapter, I argue that, alongside educational disparity, social class and associated status strongly influenced the decision not to grant New Zealand pharmacists commissioned rank for the duration of the conflict, and to only grant honorary rank to Australian pharmacists after the establishment of the Australian Army Pharmaceutical Service (AAPS) in early 1916. Perceptions of occupational professionalism and their links to educational or vocational pathways as discussed in Chapter 5 reinforced the social stratification of class, directly influencing the success or failure of New Zealand and Australian pharmacists' aspirations in the military sphere.

Social class continued to be weighted heavily in the granting of commissions in the early twentieth century armed forces, particularly in the British model. Seniority was directly influenced by civilian social position, irrespective of qualifications or education.¹ Although both New Zealand and Australian societies were considerably more egalitarian in class structure than Britain, the British preference for the socially élite to hold officer ranks remained influential in the Dominions' armed forces, particularly as the British had sent officers on loan from the British Imperial Army to set up and standardise the Dominions' military operations during the first decade of the twentieth century.²

¹ Geoffrey Field, "‘Civilians in Uniform’: Class and Politics in the British Armed Forces, 1939-1945", *International Labor and Working-Class History* 80 (2011): 122,125.

² Nathan Wise, 'The Myth of Classlessness in the Australian Imperial Force', *Australian Historical Studies* 43, no. 2 (2012): 289-292-93; Douglas E. Delaney, 'Army Apostles: Imperial Officers on Loan and the

Health Hierarchies

Educational pathways are indicative of professionalism and are therefore intrinsically tied to professionalism. Expanding on the educational aspects of professionalism signalled in Chapter 5, this chapter broadly examines the differences in the educational or vocational pathways taken by other practitioners in the health sector during the late nineteenth and early twentieth centuries, and how these differences in education affected their resultant experience in the military during World War I (WWI).³ Comparative training of doctors, dentists, nurses and pharmacists in both civilian and military environments will be explored, and the resultant differences in how these practitioners received their training and education alongside social class considerations and subsequent influence on military rank consequently frames the discussion in this chapter.

Recognition and validation of educational attainment was an important underlying factor in the pursuit of commissioned rank for both New Zealand and Australian military pharmacists during WWI. The initial underlying element driving the desire for professional recognition in the form of commissioned rank by military pharmacists in both countries was that their education and training was of a sufficient level to differentiate their role from that of other allied health providers, placing them within the same professional sphere as that of primary health practitioners such as doctors and dentists, as discussed in Chapter 5.⁴ Early twentieth century sociologists considered a specialised

Standardization of the Canadian, Australian and New Zealand Armies, 1904–1914', *War in History* 23, no. 2 (2016): 172, 174. Britain's officers were drawn almost exclusively from their upper classes.

³ For this thesis, I am focusing on educational pathways and status for those who practiced consultative medicine (i.e. doctors/general practitioners) rather than surgery or surgical services, as pharmacists during the nineteenth and early twentieth centuries in New Zealand and Australia aligned themselves alongside general practitioners.

⁴ 'Allied health' refers to roles that are related to health care, but are distinct from the direct practices of medicine and nursing, e.g. podiatry or radiography.

body of knowledge to be an accepted and fundamental requirement for an occupation to become professionalised, usually gained through a period of prolonged training and an institutionalised educational process such as a university degree (again, see Chapter 5). Until the late 1950s and early 1960s, however, pharmacy in both New Zealand and Australia had taken the apprenticeship as its educational route for the occupation.⁵ Along with being in retail business, the lack of formalised educational process resulting in a nationally-recognised qualification and the association of apprenticeship with manual labour contributed to the perception by others within both the health sector and the military during the early twentieth century that pharmacy was in fact a trade, and that pharmacists did not hold the same professional standing as doctors or dentists.

The educational experiences of early twentieth century doctors, dentists and nurses were chosen as they were the most visible health practitioners to the general public alongside pharmacists, in contrast to other auxiliary or allied health roles such as physiotherapists (known as masseurs in the early twentieth century), chiropractors, and podiatrists. These are also the health practitioners that pharmacists considered themselves to be most aligned with as a result of their own specialised educational requirements, alongside their perception that their occupation was professionalised by the early twentieth century. Clinical autonomy and practice traditionally determine the hierarchy of health

⁵ Pharmacy students in New South Wales, Australia were required to attend classes in botany, organic and inorganic chemistry, and *materia medica* at the University of Sydney from 1897. These classes did not constitute a degree course, but formed part of their studies during their apprenticeships. See Gregory Haines, *'The Grains and Threepen'orths of Pharmacy': Pharmacy in N.S.W. 1788-1976* (Kilmore, VIC: Lowden Publishing Co., 1976), 269. In Victoria, a similar situation was evident, but the Melbourne (Victorian) College of Pharmacy had been established in 1881, again offering similar courses as part of apprenticeship studies. See Gregory Haines, *A History of Pharmacy in Victoria* (Melbourne: Australian Pharmaceutical Publishing Co., in association with the Pharmaceutical Society of Australia (Victorian Branch), 1994), 129. New Zealand's government decided that from 1960, the apprenticeship system would be replaced with pharmacists undergoing education through a technical training institute at Petone in Wellington (which became the Central Institute of Technology or CIT), with a university degree course as advanced training for those who wished to enter research. See Susan Heydon and Stephen Duffull, *Pharmacy at Otago: The First 50 Years* (Dunedin: New Zealand's National School of Pharmacy, 2013), 1.

care. In this structure, doctors hold the top position of professional authority, with dentists below them. Nurses occupy a somewhat different space; as feminised health care practitioners, their role is directly subordinate to doctors yet they also have a degree of clinical autonomy in their interactions with the patient. Pharmacists are also subject to the direction of doctors in their practice, but do not hold clinical autonomy; they do not diagnose, prescribe or determine which medicine the patient should take, thus taking a solely reactive role to the dispensing of medication.⁶ During the war, however, New Zealand and Australian pharmacists considered that their level of specialised education and training in the fields of *materia medica*, organic chemistry, botany and Latin held sufficient gravitas to permit them to work collaboratively with doctors on a relatively equivalent professional footing within their scope of practice. That this level of training and specialised knowledge did not result in the level of respect and social standing that pharmacists expected to be shown with the granting of commissioned rank was a continuing source of grievance for serving military pharmacists in both New Zealand and Australia during the war.

Education and Class

“Nor could other professional claims, either of ethics or official and unofficial status and recognition, be maintained without the base of institutionalised education.”⁷

Educational pathways and social class are inherently linked. By charting these links, pharmacists’ positions in the social hierarchies of both the civilian and military spheres can be more fully identified and determined. This section therefore surveys and

⁶ Butler also acknowledged that during the war, pharmacy and pharmacists did not “involve or include any direct participation in the actual performance of remedial or prophylactic actions.” See Arthur Butler, *The Official History of the Australian Army Medical Services in the War of 1914-1918* vol. III (Sydney: Halstead Press, 1943), 485.

⁷ John C. Burnham, *How the Idea of Profession Changed the Writing of Medical History* (London: Wellcome Institute for the History of Medicine, 1998), 105.

compares the effects of social class on medical students and students of other health professions and their educational pathways with that of New Zealand and Australian pharmacists. Due to the close relationship with British models of education that were transplanted to the Dominions through Imperial migration, the British experience will be examined as the benchmark for New Zealand and Australian class structures within medical and affiliated services' education during the late nineteenth and early twentieth centuries.

Social class was a key determinant in who received formal higher education through British institutions. In his 1995 history of medical education in the Western world, Thomas Bonner identified that social class distinctions amongst medical students were greatest in the medical schools of the two oldest English universities, Oxford and Cambridge (collectively known as 'Oxbridge'), from their establishment in approximately the thirteenth and sixteenth centuries respectively, through to the early twentieth century.⁸ Entry was restricted not only to those who had received a classical preparatory education in public (private) schools and had sufficient financial means to pay for tertiary medical education, but also to those who followed the correct religion.⁹ Religious requirements for both Oxford and Cambridge universities were not relaxed until the passing of the *Universities Tests Act 1871*, which removed the requirement for both students and staff to subscribe to a specific faith.¹⁰ Bonner's argument on restricted entry is further strengthened by Rosemary O'Day in her chapter on the social change in the history of

⁸ Early medical degrees did not include surgical training as this was under the auspices of what is today the Royal College of Surgeons of England (charter granted in 1800), which eventually developed after several iterations following the original schism between barber-surgeons and surgeons in 1493.

⁹ Thomas Neville Bonner, *Becoming a Physician: Medical Education in Britain, France, Germany, and the United States, 1750-1945* (Baltimore, MD: John Hopkins University Press, 1995), 63–64. A classical education included Latin, natural philosophy or science, Greek, and mathematics. English universities Oxford and Cambridge only admitted those belonging to the Church of England (Anglican) faith; all others were not permitted entry, including Roman Catholic and nonconforming Protestant.

¹⁰ 'Universities Tests Act 1871 c.26 (Regnal. 34 and 35 Vict)' (UK) (1871), <http://www.legislation.gov.uk/ukpga/Vict/34-35/26/contents>. (accessed 21 January 2019).

education in England between 1500 and 1800 where she argues that as early as the mid-sixteenth century, class divisions in education were well established and only the sons of the wealthy élites were sent to the Oxbridge universities for higher education. These restrictions ensured that social class stratification amongst medical students was maintained, limiting entry to only the upper classes or élite of society.¹¹

Although social class and higher education remained intrinsically linked, by the beginning of the nineteenth century the exception to this social selectivity in medical education was Scotland. Here, those students who were of “marginal economic means”, those who did not go through the public school system, or who were of religious faiths other than Church of England (Anglican) could avail themselves of tertiary medical training.¹² Scottish universities, while proud of the diversity of social classes that made up their student body, were nevertheless considered by the traditional English universities to be suitable providers of education only to the lower and middle classes, and as such were not suitable institutions for the education of ‘gentlemen’.¹³ By the early nineteenth century, the University of Edinburgh had become the leading institution for medical training, due largely to its acceptance and incorporation of science into its clinical study programmes. Until the establishment of the University of London in 1836, none of the English universities offered any clinical applications of science in their courses of study.¹⁴ In spite of this, the Edinburgh medical degree was criticised by a professor at Oxford as being “not sufficiently expensive to prevent all but the wealthy from obtaining it”.¹⁵ The expectation thus persisted that only the financially well-off or socially privileged were to

¹¹ Rosemary O’Day, ‘Social Change in the History of Education: Perspectives on the Emergence of Learned Professions in England, c. 1500-1800’, in *Social Change in the History of British Education*, ed. Joyce Goodman, Gary McCulloch, and William Richardson (London: Routledge, 2008), 14.

¹² Bonner, 64.

¹³ *Ibid.*, 64–65.

¹⁴ Roderick E. McGrew, *Encyclopedia of Medical History* (London: Macmillan Press, 1985), 180.

¹⁵ Bonner, 64–65.

have access to tertiary medical education, and that this should be attained only at one of the élite English institutions.

Methods of learning or vocational pathways were also directly related to social class, which influenced levels of educational attainment. In the introduction to their 2008 work on the social change in the history of British education, Gary McCulloch, Joyce Goodman and William Richardson noted that education systems and pathways reinforced and reproduced the class and status structures of society within England, France and Germany, and that these “social class differentials in educational attainment have remained largely unchanged during much of the last century [twentieth]”.¹⁶ As a result, social class in the mid-nineteenth century also dictated the level of educational attainment, as there was no apparent practical need for a student to be over-educated for their social position or perceived station in life.¹⁷ In this way, education was perceived as valuable only as much as it was pragmatic for the student’s position in the societal hierarchy, and this perception thus continued to reinforce well-entrenched class structures.

Changing class structures and social mobility through education slowly became achievable in Britain from the mid-nineteenth century. The religious and class barriers that restricted entry to English universities slowly eroded in response to changing attitudes towards education, the increasingly specialised needs of intensifying industrialisation, and the rise of the middle class.¹⁸ With increasing industrialisation and technological development, university education thus began to move away from the domain of the élite classes, and towards the meritocracy of the burgeoning middle classes of retailers,

¹⁶ Joyce Goodman, Gary McCulloch, and William Richardson, eds., ‘Introduction’, in *Social Change in the History of Education* (London: Routledge, 2008), 2–4.

¹⁷ Neil J. Smelser, *Social Paralysis and Social Change: British Working-Class Education in the Nineteenth Century* (Berkeley: University of California Press, 1991), 274.

¹⁸ *Ibid.*, 256, 273.

administrators and business enterprises.¹⁹ During the 1960s, American functionalist sociologists Talcott Parsons and Clark Kerr considered this movement of education towards the middle class and meritocracy as the ‘the liberal theory of industrialism’, where the economic efficiency of a society “dictates that positions in society should be allocated to individuals on the basis of their skills and competencies, rather than on the basis of, for instance, who they are.”²⁰ In the medical field, dentists in particular were quick to recognise the social impact of the rise of science and higher education, and utilised the rising social status of a university degree to facilitate social mobility and upward occupational movement from what had been previously considered a lower-class manual trade to a middle- or upper-middle class profession (as discussed in Chapter 5).

Pharmacists, however, were constrained to apprenticeships as their method of education and training by the necessarily manual nature of their occupation. Compounding of medicines required well-developed manual dexterity and a degree of physical strength. This would not change until the mid-twentieth century with the eventual development of pharmaceutical science and the advent of pre-made medicines, with the resultant transformation in the nature and form of pharmacy practice. By directly selling the products of their physical labour, as well as commodities such as over-the-counter remedies, toiletries, baby products and photographic supplies, the pharmacist was “considered a tradesman in an era when trade was regarded as an infinitely debased occupation.”²¹ With this strong retail focus, the pharmacist was essentially perceived by

¹⁹ Harold Silver, ‘Higher Education and Social Change: Purpose in Pursuit?’, in *Social Change in the History of British Education*, ed. Joyce Goodman, Gary McCulloch, and William Richardson (London: Routledge, 2008), 139, 146.

²⁰ Richard Breen, ‘Why Did Class Inequalities in Educational Attainment Remain Unchanged Over Much of the 20th Century?’, in *Understanding Social Change*, ed. Anthony Heath, John Ermisch, and Duncan Gallie (Oxford: Oxford University Press, 2005), 55.

²¹ Charles Newman, *The Evolution of Medical Education in the Nineteenth Century* (London: Oxford University Press, 1957), 3.

the general public as a shop-keeper, and an education delivered in the same method as “other mercantile trades” (i.e. an apprenticeship) was considered to be a sufficient educational pathway for what was perceived to provide an adequate level of educational attainment for their particular trade.²²

Class and Medical Education

The practice of medicine is, along with law and theology, one of humankind’s oldest occupations. Processes for healing the sick and treating the injured have been detailed in ancient Egyptian scrolls as early as approximately 3,000BC, while anatomical dissection of the human body began in Alexandria around 300BC.²³ Ancient Greek, Roman and Byzantine medical practice informed and influenced later Western medieval developments in the treatment of human ailments and injuries. One of the earliest and most comprehensive descriptions of medicines and their effects was the *Materia Medica* written by Pedanius Dioscorides around 65AD, which was used until the eighteenth century as the basis for pharmacy in the Roman, Byzantine, Arabic and Western medicine eras.²⁴ It is likely that these early documents also chronicle oral traditions of treatments and medical processes handed down from master to student from before the development of written records, following what would be recognised as a form of apprenticeship.

Although students of medicine originally followed this method of learning, formal European or Western medical teaching began in Salerno, Italy with the establishment of

²² Newman, 22; John A. Hunt, ‘The Evolution of Pharmacy in Britain (1428-1913)’, *Pharmacy in History* 48, no. 1 (2006): 39.

²³ Jacalyn Duffin, *The History of Medicine: A Scandalously Short Introduction*, 2nd ed. (Toronto: University of Toronto Press, 2010), 12, 130.

²⁴ John Scarborough, ‘Classical Antiquity: Medicine and Allied Science, an Update’, in *History of Medicine*, ed. Rebecca Greene (New York: Institute for Research in History, 1988): 29.

the first medieval medical school by the tenth century AD.²⁵ Others soon followed, and in Britain five medical schools were established by the early modern period: Oxford (by the thirteenth century – exact date unknown); St Andrews (1413); Aberdeen (1495); Cambridge (1540); and Glasgow (1637).²⁶ In colonial Australasia, the first medical school was established in Australia at the University of Melbourne, Victoria in 1862, while New Zealand's first medical school opened in 1875 at the University of Otago, Dunedin.²⁷ Prior to this, students would travel to British universities to train as doctors, graduate with a degree in medicine, and return to the colonies to set themselves up in a practice.

New, modern improvements in treatment for human illness and conditions began to be developed through the nineteenth century. Steve Sturdy and Roger Cooter examine this in their 1998 article, detailing how the rise of laboratory science from the late nineteenth century impacted on the standing and practice of hospital physicians and changes to hospital management up to the mid-twentieth century.²⁸ In similar fashion, as discussed in Chapter 5 the rise of science contributed significantly to the change in dental education. For the development of dentistry as a profession in New South Wales, Australia, Tamson Pietsch presents one perspective that the change in educational pathway from apprenticeship to degree-level qualification is directly linked to both WWI and the rise in status of the institution of the university.²⁹ Prior to the dental degree being established at the University of Sydney in 1901, Australian prospective students of dentistry were required to travel to dental schools in the United States of America (USA) if they wished

²⁵ Duffin, 132.

²⁶ *Ibid.* The early modern period is after the medieval period, and approximately between 1500-1800AD.

²⁷ Charles Hercus and Gordon Bell, *The Otago Medical School Under the First Three Deans* (London: E & S Livingstone Ltd, 1964), 7; Milton J. Lewis, 'Medicine in Colonial Australia, 1788-1900', *Medical Journal of Australia* 201, no. Supp. 1 (2014): 7.

²⁸ Steve Sturdy and Roger Cooter, 'Science, Scientific Management, and the Transformation of Medicine in Britain c. 1870-1950', *History of Science* 36, no. 4 (1998): 421–66.

²⁹ Tamson Pietsch, 'Universities, War and the Professionalization of Dentistry', *History of Education Review* 45, no. 2 (2016): 168.

to obtain a university-level qualification.³⁰ A degree conferred status and respectability, and by embracing scientific and technological advancement through tertiary-level education, dentistry in Australia signalled its validation as a health profession through its educational pathway.

In his *History of Dentistry in New Zealand*, Tom Brooking identifies the beginning of dentistry in New Zealand as a degree qualification with the establishment of the School of Dentistry under the aegis of the School of Medicine at the University of Otago in 1907.³¹ This development arose from the passing of the *Dentists Act* 1904, which brought dentistry education under the control of the University of New Zealand.³² It was anticipated that “a properly equipped, university-level dental school” would bring additional benefit and prestige to the University of Otago’s Medical School.³³ Dentistry was not, however, an independent course, but was a subordinate or adjunct department of the Medical School. Incoming students were required to pass the Matriculation Examination of the University of New Zealand, and over the course of two years’ study at Otago, attend lectures in dentistry, oral surgery, and dental mechanics as well as anatomy, physiology, chemistry and *materia medica*.³⁴ The Act also established that, with the exception of current apprentices and a ‘grandfather clause’ for those dentists who were already in practice, registration was concomitant with the applicant holding a degree in dental surgery from the University of New Zealand.

³⁰ Ibid., 168, 170.

³¹ R. F. Stockwell, *The Origins of the Dental Profession in New Zealand* (Dunedin: New Zealand Dental Association, 1977), 5–6; Tom Brooking, *A History of Dentistry in New Zealand* (Dunedin: New Zealand Dental Association Inc., 1980), 48.

³² Brooking, 50; *Dentists Act* (NZ) 1904 (4 EDW VII 1904 No. 57) (NZ) (1904), http://www.nzlii.org/cgi-bin/download.cgi/cgi-bin/download.cgi/download/nz/legis/hist_act/da19044ev1904n57216.pdf, accessed 13 September 2018. The University of New Zealand consisted of four degree-granting universities (Otago, Canterbury, Victoria and Auckland) and two agricultural colleges. It was dissolved in 1961.

³³ Brooking, 48.

³⁴ Stockwell, 17.

Thomas Kay Sidey, who introduced the private member's Bill that resulted in the *Dentists Act* in 1904, was a progressive thinker with liberal leanings. He recognised that dentistry training under the apprenticeship system that had been imported from Britain was both inadequate and prohibitively expensive. Apprentices were expected to pay a £200 premium to begin their studies and were also then required to travel to overseas schools in order to complete their studies.³⁵ By establishing a dental school in New Zealand, students could be educated locally and admitted on the basis of merit rather than financial means, thus removing the practice of dentistry from the province of only those families who could afford to pay the apprenticeship premiums and travel costs for their sons.³⁶ This directly contradicts the concept that, by virtue of an apprenticeship as its main educational pathway, dentistry was a manual 'trade', and thus firmly within the occupational scope of the working class. In order to be able to afford the apprenticeship premium and associated fees, families needed to have a level of disposable income sufficient to meet those costs. With the change from the established vocational pathway of apprenticeship in the late nineteenth century to a degree qualification in the opening years of the twentieth century, newly-qualified dentists could ensure their social mobility prospects from a perceived working-class 'trade' to a 'middle-class' profession were firmly established.

Prior to the opening of the University of Otago's Medical School, those New Zealand students wishing to study medicine were required to return to Great Britain to attend one of the English universities or to Scotland if they did not meet the entry requirements for Cambridge or Oxford. Some may have also travelled to Europe to study. With the high cost of travel and overseas study, New Zealand medical students necessarily

³⁵ Brooking, 50.

³⁶ *Ibid.* In the 1901 census, 307 dentists were identified, of which 23 were women. Higher education for women in the health sciences during the late nineteenth and early twentieth centuries was discouraged, and few women took up places. New Zealand's first female doctor, Emily Siedeberg, graduated from the Otago School of Medicine in 1896.

came from families that could afford to provide the financial means to do so. Otago's initial course in medicine was only partial and did not lead to immediate qualification; the British General Medical Council and licencing bodies in England and Scotland did not recognise the full course, and Otago students were required "to proceed to the completion of the four-year curriculum in Great Britain" for final qualification and registration.³⁷ Recognition of proposed lectures in anatomy and physiology was eventually agreed to only by the Scottish universities of Edinburgh and Glasgow, Trinity College in Dublin, Ireland, and the Royal College of Surgeons in London.³⁸ The English universities of Cambridge and Oxford did not, however, recognise the colonial medical course, and Otago students were required to attend universities in Great Britain to complete their training for registration.³⁹

Although the University of Sydney was the first to be established in Australia in 1850, it was the University of Melbourne which founded the first actively-teaching medical school in 1862, commencing a stringent five-year degree course in the face of opposition from local practitioners.⁴⁰ Hercus and Bell write that with the University's insistence on high academic standards, the Melbourne course did not attract many students, and that "40 years later the majority of these medical students went to Britain for qualification."⁴¹ Social class was a factor in the founding of the universities in Sydney and Melbourne, both of which were established by those who enjoyed higher standing in Australian polite society, specifically "educated politicians, administrators and

³⁷ Hercus and Bell, 11.

³⁸ Ibid.

³⁹ Ibid. This is likely to be due to the entrenched élitism of the established English universities, with their long histories of catering to upper class or socially élitte students.

⁴⁰ Hercus and Bell, 10; W. J. Gardner, *Colonial Cap and Gown: Studies in the Mid-Victorian Universities of Australasia* (Christchurch: University of Canterbury, 1979), 15–16, 20; Lewis, 7. Although the University of Sydney's Medical School was established in 1854, it did not begin teaching until the early 1880s.

⁴¹ Hercus and Bell, 10.

professional men, both lay and clerical.”⁴² Social exclusivity was also reflected with the geographical siting of both the University of Melbourne and the University of Sydney outside their respective city centres, meaning only those students who had the ability to afford transport (i.e. via horseback) to the suburbs were able to attend classes.⁴³ This thus restricted the student body to those of a more affluent social stratum.

Business and Class

One of the early defining characteristics of professionalism is the acceptance of the occupational group’s expertise by the general public, and a subsequent increase in societal prestige of that group.⁴⁴ Doctors were held in a high level of esteem within society by the beginning of the twentieth century, and dentists were also beginning to be recognised with a commensurate level of social status for their professional credentials at the time.⁴⁵ Pharmacists, however, while attaining a degree of social status as successful business owners, did not appear to command as high a level of community prestige as those who had clinical practices. Trade, or a purely transactional process for selling goods for profit, was held at a lower standing in the social hierarchy than a practitioner who charged for his knowledge and clinical skills, and who had a direct action upon the patient’s physicalself. Although nurses also had direct contact with the physicality of the patient, during the war they did not hold commissioned rank or status, but were accorded the privileges that came with commissions because of their gender as the ‘fairer sex’.⁴⁶ The lack of physical

⁴² Gardner, 21; Kaye Tully and Clive Whitehead, ‘Audacious Beginnings: The Establishment of Universities in Australasia, 1850-1900’, *Education Research and Perspectives* 36, no. 2 (2009): 3.

⁴³ Gardner, 20–25. It was expected that young gentlemen would ride to lectures. See also John Gascoigne, ‘The Cultural Origins of Australian Universities’, *Journal of Australian Studies* no. 50-51 (1996): 18-27.

⁴⁴ Geoffrey Millerson, *The Qualifying Associations* (London: Routledge & Kegan Paul, 1964), 13.

⁴⁵ T. S. Pensabene, *The Rise of the Medical Practitioner in Victoria* (Canberra: Australian National University, 1980), 47–49.

⁴⁶ ‘Military Status of Pharmacists, New Zealand’, *Chemist and Druggist of Australasia* 31, no. 5 (1 May 1916): 166; Hester Maclean, *Nursing in New Zealand: History and Reminiscences* (Wellington: Tolan, 1932), 136–37.

interaction with the patient or clinical application of specialised knowledge and skills resulted in pharmacists being relegated to a “subordinate and narrowly technical position in the conduct and execution of this military-medical function” within the Dominions’ respective Army Medical Services.⁴⁷ Subsequently, military pharmacists did not receive a similar level of recognition, status or privilege as these other health professionals in the armed forces. Military pharmacists continued to be perceived as holding lower social standing through their strong association with trade and business.⁴⁸

Established qualifications that indicated a higher level of educational attainment, subsequent registration and the status associated with a profession therefore became important justifications for pharmacists to elevate their occupation away from the subtext of being ‘in trade’. This was particularly paradoxical for WWI military pharmacists; on enlistment, community pharmacists were expected to perform a role usually associated with hospital pharmacists, one that carried a significantly lower social standing within the profession itself, but without a commission to indicate their élite status within their occupational sphere.⁴⁹ Yet hospital pharmacists were *not* associated with trade. By the nature of their function, hospital pharmacists did not sell products, did not interact with the public, did not own or lease a retail shop, and worked for a set salary instead of being in business for themselves. As ‘trade’ was therefore not a key function of a hospital pharmacist’s role, this should logically have given pharmacists the requisite level of social standing within the military to justify the conferral of commissioned rank if trade was the deciding factor for professional acceptance. As this did not occur in the New Zealand

⁴⁷ Butler, 489.

⁴⁸ ‘Minute, Brigadier-General A.W. Robin to Minister of Defence. Establishments and Recruitment - Enlistment of Chemists NZEF 1916-1917’, 7 April 1916, AAYS 8638 AD1/829 29/144, Archives New Zealand, Wellington.

⁴⁹ Reg Combes, *Pharmacy in New Zealand: Aspects and Reminiscences* (Auckland: Pharmaceutical Society of New Zealand, 1981), 218; John Fraser, Personal communication, 7 September 2016.

forces, and only occurred in the Australian forces at an honorary level after the establishment of the AAPS, other social factors must have been implicit in the reluctance of the military authorities to recognise pharmacists as a professional occupational group. An in-depth examination of the linkages between pharmacy trade and business acuity in relation to the war procurement of medicines and business activities of Australasian military pharmacists is discussed in Chapter 3.

Nursing – an Outlier

As with pharmacists, nurses also were not given commissioned rank during the war. Traditionally a predominantly feminised occupation until the mid-twentieth century, nursing was directly connected to the nurturing role of womanhood, and was a task carried out by the women of the household as part of their domestic duties.⁵⁰ As an established health occupation, nursing had a subservient role to that of medicine, reflective of the gendered nature of the relationship between doctors and nursing staff. Not only gender, but education and occupational knowledge also impacted on how nursing staff interacted with medical staff, in public hospitals as well as other areas of employment such as private nursing homes and specialist maternity hospitals. As such, nurses occupied and operated in a different professional space to doctors, dentists and pharmacists.

Nursing also has a long-established history alongside that of doctors. Nursing evolved from domestic service origins from the early Christian religious monastic and convent hospitals, when male and female servants working for the order were paid a salary

⁵⁰ Lucy Ridgely Seymer, *A General History of Nursing*, 4th ed. (London: Faber, 1957), 49; Robert Dingwall, Anne Marie Rafferty, and Charles Webster, *An Introduction to the Social History of Nursing* (London: Routledge, 1988), 7–9.

to assist the monks and nuns in caring for the sick.⁵¹ Nursing as an occupation associated with religious orders afforded the practitioner a degree of protection, as this was work “idealised as sacred, as service to mankind,” while the symbolism of the nun’s veil continued into the twentieth century as the nurse’s professional headwear.⁵² Reform of nursing into a socially acceptable women’s occupation began in the nineteenth century when Elizabeth Fry (1780-1845), although more widely-known for her reform and rehabilitation work with prisoners, established in 1840 an Institute of Nursing Sisters, a small society of nurses recruited to work with the poorer citizens of London.⁵³ Hospital nursing reform, however, was begun in 1848 with St John’s House in St Pancras, London, with the establishment of the Training Institute for Nurses in Hospitals, Families and for the Poor. It is this ‘House’ that developed the traditional training programme with ‘probationers’ as students (although they had to pay a premium for the privilege of being trained, similar to an apprenticeship), who then became certified nurses after a training period of two years followed by five years’ bonded service in a hospital.⁵⁴

Florence Nightingale is one of the most well-recognised and influential nurses in the English-speaking world. Her work in the hospitals at Scutari during the Crimean War (1853-1856) established nursing firmly as a military occupation, as well civilian. On her return from Crimea, she established the ‘Nightingale School’, a training programme for professional or career nurses which further reformed and influenced the education and training for nurses in Britain and eventually throughout the British Empire.⁵⁵ Nurses

⁵¹ Seymer, 37; Monica E. Baly, *Nursing and Social Change*, 2nd ed. (London: William Heinemann Medical Books Ltd, 1980), 22–27. One of the most well-known of the religious orders who cared for the sick and infirm is the Order of the Knights of St John and Jerusalem, also known as the Hospitallers.

⁵² Janet Butler, ‘Journey into War: A Woman’s Diary’, *Australian Historical Studies* 37, no. 127 (2006): 206–7.

⁵³ Seymer, 69–70.

⁵⁴ *Ibid.*, 74–75.

⁵⁵ Mark Bostridge, *Florence Nightingale: The Woman and Her Legend* (London: Penguin Group, 2008), 364–68.

initially accepted into the Nightingale programme were expected to be “educated” women, and although Nightingale herself insisted that the same training be given to all students, middle- and upper-class women who had the ability to contribute financially towards their training were generally those who rose to higher-level positions within the nursing structure.⁵⁶ Hygiene and sanitation were key components of Nightingale’s philosophy “that every element in the patient’s environment was the nurse’s responsibility”, and training for probationers reflected this emphasis on cleanliness with assigned tasks including scrubbing and polishing floors and walls, emptying and cleaning bedpans, and changing bed linen.⁵⁷ Training schools based on the Nightingale model were established throughout England, Scotland, Ireland, Australia, New Zealand, South Africa and Israel.⁵⁸ As with pharmacists, dentists and other health occupations, these ideas of the structure of a nurse’s training were transplanted to New Zealand and Australia with in-bound migration of colonial settlers.⁵⁹

New Zealand passed the world’s first legislation for the registration of trained nurses in September 1901, coming into effect on 1 January 1902.⁶⁰ This was due in no small part to the efforts of Grace Neill, Assistant Inspector of Hospitals and predecessor of Hester Maclean within the public service. Neill reformed nursing training within New Zealand with the development of nursing regulations and a formal training syllabus.⁶¹ As a

⁵⁶ Baly, 125. Baly also notes that access to education and sufficient financial wherewithal were likely to be synonymous.

⁵⁷ Kirsty Harris, *More Than Bombs and Bandages: Australian Army Nurses at Work in World War I* (Newport, NSW: Big Sky Publishing, 2011), 22.

⁵⁸ Seymer, 128.

⁵⁹ See, for example, Judith Godden, *Lucy Osburn, a Lady Displaced: Florence Nightingale’s Envoy to Australia* (Sydney: Sydney University Press, 2006); Jan Rodgers, “Nursing Education in New Zealand: The Persistence of the Nightingale Ethos”, MA thesis, Massey University, Palmerston North, 1985.

⁶⁰ Maclean, 22.

⁶¹ Rosemary Gage, *Tracing History: One Woman’s Journey and Influence on Nursing Education. From Hospital Training to Tertiary Education in 1974: An Oral History*, Nelson Marlborough Institute of Technology Working Paper Series (Nelson, NZ: Nelson Marlborough Institute of Technology, 2013), 2; Seymer, 131–32.

result, nurses were required to undertake a minimum of three year's training in a hospital, and to pass "an examination in theoretical and practical nursing by examiners appointed by the [Hospital] Governor".⁶² Certificates of proficiency were issued after passing this examination, and as with dentistry and pharmacy, registration was only granted on the applicants' successfully gaining the certificate and payment of the registration fee. Employment in public hospitals became contingent on holding registration, as Section 12 of the *Nurses Registration Act* stated that:

12. In all appointments of nurses in hospitals under the control of Boards constituted under "The Hospitals and Charitable Institutions Act, 1885," preference of employment in regard to future vacancies shall be given to registered nurses: Provided that nothing herein contained shall be construed to interfere with the employment of probationer nurses in such institutions.⁶³

All training for New Zealand nurses was conducted within public hospitals.⁶⁴ Here, under the auspices of the medical staff, the matron, and registered or senior nursing sisters, the probationer nurse would mainly learn from hands-on experience and practical demonstrations of how tasks such as wound dressing and temperature-taking were to be performed. As with pharmacy, nursing consisted largely of manual labour, and was, in effect, an apprenticeship. Yet nursing was neither a trade nor a profession; rather, it was considered a 'calling' or 'vocation', with strong principles of service, self-sacrifice, and dedication, similar to clergy and reflective of nursing's origins in religious houses. As Jan Rodgers demonstrates in her Master's thesis on nursing education in New Zealand, the Nightingale ethos reinforced the expectation of nurses' behaviour and character, including

⁶² *Nurses Registration Act* (NZ) 1901 (1 EDW VII No. 12), http://www.nzlii.org/cgi-bin/download.cgi/cgi-bin/download.cgi/download/nz/legis/hist_act/nra19011ev1901n12347.pdf. (Accessed 16 September 2018).

⁶³ *Ibid.* Probationer nurses were trainees, undergoing their three-year training programme.

⁶⁴ Rodgers, v.

being “obedient, quiet, orderly, punctual, neat, sober, and trustworthy”.⁶⁵ As a result of the Nightingale system, however, nurses themselves were drawn from the same middle classes of society as pharmacists, with a corresponding rise in social status for nursing as an acceptable occupation for respectable women.⁶⁶

Nurses’ training in Australia followed the same lines as New Zealand. Both countries imported the Nightingale system from Britain, with training carried out in civilian or public hospitals, whose patients were mainly from the lower socio-economic sectors of society.⁶⁷ As with New Zealand, training was mainly applied and conducted through “observation and repetition”, with probationers beginning their nursing training on the ward from the first day.⁶⁸ The similarity of nursing training with an apprenticeship was, however, acknowledged. Kirsty Harris, in her monograph on Australian nurses during WWI, specifically notes that “The sisters in charge and other senior staff delivered the bulk of the teaching in the manner of an apprenticeship”, exposing probationer nurses to different skills and learning through periodic rotations into other areas of the hospital.⁶⁹ It is due to the heavily manual nature of the occupation that nursing education was treated in a similar manner to an apprenticeship.

In line with nursing’s role of providing direct physical care to patients, character traits and moral integrity were considered of at least equal importance to clinical

⁶⁵ Ibid., 9.

⁶⁶ Dingwall, Rafferty, and Webster, 41–43.

⁶⁷ See for example, Dorothy Mary Armstrong, *The First Fifty Years: A History of Nursing at the Royal Prince Alfred Hospital, Sydney From 1882 to 1932* (Glebe, N.S.W.: Royal Prince Alfred Hospital Graduate Nurses’ Association, 1965); Richard Trembath and Donna Hellier, *All Care and Responsibility: A History of Nursing in Victoria* (Victoria, Australia: The Florence Nightingale Committee, Victorian Branch, 1987); Joan Durdin, *They Became Nurses: A History of Nursing in South Australia 1836-1980* (North Sydney, N.S.W.: Allen & Unwin, 1991); Harris, 16. Wealthy patients could afford to hire private nurses to care for the infirm within their own homes.

⁶⁸ Harris, 19.

⁶⁹ Ibid.

knowledge or practical skills. Harris notes that in a 1910 introductory lecture, the nurses' "qualifications must include: (1) gentleness, (2) cleanliness, (3) truthfulness, (4) obedience, (5) observation, (6) order, (7) courage and coolness, and (8) tact", and were all desired traits for nurses to possess.⁷⁰ The implication of this requirement was that clinical skills were not as valued for nursing work; character, aptitude and attitude were more important. These personal characteristics are commensurate with the Nightingale ethos of nursing as a service-based vocation.

While educational pathways were limited to practical applications of demonstrated techniques for various tasks, lectures were also given to probationers in preparation for their examinations. Anatomy, physiology and surgery lectures were delivered by doctors, while teaching on hygiene, applied medical and specialised surgical nursing, and the specialised nursing of patients with infectious diseases were given by matrons, bridging practice with theory.⁷¹ These pathways were also similar to those of pharmacists, who were required to attend lectures or courses as well as working in the pharmacy for their practical training.

Pharmacy Education

As discussed in the Background section of the Introduction (see pages 7 to 9), pharmacy education in Britain had been a master/student or apprenticeship system from the fourteenth century, when the role of the apothecary separated from pepperers and spicers, who were early traders in medicinal products. This situation continued to evolve, with a further demarcation of roles during the seventeenth and eighteenth centuries, where the role of the apothecary again separated into apothecaries and chemists and druggists.

⁷⁰ *Ibid.*, 21.

⁷¹ *Ibid.*, 20.

Apothecaries became doctors (general practitioners), while chemists and druggists then took on the role of suppliers of prescription medications and also sold over the counter or patent medicines. After the formation of the Pharmaceutical Society of Great Britain (PSGB) in 1841, one of the first things to be established was organised assessments for pharmacy apprentices, with the first examinations in the fields of *materia medica*, chemistry, organic chemistry, botany and pharmacy held in 1842.⁷² Sociologist Geoffrey Millerson considered these examinations to be unusual for the time, as pupillage or apprenticeship was thought to be a sufficient or a suitable method of training, while formal examinations were not widely accepted in society as a “necessary test of ability”.⁷³ Alongside this, there was no uniform system or curriculum for primary, secondary or higher education, while membership of an official association such as the PSGB was not considered necessary for some occupations. Finally, a lack of institutional teaching facilities meant that qualifying associations were not structurally prepared to undertake formal training.⁷⁴ Pharmacy was, nevertheless, an early adopter of the examination system, with the PSGB arranging special occupation-based (knowledge-based) lectures for students. Passing the examinations that resulted from the lectures allowed students to qualify for membership and then to hold official registration from 1842. This in turn gave pharmacists an effective licence to practice. British pharmacy education pathways were then transferred to New Zealand and Australia through emigration of pharmacists.⁷⁵

By the beginning of the twentieth century, trainee pharmacists in both New Zealand and Australia were required to undergo a four-year indentured apprenticeship and

⁷² S. W. F. Holloway, *Royal Society of Great Britain 1841-1991: A Political and Social History* (London: The Pharmaceutical Press, 1991), 96. An understanding of Latin would also have been required as part of a pharmacy apprentice’s training as doctors wrote their prescriptions in this language.

⁷³ Millerson, *The Qualifying Associations*, 122.

⁷⁴ *Ibid.*

⁷⁵ Gregory Haines, *Pharmacy in Australia: The National Experience* (Sydney, N.S.W.: The Pharmaceutical Society of Australia, 1988), 10–11, 168.

on-the-job training, as well as additional study in *materia medica*, chemistry, botany, pharmacy practice, and Latin.⁷⁶ In New Zealand, apprentices studied for national examinations in their own time, after working long hours in their master's shop.⁷⁷ While each state determined its own specific legislative requirements for pharmacy and pharmacists, Australian apprentices were required to attend part-time courses at state-specific universities on "botany, organic and inorganic chemistry, *materia medica* and practical pharmacy", as well as working in the pharmacy.⁷⁸ Although these courses were physically conducted at universities, however, they did not constitute part of a degree-level qualification. Instruction was arranged by the states' Pharmaceutical Societies, who paid the cost of tuition to the university, then recouped the expense from the apprentice.⁷⁹ Again, infrastructure requirements precluded the Societies from teaching their own courses, while universities were already equipped with the chemistry laboratories and expertise in other subjects (i.e. Latin) that were needed. Theoretical aspects of pharmacy education were effectively sub-contracted or outsourced to the universities.

Army-Dispensers and Army-Compounders – In-House Training

New Zealand and Australia took their pattern of military structure from the British Army model. This included the structure of their military medical services, encompassing pharmacy and dispensing. Army-dispenser and Army-compounder were military roles that reflected the British Army's awareness of or disregard for the shift in educational standards and legal requirements that pharmacists were required to undertake in the civilian sphere. Prior to the commencement of the war, the *Chemist and Druggist of Australasia* (C&DA) noted the anomaly that regulations for the Australian citizen-militia

⁷⁶ Heydon and Duffull, 3–4; Combes, 45–47; Haines, *Pharmacy in Australia: The National Experience*, 100.

⁷⁷ Combes, 46–47.

⁷⁸ Haines, *Pharmacy in Australia: The National Experience*, 133.

⁷⁹ *Ibid.* Courses were held at universities as laboratories were set up and fully equipped for teaching purposes, whereas the Pharmacy Boards had no such facilities available in-house.

were contradictory between statement and practice. An article published in the 1 February 1911 edition of the *C&DA* stated that Army-compounders “are engaged in any [civilian] occupation but that of handling drugs – carpenters, clerks, machine hands, &c [sic],” who had progressed through the ranks from private through corps or military experience, rather than specialist expertise in the role itself.⁸⁰ The unnamed writer also stated that these compounders “are instructed in the simplest rudiments of the art, and most of the drugs are in tablet form with directions for use on the bottle. This is a curious commentary on the fact that the orders state (paragraph 130) that ‘all prescriptions will be dispensed by qualified dispensers.’”⁸¹ This is a clear contradiction between military orders and actual practice, yet there appeared to be little appetite for changing either to reflect the civilian legal requirements of registration for drug handling. It is also possible that the governments of both countries considered that their militaries were outside the normal bounds of regulation and thus not constrained or subject to civilian legislation, although there is no evidence to support this.⁸² That this article discussing the Australian experience was cut out and included in an Archives New Zealand file on the provision of honorary commissions for military pharmacists implies that this issue was being discussed by both countries’ governments at least three years before the outbreak of war.⁸³

In its January 1915 issue, the *C&DA* published an account of a deputation made to Mr Jens August Jensen, the Australian Assistant-Minister of Defence late in 1914 by Frank Buckhurst, President of the Pharmaceutical Defence Limited (PDL), Charles E. Towl, President of the Pharmacy Board of Victoria (PBV), and C. L. Butchers, General Secretary

⁸⁰ ‘Commissions - Honorary Commissions to Pharmacists’, n.d., AAYS 8652 AD19/1 18/22. Archives New Zealand, Wellington. This article was cut out and pasted into the file in Archives New Zealand as supporting documentation.

⁸¹ *Ibid.*

⁸² Military law is a separate body of legislation, and it may have been considered that military forces, being subject to military law and courts-martial therefore were not also subject to civilian law.

⁸³ See footnote 80.

Australasian Pharmaceutical Conference. Each delegate made a number of points as to why the situation regarding lack of commissions to pharmacists serving in the Australian Imperial Force (AIF) was untenable. Butchers pointed out to the Assistant-Minister that the educational and legal requirements for pharmacists to practice had shifted significantly for dispensing, requiring “strict training and high qualification” and that the “British system of army compounders was inaugurated before this training was demanded for the civil population.”⁸⁴ Continuing in this vein, Butchers was also critical of Australia’s insistence on retaining the British system, considering that “the present greatly improved status [of pharmacy practice] should be recognised in spite of hoary traditions.”⁸⁵ It is obvious that the British Imperial Army system had not kept pace with the educational or indeed legal requirements for pharmacists, and was severely outdated.

According to the British military system, anyone could become a compounder or dispenser if they had passed their corps examinations to attain the rank of Corporal and, after a rudimentary training period of around nine months, also passed the in-house examination set by the Army’s medical officers.⁸⁶ In Australia, this examination consisted of two sections comprising a written examination and a practicum (*viva voce*), and was set and examined by a Board of three medical officers, all of whom were doctors. The practicum consisted of several prescriptions for the candidate to make up and dispense, while the written aspects consisted of eight questions for each of the dispenser and compounder modules. Neither of the sections appeared to be particularly difficult, and all components of the examination would have been considered quite simple for a fully-trained pharmacist’s apprentice. In September 1912, Corporal H. Russell of the Australian

⁸⁴ ‘Military Pharmacists and the Desire for Commissions’, *Chemist and Druggist of Australasia* 30, no. 1 (1 January 1915): 9.

⁸⁵ *Ibid.*

⁸⁶ Haines, *Pharmacy in Australia: The National Experience*, 190.

Army Medical Corps (AAMC) Permanent Services sat his exams for dispenser at the Garrison Hospital in Victoria Barracks, Sydney, returning to sit the compounder module four months later in January 1913.⁸⁷ Russell attained 87 marks for the written components of the exam, while the Board considered the practical work to be of a satisfactory standard with 50 marks, thus considering him to be “fit for the duties of a dispenser of medicines.”⁸⁸

Russell’s examination was set, examined and the result determined by doctors, not pharmacists. This was understood by the Council of Pharmaceutical Societies of Australasia (CPSA) to be representative of the AAMC being controlled in its entirety by doctors or “medical men”.⁸⁹ The practice of non-pharmacists determining who was considered fit to dispense medicines was, however, in direct contradiction of State legislation passed from 1876, when the Pharmacy Board of Victoria (PBV) was the first state regulatory body to be given the right to examine and regulate pharmacists.⁹⁰ This Act determined that only registered pharmacists could be members of the PBV, and it was the Board itself that had the “power to control and direct all examinations in practical pharmacy and such other subjects as may from time to time be approved.”⁹¹ This meant that in essence, only pharmacists had the authority to pass or fail a candidate for examination. Doctors were thus legally not permitted to examine or assess the competence or fitness to practice of pharmacists. Whether Australian Commonwealth or State governments were aware of this anomalous situation and chose to ignore it as unregistered pharmacists were cheaper to employ (as was the case with many hospital dispensers), or

⁸⁷ ‘Proceedings of Board to Examine Corporal H. Russell, AMC for Dispenser of Medicines’, 1912-1913, MP84/1 1862/10/385, National Archives of Australia, Melbourne. While no records of similar examinations being undertaken are extant in Archives New Zealand, it is reasonable to infer that a similar system within the New Zealand military was in effect.

⁸⁸ *Ibid.*

⁸⁹ ‘58th Annual Meeting Minutes’ (Council of Pharmaceutical Societies of Australasia, 23 March 1915), 171, MS9601 Y Box 23, State Library of Victoria, Melbourne.

⁹⁰ *Pharmacy Act 1876* (40 Victoriae Reginae No. 558) (VIC)
http://www7.austlii.edu.au/au/legis/vic/hist_act/pa187698.pdf. (7 September 2018).

⁹¹ *Ibid.*, 5.

the illegality of permitting unqualified and unregistered men to dispense was simply not brought to their attention is unknown.⁹² As discussed in Chapter 5, self-regulation and assessment of competence was one of the key factors in the evolution of a trade or occupation into a profession.

Consequently, military dispenser examinations were considered by state pharmacy regulatory bodies to be distinctly sub-par. Not only was there no registered pharmacist as an examiner, there was also no standardisation between each venue for examination, and the standard and scope of the questions could be altered without reference to the relevant Pharmaceutical Society.⁹³ Differences between the two sets of examinations (military and civilian) were substantial. Using Russell's examination papers as an exemplar, it is evident that military dispensing examinations did not go into sufficient detail in all aspects of pharmaceutical science. The significant differences between the civilian and military examinations came as a surprise to the military, however. The *C&DA* in May 1915 reported on the opinion of a Major Stanistreet regarding the pharmacist's examination, where the Major expressed the view that "he had not expected to find the Pharmaceutical Examination so highly scientific and technical, and had no hesitation in admitting that the standards of the two examinations were widely different."⁹⁴ Stanistreet also noted that the "chief difference between the two sets of candidates was the social position, the

⁹² In her Master's thesis on New Zealand women pharmacists, Louise Shaw notes that during the late nineteenth and early twentieth centuries, female and unregistered labour in hospital pharmacies was indeed cheaper, and that hospital boards preferred to employ someone who was unregistered to do dispensing alongside other hospital duties. See Louise Shaw, "Prescription for Change? Dispensing with Men: A History of Women in New Zealand Pharmacy, 1881-1991", MA thesis, University of Otago, Dunedin, 1996, 35, 43.

⁹³ 'British Military Dispensers - An Unexpected Danger to Australian Pharmacy', *Chemist and Druggist of Australasia* 30, no. 5 (1 May 1915): 165.

⁹⁴ *Ibid.*

preliminary education, and the twelve months' school training which candidates received at the School of Pharmacy."⁹⁵

Army-trained dispensers and compounders could not be registered with the Pharmacy Boards as their level of skill and knowledge was insufficient to meet the requirements of the pharmacy regulatory bodies, both in New Zealand and Australia. Registered pharmacists keenly felt the injustice of being expected to work in a similar role as those men who they knew were not qualified; they considered their official qualifications to be superior, and "they ought not to be expected to enter as army compounders in the same position, and doing the same work as men whose qualifications were such that it was impossible to admit them to a standing equal with pharmacists in the general service of the public."⁹⁶

The financial burden to the government of registered pharmacists' salaries may have been a key factor in the appointment of unregistered dispensers in both hospital dispensaries and in the military environment. Hospital dispensers were frequently unregistered, with many of them having done their full apprenticeship time, but failed their final exams.⁹⁷ As they had received full training, however, they were more useful than apprentices, but were cheaper to employ than fully qualified and registered pharmacists, who could command a premium for their labour.⁹⁸ Similarly, hospital dispensaries were

⁹⁵ Ibid.

⁹⁶ Ibid.

⁹⁷ Pass rates for pharmacy examinations were low. In 1915 New Zealand, only 41.6% of pharmacy apprentices passed the full set of examinations for registration. For Section A (English; mathematics; science) 42.8% passed, for Section B (chemistry; botany) 29.5% passed, while 100% of those sitting Section C (*materia medica*; practical pharmacy) passed. All three examinations, however, had to be passed to gain registration. 'Pharmaceutical Society of New Zealand Annual Report', 1916, MS-Group-1838 81-084-01, Alexander Turnbull Library, Wellington.

⁹⁸ Haines, *Pharmacy in Australia: The National Experience*, 189.

often the domain of women dispensers, who were not only cheap labour due to their lack of registration, but also because they were women.⁹⁹

After the passing of the United Kingdom's *Medical Act* of 1858, the Worshipful Society of Apothecaries of London established a certificate in dispensing. While this was a much shorter course and did not take the place of a full pharmacy apprenticeship, however, following the British model it was considered in the Australian military hierarchy to be a suitably sufficient qualification for dispensers in the armed forces; that is, it was deemed to be 'good enough'.¹⁰⁰ It was considered to be easier to obtain that to pass the Pharmaceutical Societies' examinations, and was often held by women, many of whom held the role of dispenser in Australian-based military hospitals.¹⁰¹ As with military dispensing examinations, the Apothecaries' Board of Examiners also did not include a registered or qualified pharmacist, nor was there any "statutory control of the examination."¹⁰² In 1916, the *Australasian Pharmaceutical Notes and News* (APNN) reported that the Australian Army Council had issued an order that *only* women were to be employed as dispensers in army hospitals, and these posts were filled by Apothecary Hall dispensing certificate holders.¹⁰³ The instruction to employ women as dispensers in Australian-based army hospitals may have also been made from a position of allowing male dispensers to be posted to overseas roles, leaving women to attend to garrison duties. The Australian Army's lack of recognition of full pharmacy qualifications and registration by following the British model for a military medical corps, however, set in place their

⁹⁹ Shaw, 34, 43.

¹⁰⁰ Copeman, 70. This certificate remains in use today as "Technician in Pharmacy", and continues to be awarded.

¹⁰¹ 'Society of Apothecaries Certification', *Australasian Pharmaceutical Notes and News* 13, no. 3 (1 August 1916): 34.

¹⁰² 'British Military Dispensers - An Unexpected Danger to Australian Pharmacy', *C&DA*, (1 May 1915) 165.

¹⁰³ 'Society of Apothecaries Certification', *APNN*, (1 August 1916), 34.

subsequent refusal to initially contemplate equivalency in rank between pharmacists and doctors or dentists.

Dissatisfaction with the Australian government's position on the provision of commissions to registered pharmacists continued well after the establishment of the AAPS until the very end of the war in late 1918. Not content with honorary commissions being awarded to those who were placed in control of Army dispensaries or medical depots, the Queensland Pharmaceutical Society (QPS) continued to push for commissioned rank for *all* pharmacists handling medicines. In their letter tabled at the Council of Pharmaceutical Societies of Australasia's (CPSA) monthly meeting in October 1918, the Secretary of the QPS wrote that "considerable dissatisfaction prevailed in respect to the position occupied by the pharmaceutical chemists acting as dispensers in the AIF, and the anomalous position in which they were placed in view of their special training legally imposed in order to obtain registration."¹⁰⁴ They also felt that "special educational training entitled to higher rank than they at present received."¹⁰⁵ A continued focus remained on the disconnection between education and training and pharmacists' position, even within the AAPS. This indicates that Pharmaceutical Societies and, by extension, their members, remained concerned that pharmacists' specialist education and training continued to be disregarded or considered insufficient by other health practitioners within the military, and by the military authorities in turn.

¹⁰⁴ 'Monthly Meeting Minutes' (Council of Pharmaceutical Societies of Australasia, October 1918), 424, MS9601 Y Box 23, State Library of Victoria, Melbourne.

¹⁰⁵ Ibid.

Class and Rank – Status and Standing in the Armed Forces

“They could offer their services for half-pay, or Staff-Sergeant’s pay at the start, provided they were allowed to wear the uniform of a Lieutenant.”¹⁰⁶

The importance of status to both military and civilian pharmacists during the late nineteenth and early twentieth centuries should not be underestimated. Issues of status played important roles for New Zealand and Australian military pharmacists throughout the duration of the conflict. Pharmacists became almost desperate for recognition of both their profession and their qualifications, and for the associated status that this recognition would bring to serving pharmacists. Compromises were suggested to promote and facilitate the granting of commissions, such as pharmacists being willing to do the work for a Staff-Sergeant’s salary, so long as they could hold the rank of Lieutenant and also wear the corresponding uniform, as described in the quotation at the beginning of this section.¹⁰⁷ It became important to serving pharmacists that their position in the Dominions’ militaries should at the very least be *seen* as holding the status of a commissioned officer, if not actually receiving the pay rate commensurate with that rank. The *appearance* and social status of a commission thus took on greater importance than any fiscal aspect or remuneration for the role.

Education was also key in the perception held by pharmacy regulatory bodies that Army-trained dispensers were sub-standard, and these soldiers should therefore not be accorded a level of military social status equivalent to a properly trained, qualified and registered pharmacist. During the meeting with Mr Jens Jensen in 1914, Charles Towl reiterated to the Minister that the Department of Defence had previously given an

¹⁰⁶ ‘Pharmacists and Commissions in the A.A.M.C.’, *Chemist and Druggist of Australasia* 31, no. 4 (1 April 1916): 121.

¹⁰⁷ *Ibid.*, 120; ‘Military Matters’, *Council of Pharmaceutical Societies of Australasia Annual Meeting Minutes*, no. 18 (28 March 1916): 245–46.

undertaking that “army dispensers, after a few months’ training, should not be called by any name or **given any status** which would make it appear that they were qualified pharmacists.”¹⁰⁸ By making this point, Towl reinforced the concept that qualifications and education should place a registered pharmacist at a higher level of status than an Army-trained dispenser. Again, the emphasis on educational attainment was expected to link to improved military social standing.

As discussed in the prior section, Army-trained dispensers and compounders were subject to significantly lower standards in their training and examination than civilians undergoing full apprenticeships, where the “chief difference between the two sets of candidates [Army-trained students and civilian apprentices] was the social position.”¹⁰⁹ This comment underscored the low status position held by the dispenser or compounder within the army, and reinforced the perception held by senior military medical officers of pharmacists being at significantly lower social strata than other health-related occupations. The terms ‘Army-Dispenser’ and ‘Army-Compounder’, used to denote those who were Army-trained, however, were not removed in the Australian armed forces until after the establishment of the AAPS.¹¹⁰ As long as Army-trained dispensers and compounders, who were held in low regard by the military authorities, remained as part of the military establishment, however, qualified and registered pharmacists who enlisted to serve at the outbreak of the war were treated as members of the same social stratum.

Although New Zealand pharmacists did not achieve commissioned rank during or after the war, Australian military pharmacists serving in dispensaries and medical supply

¹⁰⁸ ‘Military Pharmacists and the Desire for Commissions’, *C&DA* (1 January 1915), 9. Emphasis mine.

¹⁰⁹ ‘British Military Dispensers - An Unexpected Danger to Australian Pharmacy’, *C&DA*, (1 May 1915) 165.

¹¹⁰ ‘Military Matters - Victoria’, *Chemist and Druggist of Australasia* 31, no. 2 (1 February 1916): 49.

base depots were granted the rank of honorary lieutenant after the formation of the AAPS. This rank differed from a permanent commission, as it only applied for the duration of hostilities or for a particular posting, and once ended, the honorary officer then returned to his original rank. This process had financial imperatives; by being an honorary appointment, the officer did not receive pay at the same pay rate as those who held permanent commissions, and he was also expected to pay for his own uniform and full mess fees.¹¹¹ Butler, in his work on the Australian Army Medical Service during WWI, casually noted that honorary commissions to pharmacists were conferred “by the Army to circumvent the necessity of granting ‘substantive’ commissions to other than **certain socially acceptable classes** of personnel.”¹¹² Although Butler does not expand on this comment, the casualness of his observation indicates that the British preference for members of a particular social class to populate the officer ranks was a dynamic that remained influential in the Australian armed forces, and that this preference was such common knowledge and so widely accepted in the Army that no further explanation was required.

Perceptions of status and profession disparity between the roles of pharmacist and other health practitioners were also challenged. New Zealand pharmacist, James Macalister of Macalister and Co. in Invercargill, wrote to the President of the Pharmacy Board of New Zealand (PBNZ) on 25 November 1915, taking the Board to task for not sufficiently championing pharmacists’ status in the military, and comparing the lack of action on the Board’s behalf to that of the regulatory body for New Zealand dentists. In his memo, he wrote:

¹¹¹ ‘Nominations of “Senior Pharmacists” to Be Honorary Captains’, *Chemist and Druggist of Australasia* 31, no. 2 (1 February 1916): 48–49; ‘Council of Pharmaceutical Societies of Australasia Monthly Meeting Minutes’, January 1916, 223–24, MS9601 Y Box 23 Vol. 18, Victoria State Library.

¹¹² Butler, 490. Emphasis mine.

Let us take the Dental profession. This profession by using its directing head that is the Dental Association has obtained for all qualified dentists nothing less than a commission while the workshop labourers – the mechanics – take the rank of sergeant. Any layman can see how unimportant a dentist's work is comparatively speaking with the general knowledge of the average chemist in surgery, tooth extraction, bandaging, etc [sic] to say nothing of the all important dispensing. My own opinion is that registered chemists should be appointed as doctor's assistants and given a lieutenancy.¹¹³

In his correspondence, Macalister clearly has little regard for dentists, considering their work to be less important and therefore of less value or status than that of pharmacists, by virtue of the wide and complex range of a pharmacist's education and training. He also considered that pharmacists would be of greater benefit and value to doctors by working collaboratively alongside as their assistants, and should therefore be granted a suitable rank to demonstrate a correspondingly higher occupational status than that of the dental 'workshop labourer' or 'mechanic'. By working directly alongside the medical officers, pharmacists would acquire a degree of 'reflected' status, thus increasing their own prominence and promoting pharmacy as a health profession, rather than a manual trade.

A lower level of social standing in the civilian sphere impacted directly on New Zealand military pharmacists. On 25 March 1916, the PBNZ sent a deputation to meet with the New Zealand Minister of Defence, James Allen (later Sir James), to again pursue the subject of commissions for serving pharmacists. This deputation did not achieve their goal, and Allen refused their request on 1 May 1916 on the basis that the British model for

¹¹³ 'Letter, J. Macalister to Pharmacy Board of New Zealand', 25 November 1915, Box 14 81-084-14, Alexander Turnbull Library, Wellington.

the Royal Army Medical Corps strictly required progression through the Corps examinations to become eligible for promotion to non-commissioned rank.¹¹⁴ Prior to this meeting, however, Brigadier-General Alfred William Robin had sent a short, hand-written minute to the Minister, advising him that “It would not be wise to give commissions as suggested by the deputation. Most of these men have done little in volunteering in territorials. It is open to qualify for Quartermaster in Ambulance Corps.”¹¹⁵ How Robin was able to determine this lack of volunteering is not evident; a review of the enlistment forms of the nearly 300 New Zealand pharmacists or those who had some form of pharmaceutical training who signed up over the course of the war, however, indicates that most of them did, in fact, have some previous military experience in cadet corps, rifle clubs, or the territorials. Robin may have assumed that, as most pharmacists were occupied in retail trade and found it difficult to get away to annual camps, they did not participate in territorial training. It is therefore reasonable to infer that Robin’s reluctance to support the granting of commissions to New Zealand military pharmacists may have stemmed from social, rather than operational, concerns.¹¹⁶

It was not the intention of the respective New Zealand and Australian Pharmaceutical Societies to upset the traditional medical hierarchy that was firmly established in the civilian sphere, however, but to reserve for serving pharmacists what they considered to be a suitable position in the social strata of the military. Should pharmacists be granted the lowest-ranking commission, i.e. 2nd Lieutenancy, they would

¹¹⁴ ‘Letter, Minister of Defence to Pharmacy Board of New Zealand, Establishments and Recruitment - Enlistment of Chemists in NZEF’, 1 May 1916, AAYS 8638 AD1/829 29/144, Archives New Zealand, Wellington.

¹¹⁵ ‘Minute, Brigadier-General A.W. Robin to Minister of Defence. Establishments and Recruitment - Enlistment of Chemists NZEF’. Quartermasters were traditionally promoted from the ranks, rather than granted as a commission.

¹¹⁶ This is ironic, as Robin himself was the son of a baker and worked as a coach and carriage builder before entering the New Zealand Army (artillery) as a soldier in the permanent forces.

not militarily rank above doctors, whose lowest rank on enlistment was captain, thus preserving the semblance of the civilian medical hierarchy (see Appendix 2 for military structure).¹¹⁷ As 2nd Lieutenants, pharmacists would, however, be able to avail themselves of ease of access to medical staff in order to work collaboratively alongside the Medical Officers, thus increasing their professional standing with ‘reflected’ status. They would also be able to access those benefits that accrued with holding an officer’s rank that they felt entitled to through their qualifications, such as entry to the officers’ mess.

The Importance of the Officers’ Mess

Being able to dine in the officers’ mess was a public affirmation of the military social standing of the officer.¹¹⁸ By virtue of their educational attainment and qualifications, pharmacists felt that they deserved to both eat and associate with others who they considered to be their social equals. That military pharmacists were relegated to the non-commissioned officers’ (NCOs) mess due to not being able to attain higher rank than Staff-Sergeant was a perceived injustice, keenly felt.¹¹⁹ This is demonstrated by a correspondent to the editor of the *Australasian Journal of Pharmacy* (AJP) in early 1915, who wrote that he had resigned from the AIF because of “the scant recognition [he] received financially (in comparison to other members of the corps, for the especial information which the job required), and because of the rough life with other sergeants, who were not too well mannered, to say the least.”¹²⁰ The writer of this letter clearly

¹¹⁷ ‘58th Annual Meeting Minutes’, *CPSA*, (23 March 1915), 171.

¹¹⁸ The word ‘mess’ originates from ‘mes’ in Old French, meaning a meal, a portion of food, or a dish.

¹¹⁹ The British system, transferred to New Zealand and Australia, operated three mess levels: Officers’ Mess (for commissioned officers only); WO’s (Warrant Officers) and Sergeants’ Mess (for senior NCOs); and Junior Officers’ and Other Ranks (for Corporals, Lance Corporals and Privates). After the establishment of the AAPS, Australian pharmacists holding honorary commissions were entitled to dine in the Officers’ Mess, which had access to a wider range and quality of food than in other messes. This, of course, did not apply to New Zealand military pharmacists.

¹²⁰ ‘Military Pharmacists’, *Australasian Journal of Pharmacy* 30, no. 350 (20 February 1915): 72.

considered that he inhabited a higher social stratum than his fellow sergeants, and that they were socially inferior to him.

After the establishment of the AAPS, Australian pharmacists embraced the role of medical quartermaster. As officers, quartermasters and those in charge of medical depots and stores were granted the privilege of dining in the officers' messes. While at Gallipoli, New Zealand medical officer and surgeon Captain Charles Mackie Begg wrote in his diary in May 1915 that "Next door to us is an [Australian] Advanced Depot of Medical Stores and the Officer-in-Charge, a Captain Edmonds, messes with us."¹²¹ Although they were then entitled to join other officers in their own mess after the establishment of the AAPS in early 1916, as honorary appointments, pharmacists were required to pay their own mess fees in full (rather than at a subsidised rate).¹²² This was, however, a financial price that was willingly paid for the increased status accruing to military pharmacists by association with other officers on a relatively equal social footing in their own space.

Status was not the only reason for pharmacists wanting access to the officers' mess. As described by Patrick Bury in his work on the 'Barossa Night' ritual of the Royal Irish Regiment, entry to the officers' mess indicated admission to a highly selective set of formalised social rites, designed to confer professional legitimacy, cohesion, and exclusiveness on the participants.¹²³ Although his work studies a modern-day combat unit freshly returned from a tour of duty in Afghanistan in 2009 and the reasons behind the deviation of the junior officers from the traditions of the regiment's 'Barossa Night'

¹²¹ 'Transcript of Charles Mackie Begg's Diary', 15 May 1915, 23, AG-497-10, Hocken Library, University of Otago, Dunedin. Edmonds was not, however, a pharmacist as the AAPS was not established until after the evacuation from Gallipoli.

¹²² 'Nominations of "Senior Pharmacists" to Be Honorary Captains', *C&DA*, (1 February 1916), 48–49; 'Council of Pharmaceutical Societies of Australasia Monthly Meeting Minutes', (January 1916), 223–24.

¹²³ Patrick Bury, 'Barossa Night: Cohesion in the British Army Officer Corps', *British Journal of Sociology* 68, no. 2 (2017): 314–16.

ceremony, Bury clearly identifies that historic class dynamics and “elitism [sic] remained a key cultural characteristic of the officer corps.”¹²⁴

Rituals around the type, quantity and availability of food and its function in reinforcing class or social status have been widely examined, often as facets within broader anthropological studies. Social identities and structures in different cultures often revolve around the provision of hospitality, and many societies have strict social systems regulating who is permitted to prepare food for or share food with whom.¹²⁵ The preparation and consumption of food therefore takes on complex layers of meaning and expression.¹²⁶ As officers’ messes are by their nature closed systems, their specific rituals and traditions have received little scholarly attention. In gaining entry to the officers’ mess, even in an honorary capacity, pharmacists sought to integrate themselves within the cultural ‘tribe’ of the officer corps, and align themselves with a higher stratum of class through accepted shared experience and ritual.

Conclusion

The lack of recognition of full pharmacy qualifications and registration by following the British model for a military medical corps set in place New Zealand and Australia’s initial refusal to contemplate equivalency in rank between pharmacists and doctors or dentists. As discussed in Chapters 1 and 2, New Zealand pharmacists did not achieve parity, while Australian pharmacists were eventually successful in doing so, albeit

¹²⁴ *Ibid.*, 315.

¹²⁵ For example, the caste system in India strictly prohibits Brahmin from eating food prepared by those of a lower caste, and members of the Dalit (‘untouchable’) caste are prohibited from eating in the company of any caste other than their own. As Indian troops have been part of the British Army for a long period, these dietary considerations have been well-entrenched, and the British Army were accustomed to accommodating them.

¹²⁶ John Monaghan and Peter Just, *Social and Cultural Anthropology: A Very Short Introduction* (Oxford: Oxford University Press, 2000), 39.

honorary only. The drive of military pharmacists for recognition and validation of their profession, along with the corresponding increase in social status as discussed in Chapter 5 should not be underestimated. Education is also interlaced with professionalism, reinforcing the social stratification of class. Higher education, traditionally the domain of the well-to-do, had the greatest class distinctions – it was only the offspring of the wealthy and therefore élite classes that could afford to attend university. University-level study required a substantial financial commitment, which in turn maintained social class stratification.

Social class also dictated what level of educational attainment was available according to the student's social position in life. Education was considered valuable, but only in so far as it fitted the student for their expected position in the societal hierarchy. Social mobility through education during the nineteenth century was a result of the rise of the middle class, increasing industrialisation, and the increase in awareness and social status of science. This created the beginnings of educational change needed for the meritocracy of administration (particularly in the colonial Empire), retail and other business enterprises. Pharmacy, however, remained confined to the apprenticeship model of education, as the occupation had a high degree of manual labour and a strong commercial focus associated with it. Being 'in trade' or associated with one of the mercantile businesses was to be of a lower class socially.

Under the British military model, pharmacists were the only health role to have Army-specific training in their occupational function. Doctors, dentists and nurses did not receive any further training in their professional roles or occupations after enlisting in the Army Medical Corps in both New Zealand and Australia. Internally-trained Army-

dispensers and Army-compounders were considered to be 'good enough' for the serving soldier, although this perception was directly contrary to legislative requirements in both countries, and the internal examinations were well below accepted civilian educational standards. It is evident that British, New Zealand and Australian military attitudes towards pharmacy and dispensing had not kept up with civilian educational or legislative developments, and were slow to adapt to changing circumstances. By having an in-house training programme, however, the military authorities recognised that dispensing and compounding required a minimum level of specialised knowledge to perform the roles. It is therefore extraordinary that established civilian qualifications and registration of pharmacists were not acknowledged or accepted. Although qualified to a level that permitted legal registration, it is likely that the authorities considered that pharmacists' apprenticeships did not hold the same gravitas as a university degree. Pharmacy was therefore deemed within the military as a trade, not as a profession or even quasi-profession. Educational pathways therefore were key factors in the links between rank, class and social status.

Social status was highly important to military pharmacists. Their qualifications and resultant registration were considered indicative of educational attainment, and therefore of increased social status. Professional stratification within the occupation was the result of internecine issues with status at the core. Community pharmacists, who interacted with the public and directly diagnosed and treated minor ailments, were held to a higher social stratum than hospital pharmacists, who did not. Yet, those community pharmacists who enlisted in WWI were expected to perform a role equivalent to hospital pharmacists, with no recognition or validation of their professional social standing.

Resentment that military pharmacists were considered to be at the same social and thus occupational level as dental workshop technicians ('mechanics'), while dentists themselves held commissions was evident. The role of dental 'mechanic' was, like pharmacy, also of a highly manual nature, yet pharmacists had a wider and more complex educational background than the dental workshop labourers, with legal registration after successfully passing their examinations. This, pharmacists deemed, should have entitled them to at least the lowest commissioned rank, and to be able to work alongside medical officers. Reflected status from working as a doctor's assistant would also add to the professional and therefore social standing of the military pharmacist. Underpinning the drive for recognition and correspondingly increased social status was the desire for pharmacy to be understood and thus respected, not as a trade, but as a profession.

Conclusion

At the 11th hour of the 11th day of the 11th month in 1918, the big guns fell silent. Armistice was declared, and the war that had raged for four long years across Europe and the Mediterranean, involving most of the large Empires of the early twentieth century and their respective colonies and Dominions, was finally over. Surviving New Zealand and Australian pharmacists returned home, to a world that was forever changed. While researching the database, it became clear that some New Zealand pharmacists moved to live and practice in other countries after the war, while a few gave pharmacy away altogether, and moved into other careers or jobs. As discussed in Chapter 1, at least five had died by their own hand by 1932, although it is not known whether their actions were deliberate or accidental, or stemmed from physical, mental or emotional trauma sustained from their war experience or from other reasons, such as relationship or family breakdown or financial difficulties. The majority of those New Zealand pharmacists who survived returned to their interrupted lives and businesses and were reabsorbed into their local communities. It is reasonable to conclude that Australian pharmacists were likely to have done the same. Pharmacy as a wider profession and practice, however, did not change substantially as a result of the war. Innovation and technological advancement in pharmaceutical science, changing the nature of pharmacy practice and the eventual role of the pharmacist, would not be evident until well after World War II (WWII).

This thesis explored and resurrected the experience of New Zealand and Australian pharmacists serving in their respective countries' militaries during World War I (WWI). It illuminates a hitherto unrecognised area of both WWI studies and military medical history. In doing so, it highlights cultural and social issues that faced pharmacists who served in

the militaries of both New Zealand and Australia during WWI, and continued to face until the later part of the twentieth century.

As stated in the Introduction, the aim of this thesis is to answer four main research questions concerning the role and experiences of pharmacists in the Australian and New Zealand Army Corps (ANZAC) serving their countries during WWI *as pharmacists*.¹

These questions are:

- What was the role and experience of military pharmacists in the ANZAC forces during WWI?
- How did pharmacists perceive themselves within the military context?
- What were the social and cultural factors involved that determined or impacted on their war experience?
- Were military pharmacists recognised as health professionals by the military authorities, and if not, why not?

What was the Role and Experience of Military Pharmacists in the ANZAC Forces During WWI?

Little material exists that directly portrays actual pharmacy practice and day-to-day operations in hospital, troopship, and hospital ship dispensaries. Records have not been kept in either New Zealand or Australian archival institutions that discuss these practices in detail.² The professional invisibility of pharmacists and their work due to their position in a support area has been identified in the thesis as contributing significantly to their lack of representation in archival, and subsequent historiographical, material.

¹ Many pharmacists in both New Zealand and Australia did not work in dispensaries, but either joined combatant units or were assigned to other areas of the Medical Services, such as stretcher-bearers, orderlies or clerks.

² Lack of archival material is due, in part, to previous institutional collection and records management policies and processes.

In their attempt to chart the role and experience of each country's serving pharmacists, Chapters 1 and 2 of the thesis do, however, identify and examine the political environment and background that influenced the broader experience of military pharmacists, including the role of the pharmacy regulatory bodies in both countries. New Zealand pharmacists were proscribed in their ambitions for professional recognition for the duration of the war by the government's inconsistently-applied insistence on maintaining the precedent of the Imperial British military structure, which did not allow for pharmacists to hold commissioned rank. Australian military pharmacists were successful in obtaining honorary commissions after their push to create the Australian Army Pharmaceutical Service (AAPS) in early 1916, which came about as a result of political agitation by the combined state Pharmacy Boards.

A unique database of New Zealand serving pharmacists was developed as part of the research to more fully investigate the otherwise 'silent' experiences of this country's cohort. Not only did this database identify and broadly chart the wider lives of nearly 300 military pharmacists, examination of their personnel files also permitted individual military experiences to be teased out to a greater degree than from other archival records. Personnel files are, however, brief in their description of specific work roles, therefore the everyday experiences and work practices of military pharmacists could only be construed based on where they were posted.

Roles and work experience of military pharmacists in the ANZAC forces during WWI can therefore only be broadly surmised, rather than definitively determined. Lack of archival material prohibits full analysis of day-to-day tasks, while wider political contexts can only be conjectured, based on high-level correspondence between Pharmacy Boards

and the governments of both countries. Detailed dispensing practice can, however, be inferred from anecdotal evidence of practice in community and hospital pharmacies of the period, as well as letters from serving pharmacists to the editors of pharmaceutical journals. It is therefore reasonable to assert that these practices did not differ significantly in the military context. The lack of archival reference to WWI military pharmacy and pharmacists also directly correlates to the absence of historical analysis of this occupational group in WWI or military medical histories.

Pharmacists did, however, perform as dispensers, compounders, and medical quartermasters during their military service. The nature and form of these roles were not as pharmacists themselves expected, and positions were few. Military pharmacists' expectation was that they would work collaboratively alongside medical staff to assist doctors and directly contribute to the health of the troops, which did not occur. The experiences of New Zealand and Australian military pharmacists were thus highly variable, and reflected their respective governments' opinions of what the role entailed. With a dearth of concrete primary evidence, however, these roles cannot be fully substantiated, particularly in respect to New Zealand military pharmacy.

How did Pharmacists Perceive Themselves Within the Military Context?

In both countries, serving pharmacists considered themselves as professionals in the health sector, in direct opposition to how they were seen by other health practitioners. This disconnect in *perception* of the professionalism of pharmacists by other health providers consequently influenced the perception of pharmacists as professionals by the military authorities, and is examined in Chapter 5. Accordingly, this created resentment amongst members of the profession in New Zealand. In Australia, the business and trade

aspect of pharmacy was reluctantly accepted by pharmacists as their means to recognition by the authorities, rather than their health care expertise. By focusing on the business side of pharmacy, military pharmacists in Australia created a niche role in the Australian Army for themselves as medical quartermasters. In this role, they used their business acumen to save the Commonwealth government a not-insignificant amount of money on medical stores and commodities. War economics, trade in medicines and pharmacists' involvement in these processes during the war are discussed in Chapters 3 and 4. It is, however, the aspect of the profession that pharmacists were most desirous to move away from (being 'in trade') that determined their value to the authorities, rather than their skills as health professionals.

New Zealand pharmacists were not given the same opportunity. Although they also considered themselves to be health professionals and expected that they would work collaboratively with other medical staff at the outbreak of the war as part of the medical service, their skills were completely unrecognised and unvalued. This meant that their service throughout the war remained invisible as they both worked in supply and logistics as part of a support function, and also could not be promoted above the non-commissioned officer rank of Staff-Sergeant, as determined by British Imperial Army practice. Lack of commissioned rank was a contributing factor in the invisibility of their experiences in both the archival record as well as subsequent historiography.³ With the lack of official records relating to military pharmacists and pharmacy, it is only through serving pharmacists' correspondence with the Pharmacy Board of New Zealand (PBNZ) and to the editors of trade journals that determination of how serving military pharmacists considered themselves and their role in the military context can be made.

³ Non-commissioned officers were referred to as 'Other Ranks' in official records, with no further delineation or explanation.

Military pharmacists in New Zealand and Australia felt disrespected and slighted at the lack of recognition for their education, qualifications and skills shown to them by both medical staff and military authorities. Commissioned rank was expected to be granted to military pharmacists on enlistment based on their professional skills and knowledge of medicines, and pharmacists were affronted that this did not occur. Serving pharmacists themselves, however, did not recognise that it was their highly manual work practices that relegated their skills and knowledge to a lower rank in the military hierarchy.

What Were the Social and Cultural Factors Involved that Determined or Impacted on their War Experience?

Social class and educational pathways, along with issues of professionalism perceptions, were the social and cultural factors that impacted on the war experience of military pharmacists. These social and cultural factors have been examined in Chapter 6. Social class (wealth-based) broadly determined the educational pathway for pharmacists, with the apprenticeship and its emphasis on manual labour as pharmacy's training method until the mid-twentieth century. Upper-working and middle-class families often chose apprenticeship pathways for their offspring as costs related to training and education were lower, while university study was mainly reserved for the children (mainly sons) of wealthy families. Although some British universities such as University of Edinburgh and the London Hospital Medical College did offer courses in medicine at lower cost and were more accessible than the traditional British medical schools of Cambridge and Oxford, pharmacy was not included as a degree-level course. With a strong focus on artisanship and manual labour in the form of compounding medicines and manufacturing of tablets,

pills and other products, the occupation remained attached to the apprenticeship as its training format.

Although pharmacy did not have state-recognised qualifications, pharmacists were nevertheless required to pass stringent and difficult internal examinations to gain registration with the regulatory pharmacy bodies in both New Zealand and Australia in order to practice. As a result, ANZAC pharmacists considered their specific occupational skills, body of knowledge and legal requirements for registration to be relatively (although not exactly) equivalent to a university-level degree. University degrees were, however, the pathway for social recognition of professionalism, as both doctors and dentists were required to hold tertiary qualifications for registration to practice. Apprenticeships were the educational delivery method for mercantile trades such as pharmacy rather than professionals, with strong manual labour associations as well as societal bias of being 'in trade'. Doctors and dentists charged patients for their clinical skills and knowledge; pharmacists charged patients for the products they made.

Nursing was, however, an outlier. By the time of the outbreak of war, nursing was increasingly seen as an acceptable paid employment for members of the respectable working or middle classes, the same social strata as pharmacists. Nursing education was also equivalent to an apprenticeship, with hands-on training on the wards, supplemented by lectures given by the medical staff or Matrons. There were no recognised university courses or tertiary education certificates for nursing; only those nurses who held the certificate issued through completion of the hospital-based training programmes were permitted to register as qualified nurses. As women, nurses were permitted a privileged position based on their gender, according to societal expectation of the period. Although

they were not allowed to hold commissioned rank during the war, nurses were, however, accorded privileges concomitant with commissions. This is a result of nursing being considered not as a profession, but as a vocation or calling, with strong intimations of self-sacrifice and service, reflecting nursing's occupational origins in religious houses.

Were Military Pharmacists Recognised as Health Professionals by the Military Authorities, and if not, Why Not?

Pharmacists' value to both governments lay chiefly in the ability to initiate cost savings on the provision of medicines and drugs. In New Zealand, these cost savings were largely unreported and unrecognised other than in annual reports to the House of Representatives, as New Zealand did not establish a dedicated military pharmaceutical service. As non-commissioned officers, those military pharmacists who were responsible for these savings were silenced and disregarded.

In Australia, the development of the AAPS reflected the Commonwealth government's clear awareness that military pharmacists could use their business as well as technical skills in purchasing, trade contacts and bulk compounding to save costs in medical stores. Stock and inventory control, and records management skills developed through civilian business practices of running community pharmacies were valued over the provision of assistance to medical officers and the ability to treat minor ailments.

The drive for political recognition of their professional qualifications was the underpinning factor throughout the pharmacists' experience for the duration of the war. Full recognition by the military authorities of the qualifications and legal registration requirements in order to practice as a pharmacist did not, however, eventuate for either

New Zealand or Australian military pharmacists. New Zealand military pharmacists were completely side-lined by the military authorities, while Australian military pharmacists were reluctantly granted honorary commissions only. Civilian social and cultural factors of class and education method therefore directly contributed to the lower ranked position that ANZAC military pharmacists found themselves in at both the start and for the duration of the war.

Interwoven throughout this thesis is a single core theme: the invisibility of military pharmacy. During the war, as discussed in Chapter 4, while articles on the treatment of military diseases and wounds were regularly contributed to and discussed in medical journals, the sourcing of medicines and those who worked with them were omitted. Archival material collected after the war did not recognise pharmacy and pharmacists, and their experiences went unheeded. Official military histories written directly after the war focused on the officer classes, and ‘other ranks’ were omitted from the historiographical record. Subsequent histories written by scholars of WWI and military medical history have also overlooked pharmacists, drawing as they have on archival resources as well as anecdotal or first-person evidence in the form of diaries and letters. Returned pharmacists, however, disappeared back into their normal lives and communities, while as support staff, military pharmacists disappeared into the ‘other ranks’ in official records.⁴

Military pharmacists in both New Zealand and Australia were not recognised as health professionals. As such, pharmacy practice and its practitioners were effectively marginalised within the military context. This lack of recognition of the professionalism of military pharmacists was due mainly to the élitist mind-set of the upper echelons of the

⁴ I have been unable to locate any surviving diaries or letters of serving pharmacists.

military hierarchy, with their strong emphasis on ‘correct’ social class. Doctors who also held a high rank within the military had a vested interest in keeping other health practitioners in their professional places in order to retain the established medical hierarchy with doctors at the top, and influenced how the military authorities perceived pharmacists.⁵

Going Forward

Research into the status and role of military pharmacy and pharmacists is a new field of study, with potential for further investigation to be conducted. As this thesis is the first in-depth study of New Zealand and Australian military pharmacists in the early twentieth-century, it has necessarily taken a broad view. Further research could expand it, taking the timeline further forward into the interwar period and beyond, examining whether the experiences of ANZAC military pharmacists in WWI impacted on their status and experience during later service during the conflicts of WWII, Korea or Vietnam.⁶ How did the development of penicillin during WWII affect military pharmacy practice? The database that was created for this thesis could also be expanded to include the Australian cohort, and be more fully interrogated as a comparative exercise in order to contribute to a larger social history of New Zealand and Australian pharmacy. As very few histories of the pharmacy profession in both countries have been written, it would be timely to review and update these, thus increasing the visibility of pharmacists in both community and military contexts. As an example, there is no evidence to indicate how pharmacists who returned from the war were perceived by their communities or families. Did they struggle to reintegrate? That several New Zealand pharmacists died by their own

⁵ Neither Richard Fetherston (Australian Director-General of Medical Services) nor James Purdy (New Zealand Director-General of Medical Services), both doctors, were supportive of pharmacy and pharmacists in the military.

⁶ A number of the younger New Zealand pharmacists served in both WWI and WWII.

hand directly after the war may be indicative that perhaps some did not manage to. Did their social status increase by virtue of them having served God, King and country? Or did they simply fade into the background as independent small business owners, focusing on running their pharmacies and providing for their families? Further research to answer these questions would contribute to a fuller understanding and thus greater visibility of the pharmacy profession and its practitioners within New Zealand and Australia.

Epilogue – Military Pharmacists of Today

During the course of this PhD journey, I was honoured to have an invitation extended to me to give a talk at the annual Australian Defence Force (ADF) Military (Pharmacy) Special Interest Group (MILSIG) meeting, held at the Royal Australian Navy base *HMAS Penguin* on Sydney's North Shore over two days in July 2018. This meeting drew together the majority of the current ADF serving and civilian pharmacists, with the obvious exception of those who were deployed on active service in other countries. My talk described the origins of the Australian Army Pharmaceutical Service from its genesis in WWI, and was very well received, with nearly all attendees previously unaware of how the Service had developed. I was permitted to stay for the entire duration of the meeting, and it became obvious from other talks that were given as well as discussions with a number of the attendees during the two days of the meeting that many of the problems that beset Australian military pharmacists of 1914-1918 remain the same today, with one fundamental difference. Pharmacists in today's military enter the forces as commissioned officers, and have the ability to rise through the ranks to full Colonel. This is a direct result of pharmacy becoming a university-level qualification, and the BPharm. is now recognised as part of the professional pathway for specialist officer recruits.

Some issues from 1914-1918 remain, however.⁷ Pharmacy in the ADF is not part of the Medical Service; rather, it forms part of the Supply and Logistics section. Military pharmacists continue to be unrecognised as health specialists, and also continue to hold the role of medical quartermasters as developed by the original AAPS. Clinical pharmacy practice and direct interaction with patients is rare. Australian military pharmacists thus continue on the pathway set with the establishment of the AAPS during WWI as medical logistics and supply experts, rather than clinical pharmacy practitioners. As with their predecessors of a century ago, today's military pharmacists and their work continue to remain 'invisible'.

⁷ Several of the main issues are operationally sensitive, and as such, I am unable to discuss them.

Fig. 13: Attendees, Australian Defence Force Military Pharmacy Special Interest Group (MILSIG) Meeting, 25-26 July 2018, HMAS Penguin, Sydney



Source: L. Doughty, Personal Collection (reproduced with permission)⁸

⁸ Images of current serving personnel are never named for security reasons, and permission to reproduce this photograph in this thesis was contingent on de-identification.

GLOSSARY

Allied Forces/Allies	Combatant nations including Britain, France, Italy, Russia, United States of America, as well as Dominions of the British Empire – Australia, Canada, India, New Zealand, South Africa
Axis Forces/Axis	Combatant nations including Austria-Hungary, Germany, Turkey
Commonwealth of Australia	Federation occurred in 1901, uniting the individual self-governing colonies of Queensland, New South Wales, Victoria, Tasmania, South Australia and Western Australia to become states of the wider Commonwealth of Australia
Crocks	Large earthenware jars
Establishment	Structure of military units, detailing required numbers of officers, non-commissioned officers, and rank and file members, and their associated roles
Extractum Opii B.P.	Extract of opium to <i>British Pharmacopoeia</i> standard
Extractum Opii Liquidum B.P.	Extract of opium in liquid form to <i>British Pharmacopoeia</i> standard
Galenical	Plant-derived medicine, rather than chemical
Lines of communication	Secure route that connects an operating military unit with its supply base to facilitate and ensure an uninterrupted supply of materiel and men
Materia medica	Body of knowledge relating to the therapeutic properties of medicines (Latin)
Materiel	Military supplies and equipment
Oxbridge	Oxford and Cambridge Universities, Great Britain
Polyvalent	Vaccine prepared from cultures of two or more strains of the same species of micro-organism or virus
Quartermaster	An officer commissioned from the ranks who is responsible for the supervision of stores and distribution of supplies and provisions
Therapeutics	Treatments, therapies or drugs
Tincture Opii B.P.	Opium dissolved in alcohol (tincture) to <i>British Pharmacopoeia</i> standard

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Appendix 1: New Zealand Military Pharmacists: Nominal Roll

Surname	First Names	Service No.	Birthplace	PBNZ Reg. No.	Marital Status	Enlist Year	Enlist Age	Age at Death	Year of Death
A'Court	William Henry	61039	New Zealand	-	Single	1915	39	71	1947
Adams	Charles Nightingale	50972	Australia	-	Single	1916	26	54	1944
Aldersley	Reginald Theodore	3/2714	England	-	Single	1916	23	86	1979
Allen	George Douglas Brookes	41710	Ireland	-	Married	1916	42	67	1941
Anderson	William Harry Jackson (aka Wallace)	40477	England	-	Married	1916	42	67	1941
Andrews	Leonard Edward	68493	New Zealand	-	Married	1917	25	Unknown	Unknown
Armstrong	Gilbert Claude	65580	New Zealand	885	Single	1917	37	64	1944
Arnold	Frank Purvis	3/3847	New Zealand	994	Unknown	1917	25	64	1956
Austin	John Blyth	3/188	New Zealand	-	Single	1914	20	93	1987
Ayson	Leslie Duncan	3/2277	New Zealand	-	Single	1915	21	77	1971
Bardsley †	Daniel	8/1186	New Zealand	-	Single	1914	25	26	1915
Barnett	William Joseph Francis	48892	New Zealand	703	Single	1915	35	88	1968
Bartley	George Frederick	3/4223	Australia	1064	Single	1917	20	65	1962
Bevege	William Eric	3/1756	New Zealand	-	Single	1915	20	72	1967
Bird †	James Samuel	3/564	New Zealand	992	Single	1915	26	26	1915
Blacklin	Edwin Algernon Heighington Aylmer	3/47	England	-	Single	1914	35	Unknown	Unknown
Blair	Kenneth Patrick	3/2644	New Zealand	-	Single	1916	21	73	1968
Bonnington	Cyril John	44964	New Zealand	-	Single	1916	22	86	1980
Boock	Henry Lewis	3/2612	New Zealand	1085	Single	1916	21	82	1977
Boock †	Bertram	3/2344	New Zealand	-	Single	1915	28	31	1918
Booker	Leonard	55173	New Zealand	846	Single	1917	32	62	1947
Boyd	Sydney Lionel	3/1901	England	-	Single	1915	20	86	1981
Boyd	John	23/1940	Ireland	-	Unknown	1915	25	65	1955
Boyd	Joseph Henry	3/4333	New Zealand	-	Single	1918	20	72	1970
Brady †	John	61511	New Zealand	-	Single	1917	35	37	1918
Broadbelt	Richard	32423	New Zealand	-	Single	1916	36	76	1956
Brooks	John Frank	3/3939	New Zealand	890	Married	1917	32	87	1972
Brosnahan	William Godfrey	17121	New Zealand	780	Single	1916	33	Unknown	Unknown
Brown	William Thomas	75873	New Zealand	-	Single	1917	20	86	1983
Bryan	Benjamin Amos	63821	Ireland	-	Single	1917	26	60	1951
Burt	James Macalister	3/3777	Scotland	1035	Single	1917	22	38	1933

Surname	First Names	Service No.	Birthplace	PBNZ Reg. No.	Marital Status	Enlist Year	Enlist Age	Age at Death	Year of Death
Burt	Charles Lancelot	3/3551	New Zealand	-	Single	1917	20	78	1975
Butler	Leslie Waltham	3/2878	England	-	Single	1916	20	Unknown	Unknown
Cameron	James Muir	3/761	New Zealand	-	Single	1915	19	19	1915
Campbell	Adam Whitelaw	43952	Scotland	-	Married	1916	34	68	1950
Campbell	William John	3/4233	Scotland	-	Single	1917	19	86	1984
Carter	Albert Harold	91657	New Zealand	-	Married	1918	34	85	1969
Catton	Rupert Hector	3/3724	New Zealand	-	Married	1917	26	55	1946
Chapman	John Hardy	79857	New Zealand	-	Single	1917	20	Unknown	Unknown
Chappell	William Arthur	3/1589	New Zealand	860	Married	1915	31	61	1945
Chidley	Richard Albert	3/770	England	-	Single	1915	35	45	1925
Chong	Gerald McNaughton	3/2158	New Zealand	-	Single	1916	21	86	1982
Clarke	Arthur Spargo	28858	New Zealand	-	Single	1916	23	67	1960
Clarke	Edward William	3/3119	New Zealand	-	Single	1916	20	Unknown	Unknown
Clarke	Thomas Follett	58310	New Zealand	-	Single	1917	20	41	1939
Clift	Charles William	65280	New Zealand	-	Single	1917	21	88	1984
Clotworthy	James Wilson	3/2159	New Zealand	-	Single	1916	20	47	1942
Cockerill	Francis Henry	5/463a	New Zealand	766	Single	1914	32	64	1956
Compton	Kenneth George	3/2506	New Zealand	-	Single	1916	22	36	1930
Coningham (or Conningham)	Arthur	3/2378	Australia	-	Divorced	1916	45	Unknown	Unknown
Coombridge	Walter Samuel	55428	New Zealand	740	Single	1917	37	71	1951
Cooper	Edgar William	63564	England	-	Married	1917	32	Unknown	Unknown
Cooper	Patrick Charles	40517	New Zealand	-	Single	1916	26	83	1973
Corbett †	Eric	56246	Fiji	903	Single	1917	31	32	1918
Craig	Alexander George Muir	3/2177	Australia	-	Single	1915	25	59	1949
Craig	James Gordon	85182	New Zealand	867	Single	1917	31	35	1922
Crawford	David	61085	New Zealand	-	Single	1917	29	78	1966
Crawshaw	Lewis Gordon	3/2089	New Zealand	-	Single	1915	20	90	1985
Crotty	Thomas Vincent	31815	New Zealand	1079	Single	1916	21	75	1970
Devereux	Edward Jeffrey	11251	New Zealand	-	Single	1916	20	80	1975
Dingle	Jack Edward	3/1390	New Zealand	-	Single	1915	22	71	1965
Dixon	Frederick William	3/1832	New Zealand	-	Single	1915	20	52	1947
Dodds †	Harold Binnie	23475	New Zealand	925	Single	1915	26	28	1917
Dolphin	Frederick Horace	3/2055	New Zealand	-	Single	1915	19	72	1968

Surname	First Names	Service No.	Birthplace	PBNZ Reg. No.	Marital Status	Enlist Year	Enlist Age	Age at Death	Year of Death
Donaldson	Bertrand Robert	3/771	New Zealand	-	Single	1915	30	61	1946
Donnelly	William	3/1876	New Zealand	955	Married	1916	25	73	1964
Double	Charles Amos	38944	New Zealand	-	Married	1916	33	70	1953
Dowling	Richard Egbert Compere	3/128	New Zealand	1026	Single	1914	20*	81	1977
Duff	William John	3/2246	New Zealand	944	Single	1916	25	77	1968
Eccles	Russell	3/3678	New Zealand	-	Single	1917	20	54	1951
Ellerm	Harold	3/1390	New Zealand	1051	Single	1916	20*	81	1977
Ellis	John Weaver	3/139	England	999	Single	1914	26	Unknown	Unknown
Estall	Henry Wilson	3/3562	New Zealand	-	Single	1917	21	89	1985
Evenden	James Charles	9/1830	New Zealand	-	Married	1915	22	74	1985
Fairley	John	54483	New Zealand	648	Single	1917	40	79	1956
Falvey	William Bartie	3/2766	New Zealand	-	Single	1916	20	74	1970
Farmer	Francis Attila	3/3676	New Zealand	909	Married	1917	28	80	1970
Ferrick	Allan Clyde	3/2060	New Zealand	-	Single	1915	23	78	1971
Findlay	Allan James	6/227	Australia	-	Single	1914	24	45	1935
Findlay	Hugh Osborne	3/1677	New Zealand	970	Single	1915	24	66	1957
Findlay	James Gilbert	2/217	New Zealand	1030	Single	1914	22	34	1926
Fitzgerald	Gerald Henry Patterson	52593	New Zealand	794	Married	1917	32	82	1967
Fitzgerald †	Richard Henderson	39040	New Zealand	-	Single	1916	22	24	1918
Fitzgerald-Eagar	Neale	3/124	Australia	958	Single	1914	27	33	1920
Foster	Charles Loveday	21382	New Zealand	-	Single	1916	21	49	1945
Fraser	Percival Cecil	3/2065	New Zealand	-	Single	1916	22	83	1977
Freed	Harold Edmond	3/1740	New Zealand	-	Single	1915	23	78	1970
Fyson	Arthur Forbes	3/2549	New Zealand	-	Single	1916	21	62	1957
Galbraith	Walter Ernest	3/3831	New Zealand	-	Single	1917	20	66	1963
Gallagher	Joseph George	78134	New Zealand	881	Married	1917	29	81	1969
Gass	William	47420	England	1049	Single	1917	22	Unknown	Unknown
Gebbie	Norman William Thomas	18888	Scotland	-	Single	1916	23	23	1917
Gilchrist †	Jack Edward	3/323	New Zealand	-	Single	1914	30	30	1914
Gilpin	Herbert Cecil	24635	England	-	Single	1916	23	Unknown	Unknown
Given †	William	44468	Ireland	1017	Single	1916	26	27	1917
Goddard †	Douglas	3/498	New Zealand	922	Single	1914	25	27	1916
Goldsbury	Elwyn	92756	New Zealand	904	Married	1918	30	88	1976
Good	Robert Henry Bennett	41533	Ireland	1023	Single	1916	30	80	1966

Surname	First Names	Service No.	Birthplace	PBNZ Reg. No.	Marital Status	Enlist Year	Enlist Age	Age at Death	Year of Death
Gooding	Wallace Royal	3/2490	New Zealand	-	Single	1915	27	74	1961
Goodwin †	Erdington	16/1326	New Zealand	-	Married	1915	35	38	1918
Gower	Percival Fred	3/545	New Zealand	-	Single	1915	25	59	1951
Grant	Harold Herbert Francis	3/3456	New Zealand	973	Married	1917	26	79	1970
Grant	Leslie Robert	50206	New Zealand	-	Single	1917	20	44	1941
Gray	Richmond John Stevenson	83614	New Zealand	1022	Married	1917	34	67	1950
Gray	William Gabriel	3/3388	New Zealand	-	Single	1916	20	86	1982
Greaves	Sidney Hubert	3/3715	New Zealand	-	Single	1917	22	54	1950
Hall	Stanley Leonard	42501	New Zealand	-	Single	1916	20	80	1976
Hall	Walter Ernest	3/782	New Zealand	-	Single	1914	24	33	1923
Hamilton	Donald Cameron	3/3778	New Zealand	749	Single	1917	34	41	1925
Hammond	Edgar James	3/3684	New Zealand	-	Single	1917	20	27	1924
Hammond	Frederick Alva	3/3566	New Zealand	1000	Married	1917	26	Unknown	Unknown
Hampden	Alexander	8/3281	England	-	Single	1915	25	Unknown	Unknown
Hanan	Alfred Ernest Stanley	3/1519	New Zealand	-	Single	1915	23	58	1950
Hancock	Arthur Newlan	88391	New Zealand	1011	Single	1917	29	77	1966
Harper	William Stanley Blyth	67558	New Zealand	1038	Single	1917	23	83	1977
Harrop	Osmond Wilfred	40944	England	-	Single	1916	28	76	1965
Hawken	Phillip Henry	42099	New Zealand	-	Single	1916	22	92	1986
Hawkes †	Victor Edward	6/3733	New Zealand	-	Single	1915	23	24	1916
Hawkhead	Edward	75578	England	1021	Married	1917	24	74	1967
Hay	Eric	78132	New Zealand	-	Married	1917	25	73	1965
Hedge	Stanley John	59902	New Zealand	1059	Single	1917	21	86	1982
Hemus	Harwood Clifford	3/2642	New Zealand	729	Married	1916	34	69	1951
Herron	William John	11666	Australia	-	Single	1916	20	73	1968
Hesketh †	Ernest John	38703	England	-	Single	1916	36	37	1917
Hickmott	George William Edgard	3/3633	New Zealand	-	Single	1917	24	60	1953
Hildreth	Horace Victor	3/2576	New Zealand	-	Single	1916	21	75	1970
Hill	Thomas La Trobe	12/255	New Zealand	-	Single	1914	22	87	1979
Hiroti	Jack Edward	16/532	New Zealand	-	Single	1915	19	82	1979
Hobson	George Charles Edward	60119	New Zealand	1046	Single	1917	22	40	1936
Hodgson †	William Michael	57889	New Zealand	-	Single	1917	20	21	1918
Hogg	Leonard Frederick	25526	New Zealand	-	Widower	1916	27	62	1952
Hooker	Archie Cecil	74912	New Zealand	-	Single	1917	19	80	1978

Surname	First Names	Service No.	Birthplace	PBNZ Reg. No.	Marital Status	Enlist Year	Enlist Age	Age at Death	Year of Death
Hooper	Ormond Randolph	3/2087	New Zealand	-	Single	1916	21	48	1943
Hornibrook	Henry Bowles	3/3409	Ireland	-	Single	1917	37	89	1970
Hounsell	Walter Kingsford	3/1746	New Zealand	-	Single	1915	21	71	1965
Hughes	Norman	14430	New Zealand	-	Single	1916	22	23	1917
Humphrey	Henry	86739	New Zealand	645	Married	1918	40	54	1932
Hunt	Lawrence Cecil	3/1036	New Zealand	1078	Single	1915	26	65	1953
Hutton-Potts	Robert	22284	New Zealand	-	Single	1916	20	76	1972
Ilsley	Edward Francis	69240	England	-	Married	1917	33	65	1949
Ingle †	William John	3/2148	New Zealand	978	Single	1916	36	38	1918
Jackson	Alexander Miller	35672	New Zealand	-	Single	1916	21	74	1970
James	Lionel Harry	68723	New Zealand	-	Single	1917	21	77	1973
Jefferson	Herbert Henry	60133	New Zealand	-	Single	1917	21	50	1946
Johnstone	John Francis	3/2222	New Zealand	918	Single	1916	26	56	1945
Kaye	John Bauchop	3/2067	New Zealand	-	Single	1916	22	38	1932
Keany	William Bartholomew	3/3839	New Zealand	-	Single	1917	29	88	1976
Keene	Randall Richard	3/2027	New Zealand	-	Single	1916	23	49	1943
Kendall	Lawrence Elliott	22813	New Zealand	-	Single	1916	21	79	1973
Kerr	Harry	3/3571	New Zealand	-	Single	1917	22	69	1964
King	Oliver	8/2438	New Zealand	853	Single	1915	27	67	1954
Kirk	Robert	3/3906	New Zealand	-	Unknown	1916	24	Unknown	Unknown
Lahman	Otto Robert	31861	New Zealand	-	Married	1916	28	50	1938
Lahman †	Sydney	58548	Australia	-	Single	1917	27	28	1918
Laing	Gordon Smith	3/1916	New Zealand	1029	Single	1915	31	71	1957
Lang	Thomas Ernest	54433	New Zealand	839	Single	1917	30	63	1949
Law	George Duncan	3/3538	Scotland	-	Single	1917	20	82	1979
Lawson	James Stephen	73265	New Zealand	-	Single	1917	27	63	1953
Lewis	Percy	3/3653	Australia	-	Single	1917	22	58	1953
Long †	Francis Selwyn	8/2042	New Zealand	-	Single	1915	29	30	1915
Macalister	James Eric	74587	New Zealand	964	Single	1917	27	77	1968
Mackay	Robert Alexander	59420	New Zealand	-	Single	1917	21	81	1976
Manson †	Stanley Roy	24/2031	New Zealand	-	Single	1915	26	28	1917
Marple	Clarence	22168	New Zealand	-	Single	1916	20	Unknown	Unknown
Mason	Robert Brockie	3/3129	New Zealand	-	Single	1916	19	74	1970
Mather	Johnson Keal	17203	New Zealand	-	Single	1916	22	85	1979

Surname	First Names	Service No.	Birthplace	PBNZ Reg. No.	Marital Status	Enlist Year	Enlist Age	Age at Death	Year of Death
Maxwell	John Cunningham	3/2068	Ireland	-	Single	1916	32	Unknown	Unknown
Mayo	Alfred Rudolf	3/2721	New Zealand	-	Single	1916	23	66	1959
McCully	William	3/3572	Ireland	852	Single	1917	39	84	1962
McDougall	Colin Barclay	3/3885	New Zealand	917	Married	1917	29	93	1982
McHardie †	Cyril James	3/700	New Zealand	1014	Married	1915	26	29	1918
McKenzie	Douglas	3/2109	New Zealand	-	Single	1916	20	42	1938
McKenzie	John Warneford Wilmer	63654	New Zealand	-	Married	1917	39	96	1974
McKeown	Walter Andrew	3/2007	New Zealand	-	Single	1915	23	72	1964
McKernan	Hugh Joseph	44648	New Zealand	-	Single	1916	21	87	1982
McLaughlin	Daniel	3/2702	New Zealand	-	Single	1916	21	73	1968
Morris	William Benjamin	3/271	New Zealand	1076	Single	1914	28	75	1961
Munro	Ernest James	16/683	New Zealand	-	Single	1915	22	77	1970
Murphy †	Stanley	28761	New Zealand	-	Single	1916	22	23	1917
Napper	Albert	33163	New Zealand	-	Single	1916	22	64	1957
Neilson	Frederick August	27942	New Zealand	-	Married	1916	34	90	1972
Newell	Frederic James	3/3386	New Zealand	949	Single	1917	26	64	1954
Northey †	Samuel	10/996	New Zealand	-	Single	1914	33	34	1915
Nuttall	William McLeod	10879	Scotland	-	Single	1916	32	79	1963
O'Connor	James Vincent	3/2666	Ireland	-	Married	1916	59	89	1946
Ogle	Geoffrey	3/3578	New Zealand	-	Single	1917	26	64	1955
O'Malley	Joseph Power	50227	Ireland	-	Single	1917	21	79	1976
Owen	Barnard	18024	New Zealand	-	Single	1916	20	46	1941
Palmer	Charles William	3/3578	New Zealand	-	Single	1916	29	82	1969
Parkinson	William Bruce	3/3130	Australia	-	Single	1916	20	69	1965
Parnham	Ralph Reader	78713	New Zealand	446	Married	1917	44	84	1957
Patton	Louis Henry	3/1330	New Zealand	-	Single	1915	19	64	1961
Paul	Stanley Drynan	3/1350	New Zealand	807	Single	1915	29	58	1944
Peat †	John Trevor (aka Jack)	3/829	New Zealand	993	Single	1915	23	26	1918
Penney	George John	3/3916	New Zealand	1015	Unknown	1917	23	86	1980
Perrott	Walter Brooks Percival	79082	New Zealand	681	Single	1917	39	76	1954
Philip	William Andrew	3/2244	New Zealand	-	Single	1916	22	89	1982
Phillips	Isaac	3/3517	Australia	989	Single	1917	27	68	1958
Pierson	Charles William	3/1353	New Zealand	602	Married	1915	41	78	1952
Plunkett	Edward Lawrence	61106	New Zealand	-	Single	1917	21	74	1969

Surname	First Names	Service No.	Birthplace	PBNZ Reg. No.	Marital Status	Enlist Year	Enlist Age	Age at Death	Year of Death
Pollock	William Francis Stanley	3/2756	New Zealand	-	Single	1916	20	83	1979
Prentice	James Roslin	57320	Auckland	966	Married	1916	28	65	1954
Prentice	James William Allan	3/3471	New Zealand	1007	Single	1917	26	42	1932
Quin	Thomas John	3/3911	New Zealand	657	Single	1917	39	51	1929
Rasmussen	Carl Frederick Waldemar	17034	Australia	-	Unknown	1916	22	Unknown	Unknown
Reddish	James	69634	England	-	Single	1917	43	86	1960
Rees	William Percy Mostyn	3/281	New Zealand	-	Single	1914	25	61	1950
Rhodes †	Charles Victor	3/622	New Zealand	1016	Single	1915	30	30	1915
Richardson	Charles Harold Hope	3/1188	India	799	Married	1915	31	68	1952
Roberts	Arthur	3/282	New Zealand	1008	Single	1914	23	74	1965
Robertson	David Mackie	3/3987	New Zealand	-	Single	1917	23	86	1980
Robertson	Leslie Cowan	9/1228	Australia	-	Single	1915	20	Unknown	Unknown
Robertson	William	3/2846	New Zealand	-	Single	1916	32	76	1960
Roche	Norman Robert	3/625	New Zealand	940	Single	1915	26	65	1954
Rosie †	Robert Hunter	22372	New Zealand	-	Single	1916	21	22	1917
Roussel-Cossey	George	56351	New Zealand	-	Married	1917	35	87	1969
Rushton	Erle Vivian	3/804	New Zealand	-	Single	1915	20	88	1983
Russell	Walter Harry	22110	New Zealand	-	Single	1916	21	74	1968
Ryan	Frank Victor St George	79237	New Zealand	-	Single	1918	19	68	1967
Ryan	Timothy Francis	51904	New Zealand	-	Married	1917	30	63	1949
Sainty	George Nicholson	60210	New Zealand	-	Single	1917	24	74	1966
Sanders	Alexander Alfred	29869	New Zealand	-	Single	1916	20	73	1970
Sandman	John Henry Mathew	3/3432	New Zealand	-	Married	1916	31	54	1938
Savage	Vernon Clement	3/924	New Zealand	-	Single	1915	20	28	1922
Sceats	John Robert	81681	New Zealand	-	Divorced	1917	36	57	1937
Semadeni	Caspar Spencer	3/285	New Zealand	-	Single	1914	22	68	1960
Shaw	Charles Fredrick	54671	New Zealand	849	Single	1917	30	46	1933
Shine	James Joseph	71834	New Zealand	-	Single	1917	20	81	1978
Sinclair	John	85569	New Zealand	804	Single	1917	36	78	1959
Sinclair	William Bruce	3/1864	New Zealand	-	Single	1915	20	27	1922
Sloan †	William James	3/225	New Zealand	-	Single	1914	24	26	1916
Sloane	Andrew Dunbar	3/750	New Zealand	682	Married	1915	37	78	1957
Sloane	Thomas Seddon Evans	3/2497	New Zealand	-	Single	1916	31	63	1948
Smellie	David Alexander	74608	New Zealand	-	Single	1917	19	66	1964

Surname	First Names	Service No.	Birthplace	PBNZ Reg. No.	Marital Status	Enlist Year	Enlist Age	Age at Death	Year of Death
Smellie	William James	39339	New Zealand	-	Single	1916	20	78	1975
Smith †	Albert David	14716	New Zealand	-	Single	1916	22	23	1917
Smith	Ranfurlly	27972	New Zealand	-	Single	1916	29	67	1954
Smithson	Harrison Steel	46622	New Zealand	-	Married	1916	27	48	1937
Spence	Alexander William	3/3704	New Zealand	1052	Married	1917	27	59	1949
Spratt	Richard	3/3585	New Zealand	1012	Single	1917	36	52	1932
Stevenson †	Bertram Onslow	11587	New Zealand	-	Single	1915	33	36	1918
Stewart †	Augustus James	26/221	New Zealand	-	Single	1915	21	24	1918
Stewart	Francis John	49020	New Zealand	-	Single	1917	20	62	1959
Stohr	Leonard	3/3651	New Zealand	-	Single	1917	27	83	1973
Strachan	Arthur George	69730	New Zealand	-	Single	1917	20	76	1973
Stringer	Henry George (aka Harry)	35315	New Zealand	-	Single	1916	20	77	1973
Stubbs	David William	2/2954	New Zealand	-	Unknown	1915	21	79	1973
Sutcliffe	Norman Baxter	3/1464	New Zealand	-	Single	1915	20	Unknown	Unknown
Sykes	David Sidney	71357	New Zealand	-	Single	1917	20	52	1949
Tait	George Crichton	42929	New Zealand	-	Single	1916	23	58	1951
Tait	William Leslie Stuart	73971	New Zealand	-	Single	1916	20	75	1972
Taylor	William Reginald	3/1366	New Zealand	-	Single	1917	23	81	1975
Teed	David Lionel	3/3529	New Zealand	692	Single	1917	21	73	1969
Thompson †	Joseph Lyons	44803	Ireland	-	Single	1916	26	29	1918
Tindle	George McCabe	3/2627	New Zealand	-	Single	1916	26	75	1973
Toomath	Roderick William	13832	New Zealand	-	Single	1916	21	88	1983
Trebilcock	Joel Carter	37893	New Zealand	1031	Single	1916	27	82	1971
Tyerman	Harold Berkley	3/3051	New Zealand	1041	Single	1916	21	75	1970
Veale	James	45758	Ireland	-	Single	1917	31	Unknown	Unknown
Vokes	John Charles Louis	49130	New Zealand	-	Single	1917	26	64	1955
Wagg	George Thomas Keep	3/68	New Zealand	-	Unknown	1916	22	79	1972
Walker	Innis Durie	3/459	New Zealand	-	Single	1914	23	75	1966
Walker	Thomas Wilson	1/506	New Zealand	-	Single	1916	20	68	1964
Wallace	Lachlan Calder	3/3795	New Zealand	1047	Single	1916	22	40	1935
Walter	John William	44041	New Zealand	-	Married	1916	27	46	1935
Waters	Leonard Albert	15266	New Zealand	-	Single	1916	22	89	1984
Watson	James Ernest	3/3164	New Zealand	-	Single	1916	36	Unknown	Unknown
Wharton	George Edwin	3/2149	England	491	Married	1915	43	81	1953

Surname	First Names	Service No.	Birthplace	PBNZ Reg. No.	Marital Status	Enlist Year	Enlist Age	Age at Death	Year of Death
Wheeler	William Arthur	3/1258	Ireland	1018	Unknown	1915	55	58	1918
White	David	8/1672	Scotland	503	Unknown	1914	41	75	1948
White	Murdoch Donald	48813	New Zealand	-	Single	1917	25	54	1951
Whitwell †	Beaumont	47491	New Zealand	-	Single	1917	22	23	1917
Wilkinson	Gordon Victor	3/3830	New Zealand	-	Single	1917	23	56	1950
Willetts	Arthur Henry	64725	New Zealand	-	Single	1917	24	79	1972
Williams	Osborne Mostyn	52911	New Zealand	-	Single	1917	21	70	1965
Williamson	George	3/3383	New Zealand	-	Single	1917	33	66	1950
Williamson	Leslie John	3/3779	Australia	1034	Single	1917	22	45	1941
Willis	Charles Chapman	3/2798	New Zealand	-	Single	1916	20	75	1970
Wilson	John	9/2008	New Zealand	-	Single	1915	25	81	1971
Winkelmann	Arthur Charles Terence	3/3480	New Zealand	-	Single	1917	33	78	1962
Wiseman	Frank Victor St George	3/1575	New Zealand	-	Single	1915	21	46	1939
Wood	Allan Bertram	74257	New Zealand	-	Single	1917	20	90	1987
Yallop	George William Edgar	3/42	New Zealand	-	Single	1914	20	59	1953
Yeoman	Arthur Benjamin	3/1731	New Zealand	-	Single	1915	20	83	1978

† Died on active service.

*Although enlistment age is stated as 20, both these pharmacists have registration numbers. It is possible that they registered after enlisting, once they turned 21, or that they ‘adjusted’ their ages on enlistment.

Appendix 2: New Zealand Military Rank Structure during WWI

