

Title: 19th century American Social Milieu and Alternate Disease Theories: Origins of Chiropractic

Desmond Wiggins MPH MAppSc DC

Student Number: 44730918

A thesis presented in candidature for the degree of Master of Research (Chiropractic)

Department of Chiropractic

Faculty of Science and Engineering

Macquarie University

Supervisors: Dr Roger Engel (Primary)
Professor Chris Dixon (Secondary)

Commenced: 1st July, 2016

Submission Date: 28th November, 2018

Table of contents

Table of contents	i
Abstract	iii
Dedication	iv
Acknowledgements	iv
Statement of originality	v
List of Figures	vi
List of Tables	vii
List of Appendices	viii
Abbreviations	ix
INTRODUCTION	1
Writing conventions	3
Chapter 1 NINETEENTH-CENTURY AMERICAN SOCIETY	
1.1 Introduction	4
1.2 Factors that shaped 19th century American society	4
1.2.1 Antebellum period (1812-1860)	4
1.2.2 Postbellum period (1865-1915)	8
1.3 Aim	12
1.4 Objective	12
1.5 Research question	12
1.6 Rationale	12
1.7 Summary	12
Chapter 2 A REVIEW OF THE LITERATURE	
2.1 Introduction	14
2.2 Search strategies	14
2.3 The early years	15
2.4 The middle years	16
2.5 The later years	17
2.6 Summary	18
Chapter 3 DANIEL DAVID PALMER	
3.1 Introduction	19
3.2 Early years 1845-1886	19
3.3 Magnetic healing practice 1886-1895	21

3.4	Origins of Palmer’s chiropractic theory.....	25
3.5	Summary	31
Chapter 4 METHODOLOGY AND RESULTS		
4.1	Introduction	32
4.2	Methodology	32
4.3	Results.....	33
4.3	Summary	36
Chapter 5 DISCUSSION		
5.1	Introduction	38
5.2	The four main factors	38
5.3	The relationship between Palmer’s theory and the four main factors	41
5.4	Limitations	45
5.5	Summary	45
Chapter 6 CONCLUSION		46
Chapter 7 REFERENCES		48
APPENDICES		
	Appendix 1	75
	Appendix 2	76
	Appendix 3	77
	Appendix 4	78
	Appendix 5	79
	Appendix 6	80
	Appendix 7	81

Abstract

Studies on the origins, development and acceptance of chiropractic in America have typically emphasised the period September 1895 when Daniel David Palmer is reported to have successfully treated Harvey Lillard for a seventeen-year history of deafness with a 'new' form of manual treatment called 'chiropractic'. The aim of this research was to establish if factors present in American society during the latter part of the 19th century created a favourable environment for the development and acceptance of chiropractic. A retrospective constructivist grounded theory methodology was used to conduct an examination of primary and secondary sources related to this period. Four factors were highlighted as contributing to the creation of a favourable environment for the development of alternate theories of disease. These factors were medicine, economics, religion and politics. A clearer understanding of these factors and the role they played in shaping the scope of chiropractic during the early years will help inform the current debate about the use of Palmer's theories in modern chiropractic.

Dedication

The writing of any substantial piece or work require patience, not only from the writer, but also from those whose lives become involuntarily entwined within it. This thesis is no exception. I dedicate this work to my wife Judy who has always encouraged me to fulfil my academic goals. Thank you for graciously allowing me to spend such a large amount of time researching and writing this thesis, time that was rightfully yours.

Acknowledgements

To my supervisors, Dr Roger Engel and Professor Chris Dixon, thank you for your help with this thesis. Your tireless efforts in correcting the numerous drafts are appreciated. The task of writing about an historical event within a science department was frustrating at times but you both encouraged and guided me through the process. Thank you for always taking the time to answer my calls for help. To the faculty members of the Department of Chiropractic at Macquarie University who took the time to listen to my presentations and review my submissions, I would like to say thank you. I appreciate your constructive criticism and guidance. I would like to thank and acknowledge the tireless efforts of Rosemary Riess and Kelley Keimig, librarians at the Special Collections and Archives Department of the David D. Palmer Health Sciences Library at Palmer College of Chiropractic. Without your help, bringing this thesis to fruition would have been much harder. I would also like to acknowledge the help I received from Todd Waters the ‘Chiro-picker’.

Statement of originality

This is to certify that to the best of my knowledge the content of this thesis is my own research. This thesis does not incorporate any material submitted for a degree at any university, previously published, written or produced by another person except where due reference is made in the text.

Desmond Wiggins

23 November, 2019

List of Figures

Figure 3.1 Timeline of events for Paul Caster, JS Caster and DD Palmer:1866-1899 ..	23
Figure 3.2 Nerve-tracing chart 1841	28
Figure 3.3 Schematic representation of Palmer's theory of chiropractic	29
Figure 4.1 Key phrases used in the literature search	34

List of Tables

Table 2.1 MESH terms and keywords	15
Table 4.1 Breakdown of primary source documents	34

List of Appendices

Appendix 1 Publications of the American Statistical Association	75
Appendix 2 Supplementary analysis and derivative tables:12th United States Census.	76
Appendix 3 Newspaper reports about Palmer’s magnetic healing practice in Iola	77
Appendix 4 Name change from <i>Magnetic Cure</i> to <i>The Chiropractic</i>	78
Appendix 5 Comparison of magnetic healing and chiropractic treatment rooms	79
Appendix 6 Weed’s list of Greek words	80
Appendix 7 Palmer’s death certificate	81

Abbreviations

ABBREVIATION	MEANING
AMA	American Medical Association
CBA	Chiropractic Board of Australia
CBQR	Chicago Burlington and Quincy Railroad
CINAHL	Cumulative Index to Nursing and Allied Health Literature
DD Palmer	Daniel David Palmer
MeSH	Medical Subject Headings
PSC	Palmer School of Chiropractic
RACGP	Royal Australian College of General Practitioners
UK	United Kingdom

Introduction

Science is littered with examples of theories that were considered radical in their time. Some proved invaluable for advancing knowledge of the human body and disease while others fell into disuse. During the late 19th and early 20th centuries, a more scientific approach to investigation began to be adopted in the sciences. This transformation was accompanied at varying times throughout the 19th century by theories from both traditional and non-traditional areas; theories such as eclecticism, ‘magnetic healing’, homeopathy, osteopathy and chiropractic are examples from non-traditional areas that enjoyed popularity during this period. (1-5) This thesis focuses on the development of one of those theories: chiropractic.

The study is not meant to be an exhaustive historical account of chiropractic, nor a comprehensive investigation into the internal conflicts between factions within the current profession. (6, 7) Rather, using the historical context of chiropractic (19th century American social milieu) as the backdrop, the thesis will analyse on a broader scale the factors that helped create a favourable environment for the development of chiropractic. Understanding the role of these factors may help provide the basis for an informed decision about whether Palmer’s theory was context-specific *i.e.* whether it is valid to use his 1895 ‘somato-visceral’ disease model (8) as a basis for practice in the 21st century. This question is pertinent given the number of individuals within modern chiropractic who promote a mono-causal approach to disease aetiology (the so-called ‘subluxation theory’). This stance is at variance with the modern idea that most diseases are multi-causal *i.e.* a combination of environmental, social, genetic and as well as harmful lifestyle factors (*e.g.* smoking). Moreover, modern science does not currently support the notion that the spine and the peripheral nervous system are the governing organs in relation to most pathologies of the human body. (9) Therefore, failure to fully understand the basis of Palmer’s theory may unwittingly promote the conclusion that his theory should be viewed as permanent.

Chiropractic originated in Davenport, Iowa in 1895/96 when Daniel David Palmer, a self-taught medical sectarian, proclaimed he had ‘discovered’ a new ‘scientific’ approach to understanding the nature of disease. (10, 11) During this period, morbidity and mortality rates from diseases such as yellow fever, typhoid, diphtheria, cancer and pneumonia were high throughout America. Although located in the American Midwest, Davenport was not immune to the high mortality rates found in larger cities with reports that the city had higher death rates than many of its larger Iowan counterparts in the late 1880s. (12) (See Appendix 1) By 1900, death rates per 100,000 from diarrheal diseases, typhoid and cancer in Davenport (pop. 35,250) were higher than those for Albany, New York (pop. 94,150) while death rates from typhoid and cancer during the same period were higher than those amongst the population of Chicago, Illinois (pop. 1,698,570). (13) (See Appendix 2) This

circumstance may be explained by the numerous “slums and unsolved health and sanitation problems” present in Davenport at that time. (14) Essentially, Palmer was located within a highly vulnerable population, a perfect ‘laboratory’ for his new treatment.

Despite the vast change in medical knowledge since the late 1800s, theories analogous to Palmer’s original tenet that disease was related to the spine, continue to be promoted by elements within today’s chiropractic profession. Some established American chiropractic colleges still use a Palmer-based definition of chiropractic that incorporates 19th century theories such as ‘vitalism’ (a ‘life force’ possessed by living organisms that is neither chemical nor physical), holism (the mind and the body are one) and naturalism (the belief that everything arises from natural properties and causes). (15)

A newly proposed Australian chiropractic college is promoting an approach that synthesises tenets of contemporary science with Palmer’s 1895 chiropractic theory that spinal manipulation cures disease. (16) The Chiropractic Board of Australia (CBA) disagrees with this stance stating that no satisfactory evidence has been presented to substantiate such claims. (17) Ongoing statements that correcting spinal misalignments can cure disease have alarmed many medical professionals including the Royal Australian College of General Practitioners (RACGP). As a result, the College recommended that its members not refer patients to chiropractors. (18) Some medical professionals advocate the closure of chiropractic departments attached to Australian universities claiming that continuing to train chiropractors could create a serious public safety issue. (19)

This discussion about the scope of chiropractic may have overlooked a critical factor regarding the use (or lack thereof) of historical context in arguing the validity of Palmer’s spinal manipulation theory. Paying attention to historical context enables interpretation and analyses of past events in their setting as opposed to judging them by contemporary standards. It does not, however, support arguments about the validity of that event. Notwithstanding, elements within the chiropractic profession continue to promote ideas that are analogous to Palmer’s original theory that chiropractic can cure disease. (20-22)

Conversely, critics of the profession cite the same material when arguing against the use of chiropractic as a valid therapeutic intervention. By failing to adequately consider the historical context in which chiropractic theory and its claims about curing disease were developed, some chiropractors may have interpreted the theory as being the culmination of scientific observation and testing, attributing a level of evidence to it that may be unwarranted, unjustifiable and self-interested. It is these claims, based on a literal interpretation of a theory from another era, that form the basis for much of the ongoing criticism of the profession.

This study investigates the key contextual factors that may have played a role in the development and acceptance of chiropractic as an alternative disease theory in America during the 19th century. In establishing this context, Chapter 1 outlines the key factors that shaped American society during this period while Chapter 2 presents a review of the literature. An investigation into the life of DD Palmer from his birth in 1845 until his death in 1913 is presented in Chapter 3. To meet the requirements of a science-based thesis, a Methods and Results chapter (Chapter 4) has been included which explains why a retrospective constructivist grounded theory approach was considered the most suitable method for this investigation. It also highlights the factors that were uncovered and describes the limitations associated with this type of research. A discussion of the factors comprises Chapter 5 while Chapter 6 concludes the thesis and includes recommendations for future research.

Improving our understanding of the factors that influenced the development of chiropractic in America in the late 19th century will help to explain why the treatment may have been acceptable to the general population at that time. Adopting this approach will provide an insight in to the accuracy of our current understanding of Palmer's original theory and may help to inform discussion about the profession's current scope of practice. This study differs from previous studies in that it only uses information that has been independently verified and not accepted as 'fact' through popular belief.

Writing conventions

Although the focus of this study is an historical event (the origins of chiropractic), this thesis is not written in a typical historical format. An explanation about the structure and referencing style used is therefore pertinent from the outset. The thesis crosses two disciplines - history and science. It uses conventions from both disciplines but as the candidate is enrolled in a Faculty of Science & Engineering, a science format was adopted as the primary format for submission. Vancouver style referencing was therefore chosen for the references. It uses a numeric referencing style that gives each source a number corresponding to the order in which it appears in the text. Footnotes are not used in this style of referencing. It is therefore appropriate to request the reader to approach the thesis with these conventions in mind. I apologise in advance for any difficulties this process of 'serving two 'masters' may cause the reader.

Chapter 1

Nineteenth- century American Society

1.1 Introduction

A sense of restlessness characterised America throughout the 19th century, due mainly to the rapid expansion of the economy, ongoing political turmoil and a series of religious revivals that left a society marked by widespread racial, gender and social inequalities. (23, 24) Despite a modest upward trend in life expectancy between 1793 and 1898 (36 to 42 years) morbidity and mortality rates continued to rise. (25, 26) The Civil War of 1861-1865 altered the course of American history and continued to influence society well into the 20th century. (27) The decades preceding the Civil War are referred to as the ‘Antebellum period’. This was followed by the period between the end of the Civil War and the beginning of World War I, commonly referred to as the ‘Postbellum period’. It should be remembered that these two periods were not mutually exclusive and cumulatively affected the latter part of the 19th century in America, the time Palmer was developing his original theory of chiropractic. (28-35) Therefore, reviewing the factors that shaped American society during this period is appropriate as these factors provide the backdrop against which Palmer lived and functioned.

1.2 Factors that shaped 19th century America

1.2.1 Antebellum period (1812-1861)

The Antebellum period in America covered the years between 1812 and 1860. A number of factors helped shape American society during this period including medicine, race, gender, economics, education, religion and politics.

Medicine

Early 19th century medicine in America was based on ‘humoral theory’ where an individual’s personality and health were viewed as a balance of systemic forces *i.e.* the four bodily fluids or humors: black bile, yellow bile, blood and phlegm. It was understood that any imbalance within these humors brought on by a miasma (foul smell *e.g.* sewer pond), evil spirit or contagion resulted in an over or under-stimulation of the body creating a diseased state. (36-38) Humoral imbalances were corrected by applying several treatments known as ‘heroic medicine’ or ‘heroic practice’ consisting typically of bloodletting, blistering, purging and the ingestion of mercury or arsenic. (39-43) Although these early theories of disease may seem strange when compared to our modern understanding, they were considered to be based on “solid science and experiential evidence” at the time. (44)

The duration of heroic medicine in America has been the subject of debate with some arguing the practice had faded by the 1820s (45) or continued as late as the 1860s (38) while others argue that it

was still in vogue well into the early 20th century (41, 46-48) a stance supported by medical publications of the period. For example, *Materia medica* listed the use of mercury, blistering and venesection up until the turn of the 20th century; (49-56) mercury was reported as a treatment for syphilis until 1910; (57) and ‘venesection’ (bloodletting) was still registered as a treatment for pneumonia by Sir William Osler as late as 1930. (58)

During the first half of the 19th century, many young American physicians travelled to France, particularly Paris, to increase their medical and surgical knowledge. Although precise figures are not available, the number that travelled there during this period appears to have been substantial. (59) Warner describes France as a “medical Mecca for foreign students” (60) while Snowden claims “large numbers of Americans made the pilgrimage to Paris to study with its masters”. (61) It is not self-evident why these physicians would invest their time and money in this form of professional development as there were few requirements for formal training as a physician in America at the time. (60, 62)

The circumstance may be explained by three factors: French trained American physicians were considered part of the ‘medical elite’ worthy of charging higher fees than their American counterparts; (38, 60) the greater experiential knowledge learnt at the patient bedside and dissecting table; and French hospitals were at the forefront of medical and surgical knowledge thus offering greater opportunities for clinical observation. (63) Despite the establishment of medical specialties such as paediatrics, psychiatry, orthopaedics and urology in France many older American physicians scorned French medicine claiming its adherents were “ostentatiously proud”, “do-nothing doctors bereft of professional legitimacy”, more interested in the aetiology of disease rather than its cure and willing to let their patients die to satisfy their quest for knowledge. (38, 62, 64-66)

Older American physicians may have felt their claims were justified when they compared the high mortality rate of newborns in French hospitals (30%) to the relatively low infant mortality in America at the time. (65, 67) However, this stance may not have taken into account the much lower percentage of urban population in America compared to France. Simply stated, urban populations had higher disease rates than their rural counterparts. (67) Coincidentally, the surgical knowledge gained in Paris during these trips would prove invaluable in the American Civil War with Paris-trained American physicians the only ones equipped with the necessary surgical skills to deal with the large number of battlefield wounds arising as a consequence of the War. (35)

The therapeutic approach used in the United Kingdom (UK) during this period more closely resembled that of America, but despite routinely praising English medical skills, some American and English physicians claimed English therapeutics were worthless. (68) This view was based on the assumption that American patients required ‘depletion’ techniques (such as bloodletting) rather than

the ‘tonics’ and ‘stimulants’ used by UK practitioners (such as alcohol). Moreover, there was the belief that interchanging treatments could prove fatal to the patient. (60, 69) In short, many Americans physicians held UK medical education in low esteem. (68, 70) Despite American disdain for European medicine during this period, it helped shape America’s initial public health responses to water supply, sewerage and refuse problems. (71)

Sectarianism

During this period, a variety of medical sectarians (‘irregulars’) such as chemists, druggists, homeopaths, herbalists, bone-setters, magnetic healers, fortune tellers, phrenologists and cunning-folk (magical healers) promoted all manner of treatments for a range of conditions that were considered bizarre by orthodox physicians (‘regulars’). (72-76) Regulars described these poorly trained sectarians as “prostitutes who roam [the country] practising all the arts of provocation with no end to their devices that injure health and destroy life”. (77) At the same time, sectarians accused regular physicians of being “ignorant of what is really useful in curing disease”. (78) Notwithstanding, regular and irregular physicians were not mutually exclusive. For example, Thomsonian herbalists established the Botanico-Medical College in Columbus Ohio in 1836. The college relocated to Cincinnati in 1839, gained State charter and established the Botanico-Medical Institute of Ohio which incorporated the College of Physicians and Surgeons. (79) At the same time, prominent physicians (many of whom had undertaken postgraduate medical studies in Paris) utilised aspects of sectarian medicine (*e.g.* herbalism) because they considered them a valid and effective treatment. (35, 80) From a 21st century perspective, it is easy to criticise the medical circumstances of the time, however it must be remembered that during this period the notion of an effective treatment was not based on any scientific measure, but rather on a person’s assessment of symptom relief. (81)

Race

In the early to mid-19th century, race was being used to explain the workings of the body. When compared to whites, black people were considered to have disfigured skeletons, consume less oxygen, have decreased mental and muscular capacity and have a nervous system that made them unmanageable and unsuitable for personal liberty. (82, 83) This attitude of racial inequality was commonplace across all sections of society during this period.

Gender

The dominant gender ideology (‘masculine’) within early 19th century America dictated that men and women should be designated to separate ‘spheres’ of life: women to the private world of family and morality and men to the world of economics, politics and social competition. (84, 85) A policy of subservience to men was practiced across all aspects of society. (86, 87) Women were taught that

education in excess of what was required to become a wife and mother was unnecessary. (88) They were encouraged to accept 'inferiority' relative to their more 'distinguished' male counterparts. (89) Invoking religious sanctions to support their case, some 19th century writers argued that women "were frail and incapable of sustained physical or intellectual exercise". (90)

Economics

During the Antebellum period, the American economy was characterised by two interdependent sectors: the industrial arm of the North and the agricultural 'Cotton Kingdom' of the South. (91) Industrialisation created an increase in urbanisation and employment. However, factory conditions were harsh and workers received little pay for their efforts. The situation was exacerbated by an increase in European migrants who were willing to work for less pay than the locals. (92) As a result, immigrants were often vilified and forced to live in slums. (93)

Education

Despite Thomas Jefferson advocating for state-funded public education during his time as president from 1801-1809, the number of state-sponsored schools remained low during the early part of the 19th century. Education was seen as unnecessary for the masses. The situation began to change in the 1830s when Horace Mann established the 'common school movement' designed to provide universal education for all children. (94) By the 1860s, organised systems of common schools had emerged in the Northern and Midwestern states. (95) These institutions taught three core components of reform: education for the common man and woman, greater access to higher education for women and schooling for free blacks. (96) Throughout the Antebellum period most colleges were church affiliated, but by the 1850s cities like New York had begun to offer tuition-free education to all students from elementary school to college. (97)

Religion

In the early part of the 19th century, regular physicians accused elite politicians of dictating society's opinions about religious freedom. For instance, Benjamin Rush described the government as restricting freedom in medicine in a similar manner to the restriction placed on "the freedom of religion". (98) During this period, the religious revival movement known as the 'Second Great Awakening' began to revolutionise religious thinking in America with its supporters arguing that adherence to the beliefs of the church was no longer the only path to salvation. (99)

Politics

In America in the late 1790s, an elite political aristocracy had argued for a strong central government that would influence all aspects of life. (100) President Thomas Jefferson (1801-1809) challenged political elites describing them as dangerous, artificial and founded on wealth. (101) Jefferson favoured an agrarian society arguing that those who stayed on the land were the repository of a

substantial amount of God's blessings. (102, 103) Andrew Jackson's presidency from 1829-1837 also had an effect on the rule of the elite. His anti-intellectualist Democratic Party heralded in an egalitarian culture that promoted opposition to government intrusion in private affairs. (98) The Party supported political and economic freedom opposing legislation that promoted the interests of the affluent and influential at the expense of the 'common good'. (104) Jackson rejected 'expert' opinion believing the 'common man' was the best person to decide his own destiny in all spheres of life, including political beliefs and choice over health treatments. Consequently, his *laissez faire* style indirectly encouraged the growth of sectarian medicine. (105)

1.2.2 Postbellum period (1865-1915)

The Postbellum period in America covered a fifty-year period between 1865 and 1915 beginning with the American Civil War and ending when America entered World War 1. A number of factors were influential in shaping American society during this period including medicine (European and UK), economics, education, race, gender, religion and politics.

Medicine

By the latter half of the 19th century, the journey to Paris for medical study had lost its sense of mission for many American doctors. They complained auditoriums were grossly overcrowded because clinical discourses were freely open to all (irrespective of the quality of their medical education) while lectures were difficult to understand as they were delivered rapidly in French. As a result, many physicians turned to the medical schools in Vienna and Germany. (60, 106) The attraction of Vienna appears to have been the exceptional access to large numbers of patients at Vienna's general hospital. (38) However, it did not take long for American physicians to come to the conclusion that Viennese therapeutics were less acceptable than those of the French as Viennese physicians appeared more interested in developing new surgical techniques on cadavers than curing the sick. (107, 108)

This led to more American physicians travelling to Germany which was considered to be the pinnacle in medical education and research. This high level of research would later become the foundation of modern medicine. (109-111) The American physicians embraced German medicine because it was clinic-based and created a source of construct for their "sense of mission and self". (60) During this period, aetiology was drawn from a variety of sources: professional, vernacular, supernatural, and exotic with Americans accepting of an overlap between spiritual, moral and behavioural explanations of illness rarely dismissing any theory that seemed plausible. Consequently, unsupported theories often became the benchmark for well-being. (112) However, as medical reforms slowly took hold, the division between elite and popular medical displays became more recognisable. (113) It should be remembered that European medicine also influenced sectarians like Palmer. (114)

Economic constraints within medicine

American medical education was expensive during this period and provided meagre financial return on investment. (115) Popularity of irregular physicians meant that fees seen as rightfully belonging to the regulars were being channelled elsewhere. (116) The emergence of medical licensing in America in the 1870s did little to stem the flow of fees to the irregulars. However, it unintentionally caused a shortage of trained medical professionals in many counties as the cost of medical education significantly increased thereby restricting the numbers who could afford to undertake medical study. (115)

Public health

Industrialisation in America resulted in rapid urbanisation and the emergence of slums within crowded cities. Pollutants littered the city streets creating a favourable environment for the spread of malaria, cholera, tuberculosis and yellow fever. (117, 118) Although a number of public health initiatives were introduced, they had limited success resulting in continually increasing morbidity and mortality rates. A heightened fear of disease arose amongst the public which coincided with an inability of medicine to control or cure these diseases. As a result, the public had little respect for physicians. (119, 120) The public's poor opinion of doctors can be attributed to two factors of the time: a general lack of understanding by medical physicians about the cause of many of the common diseases; and the low standard of medical care that flowed from having such poor knowledge. (121) By the latter part of the century, the practice of medicine had a lower status than law, the army or the clergy. (122)

Sectarianism

The failure of orthodox medicine in treating disease prompted the public to seek alternative options. As a result, sectarian theories of disease, which were often based on non-scientific theories, anecdotal evidence and a promise to remove the cause of disease rather than its symptoms, flourished. (123) It has been estimated that up to 25% of health practitioners in America during this period were sectarians. (124) This group presented 'miracle cures' that were diverse and innovative duplicating aspects of the conceptual base and scope of services offered by regular physicians. Topics considered as essential for producing well-trained medical practitioners such as anatomy, physiology and pathology were acknowledged by sectarians even though they arrived at entirely different conclusions about what this knowledge meant when it came to treatment. (125)

Sectarians were a disparate group but shared some common ground: the concept of universal delivery from disease (each sectarian claimed their treatment cured all disease); condemnation of what they referred to as an "unnatural modernised lifestyle"; and accusations of self-aggrandisement against orthodox physicians. (37, 126) Many sectarians had trained for only short periods (sometimes as little

as 3 weeks in the case of magnetic healing) and appropriated the title ‘doctor’ or ‘professor’ before espousing various disease theories and treatments. (2, 115, 127) Against the backdrop of medical pessimism sectarian theories and treatments sounded plausible and offered hope to the masses. (37)

Race

At the start of the Civil War in 1861, approximately 4 million black men, women and children were slaves while at the end of the War, the 13th amendment abolished slavery in America. (128) In 1866, the Civil Rights Act supposedly invalidated the so-called Southern ‘Black Codes’ that had changed slavery from ‘slavery to individual masters’ to ‘slavery within society’. However, by the late 1880s, conditions had not improved and the separation between blacks and whites grew wider. (129) Medical physicians in the late 1890s, were describing blacks as intrinsically different from whites both genetically and morally, claiming they had inferior constitutions which resulted in higher mortality rates. (130)

Gender

The American Civil War heralded in a period of change in gender politics for white women. Conservative social feminists and radical *suffragettes* were instrumental in the push towards ‘self-determination’ for women which paralleled the shift for women to become the central figure of moral influence in the home and to all intents and purposes, the nation. (131) By the 1880s, complex industrialisation had forced the role of women to be redefined when they took up factory employment. (132) Toward the end of the 19th century much was written by medical and religious writers about the health of women or more accurately, the lack of health. (133) The middle and upper-classes viewed women as ‘invalids’ while male medical professionals expressed their thanks in belonging to the “other sex” as they believed the natural tendency of women was towards sickness. (134, 135)

Economics

The Industrial Revolution resulted in a change in America’s workforce from rural to urban. (136) The expansion of the railroads in the late 1800s transformed a number of smaller local markets centred around large cities into one national market. Mass manufacturing combined with mass distribution lowered costs and maximised profits. However, while industrialisation brought wealth, commercialism was unpredictable and led to a series of financial depressions between 1870 and 1890 that saw many Americans lose their jobs and incomes.

Education

Throughout most of the 19th century, American society was dominated by successful businessmen who had attained eminence in their fields without formal education. As a result, many considered academic schooling unnecessary for success in business. ‘Autodidacticism’ (self-education) was

common (137) with formal schooling only considered necessary for advancement in the personal sphere. (138) As the century progressed, support grew amongst educators for public education which was based on the belief that all people had the capacity to become moral, intelligent and productive citizens if properly educated. However, with the steady growth of ‘populist’ democracy in America in the late 1800s, anti-intellectualism prospered a factor that would work in favour of sectarians like Palmer. (139)

Religion

Throughout the Postbellum period, many Americans heeded the message of religious tolerance swapping their mainstream Protestant beliefs for a synthesis of Christianity and Spiritualism. (140, 141) Adherents to spiritualism claimed their perspective had permeated all systems of religion and philosophy by the turn of the 20th century (142) maintaining spiritualism was the only way to overcome the “greatest curse of modern times – deadly materialism”. (143) The rapid social change combined with diverse ethnic, religious and cultural backgrounds resulted in the emergence of fringe faiths that targeted the individual self-help experience of the ‘common’ person. (37) This alarmed religious leaders who believed this ‘new liberalism’ would breakdown the family unit and fragment society. (144) Moreover, the promise of communicating with deceased children and husbands killed in the Civil War gave hope to the general populace thereby increasing the popularity of Spiritualism. Spiritualism influenced many 19th century sectarians including DD Palmer, the founder of chiropractic and AT Still, the founder of osteopathy. (137, 145-147)

Politics

The Postbellum period in America saw the simultaneous emergence of two disparate political parties: the ‘Populist Party’ and the ‘Progressive Party’. Populists were an agrarian-based movement identified as the natural heir to Jacksonian democracy whereas ‘progressives’ argued for increased government intervention at all levels of society. Populists criticised the concentration of wealth under banks and financial elites arguing that wealth belonged to those who created it. (148) While the Populist Party did not successfully form government, many of its reforms were adopted by the ‘Progressive Movement’ in the late 1880s.

Chiropractic

It was against this backdrop of changes in medicine, race relations, gender equality, education, economics, religion and politics that Daniel David Palmer, an uneducated self-declared ‘doctor’ from Davenport, Iowa announced his new theory of disease called ‘chiropractic’. Palmer rejected ‘germ theory’, drugs, surgery and dietary constraints promising a simple solution to the complex problems of disease. Palmer claimed that chiropractic could successfully diagnose acute and chronic diseases through palpation of the spine, a process designed to detect misaligned vertebrae. Manipulating these

vertebrae would reduce obstructions in the flow of the ‘vital force’ which would facilitate the body to heal itself. (149, 150)

1.3 Aim

The aim of this study is to establish the factors present in American society in the 19th century that created a favourable environment for the development and acceptance of chiropractic theory.

1.4 Objective

To improve our understanding of the factors that were influential in the development and acceptance of chiropractic in America in the late 19th century.

1.5 Research question

The research question this study seeks to answer is ‘What factors may have created a favourable environment for the development and acceptance of chiropractic in America in the late 19th century?’

1.6 Rationale

Studying the origins and development of chiropractic is not simply memorising and regurgitating ‘known’ facts that may not have been subjected to critical review. (151) Rather, research on the topic should include an understanding of the context in which chiropractic emerged. Understanding the period from which chiropractic emerged provides an explanation for evaluating the current profession’s scope of practice. (152) This is of particular relevance for two reasons:

1. Sections of the modern chiropractic profession continue to rely on Palmer’s original theories and tenets to justify current chiropractic intervention; and
2. Criticisms of this behaviour from outside the profession appear to rely to a large extent on Palmer’s original theories and explanations of how chiropractic cures disease.

A better understanding of the factors that helped provide a favourable environment for the development and acceptance of chiropractic and why it was so readily accepted in the late 1890s, will help facilitate an evidence-based discussion about the state of the profession and the current debate about chiropractic’s scope of practice.

1.7 Summary

The atmosphere in America throughout the 19th century was one of upheaval and reform. Large scale expansion brought about by the Industrial Revolution had not only created inequalities within society, but also higher morbidity and mortality rates as unsanitary conditions increased. Medical treatments were often based on limited knowledge which exacerbated the already unacceptably high rates of disease and death. As the century progressed, the public desperately sought answers to the nationwide health crisis. In response to the inadequacy of medicine at the time, an anti-medical sentiment began

to emerge amongst the general populace. Despite being incapable of adequately diagnosing or treating many common diseases, orthodox medicine discouraged people from seeking help from practitioners who were considered outside the 'traditional' system. (153) This combination of events helped create a favourable environment for the origins and acceptance of chiropractic in America in the late 19th century.

Chapter 2

A review of the literature

2.1 Introduction

Scientific method began to emerge in the US in the 1850s as part of the ‘self-culture’ movement and was used by both the clergy and doctors to support religious and medical concepts. (154, 155) This approach was integrated into the curricula of colleges during this period becoming an accepted facet of liberal education without hostility from the theological authorities. (156) Although the emergence of Darwin and his theories in the late 1850s interrupted this integration, the basic scientific methodology remained intact. (157) By the late 1870s, the scientific approach was part of mainstream medical practice which centred around an interpretation of the universe as being neither artificial, arbitrary, faddish or convenient nor “at the mercy of popular whim”. (158, 159)

This new approach had a major impact on the understanding of health and disease with experimental research leading to new knowledge in histology, pathology and microbiology. In the US, the practice of medicine became a battleground between ‘regular’ and ‘irregular’ practitioners with the distinction based on the presence or absence of formal medical education. Chiropractors were considered ‘irregular’ practitioners with no formal medical training. Unlike osteopathy, which had been incorporated into mainstream medicine by the early 1900s (160-162), chiropractic was, and still remains, distinctly separate from medicine. Moreover, chiropractic has gone on to become the most widespread drugless therapy in parts of the western world including America, Australia and Europe. (163) This makes the practice of chiropractic an important social and medical phenomenon and worthy of further investigation.

The aim of this review is to examine the literature related to the origins of chiropractic and to identify the main factors that influenced its development.

2.2 Search strategies

Articles were obtained by searching the electronic databases Ovid MEDLINE, ScienceDirect, PubMed, Proquest, CINAHL Complete, Index to Chiropractic Literature, Mantis, Yale Law School Legal Scholarship Repository, Cornell’s Digital Repository, Library of Congress Online Catalogue and the Library of Michigan University’s Historical Repository using MeSH terms and keywords from inception to September 2018. (See Table 2.1) Only full texts were included in the review. Citations and reference lists were also used to search for articles and publications. Additional searches were undertaken using the Macquarie University Library Multisearch facility as well as HathiTrust and Archive.org. The search engines Google, Google Scholar, Microsoft Academic and Semantic Scholar were also used. The Palmer College of Chiropractic library was accessed including

Special Services, Special Collections and Archives as well as the David D Palmer Health Sciences Library.

Table 2.1 MeSH terms and keywords

MeSH Terms	Keywords
Chiropractic.	Chiropractic history; 19th century American social milieu; cultural milieu of 19th century America; origins of chiropractic; alternate theories of disease; 19th century politics; 19th century religion; 19th century education; and 19th century economics.

2.3 The early years

The earliest histories of chiropractic were written by ‘insiders’ and continue to be important for sections of the profession as a basis for justifying where and when chiropractic intervention should be applied. Langworthy’s *Modernized Chiropractic* published in 1906, (164) Palmer’s *The Chiropractor’s Adjuster* published in 1910, (165) Carver’s *Chiropractic Textbook*; (166) and Dye’s *The Evolution of Chiropractic* (167) are examples of such works. While new approaches to health and healing were being considered by many health professions in the early 1900s, chiropractic remained focused on two models to explain Palmer’s original writings on the concept of the ‘vertebral subluxation’: the ‘bone out of place’ (or instability) model and the ‘foot on the hose’ (or neuropathology) model. (168, 169)

Both models were convenient for explaining to patients and students how spinal manipulation could affect the body. However, neither had been subjected to rigorous scrutiny from outside the profession. The view that a subluxation was a condition where the relationship of the articulating surfaces of a joint were altered slightly while remaining otherwise intact saw Langworthy and his co-authors, Smith and Paxson, depart from the Palmer’s original theory. The idea of an altered anatomical axis of motion carried with it the potential for verification through applied research. (170) This proposition appears to have been instrumental in creating a schism within the profession into those who used only spinal manipulation (the ‘straights’) and those who used spinal manipulation plus other modalities (the ‘mixers’). (171, 172) These factions continue to fuel division within the current profession and are instrumental in perpetuating the misrepresentation of Palmer’s early theories.

Opposition to Palmer’s original theories began in the early part of the 20th century. At the same time, the profession was beset by intra and inter-professional politics that threatened to overshadow the events that defined chiropractic during the early years. Carver sought to correct the record with his

History of Chiropractic which provided a reminder of the defining events that saw the development of the chiropractic profession in the early 1900s. (173) Others such as Gallaher (174) and Turner (175) also wrote on the topic during this period. These writings helped to perpetuate the misconceptions about chiropractic well into the 1930s, with some of Palmer's original tenets being ignored. Dye attempted to address this in his account of the early years of chiropractic's development. He included the internal and external politics surrounding the profession, growth of the chiropractic schools, and the evolution of clinical methods and use of technology. At a time when some of the seminal elements of chiropractic philosophy were waning in popularity, Dye reintroduced concepts like 'Innate Intelligence'. (167)

2.4 The middle years

In the mid-1980s, medical historians began to re-visit medical concepts that had fallen out of favour, such as antivivisection and alternative medical treatments. (176) With respect to chiropractic, this led to legitimisation of the practice to a level that would have been hard to imagine in the early years. Part of this process included a re-evaluation of the history of the profession *i.e.* editing Palmer's original theories of chiropractic to reflect the scientific, religious, and metaphysical concepts of the time. Historians such as Gaucher-Pelsherbe (1983) in his dissertation '*Chiropractic: Early Concepts in their Historical Setting*' (177) was the first to recognise the evolution in Palmer's ideas throughout his career and was also the first to identify the 'tension-regulation hypothesis' in Palmer's writings *i.e.* the importance of regulating 'normal' tension on spinal nerves. (165, 178)

One of the characteristics of post-modern medical culture was the growth of holistic healing systems alongside highly reductionist, scientific medicine. This growth may be explained by several factors. First, an ageing population with an increasing emphasis on chronic illness and lifestyle-related morbidity rather than acute illness. Second, a decline in the belief in the ability of science and technology, including medicine, to solve the problems of living. Third, the emergence of 'green' movements with a preference for organic rather than chemical-based solutions to problems. Fourth, a trend toward individualism rather than the acceptance of information from 'traditional' authority figures such as doctors. (179-181) These factors led to a surge in interest in alternative therapies that prompted historians to search for behaviours and beliefs about unorthodox healing that might shed light on the current practice of alternative therapies. This approach produced increasingly sophisticated literature on the cultural meaning of unconventional healing treatments. For instance, Fuller's *Alternative Medicine and American Religious Life* traced the association between unorthodox, non-church religions and alternative health paradigms. (182)

A conundrum that continues to persist in the US and to a lesser extent in other developed countries, is the presence of health belief systems that take their origins from the 'pre-modern' era. For

example, sections of the chiropractic profession continue to rely on metaphysical and religious concepts in explaining how chiropractic treatment works. (183) Albanese demonstrated how numerous 'nature religions' crossed religious traditions, historical periods and cultural divides to link religion to 19th century healers in America. (184) One such example was DD Palmer and chiropractic.

It was not until the 1990s and Wardell's *History and Evolution of a New Profession* (185) that a scholarly work on the history of chiropractic was produced. Its strength lay in Wardell's approach of ignoring clinical theory and concentrating on the sociological, historical and organisational basis for the evolution of the profession. One factor that had plagued chiropractic since its inception was the perpetuation of longstanding 'myths' about DD Palmer that were meant to be historically accurate. Gielow's *Old Dad Chiro* (186) sought to address this situation by investigating some of these longstanding 'myths' about Palmer's life. His work attempted to bring order and comprehensibility to the understanding of Palmer and his work.

As already noted, the practice of chiropractic survived while other 19th century healing paradigms disappeared or were assimilated into orthodoxy. Moore's *Chiropractic in America: the History of a Medical Alternative* (187) explains how chiropractic survived against substantial opposition from orthodox medicine while creating an image that exceeded its scientific foundations.

2.5 The current years

Some question the necessity for understanding the history of a profession claiming the focus should be on current practice. However, understanding the factors that facilitated the development of chiropractic theory may help to inform arguments about the current scope of practice as sections of the profession continue to rely on Palmer's original concepts for justifying where and when to administer chiropractic intervention. To this end, researchers have begun to discuss Palmer and the origins of chiropractic within the context of 19th century American society so as to understand the factors that may have influenced his thinking during this period. After all, chiropractic did not "spring into existence full grown"; rather it 'evolved' over 120 years. (188) Several factors have been highlighted including the economic circumstances of the time (Batinic *et al.*) (189) and the state of medicine (Trojanovich). (190) Other modalities such as bonesetting, orthodox science, 'popular' health reform and magnetic healing may also have influenced Palmer during this period (Kaptchuck & Eisenberg) (191).

An ongoing problem encountered when investigating the origins of chiropractic is the gap in knowledge about Palmer's various medical practices and his personal life between 1862 and 1895. Recent publications by Waters (192-195) have attempted to address this gap. A factor that continues to have a negative impact on the image of chiropractic is its connection to 19th century metaphysical

religion. This has resulted in chiropractic being viewed as 'religious' as opposed to 'scientific'. Notwithstanding, many religious adherents accept the concept of 'vitalism', a stance that is in direct conflict with Christianity. This phenomenon has been explained as people choosing effectiveness over an understanding of any theological underpinnings.(196)

Another link to religion is Palmer's incorporation of metaphysics through 'vertebral vitalism' or as Folk argues "the investiture of the spinal column with vital and even supernatural capabilities to regulate health". (114) Recreating the intellectual world of Palmer, rather than simply focussing on the way alternative medical practice offered a critique of mainstream medicine, has highlighted how trends in religion (and to some extent medicine and science) influenced the development of chiropractic particularly by portraying it as a distinct 'populist' philosophy that viewed the spine as the centre of health. (114)

2.6 Summary

This chapter describes the key authors and their work on the factors that influenced Palmer when developing his chiropractic theory. These included religion, economics, medicine and Palmer's personal life and experiences. Rather than focusing on any single factor, this thesis will take a broad view on how these factors interacted to influence Palmer. Its contribution to the literature will be in providing a synthesised assessment of the influences on Palmer as he developed the theory of chiropractic. The thesis will also seek to establish if culturally charged concepts accepted as 'fact' by the chiropractic profession are actually supported by evidence. With this in mind, it is now appropriate to review Palmer the man - from his birth in 1845 to his death in 1913.

Chapter 3

Daniel David Palmer

3.1 Introduction

By most accounts Daniel David Palmer was a colourful individual. Descriptions of the man range from “enigmatic” and a stranger in society from family members to “unethical”, a “quack and a fraud”, “a bumbling ignoramus”, a “misguided mesmerist”, and a “rugged individualist” from contemporaries. (167, 197, 198) This chapter outlines Palmer’s life and work from his birth in 1845 to his death in 1913.

3.2 Early years: 1845-1885

Despite limited information about Palmer’s early years, it is possible to construct a reasonably reliable timeline of his life between 1845 and 1870. Palmer was born in Toronto, Canada in 1845. When he was eleven years old his parents emigrated to America leaving Palmer and his nine-year-old brother ‘TJ’ behind. (165, 199) No information is available regarding the whereabouts of Palmer between 1856 and 1864. However, in April 1865, he and his brother emigrated to the United States, reuniting with their parents one month later in Iowa.

While Palmer appears to have received no formal education after the age of 11, he secured employment as a schoolteacher in Muscatine County, Louisa County and New Boston Illinois between 1866 and 1871. (186, 200) This may seem strange compared to modern teaching standards, but at that time, teaching was largely unregulated with training *ad hoc* at best. (201-203) Prior to the emergence of certification for teachers the most important criterion for teaching was seen as the ability to control a classroom. Moreover, popular opinion was that teachers were “too lazy to work or unfit for other profitable employments” so engaging uneducated persons as teachers was common practice. (204) Following this period as a teacher Palmer moved to New Boston, Illinois and established himself as an apiarist.

Magnetic healing

Innovations in the production and distribution of books and periodicals in the latter part of the 19th century created a “reading revolution” in America. (205) This meant that advertisements promoting ‘new’ treatments such as magnetic healing were becoming more widely read and understood by the general population. (37) The theory of magnetic healing relied on the premise that all things in ‘nature’ possessed a ‘magnetic fluid’ that could be transmitted by direct contact with an already magnetised body. (206) Physical ‘obstructions’ interfered with the free flow of this fluid to the brain and resulted in the development of disease. (207) Claims that disease could be eradicated if magnetic healing was properly applied appeared in the print media. (208)

There is no consensus on the duration of magnetic healing with some claiming the practice had significantly waned by the late 19th century, while others argue it was still in vogue much later. The former view appears to be based on French science writers from the early to late 1800s, who claimed the theory of “mesmerism [magnetism] and fluidism had been killed forever” by the 1840s. (209-213) However, while partly isolated from ‘scientific’ medicine during the latter part of the 19th century, there is some evidence to show that the practice of magnetic healing continued well into the late 19th and early 20th centuries. (214-221).

Palmer’s introduction to magnetic healing

Palmer’s introduction to magnetic healing has been reported in a variety of ways. Some claim he had studied magnetic healing in conjunction with many other health practices such as “Christian Science, Mind Cure, Metaphysics, Magnetic Healing, Osteopathy, and Phrenology” (168, 185, 222) while others assert Palmer had graduated from Dr Paul Caster’s ‘magnetic healing college’. Still others promote that Palmer received personal instruction from Paul Caster whilst working in his (Caster) infirmary. (186, 187, 193, 198, 223-235) However, these claims are contrary to the available evidence.

Palmer’s purported study of other modalities is based on a misunderstanding of a testimonial in *The Chiropractic*. The author is identified as “W.A. Crawford, Suite 527 Brisbane & Mooney Bld., Buffalo N.Y., May 5, 1899”, (236) yet many have inadvertently seen Palmer as the author rather than the recipient of this letter. (168, 222) Paul Caster reported that he had received his ‘gift’ from the “Divine spirit” (237) and had not taught magnetic healing to anyone stating that “if any man says I taught him the art of [magnetic] healing you may at once set him down as a humbug for it is not in my power to give [it] away or sell”. (238) JS Caster (the son of Paul Caster), also a magnetic healer, supported this claim describing his father’s “power [of magnetic healing] was a natural gift that could not be taught or imparted to others”. (239) Moreover, late 19th and early 20th century biographers of Paul Caster attributed his magnetic healing ability as a “divine gift” from God. (240)

In 1871, Palmer married Abba Lord the first of his five wives. (11, 186, 200, 241) Lord was a self-declared ‘doctor’ who described herself as a “clairvoyant physician, business medium, psychometrist (fortune teller) and psychic healer”. (242) Prior to marrying Lord, Palmer reported he had devoted “the study hours of five years to become a minster in the Advent Church, the Soul-Sleepers”. (243) Although there appears to be no modern equivalent for the expression ‘Advent Church, the Soul-Sleepers’, it is possible to gain an understanding of its meaning that gives an insight into Palmer’s religious affiliation prior to his ‘conversion’ to Spiritualism.

The five-year period of studying ministry mentioned by Palmer can be narrowed down to between 1865 (the year he reunited with his parents in America) and 1872 (when he rejected the Advent

church in favour of Spiritualism). (186, 243) Despite several groups espousing a synthesis of 'Christian mortalism' (soul-sleep or no immortal soul) and the imminent 'Advent' (second coming) of Christ, only two fit Palmer's timeline: the Advent Christian Church (organised 1860); (244) and the Seventh-day Adventist Church (organised 1863). (245) Although it is uncertain which of these two groups of 'Adventists' Palmer referred to, it is highly unlikely he was referring to the Spiritualist church as the doctrine of 'soul-sleep' was diametrically opposed to the seminal precept of Spiritualism: the 'immortal soul'. (142, 245, 246)

Palmer described how his study in the Advent Church had led him to believe 'psychic powers' were a "delusive humbug". He therefore decided to test Lord's psychic ability by monitoring ten of her cases. When Lord successfully diagnosed and treated these patients Palmer acknowledged her 'psychic' skill was genuine. (243) Around the same time, Palmer discovered he was able to place people in a 'magnetic trance' defined as the "sixth stage of magnetic sleep, a cataleptic or comatose state induced by hypnotism". (2, 10, 247, 248) Palmer described how he placed Lord in one of these trances "sending her spirit to distant places" adding that he was able to wake her from that trance whether he was present or not (243) a process he referred to as "mental telepathy". (178)

Between 1871 and 1873, Palmer lived with Lord in New Boston Illinois, but by 1874 he was living in What Cheer, Iowa with his second wife Louvenia. (241, 249) Despite having magnetic trance abilities since 1871, Palmer did not start practising as a magnetic healer until 1886 (165) which may in part have been due to a series of personal events during this period including the death of his infant daughter who Palmer referred to as 'our little chip' from 'unknown causes' in September, 1878, the birth of his son 'BJ' in September, 1882, and the death of Louvenia in late 1884. (250, 251)

3.3 Magnetic healing practice 1886-1895

Iola, Kansas

Contrary to popular opinion, Palmer established his first magnetic healing practice in Iola City, Kansas in 1886, not Burlington, Iowa. (192) Numerous stories appeared in Kansas newspapers regarding the commencement of this practice. (252-254) Although the reports do not use the descriptor 'DD' it was most likely Palmer. The *Saline County Journal* reported that "Dr Palmer of South-west Iowa [Palmer's location at that time], will locate here in a few days" (255) while the *Burlington Hawkeye's* report of Palmer's death on October 23, 1913 described how Palmer had "left What Cheer [Iowa] for Iola, Kansas, establishing himself as a magnetic healer [in Iola] where he remained for a short time (5 months) before migrating to Burlington, Iowa in 1885, then later to Davenport Iowa". (254) (See Appendix 3)

Palmer's brief stay in Iola may be explained in part by events that had transpired in the town. In the lead-up to this period and prior to Palmer commencing practice, Iola had been earmarked as a

boomtown due to the establishment of coal mining in the area. When natural gas was discovered, plans around coal were put on hold and a large sanatorium based on heated-water treatments was built. The sanatorium remained viable until July 1886, when the Neosho River burst its banks flooding the gas seams and destroying the sanatorium. (256, 257) By the time Palmer arrived in Iola City in April 1886, the population had dwindled to 1700. (258, 259) Five months after commencing practice in Iola Palmer had relocated to Burlington Iowa. He used a similar approach to Iola in promoting his magnetic healing practice by placing multiple advertisements in the Burlington press advising of the commencement of his practice. (195)

Burlington, Iowa

Burlington was a prosperous regional city in 1886 with a population in excess of 25,000 and an annual business turnover of \$26 million, which was considered a large amount for the time. (260) Despite being the only magnetic healer listed in the 1887 *Burlington City Directory* (260) Palmer suddenly left Burlington in late 1887 moving to Davenport, Iowa in January 1888. A number of explanations have been given for Palmer's sudden departure from Burlington and relocation to Davenport. They include the larger population base in Davenport; his inability to compete with Paul Caster the magnetic healer; and his inability to compete with Caster's son, JS Caster, also a magnetic healer. (185, 189, 235, 261, 262) To better understand the most likely explanation for Palmer's move to Davenport further examination of the facts is required.

It is unlikely that the basis of Palmer's decision to move to Davenport in 1888 was the larger population because the 1885 Iowa Census reported Davenport's population as 23,800, a figure not too dissimilar from that of Burlington's population at the time, listed as 23,500. (263) Leaving Burlington due to professional competition with either of the Casters is also unlikely as the chronology of events does not support this view. Paul Caster never practised in Burlington. He practised in Leon and Ottumwa, Iowa, which were 246 and 128 kilometres due east of Burlington. (240, 264) Furthermore, Paul Caster died in 1881, five years before Palmer commenced practice as a magnetic healer in Burlington. (265) Caster's son, JS Caster, commenced practice as a magnetic healer in Burlington in June 1889, 18 months after Palmer's departure to Davenport which was in late 1887. (186, 266, 267) Figure 3.1 depicts key events for Paul Caster, JS Caster and DD Palmer between 1866 and 1889. The reason or reasons for Palmer's sudden departure from Burlington must therefore lie elsewhere.

Figure 3.1 Key events for Paul Caster, JS Caster and DD Palmer: 1866-1899

Paul Caster ^{199, 236, 238, 267}	JS Caster ^{237, 238, 266}	DD Palmer ^{185, 199, 252, 254, 470}
<p>1866: Commences magnetic healing practice in Leon Iowa</p> <p>1869: Relocates to Ottumwa Iowa</p> <p>1881: Dies in Ottumwa April 19.</p>	<p>1874: Commences work in boiler room at Paul Caster's infirmary</p> <p>1877: Promoted to infirmary superintendent but does not practice 'magnetic healing'</p> <p>1881-1889: Leaves infirmary April 1881 after death of Paul Caster and commences as a machinist for Chicago, Burlington and Quincy Railroad (CBQR) in Burlington, Iowa</p> <p>1889: Leaves CBQR in June-July. Commences his first magnetic healing practice in Burlington in July 1889.</p>	<p>1886: Commences 'magnetic healing' practice in Iola, Kansas. Relocates to Burlington, Iowa in September</p> <p>1886-1887: Practices 'magnetic healing' in Burlington</p> <p>1887: Suddenly leaves Burlington commencing practice in Davenport, Iowa, 18 months before JS Caster commenced his first 'magnetic healing' practice in Burlington in 1889.</p>

The treatment of Mrs JW Thornton

In July 1886, the Iowa State Legislature passed the Iowa Medical Practice Act requiring all physicians, 'regular' and irregular', to obtain a state licence. The Act was designed to regulate the practice of medicine and ensure medical practitioners could demonstrate an acceptable level of medical education. To become licensed, a physician had to present a copy of their medical degree from a state-recognised medical school or alternatively undertake an examination in "anatomy, physiology, general chemistry, pathology, therapeutics, the principles and practice of medicine, surgery and obstetrics". (269-273) Those who could not demonstrate sufficient medical knowledge to be granted a licence were given six months to acquire a 'certificate of competency'. (270) However, by 1887 Palmer had not complied with this regulation and therefore had not obtained a license.

On October 24, 1887 the *Burlington Gazette* reported that Mrs JW Thornton had died whilst under Palmer's care. The story contained a report of how Palmer had continued to treat Mrs Thornton with magnetic healing for six hours after her death. In his defence, Palmer explained that he considered her to be "in (a) trance" and not deceased. (274) The coroner argued that Palmer should have been

aware of the patient's true condition particularly in view of the "odor [sic] of decomposition being quite apparent even to the unexperienced eyes making it evident that the patient was dead". (275) A subsequent inquest censured Palmer citing his "dense ignorance" in relation to the death of Mrs Thornton. (276) Disparaging reports continued to appear in the Burlington press between November 8 and November 10, 1887 with the *Gazette* openly supporting the court's decision that Palmer was a dangerous and incompetent 'quack'. (276)

Notwithstanding the coroner's accusation of incompetence, Palmer's actions were consistent with the magnetic healing concepts popular at the time. Reports of similar cases where patients in a magnetic trance could appear dead for up to three weeks had appeared in various publications. (277-279) Some magnetic healers recorded that an odour was released by patients undergoing magnetic healing, which could be accompanied by the secretion of a "profuse yellowing ichor [watery discharge from a wound] of a pungent and highly offensive odor [sic] that was a liquid mass of loathsome detestable putrescence" in the moments leading up to their cure. (280, 281) Based on Palmer's understanding of magnetic healing, he would have felt justified in thinking Mrs Thornton was in a trance. The ongoing negative press and impending threat of prosecution for being an unlicensed physician, punishable with a \$300.00 fine and incarceration, are the most likely basis for Palmer's sudden and unexpected departure from Burlington in 1887. (282)

Davenport, Iowa

While information regarding Palmer's movements in Davenport between 1888 and 1895 is limited, newspaper reports give a glimpse of his life during this period. Key events in his life during this period include the death of his stepson and the 'discovery' of chiropractic in 1895. (149, 283)

Magnetic manipulation

In the 1890s, the term 'magnetic manipulation' referred to three methods of manipulating the body's magnetic fields:

1. Repeated passes of the hands over the body with no direct contact to the body;
2. Direct contact with the body using manual therapy/manipulation; and
3. Spirit magnetic healing *i.e.* manipulating the body using spiritualism with no direct contact to the body. (284-287)

Initially, Palmer used Method 1, hand-passes over the body to influence the body's magnetic fields, but by 1888 he had begun to incorporate direct contact manual therapy in the form of spinal manipulation (Method 2). (288) For Palmer, this 'new' technique differed from his earlier procedures as it no longer included "long passes over the spine" (10, 289)

3.4 Origins of Palmer's chiropractic theory

Palmer did not view his lack of formal education as a hindrance to his practice as a magnetic healer. He described how educating himself, particularly in medicine, had led him to reject the established ideas of the medical ideas. (186) Palmer's account of his self-education would have struck a chord with readers for whom self-education was a common method of learning and would have played a critical role in the acceptance of chiropractic at the time. (137)

The Lillard Event

Information about the Lillard event is typically limited to his occupation, racial orientation (Negro), seventeen-year history of deafness, and the date of his cure September 18, 1895. However, this material overlooks several issues. First, the date of Lillard's 'cure' is uncertain with reports that Palmer mentioned three dates: September 18, 1895, December 1, 1895 and January 1896. (165, 290-293) Second, some have argued that the Lillard event is merely a 'myth' (294) or as Lerner summarised it: "the inescapable conclusion is that the Harvey Lillard story is more than doubtful". (114, 295) The account of Lillard's daughter, Valdeenia Simons, also casts doubt on the event. She recounted how her father had told her he had been telling a joke in the hallway outside Palmer's office. Palmer had come to the door to listen and had slapped him (Lillard) on the back with a heavy book when he delivered the punchline. Lillard told Palmer he thought he could hear a little better following the blow to the back to which Palmer suggested they could both make money out of this situation if they worked together. (296)

Third, the precise nature of the manipulation *i.e.* which vertebra Palmer adjusted, is in dispute. Despite Palmer describing how he had adjusted Lillard's "fourth dorsal [thoracic] vertebra", (165) early osteopaths claimed he had undertaken a cervical manipulation. (297) Palmer's son 'BJ', himself a chiropractor and graduate of the Palmer School of Chiropractic (PSC), took the same position claiming it was the "second cervical vertebra", not the fourth thoracic. (225) Chiropractors appear to have ignored the osteopathic claims, but BJ's stance created a division within the profession forcing him to provide an explanation.

He described how "medical men" in the late 19th and early 20th centuries had considered manipulation of the cervical spine "dangerous". In order to placate physicians and avoid the possibility of his early students "killing patients", Palmer had refrained from teaching cervical manipulations advocating they should "keep away from the neck". (225, 298) However, BJ's explanation is highly unlikely for a variety of reasons.

First, as already noted, Palmer repeatedly claimed he had adjusted the "fourth (thoracic) vertebrae". Moreover, he described how he could not manipulate any part of the spine prior to 1898 (which was 3 years after the 1895 Lillard event) except for the "fourth to twelfth dorsal (thoracic) vertebrae".

(165) By 1901 (6 years after the Lillard event), he had expanded his range of manipulations to include all thoracic and lumbar vertebrae, but cervical manipulations were still absent, not performed until at least 1902. (11) Therefore, if Palmer did not manipulate the cervical spine until this date, the Lillard manipulation in 1895 could not have been undertaken on the cervical spine.

One factor that is frequently overlooked in discussions about Lillard's cure from deafness is that the relevant nerve affecting the auditory system is wholly intracranial, so claiming Palmer's treatment (irrespective of whether it was C2 or T4) had cured deafness, disregards the implausibility of such a claim and brings the veracity of the story of the first manipulation into question. (299-301)

Magnetic healing parallels chiropractic

Despite Palmer's report of the effect of his 'chiropractic' treatment on Lillard in 1895, he continued to refer to himself as a 'magnetic manipulator' for a number of years after the event. (10, 302)) In 1896, Palmer registered his magnetic healing school, *Palmer's School of Magnetic Cure*, and included a statement in the school's charter that the school had been established to "explain why certain manipulations produced certain results, the direct causes of disease and how to cure those diseases by natural methods". (290, 303) Two years after treating Lillard, Palmer continued to acknowledge magnetic healing as the foundation of his 'new' treatment stating: "We have always done our business under the head of Magnetic Cure [and] we have not ceased to believe in magnetic treatment". (10) Palmer also continued to offer to teach magnetic healing to anyone "suitably qualified", but what he meant by 'suitably qualified' is not self-evident. (10, 149)

Further evidence that Palmer viewed chiropractic and magnetic healing as analogous during this period can be seen in the way he changed the name of his publication '*The Magnetic Cure*' to '*The Chiropractic*' while continuing to publish it under the auspices of *Palmer's School of Magnetic Cure*. (149) (See Appendix 4) Palmer's own words appear to support the view that chiropractic and magnetic healing were one and the same when he presents the terms 'magnetic manipulator' and 'chiropractic manipulator' as interchangeable in the first two editions of *The Chiropractic* (January and March, 1897). (See Appendix 5) Furthermore, when referring to the practitioner Palmer used the terms 'magnetic manipulator' and 'chiropractic' interchangeably. "Instead of waiting as the medics do for symptoms to develop, the magnetic manipulator or *chiropractic* will put the wrong to right and the symptoms will not develop for the cause is removed". (290) It would appear that in Palmer's view, chiropractic was merely an enhanced form of magnetic healing. (149)

The naming of 'chiropractic'

Palmer needed an appropriate name for his 'new' discovery. He asked the Greek scholar, Reverend Samuel Weed, to construct a list of words that could encapsulate Palmer's description of his 'new' treatment. Weed's personal preferences were '*chirocatartist*' and '*chirocatartist*' as they had "just

the right meaning, adjusting or putting right by hand”. (See Appendix 6) Contrary to reports that Weed coined the name for the ‘new’ treatment, Palmer claimed he named it ‘chiropractic’ stating “I (Dr D.D. Palmer) was pleased to name the science chiropractic on January 14, 1896”. (292, 304-306) However, ‘branding’ chiropractic unwittingly placed Palmer within the ‘rank and file’ of sectarianism because a proliferation of irregular treatments with idiosyncratic names already existed. (114)

Palmer’s explanation of ‘chiropractic’

Palmer described chiropractic as a “new idea to right the wrong”, (290) but what he meant by the descriptor ‘new’ is not immediately self-evident, so it is appropriate to explore possible reasons for his claim.

Spinal manipulation

Placing spinal manipulation at the centre of a theory for treating disease was not in itself ‘new’ as spinal manipulation had been used as the basis for other manual treatments prior to 1895 *e.g.* bonesetting (in vogue since the 1730s) and osteopathy (developed by AT Still in 1874).

Using spinal vertebrae as levers

Palmer’s use of vertebrae as ‘levers’ in his treatment (165) was not new as this technique had been used by physicians in one form or another prior to the 1890s. For instance, physicians in the 1830s had been aware that proper alignment of the spinous and transverse processes was important to health with some using these structures as levers to adjust ‘subluxations’ of the spine. (222, 307) Furthermore, AT Still had made a similar claim to Palmer stating that “bones can be used as levers to relieve pressure on nerves, veins and arteries”. (308)

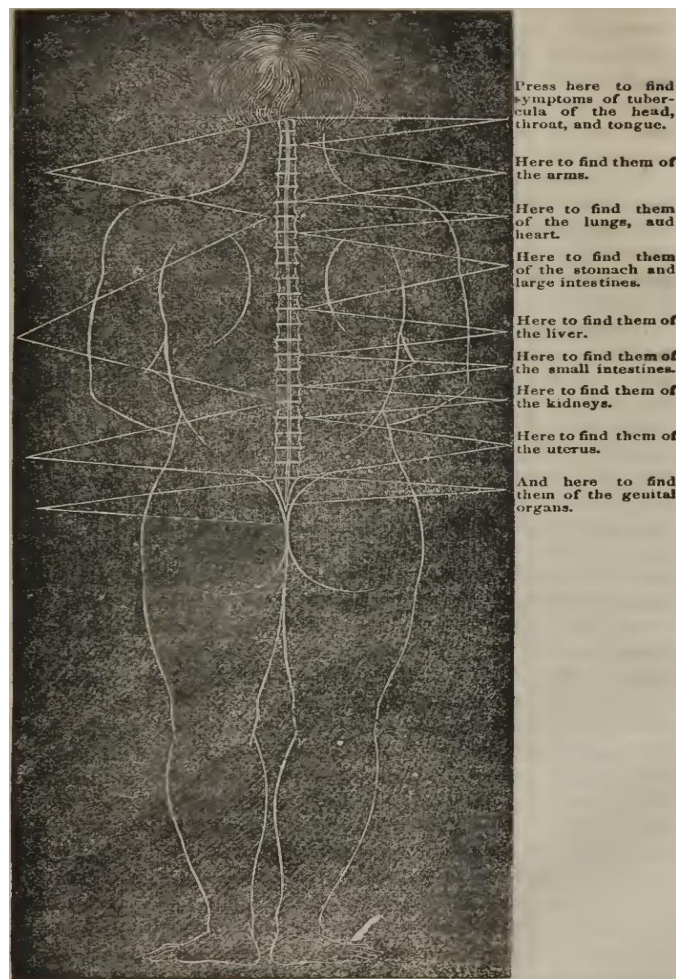
Nerve-tracing

Palmer claimed he was the “first to use nerve-tracing”. (165) However, nerve-tracing (tracing visceral diseases back to spinal nerves), had been in vogue since the 1820s and featured in medical publications in the 1840s and 1890s, hence it was not new. (309-314) (See Figure 3.2)

Curing deafness

Similarly, claiming to cure deafness with magnetic healing was not ‘new’, as magnetic healers had claimed since the early 19th century that deafness, blindness, lameness, cancer, insanity, venereal diseases, and paralysis could be cured by magnetic healing. (315-320) Therefore, the claim to ‘newness’ must lie elsewhere.

Figure 3.2 Nerve-tracing chart 1841 ³¹³



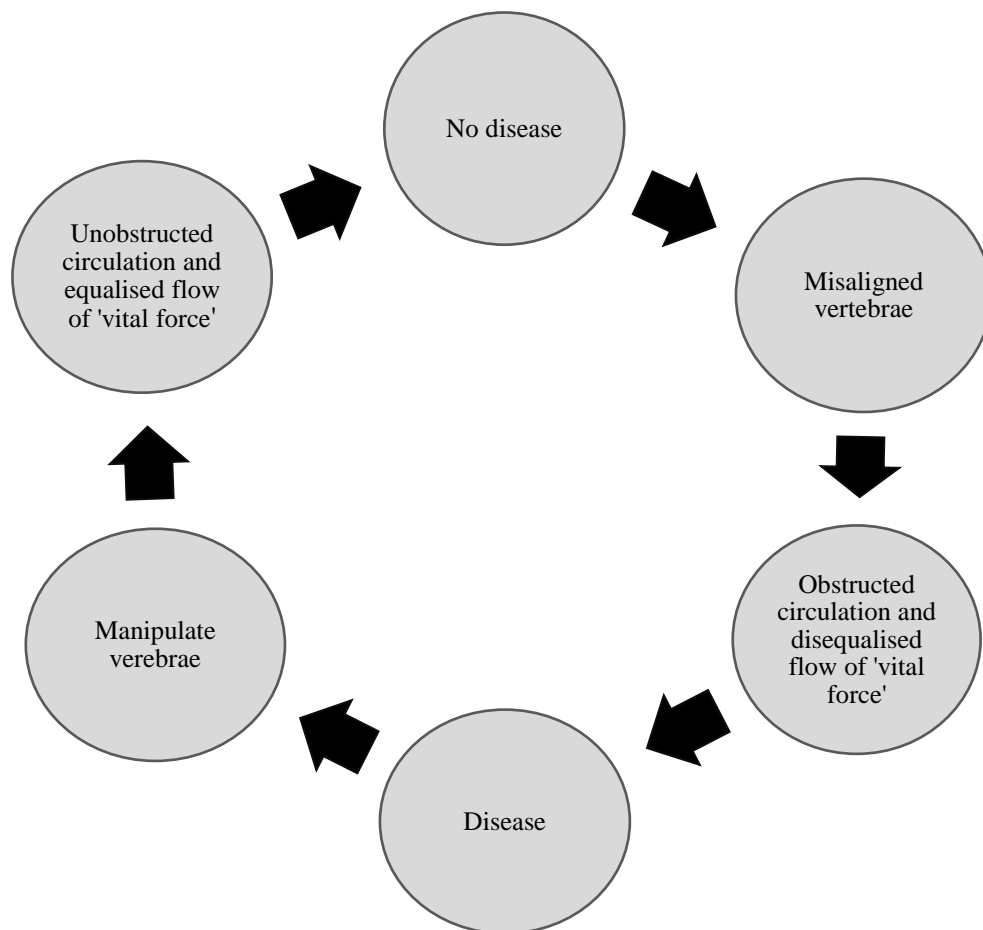
Innate Intelligence

Palmer's notion of 'Innate Intelligence', which he defined as the 'life force', 'spirit' or 'God' that "runs the the material body through the mind as long as it [the body] is habitable" (165) has typically been reported as 'new'. (321-323) Simply stated, Palmer claimed misaligned vertebrae reduced the flow of Innate Intelligence resulting in disease, whereas realigning the vertebrae using spinal manipulation 'equalised' Innate Intelligence and returned the body to health (10, 290), a claim that was considered neither evidence-based nor scientific by the medical profession at the time. Figure 3.3 summarises Palmer's theory in schematic form.

However, the idea of an intangible circulating inner force (vital force) requiring proper 'balance' was commonly promoted in 19th century medicine and had been espoused by physicians since the 1840s for cases of "collapse and great prostration of strength". (324) Moreover, contrary to popular opinion (165, 321, 325) the origin of the idiom 'Innate Intelligence', and its connection to the 'Divine' life force, did not lie with Palmer. Rather, the term was in vogue in spiritualist writings as early as the

1880s, “this being [is] non-dimensional and cannot be seen by either mortal and spirit and can only be seen through his own Innate Intelligence or divinity within”. (326, 327) This means the descriptor ‘new’ must refer to another factor.

Figure 3.3 Schematic representation of Palmer’s theory of chiropractic



Changes to society

Palmer claimed chiropractic could change society describing how manipulating spinal misalignments, and ensuring their continuing correct position, could reduce “poverty and crime as well as empty the jails, penitentiaries and insane asylums”. (178) BJ Palmer later made similar claims, but expanded chiropractic’s potential arguing it could:

1. Reduce the need for medical colleges;
2. Decrease the time involved in medical studies from seven years of “useless subjects” to a “few simple subjects confined to the spinal column”;
3. Convert drugstores [pharmacies] to “department stores selling everything but drugs”;
4. Eliminate the need for surgery except for “accidents, injuries and trauma”;

5. Reduce the need for all hospitals except for accidents, trauma and war wounds; (328)
6. Eradicate “perversities, monstrosities, wars and rumours of wars, and all manner of addictions” because “happiness and peace would come upon [the world] from within” *i.e.* from Innate. (329)

However, 19th century educators like Mann had advocated that education and religion could prevent “crime, the dark host of private vices and domestic unrest” (330) while osteopaths in the late 1890s advocated manipulation as a cure for insanity. (331) Consequently, claiming to solve society’s woes with chiropractic was not a new concept.

It is therefore difficult to pinpoint the ‘newness’ Palmer was referring to. This raises the question ‘was the descriptor ‘new’ when used to describe chiropractic, referring to some other unknown aspect of the treatment or simply the actions of another shrewd medical entrepreneur of the time’? (332)

Gauging Palmer’s success

Palmer is often viewed as a successful practitioner whilst in Davenport. (186, 198, 333) This stance, however, appears to rest on Palmer’s reports. When Palmer commenced practice in Davenport he described how he had rented three rooms in the ‘Ryan block’ on the corner of Second and Brady Streets, an ideal location for patient access as it was only two blocks from the Mississippi ferry wharf. (186, 189) According to Palmer, business soon increased forcing him to rent forty rooms. (334) To support his claims of success, Palmer pointed to copious ‘testimonials’ espousing the benefits of his treatment. However, it is highly unlikely that Palmer was a success for a variety of reasons.

First, notwithstanding Palmer widely reporting Lillard’s ‘miraculous’ cure in his broadsides the *Magnetic Cure* (1896) and *The Chiropractic*, (1897) no newspaper reports can be found about the event. In point of fact, Davenport newspapers reported to the contrary describing how “very few people realized the importance of Dr Palmer’s chiropractic infirmary” and how his rooms were “not filled with the sick”. (335, 336) Second, although chiropractic had spread far from its Iowan origin by 1910, medical publications of the time only paid scant attention to the practice reporting it was “simply too outrageous” to be taken seriously. (337)

Third, fiscal data presented by Gielow to demonstrate Palmer’s financial success lacks support. Fourth, by 1902, the Palmer School of Chiropractic (established in 1898) was insolvent, owing debts totalling \$8,000, a not insignificant amount of money in that period. (167, 193-195, 225, 334-336, 338) Palmer’s attempt to leave Davenport in secret in 1902 may have been in part due to his financial situation. This last factor may go some way to explain why his contemporaries had labelled him an “unethical dead-beat, quack and fraud”. (167) Fifth, four patients had died whilst in Palmer’s care between 1887 and 1905: Mrs Thornton (Burlington 1887); Samuel Hatton (Davenport 1902); Lucretia Lewis (Davenport 1905); and an unnamed patient who had died in his Davenport infirmary

a short time before Lewis. It was reported that in three of these cases Palmer had tried to circumvent the coroner by illegally signing the death certificate himself. (274, 339, 340)

Palmer's death

Palmer died in the County of Los Angeles, California on October 20, 1913. The death certificate listed the primary cause of death as 'typhoid fever' with longstanding 'brain congestion' as a secondary factor. (341) (See Appendix 7) Throughout the 18th and 19th centuries brain congestion was the most frequent diagnosis for conditions ranging from cognitive decline to stroke, but most often appears to be related to stroke from hypertension. (342) Close associates of Palmer rejected the official cause of death accusing BJ of attempted patricide, an approach that may have influenced media reports like 'death from son's auto[mobile]'. (343) This stance was, however, in stark contrast to Palmer's written statement of September 17, 1913 dismissing the automobile event as false. (344)

3.5 Summary

When DD Palmer administered spinal manipulation to Harvey Lillard he claimed the results were the product of a 'new' way of treating disease, a treatment he called 'chiropractic'. Despite performing manipulation on all joints of the body, Palmer focused his primary attention on the spine and its relationship to the nervous system, health and disease because he believed that correcting displaced spinal vertebrae would restore normal function to the nervous system giving chiropractic its distinct identity. His claims were particularly bold when considered against a backdrop of rising morbidity and mortality rates in urban America predominantly amongst children (50%), immigrants (40%) and the poor (35%). (67, 345-349) Physicians had searched for a panacea for disease for millennia; (350) Palmer was convinced he had found it.

Chapter Four

Methodology and Results

4.1 Introduction

Chapter 4 describes the theoretical framework underpinning this research. The aim of the chapter is to explain how the investigation into the factors present in American society in the 19th century that may influenced the development and acceptance of chiropractic was conducted. Qualitative methodology with a retrospective constructivist grounded theory approach was considered the best method to achieve this aim.

4.2 Methodology

Best approach for this study

A qualitative research design, rather than quantitative, was chosen for this study because qualitative does not seek to establish an ‘objective truth’ employing a wide-ranging approach to gathering data typically generating words rather than statistics. (351) Furthermore, qualitative research seeks to discover the experiences of people in a specified setting trying to understand the effect of these experiences as they unfold (352) while at the same time discovering contextually specific information by focussing on complex system dynamics and interdependencies. This approach helped shape a contemporaneous understanding of the experience of 19th century individuals and identify specific information relating to past, present and future events that affected those individuals while preserving the chronology of events. (353, 354).

Several qualitative methodologies were available: ethnographical; phenomenological; historical; and grounded theory. Ethnographic research was considered unsuitable because studying a culture from within (the seminal element of ethnography) (355-357), in this case the 19th century American social milieu, was not possible. Phenomenological research was precluded because its main purpose is to reduce individual experiences about a phenomenon to a description of the “universal essence” of that phenomenon. (358) In other words, the methodology provides a “thematic description of the pre-given essences and structures of the lived experience”. (359) As a result, truth is subjective and depends on the experience of individuals. (359, 360)

Historical and grounded theory research had potential for this investigation. While these methodologies share some similarities, there are a number of salient differences when studying real-life events. (361) Historical research studies often attempt to understand and interpret a past event whereas grounded theory seeks to uncover the issues that may have driven the event. (362) Historical research involves the systematic collection of data to determine if the understanding of social events has transformed over time (363) critically analysing past events and facts looking for the whole truth.

The method can draw conclusions and makes predictions about the future whereas grounded theory seeks to generate a theory from data in order to develop a range of cross-case displays that enrich the description of a single cultural action. (353, 364) Moreover, historical research generally seeks to “answer questions about causes, effects or trends to past events that may shed light on present behaviours or practices” (365) an approach that did not suit the essence of this thesis.

The best approach for this study was considered to be grounded theory, in particular constructivist grounded theory. Grounded theory tells us how to account for the participants main concerns and reveals variables that allow for incremental change. Grounded theory has been described as “what is, not what should, could, or ought to be”. (366) The critical point in grounded theory is that the research does not set out to prove or disprove a theory. (367) Adopting constructivist grounded theory facilitated the construction and discovery of themes while simultaneously permitting basic grounded theory guidelines to be combined with ‘twenty-first century methodological assumptions and practices’. (368) In other words, because constructivist methodology repositions grounded theory as a flexible approach rather than a strict methodology, it supported the process of interpretation more than discovery. (368, 369) This allowed the use of participants’ stories that were located in the world in which they lived *i.e.* within the historical context of 19th century America. (370) Because of these attributes it was felt constructivist grounded theory was best suited this study.

4.3 Results

Data collection

This study relied on a variety texts for analysis. Collected data were reviewed to establish the “who, what, when, where, why and how” of context. (371) Data were obtained from several sources including large-scale collaborative repositories of digital content from research libraries including digitised content via the Google Books project and Internet Archive digitisation initiatives such as *HathiTrust*, *Archive.org* and *Nineteenth-century collections online*. Key phrases were used to search the literature. (See Figure 4.1) Primary sources were chosen whenever possible (though secondary sources were used when primary sources were not available) because they portrayed the ‘lived’ experience of the people at that time and included personal letters and diaries, journals, books and newspapers. Table 4.1 shows a breakdown of the primary and secondary source documents used in this study.

Figure 4.1 Key phrases used in the literature search

- 19th century American society;
- Late 19th century American society;
- Factors that shaped American society in the 19th century;
- Concerns of 19th century Americans; and
- Concerns of late 19th century Americans.

Table 4.1 Breakdown of collected primary and secondary source documents

Type of publication	Number of publications used
Almanacs	1
Books	303
Census data	3
Cyclopaedias	2
Diaries	8
Dictionaries	7
Dissertations	1
Journals	131
Letters	7
Magazines	6
Newspapers	15
Pamphlets	33
Reports	4
Sermons	3
Town directories	2
TOTAL	526

Results of data analysis

Questions such as ‘What was the social and political context?’ and ‘What conditions caused or influenced concepts and categories?’ were posed. Notwithstanding the importance of all of the categories, coding established four main themes of relevance to this paper: medicine, religion, economics, and politics.

Medicine

During the 19th century, medical thinking began to distance itself from the archaic medical theories such as “keep the head cool, the feet warm and the bowels open” in favour of a more interventional approach that used bloodletting and mercury preparations to treat patients – the so-called ‘heroic’ approach to medicine. Rapid urbanisation had created a fertile environment for increased rates of communicable diseases with epidemics a serious and widely feared problem in many American cities during this period. (372) High rates of morbidity and mortality overwhelmed the medical profession in America throughout the 19th century leaving patients disillusioned with traditional doctors. This was compounded by the negative attitudes expressed by some physicians and the general public towards the practice of medicine including public health initiatives which were believed to be money wasted on undeserving parasites’, ‘physicians were corrupt, ignorant, disreputable even murderous’ and ‘can physicians be trusted with one’s physical health’. (41, 373-379)

Poor outcomes led to medicine taking on the mantle of science as sections of the profession gained competency and confidence. By studying anatomy, aetiology and symptomology medical practitioners believed they had reached a point where they understood disease and how to manage it. (380, 381) However, many outside the medical profession did not share this view claiming the masses were shrewder and more endowed with common sense and less perverted in their natural instincts than the more refined medical practitioners. (382) As the century progressed, medicine was divided over whether Pasteur’s experiments provided sufficient evidence to support a workable ‘germ theory’. Some argued that these experiments were valid while others claimed that “organisms were not, and would never be, responsible for disease” arguing that ‘germ theory’ was the “insanest crusade ever instituted on illogical lines” that would adversely affect the capabilities of young physicians. (383-385)

Religion

By the 1830s, a wave of morality had begun to spread eastward across America as new converts to the evangelical movement known as the Second Great Awakening tried to eliminate sin from society. (386, 387) All manner of social reforms emerged as a result of this movement including abolitionism, temperance, health reform and the asylum movement. Religious adherents tried to eliminate the inherited order based on hierarchy and coercion arguing that only free individuals were able to choose God. As this movement gained popularity it began to impact both medical and political thinking. (388) Religion altered the practice of medicine with doctors becoming “missionaries to the bedside”, who promoted the view that medicine’s role was ‘redemption’ not science. Furthermore, physicians began to accept the ‘moral’ theory of disease promoted by religious leaders throughout the centuries.

(389-391) This overlap of religion and medicine allowed disease to be considered an act of god and the actions of doctors some form of adjunct to prayer and divine healing. (392)

Economics

The American economy went through periods of prosperity alternating with sharp declines in a boom and bust pattern between 1865 and 1900. Following the recession of 1891, America again fell into a depression, this time more severe, between 1893 and 1897. This coincided with the period in which Palmer was developing chiropractic. (393) Although these downturns were not equal in severity, the ‘Panic of 1873’ caused wages to fall by 25%, companies to default on \$1billion debt, the majority of the railroads to go into liquidation (90%), and unemployment to reach double-digits. Even though unemployment, homelessness and malnutrition were more concentrated in the industrial sectors, all sections of society were impacted. (394)

Politics

Unrest, bitterness and violence surrounded elections that threatened to spread beyond political events was the hallmark of 19th century American politics. (395) During this period, often referred to as the ‘Gilded Age’ (1865-1900), the American Senate had become an elite ‘rich-man's club’ where practices that would be viewed as scandalous today were accepted as routine, resulting in public protests in response to the growing inequities in society. (396) Mark Twain portrayed the era as one of “every imaginable corruption”. (397) Political corruption was the norm with businessmen openly bribing public officials at the local, state and federal levels. The narrow margin between Republican and Democratic voters meant both parties were hesitant to take strong stands on any issue for fear of alienating voters. Successive presidents ensured the protection of the ‘spoils system’ *i.e.* the power of the president to practice widespread political patronage, an approach that resulted in widespread nepotism. The preservation of the ‘political machine’ and repaying favours with ‘patronage’ was important to safeguard the outcome of presidential elections. (398) The result was that little was done for the common people.

4.3 Summary

Several factors played a key role in shaping the values and views of the American population towards health and healthcare throughout the 19th century. Using grounded theory, several reoccurring factors were identified as providing a favourable environment for the origins and development of chiropractic during the latter part of the century. These factors were medicine, religion, economics, and politics. The backdrop created by these factors facilitated the acceptance of Palmer’s ‘new’ theory of chiropractic. (374, 375) It was felt that adopting a constructivist grounded theory approach resulted in improved accuracy of the data analysis and ultimately allowed for the formation of an evidenced-based theory that explains the factors that created an environment conducive to the

development and acceptance of chiropractic during this period. The combined effect of these factors and their influence on the development of chiropractic are discussed in the following chapter.

Chapter 5

Discussion

5.1 Introduction

The aim of this study was to establish the factors present in American society in the 19th century that created a favourable environment for the origins, development and acceptance of chiropractic. Four main factors were identified: medicine, economics, religion, and politics. This finding was then used to provide a framework for improving our understanding the origins and development of chiropractic during this period. Having identified the factors, it is pertinent to expand on them to see how they created favourable conditions for the acceptance of alternate theories of medicine and how Palmer used them to his advantage when formulating his ‘new’ theory of chiropractic. (10)

5.2 The four main factors

Medicine

As sanitary conditions in the tenement districts deteriorated and morbidity and mortality rates increased in the first half of the 19th century, a sense of helplessness began to emerge among sections of the population. (117) This situation increased the need for effective medical treatment at a time when treatment was unaffordable to much of the general populace. (115, 399) Ironically, disease was both the cause and effect of the poverty that typified American towns at the time. (400)

Physicians, unable to effectively treat disease, were seen as “totally unfit to take charge of a single patient”. (379) A lack of knowledge about sepsis resulted in mortality rates approaching 50%. (379, 401, 402) By the 1860s, some physicians had begun to replace ‘depletion’ therapies such as bloodletting and mercury with ‘stimulants’ such as alcohol. (38) This shift in approach was based on the belief that depletion methods sought to harshly accelerate the elimination of blood, bile, sweat, faeces or phlegm whereas stimulants were more moderate in action. (403) Underlying these changes was the transformation in how physicians understood the goal of therapy. Typically they had attempted to restore the ‘balance’ of an individual’s ‘natural’ condition whereas the new approach sought to restore the body to a fixed ‘norm’. (38)

The late 1880s saw the rise of laboratory research that produced reductionist knowledge about physiological processes caused by the action of drugs. Despite the shift to a seemingly scientific approach, it is worth remembering that medicine did not simply become more scientific. What occurred was a shift in what was and was not considered science. (38) Towards the end of the 19th century, significant changes occurred in the way medicine was practiced. The influence of European medical scientists accelerated the uptake of scientific knowledge enabling America to become a leader in medicine and medical thinking by the turn of the 20th century.

Although the John Hopkins University was a privately funded institution, its establishment in 1893 triggered the rise of government-sponsored diagnostic laboratories capable of not only reproducing European experiments but contributing new scientific discoveries. Prior to its establishment, American medical schools did not receive the same acknowledgment as other professional schools. For example, in 1891 theological universities received endowments totalling \$18 million whereas medical schools attracted much less (\$500,000), forcing physicians to follow in the footsteps of their predecessors and study in Europe. The backwardness of American medicine began to dissipate with the production of scholarly medical literature. (404) However, despite the increase in medical knowledge mortality rates continued to rise well into the 1890s. (405)

Due to the pluralistic nature of American society, medical sectarianism intensified in the latter half of the 19th century. Paradoxically, the 'closed' nature of medical politics at the time generated counter-movements that sought to improve the position of these sectarians. Benevolent organisations provided an avenue for the less educated and immigrant physicians to assert their claims against established medicine in a society typified by continually changing public sentiment. (115) By the 1890s, medical therapeutics continued to be a weak point in medicine relying on an empirical and tentative approach rather than clinically-based research. (406, 407)

Physicians struggled to cope with the multitude of patients demanding 'active' therapy in treating their diseases rather than the ineffective existing treatments, that were often accompanied by excuses for failure. (408) Diagnostic procedures and disease categories had not been standardised to any reliable degree during this period. Diagnoses were retrospective and highly speculative while published case studies were idiosyncratic compared to modern standards. (112) Essentially, medical physicians of the time were no better in terms of the foundation of their therapeutic methodologies than their sectarian counterparts. At a time when the lack of basic hygiene was a major contributor to the spread of disease, it is not surprising that new theories of disease and methods of treatment, all claiming to have the solution to all disease, grew and flourished. (190)

Economics

In the late 1890s, 'hobo' camps were common; police patrolled railway stations to prevent 'tramps' entering towns. It was estimated that over 600,000 people regularly slept in railway stations. Those fortunate enough to be employed were subjected to severe wage reductions making it difficult to obtain the basic necessities. (409, 410) Conditions for many of the common people were inhumane with the poor forced to live in appalling squalor and depths of poverty and considered as a means to increase the wealth of the upper class. These economic circumstances left the people searching for ways to rapidly generate income in order to escape poverty, disease and in many cases, death. These events coincided with the period in which Palmer was developing chiropractic.

Religion

Increases in poverty, disease and death resulting from urbanisation and industrialisation were viewed as an inevitable part of God's 'divine plan'. This fostered an atmosphere of fatalism amongst the general population at varying times throughout the century. (405, 411-414) Despite an increase in the 'natural' theory of disease (the belief that the body comprises organ systems with 'natural' functions that create disease) the 'moral' theory of disease (moral failure caused disease) was prevalent. (115, 415) From a religious perspective, morbidity and mortality was seen as the result of culpable moral choices. (115, 416)

Based on that view, religious exponents argued that disease had two functions: to demonstrate the ongoing power of God; and to promote righteousness amongst the neglectful masses. (417) To restore health, the poor were encouraged to atone for their sins, revitalise their faith and emulate the rich who were seen to be "conscious of no wrong" and possessed of "perfection in moral nature". (418-421) This view ran counter to the popular belief that disease was 'sanitary' in nature *i.e.* disease was caused by inadequate clean drinking water and proper treatment and disposal of human excreta and sewage, and only served to increase the public's anguish over disease. In an attempt to mitigate their ineffectiveness physicians began to echo religion by using idioms in their treatment such as "the dignity and sanctity of the medical profession is not science, but redemption [from disease]". (38) What the medical profession appears to have failed to grasp was that the general public were searching for a simple explanation of disease where the treatment included some religious basis but did not place the blame for mortality on the patient.

Politics

As already noted, political proponents in the Gilded Age did little for the common person in regard to disease management. Many political leaders in the earlier decades of this period agreed with the religious view that disease was the result of sin. (396) Increasing inequities in society and the inefficiency of political leaders led to the emergence of the 'Populist Party'. This Party used grass roots social and religious imagery to promote a return to the 'old ways' of the 'yeoman farmer' with a reliance on God to decrease the power of the elite and bring equity to all men seen as all important. (422-424) By the 1880s, religious activists had begun to support populism, arguing it should be the politics of choice for all Christians. (425)

The free-market rhetoric of populism fuelled the argument that medicine should be based on full and open competition between individual 'healers'; determination of a 'healer's' competence based on patient evaluation not a regulatory body; no medical licensure; and no requirement for a degree from an accredited college. This stance echoed the Jacksonian populism of the 1840s, which had promoted 'individualism' arguing that the 'common' person had adequate intelligence in all areas of life

including the choice of medical treatment. (115) The progressives, who represented the educated, urban class which included orthodox physicians, disagreed with the populist stance arguing instead for greater government control over medicine through medical licensure and the establishment of medical review boards to determine the competency of individual physicians. Essentially, the progressives believed the ‘common’ person was incapable of differentiating between appropriate and inappropriate medical treatment. (114, 115)

5.3 The relationship between Palmer’s theory and the four main factors

Having identified the factors that favoured the development and acceptance of chiropractic theory in America during the late 19th century, it is now appropriate to discuss how these factors helped create a favourable environment for Palmer as he was developing chiropractic.

Medicine

The substantial increase in mortality (50% for many diseases) which in part can be explained by haphazard medical treatment led to the development of a heightened level of anxiety about disease where people were uncertain about their future health and well-being. (401, 402, 426-428) When viewed against current modern medical knowledge, it is easy to label this level of anxiety irrational but given the state of medicine at that time as well as the memories of 18th century epidemics that had killed thousands, it is understandable. The development of Koch’s germ theory led to an expectation that the situation was changing. In the early 1800s, specific bacteria were suspected of causing particular diseases and by the 1870s, Pasteur and Lister had provided evidence that bacteria might cause certain diseases, but they could not provide conclusive evidence. However, they laid the groundwork for Koch who developed a logical series of observations and experiments known as ‘Koch’s postulates’ that verified the specific element of many infectious diseases. Despite the emergence of data from European laboratories validating germ theory, many American physicians continued to question its validity as late as 1900 with some paying only cursory attention to the implications arguing that sterilisation of medical instruments only required them to be “thrust into a cake of wet soap”. (49, 406, 429) This may seem a strange stance given the new discoveries of the time, but it should be remembered that late 19th century germ theory was not a single ontological concept, but rather a multiplicity of theories. (44)

Several factors may help explain why physicians rejected germ theory. First, decades of clinical and epidemiological observation had supported the validity of ‘zygomatic theory’ and sanitary science, so Koch and Pasteur’s new experimentalism did not convince physicians to abandon well-established knowledge. (430) Second, initial advancements in medical science were viewed with doubt and cynicism because of mistakes in application or failures of quality control. (115) Third, despite the quality of data collected in European laboratories, accepting germ theory would have meant

American physicians had been wrong for decades, an idea they did not want to concede. (403) Coincidentally, the disregard of germ theory by physicians led to a higher than average mortality rate amongst doctors in the latter part of the 19th century. (122)

Continued ignorance about the origins and treatment of disease unknowingly contributed to the emergence of chiropractic by creating an atmosphere of uncertainty around the practice of medicine. Although Palmer's rejection of germ theory echoed that of many orthodox physicians, his reason was not analogous *i.e.* Palmer's rejection of germ theory was based on his belief in 'vertebral vitalism' (the investiture of the spinal column with vital and even supernatural capabilities to regulate health) (137) rather than on scepticism or the results from poor quality studies. However, in light of the confirmation that microorganisms were responsible for fourteen different human diseases by 1900, (431-433) it seems odd that the seemingly irrefutable scientific discovery regarding the bacterial nature of disease could be reconciled with a theory that claimed anatomical misplacements of the spine caused the disease.

Palmer ignored these contradictions in a similar manner to his contemporary Andrew Still, the founder of osteopathy, who when asked his opinion of germ theory, commented, "I believe but very little of the germ theory and care much less". (434) It is possible both took comfort from the dissenting sections of the medical professions who were slow to accept the theory, but this is conjecture as neither expressed this sentiment in their writings. However, having a scientific understanding of communicable diseases is not the same as having the capacity to cure them, a factor that would have lent support to Palmer's stance in dismissing germ theory. What is clear from this scenario is that Palmer was able to capitalise on the poor state of medicine. This raises doubt about his motives behind stating chiropractic could cure all disease and fuels claims that he was simply another medical entrepreneur of that period.

Despite rejecting many medical theories, Palmer continued to cite well-known 19th century physicians. In his seminal work *The Chiropractor's Adjuster*, Palmer cited 339 medical publications covering subjects such as surgery, orthopaedics, physiology, pathology, anatomy, histology and embryology, (435) an approach that would have helped silence many detractors and portrayed chiropractic as 'scientific'.

Economics

When Palmer first enunciated his theory of chiropractic in 1895, the American economy was between depressions – the 'Panic of 1893' and the 'Panic of 1896'. Notwithstanding these circumstances, Palmer claimed it was possible to generate a fortune in a short period (1-3 months) with minimal outlay and no major ongoing costs: "now is a favoured opportunity offered to you of making a fortune and doing a world of good in from one to three months. The first in the business gets the cream".

(149) When viewed in the context of medical education during this period, which sometimes required years of rigorous study at universities like John Hopkins, the expenditure of a “modest fortune” on the purchase of expensive medical equipment and no guarantee of future income (436-438) Palmer’s promise would have appeared very attractive to those contemplating a professional career. (391) Promoting chiropractic as a way to achieve economic success could therefore be seen as a shrewd business ploy given the economic circumstances.

Religion

Palmer made no secret about the inclusion of religious beliefs in the principles underpinning chiropractic. The theory of chiropractic clearly includes components from three common religious philosophies of the period: Christianity, Spiritualism and Harmonialism.

Christianity

Palmer described chiropractic with a Christian idiom: “the child [chiropractic] was born and Christened”. (165) Incorporating Christian ideas and metaphors into his theory would have helped convey the message that chiropractic was based on moral traditions and would ultimately succeed despite ridicule from the ‘atheistic’ medical physicians. Moreover, chiropractic was not just another ‘quack’ treatment solely aimed at financial gain (though large incomes were promised) and was different from orthodox medicine at a fundamental level. (333) Given the general population’s distrust of medical physicians, the use of religious overtones would have been appealing to the masses and goes a long way to explaining why chiropractic became so popular in America at the time.

Spiritualism

A personal link between chiropractic and Spiritualism was demonstrated in Chapter 3 when Palmer claimed that he had been visited by ‘spirit-friend’ (Dr Jim Atkinson) who had brought him the message of chiropractic. A further link with spiritualism is seen in Palmer’s claim that proper spinal alignment would ensure good physical and intellectual health “in this world and the next” *i.e.* the spirit world. It is appropriate to try and understand the context of Palmer’s use of the term “in this world”. (165) Palmer was an active spiritualist and an avid reader of spiritualist writings. (186, 198, 439-441) As such he would have been aware of the idea that good and bad health were transferred with the person into the ‘spirit’-world at the time of ‘passing over’. (442) By curing individuals in this world Palmer was in essence saving them from another life of disease.

Although the idea of a spirit-friend and spirit-world may be acceptable to some modern readers Palmer’s spiritualist nuances contributed to the speed with which chiropractic was, and still is, seen as unscientific. However, in the 19th century, these concepts were a common feature in society where ‘spirits’ gave guidance to individuals on all manner of topics including health, religion, morals and politics. (443-447) Linking chiropractic theory with Spiritualism would have made chiropractic

acceptable to the many American spiritualists during this period. Spiritualism was a destabilising force not only in traditional religion at that time, but in medicine as well because competing theories on the nature and treatment of illness pitted regulars against irregulars. Moreover, spiritualists generally had a preference for the milder sectarian treatments. (448) Palmer was clearly appealing to a particular audience by including a spiritual component in chiropractic.

Harmonialism

Harmonialism was the belief that a divine system ran the universe. Humans persistently sought the 'Divine' in order to understand their world. (449) Harmonial philosophy viewed humans as dual entities *i.e.* mortal and immortal, encompassed by the physical, spiritual and ethereal (otherworldly) realms. (11, 450, 451) Palmer echoed harmonial ideology sharing its interest in spiritual composure, physical health and economic success. (137) Combining metaphysics with medicine may seem strange when compared to modern medicine, but in the late 19th century it was common practice. (237, 392)

By synthesising Christianity, Spiritualism and harmonial metaphysics Palmer made chiropractic distinct. His new treatment combined physiological processes with forces of the universe to span the bridge between spirit and matter. (137, 452) He aligned it with the 'harmonial' tradition that focused on the 'indwelling healing power of nature alone' to return the individual to their God-appointed 'natural state'. Within the context of the 19th century, nature philosophy had historically included a strong bias against laboratory science, (453) a stance echoed by Palmer. This approach allowed Palmer to claim that chiropractic was not in conflict with religion and science because science served religion, demonstrating the ultimate power of God's natural laws. (454)

Politics

While it is not clear whether Palmer aligned himself with a particular political party, he did reverberate populist sentiment by promoting self-reliance in healing and encouraging contempt for elitist medical profession whom he considered 'dangerous'. (11, 114) Using a 'populist' rhetoric that appealed to the rugged individualism of the 'common' man, Palmer described how individuals could not only think for themselves but also heal themselves and others. (137) He claimed the newly formed American Medical Association (AMA) wanted state licensure to create a monopoly in medicine to prevent people from choosing the treatment of their choice. (10, 149, 455, 456) The growing level of scepticism among the general population towards doctors and politicians facilitated the uptake of new medical treatments such as chiropractic if for no other reason than as an expression of individualism and an act of defiance against the establishment.

5.4 Limitations

Some limitations were encountered during this research. First, some of Palmer's primary sources were not accessible at the time of study because they had not been released for public access by the Palmer College Special Collections and Archives Department. Second, some of the secondary sources as well as some of the 19th century sources were poorly referenced and required corroborating evidence. Third, some secondary sources were subject to confirmation bias, the tendency to search for, interpret, favour and recall information in a way that confirms one's pre-existing beliefs or hypotheses. Fourth, unlike typical grounded theory studies where 'live' participants are interviewed, this study relied on 19th century primary and secondary sources as its 'participants'. Nonetheless, these limitations did not create a significant impediment to the research as a sufficient number of reliable primary and secondary sources were available.

5.5 Summary

In late 19th century America, changes in the social, economic, and political structures brought on by industrialisation and urbanisation led to calls for reform as disparities in wealth became increasingly obvious. As a result, a level of anti-authoritarianism arose in society that saw widespread rejection of the traditional political, social and medical establishments. Political factions and bitter religious schisms, as well as disputes between orthodox physicians and sectarians, became the hallmark of the period. Against this backdrop, chiropractic appealed to the 'working class' by replacing the social rhetoric of medical elitism and intellectualism with the 'skilled craftsman' model, creating a view that healthcare that was centred around Innate and Universal Intelligence. The ability to reflect traditional values and beliefs was in stark contrast to the new form of scientific medicine and was at the core of chiropractic's early uptake during this period. (333) Palmer argued chiropractic was the only modality that could "work a revolution" in therapeutics and at the same time "give an explanation [for all healing] that would be accepted by the masses" without the need of 'faith'. (290) His claim that faith was unnecessary to 'cure' someone was typical of sectarians at that time (248, 457, 458) but was contrary to the view of regular physicians who viewed faith as an integral part of medical practice. (459)

Chapter 6

Conclusion

This study proposes a synthesised view on how the factors present in American society in the 19th century created an environment favourable to the development and acceptance of chiropractic and how these factors influenced DD Palmer when formulating his ‘new’ treatment chiropractic. Using grounded theory, four main factors were identified as contributing to the creation of this environment. Rapid industrialisation and urbanisation had led to an increase in communicable diseases, but orthodox physicians were unable to cure most of these diseases. As a result, all manner of new theories of disease like chiropractic emerged, many of which may seem bizarre when compared with modern scientific standards. However, it must be remembered that these theories developed at a time when much of what we now know about the functioning of the human body had not been discovered. When examined in the context of 19th century medical knowledge, Palmer’s original chiropractic theory would have appeared reasonable. Claims that Palmer was ‘crazy’ and that chiropractic was ‘ghost-based’, ‘magical’ or ‘bogus’ have appeared in the literature in the past 50 years. (460-463) However, these views display an ignorance of 19th century American religious beliefs. Moreover, this stance ignores the context in which Palmer’s claims were made and shows a lack of appreciation about the views of early recipients of chiropractic treatment.

In many ways, Palmer’s ‘new’ vitalistic treatment reflected the acceptable practice of rural doctors in mid-West America when many orthodox physicians had little more medical education than non-medical practitioners. Continued ignorance about the origins and treatment of disease contributed to creating an atmosphere of ambiguity about the practice of medicine. Set against this backdrop of uncertainty, Palmer’s claim that chiropractic could cure all disease appeared to remove the doubt. (149, 464) While claims of this nature may seem outrageous today, when considered against a background of ineffective medical treatment, it can be seen how a plethora of ‘alternative’ disease theories were readily accepted by the general populace during this period.

Despite significant improvements in the level of medical knowledge since then, certain sections of today’s chiropractic profession continue to promote the ‘vertebral vitalism’ model of chiropractic that is based on Palmer’s spinal manipulation theory in spite of the absence of a body of evidence supporting the theory. Consequently, groups outside the chiropractic profession have had licence to use Palmer’s original concepts in claiming chiropractic is unscientific resulting in widespread criticisms about what the profession’s current scope of practice should be. Unfortunately, these sections of the chiropractic profession who support the Palmer-based ‘vitalistic’ model have been reluctant to engage in open and transparent self-reflection on this matter leaving the profession deeply divided along philosophical lines.

Although this thesis has focussed on the factors present in American society in the 19th century that influenced the development and acceptance of chiropractic, the study calls into question the relevance of those original concepts in modern day chiropractic, particularly in relation to claims about the professions current scope of practice. Although this question falls outside the direct scope of this work, it is appropriate to use this study to pursue the question further in the future *i.e.* should theories analogous to Palmer's original concept of chiropractic inform 21st century chiropractic practice and if so, to what extent? If not, should these concepts continue to be included in the training of future generations of chiropractors or should Palmer's theories be consigned to the realm of history? These questions could form the basis of future research in the field. While such research may prove to be controversial both within and outside the chiropractic profession, the answers would go some way to addressing the climate of scepticism about chiropractic that has persisted since Palmer first announced his 'new' theory for treating disease.

Chapter 7

References

1. Weltmer SA. Disease can not exist. People's Home Journal. 1899.
2. Weltmer SA. The discovery of Weltmerism. Nevada, Missouri: The Weltmer School of Healing; 1900.
3. Felter HW. History of the eclectic medical institute Cincinnati, Ohio. Cincinnati, Ohio: Alumni Association of the Medical Eclectic Institute; 1902.
4. Haller JS. Medical Protestants: the eclectics in American medicine, 1825-1939. Illinois: Southern Illinois University Press; 2013.
5. Coulter HL. Divided legacy: the conflict between homeopathy and the American Medical Association. Berkeley, California: North Atlantic Books; 1982.
6. Ernst E. Chiropractic: a critical evaluation. Journal of Pain and Symptom Management. 2008;35(5):544-562.
7. Senzon SA. Chiropractic professionalization and accreditation: an exploration of the history of conflict between worldviews through the lens of developmental structuralism. Journal of Chiropractic Humanities. 2014;21(1):25-48.
8. Nansel D, Szlazak M. Somatic dysfunction and the phenomenon of visceral disease simulation: a probable explanation for the apparent effectiveness of somatic therapy in patients presumed to be suffering from true visceral disease. Journal of Manipulative & Physiological Therapeutics. 1995;18(6):379-397.
9. Goncalves G, Le Scanff C, Leboeuf-Yde C. Effect of chiropractic treatment on primary or early secondary prevention: a systematic review with a pedagogic approach. Chiropractic and Manual Therapies. 2018;26(10):1-20.
10. Palmer DD. The Magnetic Cure. 1896;15:1-4.
11. Palmer DD, Palmer BJ. The science of chiropractic, its principles and adjustments. Davenport, Iowa: Palmer School of Chiropractic Publishers; 1906.
12. Mortality vs. immortality. Publications of the American Statistical Association. 1890;2(11/12):152-153.
13. Du Bois WE, Hill JA, Billings JS, Young AA, Willcox WF. Supplementary analysis and derivative tables: twelfth census of the United States, 1900. Department of Commerce and Labor. Washington: Government Printing Office; 1906; 496.
14. Bowers WL. Davenport, Iowa, 1906 - 1907 a glimpse into a city's past. The Annals of Iowa. 1966;38(5):363-387.

15. Palmer College of Chiropractic. Our identity Davenport, Iowa; 2017. www.palmer.edu/about-us/identity/ [Accessed March 2, 2019].
16. Sim P. A word from our chair Malvern, South Australia: ACC Initiative; 2017. <http://accinitiative.com.au/> [Accessed January 24, 2019].
17. Chiropractic Board of Australia. Statement of advertising Melbourne, Victoria; 2016. www.chiropracticboard.gov.au/News/2016-03-07-statement-on-advertising.aspx [Accessed January 25, 2019].
18. Knibbs J. Chiro profession out of control. The Medical Republic [Internet]. 2016. www.medicalrepublic.com.au/chiro-profession-control-therefore-no-one-safe-racgp/ [Accessed 9 September, 2017].
19. Medew J. Doctors take aim at chiropractors. Sydney Morning Herald. 7 December, 2011.
20. Scott S, Branley A. Chiropractors who claim ability to prevent caesareans and cure cancer referred to health regulator Sydney, Australia: ABC News; 2016. www.abc.net.au/news/2016-01-20/abc-obtains-list-of-chiropractors-accused-of-misleading-claims/7099412 [Accessed 24 November, 2017].
21. Hale H. Conman chiropractor who claimed he could prevent and even CURE cancer is deregistered over 'predatory and unethical' actions and fined \$30,000 Sydney, Australia: Daily Mail Australia. 2018. www.dailymail.co.uk/news/article-6006435/Sydney-chiropractor-Hance-Limboro-claimed-CURE-cancer-deregistered.html [Accessed 2 August, 2018].
22. Health Care Complaints Commission v Limboro [2018] NSWCATOD 117. Occupational Division. Sydney, Australia: Civil and Administrative Tribunal New South Wales; 2018. www.caselaw.nsw.gov.au/decision/5b595e4be4b0b9ab4020e1f4 [Accessed 20 January, 2018].
23. Edmundson J. Dr. Soanes' odditorium of wonders: the 19th Century dime museum in a contemporary context Lethbridge, Canada: University of Lethbridge; 2006.
24. De Tocqueville A. Democracy in America. New York: J. & H.G. Langley; 1841.
25. Pope CL. Adult mortality in America before 1900: a view from family histories. In: Goldin C, Rockoff H, editors. Strategic factors in nineteenth-century American economic history: a volume to honor Robert W Fogel. Chicago: University of Chicago Press; 1992; 267-296.
26. Hacker JD. Decennial life tables for the white population of the United States, 1790–1900. *Historical Methods*. 2010;43(2):45-79.
27. McPherson JM. Out of war, a new nation. *Prologue Magazine*. 2010;42(1):6-13.
28. Ruef M, Fletcher B. Legacies of American slavery: status attainment among Southern blacks after emancipation. *Social Forces*. 2003;82(2):445-480.

29. Fishlow A. American railroads and the transformation of the antebellum economy. Cambridge, Massachusetts: Harvard University Press; 1965.
30. Turner F. Narrating infanticide: constructing the modern gendered state in nineteenth-century America [Dissertation]: Duke University; 2010.
31. Masferrer A. The passionate discussion among common lawyers about postbellum American codification: an approach to its legal augmentation *Arizona State Law Journal*. 2008;40(1):173-256.
32. Kaplin JM. Ministering to Dixie: medicine and distinctiveness in the American south, 1840-1870 [Thesis]. Cambridge, Massachusetts: Harvard University; 2009.
33. Newman LM. White women's rights: the racial origins of feminism in the United States. New York: Oxford University Press; 1999.
34. Olmstead AL, Rhode PW. Cotton, slavery, and the new history of capitalism. *Explorations in Economic History*. 2018;67:1-17.
35. Gregg A. Nineteenth-century American medicine: the implications of professionalism, capitalism, and implicit bias. Ohio: Ohio State University; 2017.
36. Humoral theory: Harvard University Library Open Collections Program; 2017. <http://ocp.hul.harvard.edu/contagion/humoraltheory.html> [Accessed 12 November, 2017].
37. Porter R. The greatest benefit to mankind: a medical history of humanity from antiquity to the present. Hammersmith, London: Harper Collins Publishers; 1997.
38. Warner JH. The therapeutic perspective. medical practice, knowledge and identity in America 1820-1885. Cambridge: Harvard University Press; 1986.
39. Anderson R. The back door to medicine: an embedded anthropologist tells all. Bloomington, Indianapolis: iUniverse; 2010.
40. Osler W. The principles and practice of medicine. New York: D. Appleton and Company; 1902.
41. Smith AJ, Davis JA. Naphey's modern therapeutics medical and surgical including the diseases of women and children. 9 ed. Philadelphia: P. Blakinston, Son & Co.; 1893.
42. Francis C. A discourse delivered at Plymouth, Massachusettes December 22, 1832 in commemoration of the landing of the fathers. Plymouth: Allen Danforth; 1832.
43. Graham TJ. Modern domestic medicine. London: J.Davy and Sons; 1853.
44. Steere-Williams J. The germ theory. In: Montgomery GM, Largent MA, editors. *A Companion to the history of American science*. Sussex, U.K.: John Wiley & Sons; 2016.
45. Gordon RJ. The claims of religion upon medical men": Protestant Christianity and medicine in nineteenth-century America. Fayetteville: University of Arkansas 2014.
46. Duffy J. The healers: the rise of the medical establishment. New York: McGrawHill; 1976.

47. Shryock RH. American medical research, past and present. New York: The Commonwealth Fund; 1947.
48. Wolverton N. Instruments of intervention in early American medicine. *Magazine Antiques*. 1999;156(1):98-105.
49. Cathell DW. The physician himself and things that concern his reputation and success. 10th ed. Philadelphia: The F.A. Davis Company, Publishers; 1900.
50. Bouchard CH. Lectures on auto-intoxication in disease. Philadelphia: F.A. Davis; 1898.
51. Osler W. The principles and practice of medicine. New York: D. Appleton and Company; 1892.
52. Septian M. Cholera infantum: its treatment. *Public Health Papers and Reports*. 1893;19:39-43.
53. Thomson WH. Notes on *materia medica* and therapeutics. 5th ed. New York: Trow Directory; 1894.
54. Merck's archives: a journal of *materia medica* and therapeutics for the general practitioner New York: Merck & Co.; 1902.
55. Bruce JM. *Materia medica and therapeutics*. New York: Cassell & Company Ltd.; 1884.
56. Cowperthwaite AC. A textbook of *materia medica* and therapeutics. Chicago: Gross & Delbridge; 1891.
57. Frith J. Syphilis: its early history and treatment until penicillin and the debate on its origins. *Journal of Military and Veterans' Health*. 2012;20(4):49-58.
58. Osler W, McCrae T. Principles and practice of medicine. New York: Appleton & Co.; 1930.
59. U.S. Department of Health Education and Welfare. 200 years of American medicine (1776- 1976). www.nlm.nih.gov/hmd/pdf/200years.pdf [Accessed 30 October, 2017].
60. Warner JH. Against the spirit of the system: the French impulse in nineteenth-century medicine. Princeton, New Jersey: Princeton University Press; 1998.
61. Snowden F. Lecture 8. nineteenth-century medicine: the Paris school of medicine. New Haven, Connecticut: Yale University; 2017.
62. Ackerknecht EH. *Medicine at the Paris hospital, 1794-1848* Baltimore: John Hopkins University Press; 1967.
63. Paullualt F. Medical students in England and France 1815-1858: a comparative study [Dissertation]. Trinity: University of Oxford; 2003.
64. Paine M. Dr Paine's reply to H.I.B. *The Boston Medical and Surgical Journal*. 1840;XXIII:269-278.
65. Gardner AK. Old wine in new bottles. New York: C.S. Francis & Co.; 1848.

66. Waller J. *Leaps in the dark: the forging of scientific reputation*. Oxford: Oxford University Press; 2004.
67. Haines MR. The urban mortality transition in the United States, 1800-1940. *Annales de démographie historique*. 2001;1(101):34-64.
68. Watson G. In: Watson JS, editor. *Virginia*: Virginia Historical Society; 1805.
69. Wall TT. Nature and art in the cure of disease. *The New Orleans Medical and Surgical Journal*. 1860;17:176-180.
70. Defects of the London hospital system. *London Medical and Surgical Journal*. 1835;VII(166).
71. Melosi MV. *The sanitary city: environmental services in urban America from colonial times to the present*. Pittsburgh, Pennsylvania: The John Hopkins University Press; 2008.
72. Perkins E. Evidence of the efficacy of Dr Perkin's patent metallic instruments. Philadelphia: Richard Folwell; 1797.
73. Graham J. *The guardian goddess of health or the whole art of preventing and curing diseases*. London: Rosy Heralds of Health; 1785.
74. Claridge RT. *Hydropathy or the cold water cure as practised by Vincent Priessnitz* London: James Madden and Co.; 1842.
75. Davies O. Cunning-folk in the medical market-place during the nineteenth century. *Medical History*. 1999;43:55-73.
76. Stewart DC. *Dangerous garden: the quest for plants to change our lives*. Cambridge, Massachusetts: Harvard University Press; 2004.
77. Fosbroke J. On quack compositions and patent medicines. *Provincial Medical and Surgical Journal*. 1842 III(14):269-271.
78. Thomson S. *New guide to health, or botanic family physician*. Brockville: W.Willes; 1831.
79. Norris M. Treasures of the Winkler center: 1843 Botanico-Medical College diploma of Dr. Henry Randolph Higgins Ohio: University of Cincinnati Libraries; 2014. <https://libapps.libraries.uc.edu/liblog/2014/09/treasures-of-the-winkler-center-1843-botanico-medical-college-diploma-of-dr-henry-randolph-higgins/> [Accessed 21 August, 2018].
80. Porcher FP. A medico-botanical catalogue of the plants and ferns of St. John's Berkeley, S.C. *Southern Journal of Medicine and Pharmacy*. 1847;2:1-115.
81. Tomes N. *Remaking the American patient: how Madison Avenue and modern medicine turned patients into consumers*. Chapel Hill: University of North Carolina Press; 2016.
82. Cartwright SA. Report on the diseases and physical peculiarities of the negro race. *New Orleans Medical and Surgical Journal*. 1852;7:692-715.

83. Cartwright SA. Philosophy of the negro constitution. *The New Orleans Medical and Surgical Journal*. 1852;VIII:195-208.
84. Warder G. *Women in 19th Century America* Keene, New Hampshire: VCU Libraries; 2015. <http://socialwelfare.library.vcu.edu/woman-suffrage/women-in-nineteenth-century-america-2/> [Accessed 10 August, 2017].
85. Wright DC. Theorizing history: separate spheres, the public/private binary and a new analytic for family law history *ANZLH E-Journal*. 2012;2(44-77).
86. Brown RD. *Knowledge is power: the diffusion of information in early America, 1700-1865*. New York: Oxford University Press; 1989.
87. Evans SM. *Born for liberty: a history of women in America*. New York: Free Press Paperbacks; 1997.
88. Dicker R. *A history of U.S. feminisms*. California: Seal Press; 2016.
89. Pringle J. *Commentary on the epistles of Paul the apostle to the Corinthians: John Calvin*. Edinburgh: Calvin Translation Society; 1848.
90. Dixon C. *Perfecting the family: antislavery marriages in nineteenth-century America*. Amherst: University of Massachusetts Press; 1997.
91. Olmsted FL. *The cotton kingdom*. New York: Mason Brothers; 1860.
92. *Immigrants in Antebellum America* New York; 2015. www.historycentral.com/Ant/People/immigrants.html [Accessed 30 August, 2017].
93. Parker KM. *Making foreigners: immigration and citizenship law in America, 1600–2000*. New York: Cambridge University Press; 2015.
94. Smith SJ. *Common school movement*. 2015.
95. Wagoner JL, Haarlow WN. *Common school movement: colonial and republican schooling, changes in the Antebellum era. the rise of the common school*. 2018. <http://education.stateuniversity.com/pages/1871/Common-School-Movement.html> [Accessed 27 August, 2018].
96. Winslow B. *Education reform in Antebellum America* New York: The Gilder Lehrman Institute of American History; 2009. www.gilderlehrman.org/history-by-era/first-age-reform/essays/education-reform-antebellum-america [Accessed 11 August, 2017].
97. *Pre-Civil War reform: the struggle for public schools*; 2016. www.digitalhistory.uh.edu/disp_textbook_print.cfm?smtid=2&psid=3535 [Accessed 11 August, 2017].
98. Grossman LA. The origins of American health libertarianism. *Yale Journal of Health Policy, Law, and Ethics*. 2013;13(1):76-134.

99. Crocombe J. A feast of reason: the roots of William Miller's biblical interpretation and its influence on the Seventh-day Adventist Church [Dissertation]. Brisbane, Queensland: University of Queensland; 2011.
100. Corbett PS, Janssen V, Lund J, Pfannestiel J, Vickery P, Waskiewicz S. US history. Houston, Texas: Rice University; 2016.
101. Jefferson T. To John Adams. In: Adams J, editor. Monticello; 1813.
102. Jefferson T. Notes on the State of Virginia. Richmond, Virginia: J.W. Randolph; 1853.
103. Shklar JN. The Renaissance American. New Republic. 1984;191:29-35.
104. Benedict ML. Laissez-faire and liberty: a re-evaluation of the meaning and origins of laissez-faire constitutionalism. Law and History Review. 1985;213:314-326.
105. Young JH. American medical quackery in the age of the common man. The Mississippi Valley Historical Review. 1961;47(4):579-593.
106. Bynum WF. Johann Abraham Albers (1772-1821) and American medicine. Journal of the History of Medicine and Allied Sciences. 1968;23(1):50-62.
107. O'Connell PA. A letter from Vienna. The Boston Medical and Surgical Journal. 1872;86:214-215.
108. Black JR. Remarks on the semiology and therapeutics of chronic diseases. Cincinnati Lancet and Clinic. 1881;7:110-111.
109. Weindling P. Medicine and modernization: the social history of German health and medicine. History of Science. 1986;24(3):277-301.
110. Zavlin D, Jubbal KT, Noe JG, Gansbacher B. A comparison of medical education in Germany and the United States: from applying to medical school to the beginnings of residency. German Medical Science. 2017;15:1-12.
111. Lin J. Rudolph Virchow: creator of cellular pathology. Laboratory Medicine. 1983;14(12):791-794.
112. Stowe SM. Health and disease Bloomington, Indiana: Indiana University; 2001. www.gale.com/binaries/content/assets/gale-us-en/primary-sources/newsvault/gps_newsvault_19thcentury_usnewspapers_health_disease_essay.pdf [Accessed 27 August, 2017].
113. Sappol M. A traffic of dead bodies: anatomy and embodied social identity in nineteenth-century America. Princeton, New Jersey: Princeton University Press; 2002.
114. Folk H. The religion of chiropractic: populist healing from the American heartland. Chapel Hill, North Carolina: The University of North Carolina Press; 2017.
115. Starr P. The social transformation of American medicine. New York: Basic Books; 1982.

116. Chacon HE. A public duty: medicine and commerce in nineteenth-century American literature and culture [Dissertation]. Kentucky: University of Kentucky Uknowledge; 2015.
117. Husband J, O'Loughlin J. Daily life in the industrial United States, 1870-1900. Westport, Connecticut: Greenwood Press; 2004.
118. Coury BG. Water level control for the toilet tank: a historical perspective. In: Levine WS, editor. The control handbook. Boca Raton, Florida: CRC Press; 1996; 1179-1191.
119. American versus European medical science. Medical Record. 1869;4.
120. Shapiro HD. Daniel Drake and the crisis in American medicine of the 19th century. Journal of the American Medical Association. 1985;254(15):2113-2116.
121. Foss KA. The heroic doctor and the foolish patient: constructions of health responsibility in medical dramas, 1994-2007. Minnesota: Minnesota University; 2008.
122. Ogle W. Statistics of mortality rates in the medical profession. Medico-Chirurgical Transactions. 1886;69:217-237.
123. Chambers TK. Medical theories for the bedside. Medical Times and Gazette. 1861:449-451.
124. Warner JH. From specificity to universalism in medical therapeutics: transformation in the 19th-century United States. In: Leavitt JW, Numbers RL, editors. Sickness and health in America: readings in the history of medicine and public health. 3rd ed. Madison, Wisconsin: University of Wisconsin Press; 1997. p. 87-101.
125. Gevitz N. Sectarian medicine. Journal of the American Medical Association. 1987;257(12):1636-1640.
126. Lindemann M. Medicine and society in early modern Europe. 2nd ed. Cambridge: Cambridge University Press; 2010.
127. Davies O. America bewitched: the story of witchcraft after Salem. Oxford: Oxford University Press; 2013.
128. Halpin J, Cook M. Social movements and progressiveism: Center for American Progress; 2010. https://cdn.americanprogress.org/wp-content/uploads/issues/2010/04/pdf/progressive_social_movements.pdf [Accessed 14 January, 2017].
129. Wilson WJ. Class conflict and Jim Crow segregation in the Postbellum South The Pacific Sociological Review. 1976;19(4):431-436.
130. Hoffman FL. Race traits and tendencies of the American negro. New York: American Economic Association; 1896.
131. Johnson N. Parlor rhetoric and the performance of gender in Postbellum America. In: Glenn CJ, Lyday MM, Sharer WB, editors. Rhetorical education in America. Tuscaloosa, Alabama: The University of Alabama Press; 2004; 107-128.

132. Morantz-Sanchez R. The 'connecting link' the case for the woman doctor in 19th-Century America. In: Leavitt JW, Numbers RL, editors. *Sickness and health in America: readings in the history of medicine and public health*. Wisconsin: The University of Wisconsin Press; 1985; 213-224.
133. Plunkett HM. *Women, plumbers and doctors or household sanitation*. New York: D. Appleton and Company; 1885.
134. Hartman DW. *Lives of women Fishers*, Indiana: Connor Prairie; 2017. www.connerprairie.org/education-research/indiana-history-1860-1900/lives-of-women [Accessed 17 November, 2017].
135. Lundie CA. *Restless spirits: ghost stories by American Women, 1872-1926*. Amherst, Massachusetts: University of Massachusetts Press; 1996.
136. Hofstadter R. *The age of reform: from Bryan to F.D.R.* New York: Vintage Books; 1955.
137. Folk H. *Vertebral vitalism: American metaphysics and the birth of chiropractic*. Indiana: Indiana University; 2006.
138. Hofstadter R. *Anti-intellectualism in American life*. New York: Alfred Knopf; 1963.
139. Cross RD. The historical development of anti-intellectualism in American society: implications for the schooling of African Americans *The Journal of Negro Education*. 1990;59(1):19-28.
140. Schoonmaker NG. *Mystery and possibility: spiritualists in the nineteenth-century South Carolina*. University of North Carolina; 2010.
141. Bingham SM. *The psychic movement: the spiritualist bridge*. Ohio: Kent State University; 2012.
142. Aber WW. *The dawn of another life*. Memphis, Missouri: Edward Butler; 1910.
143. Watson S. What is spiritualism? *The Spiritual Magazine*. 1875;1(1):1-31.
144. Andrews WL. Liberal religion and free love: an undiscovered Afro-American novel in the 1890s. *Melus*. 1982;9(1):23-36.
145. Albanese C. *A Republic of mind and spirit: a cultural history of American metaphysical religion*. New Haven: Yale University Press; 2007.
146. Gevitz N. A degree of difference: the origins of osteopathy and first use of the "DO" designation. *Journal of the American Osteopathic Association*. 2014;114(1):30-40.
147. Tucker EE. *Reminiscences of A.T. Still*. In: Still CE, editor. New York: Still National Osteopathic Museum; 1952.
148. Press Publishing Company. *The World Almanac*. New York; 1893.
149. Palmer DD. *The Chiropractic*. 1897a;17:1-4.
150. Palmer DD. *The Chiropractor*. 1904;1(1):17-20.

151. Cordell EF. The importance of the study of the history of medicine. *Medical Library and Historical Journal*. 1904;2(4):268-282.
152. Keating JC. Why bother with chiropractic history. *Dynamic Chiropractic*. 1990;8(12):1-4.
153. Palmer DD. *The Chiropractic*. 1899;26:1-4.
154. Rossiter M. Benjamin Silliman and the Lowell Institute: the popularization of science in nineteenth-century America. *New England Quarterly*. 1971;44:602-646.
155. Shortt SE. Physicians and psychics: the Anglo-American medical response to spiritualism, 1870—1890. *Journal of the History of Medicine and Allied Sciences*. 1984;39(3):339-355.
156. Guralnick S. Sources of misconception on the role of science in the nineteenth-century American college. *Isis*. 1974;65:352-366.
157. Cannon SF. *Science in culture: the early Victorian period*. New York: Dawson and Science History Publications; 1978.
158. Bledstein J. *The culture of professionalism*. New York: W.W. Norton; 1976.
159. Virchow R. *Standpoints in scientific medicine (1877)*. *Bulletin of the History of Medicine*. 1956;30:537-543.
160. Pizzorno JE, Murray MT. *Textbook of natural medicine*. St. Louis, Missouri: Churchill Livingstone; 2013.
161. Singer M, Baer H. *Critical medical anthropology*. Boca Raton, Florida: CRC Press; 2018.
162. Micozzi MS. *Fundamentals of complementary, alternative, and integrative medicine*. 6th ed. St. Louis, Missouri: Elsevier; 2015.
163. Chiropractic Alliance. The regulatory status of complementary and alternative medicine for medical doctors in Europe. Belgium. 2010. www.camdoc.eu/Pdf/CAMDOCRegulatoryStatus8_10.pdf [Accessed 1 September, 2018].
164. Langworthy SM, Smith OG, Paxson MC. *A textbook, modernized chiropractic*. Cedar Rapids: Laurance Press Company; 1906.
165. Palmer DD. *The chiropractor's adjuster*. Portland, Oregon: Portland Printing House Company; 1910.
166. Carver W. *Carver's chiropractic textbook*. New York City: Carver Chiropractic College; 1921.
167. Dye AA. *The evolution of chiropractic: its discovery and development*. Philadelphia, Pennsylvania: A. August Dye; 1939.
168. Leach R. *The chiropractic theories: a textbook of scientific research*. 4th ed. Baltimore, Maryland: Lippincott, Williams and Wilkins; 2004.
169. Kaptchuk TJ, Eisenberg DM. Chiropractic: origins, controversies and contributions. *Archives of Internal Medicine*. 1998;158:2215-2224.

170. Johnson C. Modernized chiropractic reconsidered: beyond foot-on-hose and bones-out-of-place. *Journal of Manipulative & Physiological Therapeutics*. 2006;29:253-254.
171. Strahinjevic B, Simpson JK. The schism in chiropractic through the eyes of a 1st year chiropractic student. *Chiropractic & Manual Therapies*. 2018;26(2):1-12.
172. Keating JC. Several pathways in the evolution of chiropractic manipulation. *Journal of Manipulative & Physiological Therapeutics*. 2003;26(5):300-321.
173. Keating JC. A brief history of historical scholarship in chiropractic. *Journal of the Canadian Chiropractic Association*. 2001;45(2):113-136.
174. Gallaher H. A history of chiropractic. Guthrie, Oklahoma: Co-operative Publishing Company; 1930.
175. Turner C. The rise of chiropractic. Los Angeles: Powell Publishing Company; 1931.
176. Worboys M. Practice and the science of medicine in the nineteenth century. *Isis*. 2011;102(1):109-115.
177. Gaucher-Peslherbe P. Chiropractic: early concepts in their historical setting. Lombard, Illinois: National College of Chiropractic; 1983.
178. Palmer DD. The chiropractor. Los Angeles, California: Press of Beacon Light Printing Company; 1914.
179. Slahpush M. Postmodern values, dissatisfaction with conventional medicine and popularity of alternative therapies. *Journal of Sociology*. 1998;34:58-70.
180. Eastwood H. Why are Australian GPs using alternative medicine? postmodernisation, consumerism and the shift towards holistic health. *Journal of Sociology*. 2000;36:133-156.
181. Coulter ID, Willis EM. The rise and rise of complementary and alternative medicine: a sociological perspective. *Medical Journal of Australia*. 2004;180:587-589.
182. Fuller RC. Alternative medicine and American religious life. New York: Oxford Univeristy Press; 1989.
183. Martin SC. Chiropractic early concepts in their historical setting. *Bulletin of the History of Medicine*. 1995;69(3):501.
184. Albanese CL. Nature religion in America: from Algonkian Indians to the new age. Chicago: University of Chicago Press; 1990.
185. Wardell W. Chiropractic: history and evolution of a new profession. St. Louis: Mosby; 1992.
186. Gielow V. Old dad chiro. Davenport, Iowa: Bawden Bros., Inc.; 1995.
187. Moore JS. Chiropractic in America: the history of a medical alternative. Baltimore: The John Hopkins University Press; 1993.
188. Keating JC, Cleveland CS, Menke M. Chiropractic history: a primer. In: Chiropractic AftHo, editor. Montezuma, Iowa: Southerland Companies; 2005; 1-50.

189. Batinic J, Skowron M, Hammerick K. Did American and social economic events from 1865-1898 influence D.D. Palmer the chiropractor and entrepreneur. *Journal of the Canadian Chiropractic Association*. 2013;57(3):221-232.
190. Troyanovich S, Troyanovich J. Chiropractic and type O (organic) disorders: historical development and current thought. *Chiropractic History*. 2013-2014;32(1):59-72.
191. Kaptchuck TJ, Eisenberg DM. Varieties of healing. 1: medical pluralism in the United States. *Annals of Internal Medicine*. 2001;135:189-195.
192. Waters T. Chasing D.D. Palmer in the news, 1886-1913. Raleigh: Lulu Enterprises; 2013.
193. Waters T. Fishing for Palmer in What Cheer 1882-1886. Raleigh: Lulu Enterprises; 2015a.
194. Waters T. The casters - magnetic healers. Raleigh: Lulu Enterprises; 2015b.
195. Waters T. D.D. Palmer's spirits of mercy. Raleigh, North Carolina: Lulu Enterprises; 2015c.
196. Gunther-Brown C. The healing gods: complementary and alternative medicine in Christian America. Oxford: Oxford University Press; 2013.
197. Palmer BJ. The bigness of the fellow within. Davenport, Iowa: Palmer School of Chiropractic; 1949.
198. Brown MD. Old Dad Chiro: his thoughts, words, and deeds. *Journal of Chiropractic Humanities*. 2009;16(1):57-75.
199. Palmer D. Biographical. The chiropractor adjuster. 1908;1(1).
200. Keating JC. DD Palmer's lifeline. National Institute of Chiropractic Research. Phoenix, Arizona;1998; 1-66.
201. Sedlak MW. Let us go and buy a schoolmaster. In: Warren D, editor. *American teachers: histories of a profession at work*. New York: Macmillan; 1989; 257-290.
202. Labaree DF. An uneasy relationship: the history of teacher education in the university. In: Cochran-Smith M, Feiman-Nemser S, McIntyre J, editors. *Handbook of research on teacher education: enduring issues in changing contexts* 3rd ed. Washington: Association of Teacher Educators; 2008; 290-305.
203. Kimball BA. The true professional idea in America: a history. Maryland: Rowman & Littlefield Publishers; 1995.
204. Hatcher WE. The life of J.B. Jeter. Baltimore: H.M. Wharton & Co.; 1887.
205. Cohen PC. The murder of Helen Jewett: the life and death of a prostitute in 19th century America. New York: Knopf 1999.
206. Lee L. Animal magnetism and magnetic lucid somnambulism. London: Longmans, Green and Co.; 1866.
207. Healer AM. Vital magnetic cure: an exposition of vital magnetism. 5th ed. Boston: Colby and Rich Publishers; 1881.

208. Stanhope LE. The science of magnetic healing, embracing hypnotism, vital magnetism and mental science. 3rd ed. Salina, Kansas: The Central Kansas Publishing Company; 1899.
209. Figuier L. Histoire du merveilleux dans les temps modernes: le magnétisme animal [history of the marvellous in modern times: animal magnetism]. Paris: L. Hachette; 1860.
210. Bottey F. Le “magnétisme animal:” Étude critique et expérimentale sur l’hypnotisme ou sommeil nerveux provoqué chez les sujets sains [animal magnetism: critical and experimental study of hypnotism or induced nervous sleep in healthy subjects]. Paris: E. Plon, Nourrit & Cie Printers; 1888.
211. Cullerre A. Magnétisme et hypnotisme: Exposé des phénomènes observés pendant le sommeil nerveux provoqué [Magnetism and hypnotism: Inquiry of phenomena observed during induced nervous sleep]. 2nd ed. Paris: J.B. Baillière et fils; 1887.
212. Binet A, Féré C. Animal magnetism. New York: D. Appleton and Company; 1887.
213. De La Tourette G. L'hypnotisme bt les etats analogues au point de vue medico-legal [Hypnotism and similar states from the medical-legal point of view]. Paris: E. Plon, Nourrit and Cie Printers; 1887.
214. Alvarado CS. Late 19th and early 20th century discussions of animal magnetism. The International Journal of Clinical and Experimental Hypnosis. 2009;57(4):366-381.
215. Durville H. Cours de magnétisme personnel: Magnétisme expérimental & curatif, hypnotisme, suggestion [Course of personal magnetism: Experimental & healing magnetism, hypnotism, suggestion 5th ed. Paris: Henri Durville; 1920.
216. Shaftesbury E. Cultivation of personal magnetism in seven progressive steps: the exercise book of the magnetism club of America. 11th ed. Meriden, Connecticut: Ralston University; 1925.
217. Alrutz S. Problems of hypnotism: An experimental investigation. Proceedings of the Society for Psychical Research. 1921;32:151-178.
218. Alvarado CS. Human radiations: concepts of force in mesmerism, spiritualism and psychical research. The Journal of the Society of Psychical Research. 2006;70(884):138-162.
219. Briggs JE. Nervous diseases and magnetic therapeutics. New York: Geo. W, Wheat; 1881.
220. MacPhail W, Benedetti P. Spin doctors: the chiropractic industry under examination. Toronto: The Dundurn Group; 2002.
221. Young JC. Magnetic America. the age of charisma: leaders, followers, and emotions in American society, 1870-1940. Cambridge: Cambridge University Press; 2016.
222. Terrett A. The genius of DD Palmer: an exploration of the origin of chiropractic in his time. Chiropractic History. 1991;11(1):31-38.

223. Maynard JE. The discovery of chiropractic. Maine Chiropractic Association; 2000. https://mainechiro.com/content/?page_id=550 [Accessed 16 May, 2017].
224. Harris FH. Adjusting expectations. chiropractic, pain, and an evolving American health care system. New York: New School University; 2000.
225. Palmer BJ. Fight to climb. Davenport, Iowa: Palmer School of Chiropractic; 1950.
226. The biographical dictionary of Iowa. Iowa: University of Iowa Press; 2009. Palmer, Daniel David.
227. The biographical dictionary of Iowa. University of Iowa Press; 2008. Palmer, Daniel David; 393.
228. Joyce S. History of chiropractic. Chico, California. 2018. [www.joycefamilychiro .com/history-of-chiropractic/](http://www.joycefamilychiro.com/history-of-chiropractic/) [Accessed 16 January, 2018].
229. Palmer College of Chiropractic. D.D. Palmer and magnetic healing. Iowa: David D. Palmer Health Sciences Library; 2017. <http://blogs.palmer.edu/library/2017/08/31/d-d-palmer-and-magnetic-healing/> [Accessed 16 January, 2018].
230. Abbott J, Conklyn S. Chiropractic history Hampton, Virginia: Abbott Family Chiropractic; 2018. www.abbottfamilychiropractic.com/index.html [Accessed 16 January, 2018].
231. Taber DJ. The neck pain solution. Raleigh: Lulu Enterprises; 2011.
232. Beideman RP. The role of the encyclopedic Howard system in the professionalization of Chiropractic National College, 1906-1981 Chiropractic History. 1996;16(2):29-41.
233. Huth J. Chiropractic theory. Texas: Texas Tech University; 2000.
234. Dalrymple C. History: 1876 to 1890 the gilded age. Texas: Texas Chiropractic Association; 2015. www.chirotexas.org/index.php?option=com_content&view=article&id=1676:history-1876-to-1890-the-gilded-age&catid=45:history&Itemid=231 [Accessed 5 October, 2017].
235. Krieg JC. Defining the debate: an exploration of the factors that influenced chiropractic's founder. The Iowa Orthopaedic Journal. 1995;15(95).
236. Palmer DD. Chiro. is all right. The Chiropractic. 1899;26:1-4.
237. Kellogg, O.N. An interesting history of Decatur County. 1880. IAGenWeb Project. <http://iagenweb.org/decaturn/historyDocs/KellogHistory.html> [Accessed 13 August, 2018].
238. Caster P. Paul's letter to the public. Ottumwa Democrat. 1 January, 1872.
239. Caster JS. Magnetic healing by the laying on of hands. Burlington Hawkeye. 24 July, 1894..
240. Waterman HL. History of Wapello County, Iowa. Chicago: The S.J. Clarke Publishing Company; 1914.
241. Palmer College of Chiropractic. D.D.'s wives. Davenport, Iowa. 2016. <http://blogs.palmer.edu/library/2016/09/01/d-d-s-wives/> [Accessed 24 March, 2017].
242. Lord A. Medium's column. Religio Philosophical Journal. 1872;XII(7).

243. Palmer DD. New Boston: Illinois. Religio Philosophical Journal. 1872;XII(16).
244. Baker LE. History and teachings of the AC Church Charlotte, North Carolina: Advent Christian General Conference; 2009. <http://adventchristian.blogspot.com/2009/01/history-and-teachings-of-ac-church.html> [Accessed 16 August, 2018].
245. Lechleitner E. Adventist denomination emerged amid debate over church structure Silver Spring, Maryland: General Conference of Seventh-day Adventists; 2013. www.adventist.org/en/information/history/article/go/-/adventist-denomination-emerged-amid-debate-over-church-structure/ [Accessed 16 August, 2018].
246. Babbitt ED. Religion as revealed by the material and spiritual universe. New York: Babbitt & Co.; 1881.
247. Braid J. Observations on trance or human hibernation. London: John Churchill; 1850.
248. Weltmer SA. The Weltmer method of magnetic healing Missouri: S.A. Weltmer; 1897.
249. Lord A. Dr Abba Lord. Religio Philosophical Journal. 1871;X(20):1-8.
250. US Census Department. Statistics of population. Census of ward 2, What Cheer. Washington;1885.
251. Palmer DD. Friend Newman. American Bee Journal. 1878;14(10):329.
252. Scribbles. Saline County Journal. April 1, 1886.
253. Personal. The Iola Register. July 16, 1886.
254. Father of chiropractic: D.D. Palmer passed away in Los Angeles a few days ago. Burlington Hawkeye. 23 October, 1913.
255. Saline County Journal. 1 April, 1886.
256. A flood in Kansas. The Chicago Tribune. 4 July, 1885.
257. Haen ME. The boom years of Iola Kansas: 1896-1907: Kansas State University; 1966.
258. Population of Iola, KS: Population.US; 2016. <http://population.us/ks/iola/> [Accessed 27 February, 2018].
259. Sims WM, Mohler M. Sixth biennial report of the Kansas State Board of Agriculture to the legislature of the state for the years 1887-88. Office of the State Board of Agriculture. Topeka, Kansas: Kansas Publishing House; 1889.
260. Spalding JL. Commercial and statistical review of the City of Burlington, Iowa: showing her manufacturing, mercantile and general business interests, together with historical sketches of the growth and progress of the "Orchard City," Burlington, Iowa: J.L. Spalding & Company; 1882.
261. Good words. Davenport Tribune. 22 January, 1888.
262. Haldeman S. The principles and practice of chiropractic. 2nd ed. Norwalk, Connecticut: Appleton & Lange; 1992.

263. Jackson FD. The Census of Iowa. Des Moines, Iowa: Geo. E. Roberts; 1885.
264. Biographical review of Des Moines county, Iowa: containing biographical and genealogical sketches of many of the prominent citizens of to-day and also the past. Chicago: Hobart Publishing Company; 1905.
265. Fox DM. Spiritualists at the hour of death. *Mind and Matter*. 1881;III(24).
266. Dr Paul Castor. *Richmond Democrat*. 12 May, 1884.
267. Caster JS. To the sick and afflicted and to those whom the name of the late Dr Paul Caster, of Ottumwa, Iowa, is yet fresh in memory. *JS Caster's New Health Journal*. 1889;1(1):1-4.
268. Gue BF. Biographies and portraits of the progressive men of Iowa, leaders in business, politics and the professions; together with an original and authentic history of the state. Des Moines, Iowa: Conway & Shaw; 1899.
269. Lawrence SC. Iowa physicians: legitimacy, institutions and the practice of medicine. *Annals of Iowa*. 2004;63(1):1-62.
270. Bowden ME. Celebrating 125 years Iowa. 2011. https://medicalboard.iowa.gov/images/pdf/History%20-%20Origin%20of%20the%20Board_%20of%20Medicine.pdf [Accessed 9 January, 2018].
271. Iowa Board of Medicine. Board overview Iowa: 2017. https://medicalboard.iowa.gov/about_the_board/overview.html [Accessed 10 January, 2018].
272. The new Iowa medical practice law. *Buffalo Medical and Surgical Journal*. 1897;XXXVII (LIII):118.
273. McClain E. McClain's annotated statutes of the State of Iowa showing the general statutes in force July 1888. Chicago: Callaghan and Company; 1888.
274. Dead or alive: a very peculiar case. *Burlington Gazette*. 24 October, 1887.
275. The Thornton case. *Burlington Gazette*. 25 October, 1887.
276. Magnetic healers. *Daily Gazette*. 8 November, 1887.
277. Cora Stickney's trance ended. *New Haven Daily Morning Journal and Courier*. 21 February, 1887.
278. Probably insane. *Bismarck Weekly Tribune*. 25 February, 1887.
279. She was only in trance. *Bismarck Weekly Tribune*. 15 January, 1892.
280. Poe EA. The facts in the case of M. Valdemar. *The American Whig Review*. 1845;0002(6):561-565.
281. Quimby PP. The world of the senses. In: Dresser HW, editor. *The quimby manuscripts*. New York: Thomas Y. Crowell; 1921;c230-274.
282. The new Iowa medical law. *Iowa State Medical Society*. 1897;III(3):82-97.
283. Frank Palmer. *Davenport Daily Republican*. 25 September, 1888.

284. Hayward AS. Epitome of spiritualism and spirit magnetism. Boston: Colby and Rich; 1876.
285. Babbitt ED. Vital magnetism the life fountain. New York: E.D. Babbitt; 1874.
286. A discovery. The Republic. 17 October, 1850.
287. Wilson JV. How to magnetize. New York: Fowler & Wells Co. Publishers; 1878.
288. Keating JC. The evolution of Palmer's metaphors and hypotheses. Philosophical Constructs for the Chiropractic Profession. 1992;2:9-19.
289. Carver W. History of chiropractic. 1936.
290. Palmer DD. The Chiropractic. 1897b;18:1-4.
291. Langworthy SM. Who are grafters? Backbone. 1903;2(3-4):40-43.
292. Palmer DD. The old and new ideas. their modes of manifestation. Annual Announcement of Palmer School and Infirmary of Chiropractic. 1904/05;2:1-36.
293. Keating JC. Dispelling some myths about old dad chiro. Dynamic Chiropractic. 1993;11(9):1-4.
294. Kent C. The Harvey Lillard story: fact or myth? Dynamic Chiropractic. 2012;30(7):1-3.
295. Lerner C. The Lerner report: a history of the early years of chiropractic. La Habra, California: National Institute of Chiropractic Research; 1952.
296. Adams P. Looking back to dad's brush with history. Journal Star. 23 April, 1983.
297. Ashmore EF. The menace of chiropractic: inside history of this fake. The Osteopathic Physician. 1907;XII(5):1.
298. Palmer BJ. History in the making. Davenport, Iowa: Palmer School of Chiropractic; 1957.
299. Demers M, Gajic Z, Gerretsen E, Budgell B. An audiometric study of the effects of paraspinal stimulation on hearing acuity in human subjects – understanding the Harvey Lillard phenomenon. Chiropractic and Manual Therapies. 2014;22(39):1-5.
300. Vasaghi-Gharamaleki B, Naser Z. Predicting the risk of hearing impairment following the cervical spine diseases by measuring the cervical range of movements: a pilot study. Basic and Clinical Neuroscience. 2017;8(5):413-418.
301. Schiotz EH, Cyriax J. Manipulation past and present. London: Heinemann Medical Books; 1975.
302. Keating JC, Charlton KH, Grod JP, Perle SM, Sikorski D, Winterstein JF. Subluxation: dogma or science? Chiropractic and Osteopathy. 2005;13(17):1-10.
303. Palmer DD, Palmer VT, Palmer BJ. Articles of incorporation: Palmer's school of magnetic healing. Scott County, Iowa; 1896.
304. Palmer DD. A brief history of chiropractic. Annual Announcement of Palmer School and Infirmary of Chiropractic. 1904/5(2):1-36.

305. Wiese GC. New questions: why did D.D. not use chiropractic in his 1896 charter? *Chiropractic History*. 1986;6(6):63.
306. The Institute Chiropractic. Chiropractic history. 2018. www.institutechiro.com/chiropractic-history/ [Accessed 18 January, 2018].
307. Griffin W, Griffin D. Observations on functional affections of the spinal cord and ganglionic system of nerves. London: Burgess and Hill; 1834.
308. Still AT. Autobiography of Andrew T. Still. Kirksville, Missouri: Self-published; 1908.
309. Buchanan JR. Therapeutic sarcognomy the application of sarcognomy, the science of the soul, brain and body. Boston: J.G. Cupples Co.; 1891.
310. Riadore JE. Treatise on irritation of the spinal nerves as the source of nervousness, indigestion, functional and organical derangements of the principal organs of the body London: J. Churchill; 1842.
311. Brown T. Dr Brown on irritation of the spinal nerves. *Glasgow Medical Journal*. 1828;I(II):131-160.
312. Scudder JM. Principles of eclectic medicine. Cincinnati; 1884.
313. Beach W. A treatise on anatomy, physiology, and health designed for students, schools and popular health. New York: Self-published; 1847.
314. Sherwood HH. The motive power of the human system with the symptoms and treatment of chronic diseases. New York: Jared W. Bell; 1841.
315. The boy phenomenon is coming with healing in his hands. *The Arizona Republican*. 20 December, 1894.
316. Hunt CL. Private instructions in the science and art of organic magnetism. London: G. Wilson; 1887.
317. Free: public healing of the sick at Grand Army Hall. *The Salt Lake Herald*. 5 June, 1890.
318. Medicine a thing of the past. *Omaha Illustrated Bee*. 1 June, 1895.
319. Deleuze JP. Practical introduction in animal magnetism. New York: Samuel R. Wells & Co.; 1879.
320. Buckland T. The handbook of mesmerism for the guidance and instruction of all persons who desire to practice magnetism for the cure of diseases. 2nd ed. London: Hippolyte Bailliere; 1850.
321. Keating JC. The meanings of innate. *Journal of the Canadian Chiropractic Association*. 2002;46(1):4-10.
322. Morgan L. Innate intelligence: its origins and problems. *Journal of the Canadian Chiropractic Association*. 1998;42(1):35-41.

323. Jackson RB. Vis mediatrix naturea, vital force to innate intelligence and concepts for 2000. *Journal of Chiropractic Humanities*. 2001;10:1-8.
324. Primm JN. *Lion of the valley: St. Louis, Missouri, 1764-1980*. 3rd ed. St. Louis, Missouri: Missouri Historical Society Press; 1998.
325. Donahue JH. D.D. Palmer and innate intelligence: development, division and derision. *Chiropractic History*. 1986;6:31-36.
326. Melchers AF. The qualifications of spirit. *The Carrier Dove*. 1887;IV(14):357-372.
327. Martin E. Intelligence in the atom. *The Better Way*. 1891;9(23):4.
328. Palmer BJ. The story of right adjustment. *Chiropractic Philosophy*. 1949;4:1-12.
329. Palmer BJ. In the beginning. *Chiropractic Philosophy*. 1949;2:1-12.
330. Vinovskis MA. *Education society and economic opportunity: a historical perspective on persistent issues*. New Haven: Yale University Press; 1849.
331. A new cure for insanity. *Journal of the American Medical Association*. 1899;XXXIII(20):1234.
332. Einspruch BC. Chiropractic in America the history of a medical alternative. *Journal of the Americal Medical Association*. 1994;271(20):1624-1625.
333. Martin SC. Chiropractic and the social context of medical technology 1895-1925. *Technology and Culture*. 1993;34(4):808-834.
334. Palmer DD, Palmer BJ. A new home for chiropractic. *The Chiropractor*. 1905;I(6).
335. How is it done. *Davenport Daily Leader* 17 June, 1896.
336. Is he a fraud? *Davenport Daily Republican*. 17 May, 1898.
337. Smith-Cunnien SL. *A profession of one's own: organized medicine's opposition to chiropractic*. Lanham, Maryland: University Press of America; 1998.
338. Peters R, Chance M. The lost years 1902-1904. *Chiropractic Journal of Australia*. 2003;33:2-10.
339. *Rock Island Argus*. 27 October, 1902.
340. Orders an inquest. *Times-Republican*. 11 March, 1905.
341. Certificate of death: Daniel David Palmer. *Californian State Board of Health*. State of California Department of Health Services; 1913.
342. Roman G. Vascular dementia: a historical background. *International Psychogeriatrics*. 2003;15(Supplement 1):11-13.
343. *Los Angeles Times*. 22 October, 1913.
344. Peters RE, Chance MA. Murder they wrote: the death of DD Palmer and its aftermath. *Chiropractic Journal of Australia*. 1993;23:143-148.

345. Rothstein WG. Trends in mortality in the twentieth century. In: Rothstein WG, editor. *Readings in American health care: current issues in socio-historical perspective*. Madison, Wisconsin: The University of Wisconsin Press; 1995; 71-86.
346. Leonard SH, Beemer JK, Anderton DL. Immigration, wealth and the 'mortality plateau' in emergent urban-industrial towns of nineteenth-century Massachusetts *Continuity and Change*. 2013;27(3):433-459.
347. Coleman M, Ganong LH, Warzinik K. *Family life in 20th-century America*. Westport, Connecticut: Greenwood, Press; 2007.
348. Glover JW. *United States life tables 1890,1901,1910, and 1901-1910* Department of Commerce, Bureau of the Census. Washington: Government Printing Office; 1921.
349. Billings JS. *Report on vital and social statistics of the United States at the eleventh census: 1890*. Department of the Interior Census Office. Washington: Government Printing Office; 1896.
350. Thomson J. *An account of the life, lectures and writings of William Cullen*. Edinburgh: Blackwood; 1832.
351. Brikci N, Green J. *A guide to using qualitative research methodology* New York: Medecins San Frontieres. 2007. <http://fieldresearch.msf.org/msf/handle/10144/84230> [Accessed 6 May, 2017]:1-36.
352. Austin Z, Sutton J. Qualitative research: getting started. *The Canadian Journal of Hospital Pharmacy*. 2014;67(6):436-440.
353. Miles M, Huberman A. *Qualitative Data Analysis*. London: Sage Publications; 1994.
354. Broom A, Barnes J, Tovey P. Introduction to the research methods in CAM series. *Complementary Therapies in Medicine*. 2004;12(2-3):126-130.
355. Donmoyer RB. Ethnographic research. In: Kridel C, editor. *Encyclopedia of curriculum studies*. Thousand Oaks, California: SAGE Publications; 2010; 350-353.
356. Reeves S, Kuper A, Hodges B. Qualitative research methodologies: ethnography. *British Medical Journal*. 2008;337(a1020).
357. Fetterman DM. Ethnography. In: Mathison S, editor. *Encyclopedia of evaluation*. Thousand Oaks, California: SAGE Publications Inc.; 2005.
358. Creswell JW. *Qualitative inquiry and research design: choosing among five traditions*. Thousand Oaks, California: Sage Publications Inc.; 2007.
359. Starks H, Trinidad SB. Choose your method: a comparison of phenomenology, discourse analysis, and grounded theory. *Qualitative Health Research*. 2007;17(10):1372-1380.
360. Van Manen M. *Researching lived experience: human science for an action sensitive pedagogy*. Albany, New York: State University of New York Press; 1990.

361. Streubert H, Carpenter D. Qualitative research in nursing: advancing the humanistic imperative 2nd ed. Philadelphia: Lippincott, Williams and Wilkins; 1999.
362. Davis M. Observation in natural settings. In: Chenitz WC, Swanson JM, editors. From practice to grounded theory: qualitative research in nursing. Menlo Park, California: Addison-Wesley; 1986; 48-65.
363. Elena T, Katifori A, Vassilakis C, Lepouras G, Halatsis C. Historical research in archives: user methodology and supporting tools. *International Journal on Digital Libraries*. 2010;11:25-26.
364. LeNavenec C. The illness career of family subsystems experiencing dementia: predominant phases and styles of managing. Ann Arbor: Univeristy of Toronto; 1993.
365. Polit DF, Beck CT. Nursing research: principles and methods. 7th ed. ed. Philadelphia: Lippincott, Williams & Wilkins; 2004.
366. Glaser BG. The future of grounded theory. *Qualitative Health Research*. 1999;9(6):836-845.
367. Fernandez WD. Exploring shared services from an IS perspective: a literature review and research agenda. In: Hart D, Grego S, editors. *Information systems foundations: constructing and criticising*. Canberra, Australia: ANU E press; 2005; 43-59.
368. Charmaz K. Grounded theory: objectivist and constructivist methods. In: Denzin N, Lincoln Y, editors. *Handbook of qualitative research*. Thousand Oaks, California: SAGE; 2000; 509-535.
369. Seaman DR, Soltys JR. Straight chiropractic philosophy as a barrier to Medicare compliance: a discussion of 5 incongruent issues. *Journal of Chiropractic Humanities*. 2013;20(1):19-26.
370. Mills J, Chapman Y, Bonner A, Francis K. Grounded theory: a methodological spiral from positivism to postmodernism. *Journal of Advanced Nursing*. 2007;58(1):72-79.
371. Birks M, Mills J. Grounded theory: a practical guide. London: SAGE; 2011.
372. Garb M. Health, morality, and housing: the “tenement problem” in Chicago. *American Journal of Public Health*. 2003;93(9):1420-1430.
373. Shrady G. A propagator of pauperism: the dispensary. *Forum*. 1897;23:420-431.
374. Vietor AC. The abuse of medical charity: the passing of the charity hospital and dispensary. *Boston Medical and Surgical Journal*. 1899;CXL(18):417-422.
375. Forrai J. History of different therapeutics of venereal disease before the discovery of penicillin. In: Sato NS, editor. *Syphilis - recognition, description and diagnosis*. London: InTech; 2011; 37-58.
376. Ware J. Success in the medical Profession - an introductory lecture, delivered at the Massachusetts Medical College, 6 November, 1850. *Boston Medical and Surgical Journal*. 1851;43:496-504.

377. Davis NS. History of the American Medical Association from its organization up to January 1855. Butler SW, editor. Philadelphia: Lippincott, Grambo & Co.; 1855.
378. Stewart FC. The actual condition of the medical profession in this country; with a brief account of some of the causes which tend to impede its progress. *The New York Journal of Medicine*. 1846;VI(XVII):151-171.
379. Editorial. *Zanesville Daily Courier*. 18 November, 1878.
380. Whitman W. Manly health and training with off-hand hints toward their conditions. *The New York Atlas*. 1858;21(17):184-189.
381. Flint A. A treatise on the principles and practice of medicine dsigned for the use of practitioners and students in medicine. Philadelphia: Collins; 1866.
382. Warren I. Household physician. Boston: Ira Bradley & Company; 1866.
383. Wilson G. The decadence of the microbe. *The American Homeopathist*. 1900;XXVI:61-65.
384. Shugart KD. Micro-organisms as the cause of disease. *Southern California Practitioner*. 1891;VI(2):131-132.
385. Beale LS. Germs, dust and disease: their supposed nature. London: J. Churchill & Sons; 1870b.
386. Jable JT. Aspects of moral reform in early nineteenth-century Pennsylvania. *The Pennsylvania Magazine of History and Biography*. 1978;102(3):344-363.
387. Rogers RL. The urban threshold and the second great awakening: revivalism in New York State, 1825-1835. *Journal for the Scientific Study of Religion*. 2010;49(4):694-709.
388. Warder G. Religion in 19th century America Virginia: Virginia Commonweath University; 2017. <https://socialwelfare.library.vcu.edu/religious/religion-nineteenth-century-america/> [Accessed 23 March, 2018].
389. Clark HC. The science of medicine. Pennsylvania: University of Pennsylvania; 1853.
390. Young A. Annual report of the Department of Health of the city of Chicago for the year ended December 31, 1894. Chicago: Bureau of Sanitation; 1894.
391. Herron GD. Between Caeser & Jesus. New York: T.Y. Crowell & Co.; 1899.
392. Gunther Brown C. Chiropractic and Christianity: the power of pain to adjust cultural alignments. *Church History*. 2010;79(1):144-181.
393. White R. The rise of Industrial America, 1877-1900 New York: The Gilder Lehrman Institute of American History; 2009. www.gilderlehrman.org/history-now/rise-industrial-america-1877-1900 [Accessed 13 March, 2018].
394. Blanke D. Panic of 1873: industrial capitalism Virginia: Roy Rosenzweig Center for History and New Media at George Mason University; 2010. <http://teachinghistory.org/history-content/beyond-the-textbook/24579> [Accessed 13 February, 2018].

395. Logan J. What 19th century politics can teach us about today Santa Barbara: University of California; 2016. www.universityofcalifornia.edu/news/what-19th-century-politics-can-teach-us-about-today [Accessed 27 March, 2018].
396. SAGE. Politics in the gilded age: the age of political machines California: SAGE; 2013. <http://sageamericanhistory.net/gildedage/topics/gildedagepolitics.html> [Accessed 19 August, 2017].
397. Twain M, Warner CD. The Gilded Age a tale of today. Hartford: American Publishing Company; 1873.
398. Guilded age politics: patronage California: Khan Academy; 2018. www.khanacademy.org/humanities/us-history/the-gilded-age/gilded-age/a/gilded-age-politics-patronage [Accessed 7 October, 2018].
399. Horowitz R. In the public interest: medical licensing and the disciplinary process. News Brunswick: Rutgers University Press; 2013.
400. Harrington C. Infantile mortality and its principal cause - dirty milk. The American Journal of Medical Sciences. 1906;132(6):811-834.
401. Gawande A. Two hundred years of surgery. The New England Journal of Medicine. 2012;366:1716-1723.
402. Reilly RF. Medical and surgical care during the American Civil War, 1861–1865. Archive of Proceedings (Baylor University Medical Center). 2016;29(2):138-142.
403. Waller JC. Health and wellness in the 19th Century. California: Greenwood; 2014.
404. Duffy J. From humors to medical science: a history of American medicine Illinois: Univerisy of Illinois Press; 1993.
405. Duffy J. Social impact of disease in the late nineteenth-century. Bulletin of the New York Acadamy of Medicine. 1971;47(7):797-810.
406. Rothstein WG. American physicians in the nineteenth-century: from sects to science. Baltimore: The John Hopkins University Press; 1992.
407. Wellington WW. Modern medicine: its need and its tendency. Massachusetts Medical Society Medical Communications. 1870;XI(IV):133-170.
408. Clarke MD. Therapeutic nihilism. Massachusetts Medical Society Medical Communications. 1888;XIV(II):221-229.
409. Ohio History Central. Panic of 1893 Ohio; 2017. www.ohiohistorycentral.org/w/Pani_of_1893 [Accessed 13 June, 2017].
410. Panic of 1893. Encyclopediacom;1997. www.encyclopedia.com/history/united-states-and-canada/us-history/panic-1893 [Accessed 20 March, 2018].

411. Duffy J. Social impact of disease in the late 19th Century. In: Leavitt JW, Numbers RL, editors. *Sickness and health in America readings in the history of medicine and public health*. Wisconsin: The University of Wisconsin Press; 1997; 418-425.
412. Frith J. History of tuberculosis. part 1 – phthisis, consumption and the white plague. *Journal of Military and Veterans' Health*. 2014;22(2):29-35.
413. Moore A, Gihon JH. Died. The Nazarene and Universalist Family Companion. 1843;IV(42):329-336.
414. Flower S. Fatalism. *Hypnotic Magazine*. 1896;1(5):305-306.
415. Morrison HC. Yellow fever not a scourge. In: Dromgoole JP, editor. *Heroes, honors and horrors*. Louisville, Kentucky: J.P. Morton & Company; 1879; 55-57.
416. Leavitt JW, Numbers RL. *Sickness and health in America: readings in the history of medicine and public health*. Madison, Wisconsin: The University of Wisconsin Press; 1997.
417. Springer G. A Sermon Preached August 3, 1832, a day set apart in the city of New York for public fasting, humiliation, and prayer, on account of the malignant cholera. New York: Jonathan Leavitt; 1832.
418. Wake CS. Life as a moral discipline. *Religio Philosophical Journal*. 1895;5(37):1-50.
419. Wheeler EJ. The religious world: the church's opportunity. *The literary digest*. 1895;XI(22):1-30.
420. Sax JB. *The organic laws: or the laws that govern the human organism*. New York: Fowlers and Wells; 1851.
421. Steiner LH. *The human body and disease considered from the Christian standpoint*. Cahmabersburg, Pennsylvania: M. Kieffer & Co.; 1858.
422. Party NPs. National People's Party Platform. *The World Almanac*. 11. New York: Press Publishing Company; 1892; 83-84.
423. Williams RH, Alexander SM. Religious rhetoric in American populism: civil religion as movement ideology. *Journal for the Scientific Study of Religion*. 1994;33(1):1-15.
424. Goode RC. The godly insurrection in Limestone County: social gospel, populism, and southern culture in the late nineteenth century. *Religion and American Culture*. 1993;3:155-169.
425. Commager HS. *The American mind: an interpretation of American thought and character since the 1880's*. London: Yale University Press; 1950.
426. Rosenberg CE. *The cholera years: the United States in 1832, 1849, and 1866*. 2 ed. Chicago: University of Chicago Press; 1987.
427. Valencius CB. *The health of the country. how American settlers understood themselves and their land*. New York: Basic Books; 2002.

428. Seeger CL. A lecture in the epidemic cholera. Boston: Andrew Wright; 1832.
429. Bumpus HC. Facts and theories of telegony. *The American Naturalist*. 1899;XXXIII(396):917-922.
430. Tomes N. The gospel of germs: men, women and the microbe in American life. Cambridge, Massachusetts: Harvard University Press; 1998.
431. Bulloch W. The history of bacteriology. New York: Dover Publications; 1979.
432. Amyes SG. Bacteria: a very short introduction. Oxford: Oxford University Press; 2013.
433. Significant events by years Washington, DC: American Society for Microbiology; 2016. www.asm.org/index.php/71-membership/archives/7852-significant-events-in-microbiology-since-1861#Year1861 [Accessed 28 March, 2018].
434. Still AT. Smallpox. *Bulletin of the Atlas and Axis Clubs*. 1901;3:6-7.
435. Gaucher-Peslherbe PL, Wiese GC, Donahue J. Daniel David Palmer's medical library: the founder was "into the literature". *Chiropractic History*. 1995;15(2):63-69.
436. Scott C. The needs of medical education in the United States. *Iowa State Medical Society*. 1897;III(3):79-81.
437. Brym RJ, Lie J. SOC+. Toronto, Ontario: Nelson Education Ltd.; 2012.
438. Dictionary of American History. New York: Charles Scribner's Sons. Medical education.
439. Senzon SA. D.D. Palmer's travelling library: the essential inspirations. Asheville, North Carolina: Integral Altitude Inc.; 2014.
440. Jarvis WT. NCAHF fact sheet on chiropractic: National Council Against Health Fraud; 2001. www.ncahf.org/articles/c-d/chiro.html [Accessed August 18, 2018].
441. Senzon SA. The secret history of chiropractic: D.D. Palmer's spiritual writings. 2nd ed. Asheville, North Carolina: Integral Altitude; 2014.
442. Shelhamer MT. Life and Labour in the spirit world being a description of localities, employments, surroundings, and conditions in the sphere. Boston: Colby & Rich Publishers; 1885.
443. Francis JR. The encyclopedia of death and life in the spirit-world. Chicago: The Progressive Thinker Publishing House; 1896.
444. Crookes W, Helleberg CG. Remarkable spirit manifestations. Cincinnati: C. G. Helleberg; 1891.
445. Marryat F. The spirit world. New York: Charles B. Reed; 1894.
446. Caylor EH. The late Dr. Sedgwick and the spirit medium, based upon facts Dayton, Ohio: United Brethren Publishing House; 1900.
447. Miller CR. Gallery of spirit art. Brooklyn, New York: C.R. Miller & Co.; 1883.

448. Van Die M. Practising medicine and spiritualism in the 1860s: sacred encounters of Drs. Moses Colby and Susan Kilborn as "lived religion". *Histoire sociale Social history*. 2009;42(84):447-478.
449. Trine RW. *In tune with the infinite or fullness of peace, power and plenty*. New York: Thomas Y. Crowell & Company Publishers; 1897.
450. Davis AJ. *Answers to ever-recurring questions from the people* New York: A.J. Davis & Co.; 1862.
451. Davis AJ. *The great harmonia, being a philosophical revelation of the natural, spiritual and celestial universe*. Boston: Sanborn, Carter and Bazin; 1855.
452. Donahue JH. D.D. Palmer and the metaphysical movement in the 19th century. *Chiropractic History*. 1987;7(1):23-27.
453. Testimony of a physician to the benefits of hydropathy. *The Magnetic and Cold Water Guide*. 1846:7-8.
454. Martin SC. A History of Chiropractic. In: Kiple KF, editor. *The Cambridge World History of Human Disease*. Cambridge: Cambridge University Press; 1993; 164-170.
455. Palmer DD. *The Chiropractic*. 1900(26):1-4.
456. Palmer DD. *The Chiropractic*. 1902;29:1-4.
457. Weltmer SA. *The profession of magnetic healing and what it costs*. Nevada, Missouri: The American School of Magnetic Healing; 1898.
458. Weltmer SA. *Regeneration*. 1st ed. Nevada, Missouri: The Weltmer Institute of Suggestive Therapeutics Company, Publishers; 1899.
459. Osler W. *Aequanimitas, with other addresses to medical students, nurses and practitioners of medicine*. London: H.K. Lewis; 1904.
460. Lazarus D. Chiropractic treatment, a \$15-billion industry, has its roots in a ghost story. *Los Angeles Times*. June 30, 2017.
461. DesOrmeaux P. Chiropractic history: DD Palmer's magical kingdom. *Basis*. 2007;25(1).
462. Smith RL. At your own risk: the case against chiropractic. 1969. [www.chirobase.org / 05RB/AYOR/01.html](http://www.chirobase.org/05RB/AYOR/01.html) [Accessed 30 March, 2018].
463. Pomeroy R. Five facts about chiropractic that might make you reconsider getting your back cracked. Chicago: Real Clear Science; 2015. www.realclearscience.com/blog/201/07/5_facts_about_chiropractic_that_might_make_you_reconsider_getting_your_back_cracked_109323.html [Accessed 30 March, 2018].
464. Council NR. *Science, medicine, and animals*. Washington, DC: The National Academies Press; 2004; 52.
465. All over Kansas. *Iola Register*. 2 July, 1886.

466. Hot weather comfort. Iola Register. 9 July, 1886.
467. Weed S. A list of Greek words. Samuel Weed Collection. Davenport, Iowa: Palmer College of Chiropractic 1896.

APPENDICES

Appendix 1

Publications of the American Statistical Association ¹²

63]	<i>Miscellany.</i>	153	
Cities.	Total deaths.	Population.	Death-rates.
Burlington,	352	30,000	11.66
Clinton,	228	17,000	1.30
Council Bluffs,	229	35,000	0.06
Cedar Rapids,	273	16,000	1.70
Davenport,	438	33,715	12.09
Des Moines,	438	58,000	0.75
Dubuque,	327	35 000	9.28
Keokuk,	192	13,151	12.00
Mt. Pleasant,	65	1,500	4.50
Ottumwa,	169	16,000	0.94

"The foregoing statistics are worthy of the genius of a Squeers. The conventional mode of expressing a death-rate is as a ratio per one thousand of the living population. The go-as-you-please method of the Iowa Board of Health can hardly be recommended for general adoption. Mortality is the common lot of all mankind, and it is quite plain that there is such a condition as a healthy, or, to use a better term, normal standard as a mortality-rate for a given community or population. By this is not meant the mortality-rate of selected classes."

"The mortality of city populations, large and small, in the United States, may be stated, with few exceptions, as from eighteen per thousand upwards; and for rural populations in well-settled districts as from eleven per thousand and upwards. But when such figures as 3.07 per thousand for a single year for a population of about two millions are quoted, it is time to call for a recount of ballots, and to inquire what are the sources from which such an estimate is made."

Appendix 2

Supplementary analysis and derivative tables: 12th United States Census ¹³

496

SUPPLEMENTARY ANALYSIS.

TABLE III.—POPULATION AND GROSS DEATH RATE, WITH DEATH RATES FROM CERTAIN PRINCIPAL DISEASES, BY COLOR: CENSUS YEAR 1900.

CITY.	POPULATION.		DEATH RATES PER 1,000 OF POPULATION.		DEATH RATES PER 100,000 OF WHITE POPULATION.											
	Total.	White.	Total.	White.	Measles.	Diphtheria and croup.	Influenza.	Typhoid fever.	Diarrheal diseases.	Consumption.	Cancer and tumor.	Heart disease and dropsy.	Pneumonia.	Diseases nervous system.	Diseases urinary system.	
Albany, N. Y.	94,151	92,962	19.3	19.2	22.6	55.9	22.6	44.1	72.1	245.3	73.1	153.8	175.3	281.8	128.0	
Allentown, Pa.	129,896	126,552	18.4	18.5	8.7	29.2	21.3	101.9	177.0	158.0	36.3	130.4	278.9	210.2	41.9	
Allentown, Pa.	35,416	35,325	18.2	18.3	.....	87.8	14.2	48.1	121.7	135.9	34.0	212.3	181.2	257.6	59.4
Altoona, Pa.	38,973	38,566	19.3	19.2	5.2	98.5	5.2	49.3	111.5	140.0	67.4	132.2	155.6	300.8	51.9	
Atlanta, Ga.	89,872	54,090	26.6	23.1	1.8	29.6	24.0	98.0	292.1	220.0	59.2	166.4	122.0	334.6	146.1	
Atlantic City, N. J.	27,838	21,267	16.7	18.1	9.4	70.5	47.0	18.8	94.0	150.5	65.8	131.7	136.4	282.1	131.7	
Auburn, N. Y.	30,345	29,814	17.2	17.1	3.4	57.0	6.7	40.2	97.3	147.6	87.2	140.9	184.5	275.0	53.7	
Baltimore, Md.	508,957	429,218	21.0	19.1	4.7	73.9	17.7	33.3	177.3	178.0	69.9	114.2	183.4	229.0	138.9	
Bay City, Mich.	27,485	27,485	12.7	12.7	18.9	76.4	10.9	29.1	47.3	69.1	83.7	181.9	47.3	131.0	40.0	
Bayonne, N. J.	32,722	32,353	16.7	16.5	18.5	40.2	15.5	15.5	136.0	157.6	43.3	105.1	234.9	225.6	98.9	
Binghamton, N. Y.	39,647	39,142	17.6	17.6	.....	104.7	12.8	33.2	120.1	171.2	53.7	117.5	153.3	270.8	84.3
Boston, Mass.	560,892	548,083	20.1	20.0	18.1	75.5	38.1	27.0	132.6	233.4	76.6	162.9	248.0	194.7	79.4	
Bridgeport, Conn.	70,996	69,775	17.3	17.1	38.7	24.4	57.3	15.8	163.4	197.8	50.2	98.9	216.4	176.3	124.7	
Brockton, Mass.	40,063	39,707	13.2	13.3	2.5	50.4	63.0	40.3	83.1	158.7	45.3	93.2	141.0	158.7	88.1	
Buffalo, N. Y.	352,387	350,586	14.8	14.7	28.8	26.5	10.8	24.5	134.1	128.9	56.5	112.7	157.7	162.9	88.7	
Cambridge, Mass.	91,886	87,875	18.5	18.2	9.1	86.5	25.0	19.3	133.1	204.8	75.1	165.0	208.3	208.3	69.4	
Camden, N. J.	75,935	70,288	16.3	15.2	11.4	126.6	18.5	27.0	69.7	152.2	46.9	126.6	133.7	229.1	122.4	
Canton, Ohio	30,667	30,525	13.3	13.3	.....	81.9	13.1	55.7	39.3	140.9	49.1	88.5	85.2	226.0	59.0
Charleston, S. C.	55,807	24,238	37.5	25.6	12.4	4.1	90.8	103.1	235.2	189.8	123.8	156.8	103.1	272.3	313.6	
Chelsea, Mass.	34,072	33,291	18.7	18.9	9.0	75.1	45.1	24.0	117.1	228.3	93.1	156.2	225.3	240.3	81.1	
Chicago, Ill.	1,697,575	1,667,140	16.2	16.1	16.4	65.6	8.9	27.5	151.5	171.9	63.8	100.1	210.4	170.8	82.4	
Cincinnati, Ohio	325,902	311,404	19.1	18.6	1.6	34.4	15.4	30.8	125.9	217.1	74.2	134.2	148.0	252.4	112.4	
Cleveland, Ohio	381,768	375,664	17.1	17.1	1.9	52.2	6.9	48.2	112.3	127.5	54.6	130.4	184.2	252.1	58.6	
Columbus, Ohio	125,560	117,335	15.8	15.4	8.5	27.3	22.2	52.0	108.2	201.1	80.1	108.2	112.5	236.1	73.3	
Covington, Ky.	42,938	40,434	20.2	20.1	.....	34.6	12.4	39.6	123.7	232.5	44.5	180.5	126.1	311.6	168.2
Davenport, Iowa	35,254	34,762	15.9	15.9	.....	2.9	5.8	66.2	77.7	141.0	86.3	120.8	100.7	253.1	83.4
Dayton, Ohio	85,333	81,923	16.5	16.3	.....	13.4	12.2	51.3	61.0	184.3	97.7	172.1	74.5	249.0	98.9
Denver, Colo.	133,859	129,609	18.6	18.4	11.6	34.7	10.8	41.7	78.7	321.7	71.0	122.7	193.7	203.7	86.4	
Detroit, Mich.	285,704	281,575	17.1	17.0	28.1	47.6	8.2	18.5	152.4	122.2	67.8	118.3	159.1	211.0	75.3	
Duluth, Minn.	52,969	52,547	13.2	13.2	5.7	15.2	1.9	41.9	108.5	93.2	72.3	79.9	156.1	121.8	83.7	
Easton, Pa.	25,238	24,907	16.7	16.6	.....	44.2	12.0	16.1	104.4	164.6	56.2	140.5	140.5	273.0	72.3
Elizabeth, N. J.	50,130	50,963	17.5	17.4	3.9	35.3	13.7	7.8	188.4	168.7	49.1	109.9	243.3	237.4	104.0	
Elmira, N. Y.	25,672	24,856	15.4	15.4	2.9	23.0	37.3	37.3	48.8	163.5	63.1	109.0	111.9	243.9	129.1	
Erie, Pa.	52,733	52,483	15.2	15.2	3.8	51.4	7.6	34.3	104.8	146.7	41.9	184.8	110.5	215.3	70.5	
Evansville, Ind.	59,007	51,486	17.7	17.0	17.5	23.3	9.7	79.6	151.5	227.2	60.2	89.3	122.4	213.7	89.3	
Fall River, Mass.	104,863	104,458	22.4	22.4	16.3	24.9	30.6	22.0	394.4	197.2	52.7	143.6	209.7	260.4	76.6	
Fitchburg, Mass.	31,531	31,439	13.6	13.6	6.4	38.2	12.7	19.1	120.9	108.1	63.6	117.7	133.6	108.1	54.1	
Gloucester, Mass.	26,121	26,050	14.9	14.9	.....	26.9	69.1	15.4	119.0	168.9	65.3	145.9	103.6	165.1	63.7
Grand Rapids, Mich.	87,965	86,952	14.4	14.5	23.0	42.6	16.1	39.1	89.7	108.1	62.1	117.3	126.5	184.0	63.3	
Harrisburg, Pa.	50,167	46,044	17.8	17.3	2.2	60.8	34.7	34.7	63.0	167.2	67.3	143.3	158.5	375.7	76.0	
Hartford, Conn.	79,850	77,837	19.4	19.4	9.0	96.4	39.8	56.5	150.3	203.0	75.8	125.9	200.4	230.0	131.0	
Haverhill, Mass.	37,175	36,756	15.1	15.2	.....	35.4	46.3	10.9	111.5	144.2	68.0	157.8	185.0	166.0	78.9
Hoboken, N. J.	59,364	59,200	21.1	21.1	23.6	55.7	11.8	32.1	145.3	223.0	50.7	148.6	287.2	282.1	103.0	
Holyoke, Mass.	43,412	43,043	17.9	18.0	41.6	29.2	32.9	28.5	223.7	181.8	50.4	83.3	157.7	216.9	65.7	
Indianapolis, Ind.	169,164	153,201	16.7	15.9	2.6	36.6	27.4	45.0	94.6	176.9	67.2	101.2	123.4	221.3	70.5	
Jackson, Mich.	25,180	24,701	13.4	13.3	.....	16.2	16.2	60.7	44.5	117.4	93.1	129.5	85.0	170.0	76.9
Jacksonville, Fla.	28,429	12,158	29.0	25.6	.....	24.7	49.4	90.5	148.1	304.3	49.4	197.4	148.1	312.6	123.4
Jersey City, N. J.	206,433	202,510	20.7	20.6	11.9	54.3	13.8	22.2	180.7	232.1	47.9	158.5	270.1	275.0	111.6	
Johnstown, Pa.	35,936	35,613	19.8	19.8	25.3	59.0	11.2	95.5	151.6	101.1	47.7	146.0	308.9	244.3	56.2	
Kansas City, Mo.	163,752	146,090	17.4	16.3	8.9	31.5	8.9	39.0	121.2	155.4	52.7	141.0	179.3	193.7	76.0	
Lancaster, Pa.	41,459	40,668	17.5	17.4	.....	122.9	39.3	56.6	122.9	130.3	54.1	213.9	122.9	211.5	120.5
Lawrence, Mass.	62,559	62,414	20.2	20.2	33.6	89.7	36.9	12.8	264.4	200.3	54.5	157.0	201.9	189.1	84.9	
Lincoln, Neb.	40,169	39,324	11.8	11.6	2.5	15.3	17.8	33.1	88.0	119.5	48.3	91.5	114.4	162.8	53.4	
Los Angeles, Cal.	102,479	98,082	18.1	17.9	1.0	45.9	16.3	45.9	69.3	352.8	78.5	122.3	124.4	197.8	115.2	
Louisville, Ky.	204,731	165,590	20.0	17.9	13.9	21.7	9.1	70.1	91.8	192.6	76.1	105.1	149.2	227.1	91.2	
Lowell, Mass.	94,969	94,774	19.8	19.8	11.6	36.9	34.8	19.0	282.8	189.9	54.9	182.5	212.1	254.3	73.9	
Lynn, Mass.	68,513	67,664	16.4	16.4	8.9	35.5	42.9	17.7	136.0	193.6	91.6	128.6	152.2	187.7	91.6	
McKeesport, Pa.	34,227	33,476	17.3	17.1	.....	83.6	9.0	38.8	176.2	101.6	32.9	89.6	271.8	247.9	59.7
Malden, Mass.	33,664	33,193	14.4	14.5	.....	36.2	48.2	15.1	123.5	156.7	66.3	135.6	105.4	204.9	96.4
Manchester, N. H.	56,987	56,926	19.2	19.2	8.8	24.6	8.8	10.5	203.8	205.5	36.9	140.5	219.6	247.7	59.7	
Memphis, Tenn.	102,320	52,380	25.1	21.9	51.5	22.9	45.8	43.9	232.9	169.9	45.8	112.6	263.5	179.5	126.0	
Meriden town, Conn.	28,695	28,470	14.3	14.3	3.5	14.0	77.3	17.6	119.4	168.6	80.8	87.8	154.5	200.2	59.7	
Milwaukee, Wis.	285,315	284,431	15.9	16.0	6.3	43.2	1.8	18.3	138.2	149.1	67.5	115.7	150.8	209.9	64.8	
Minneapolis, Minn.	202,718	201,113	10.8	10.7	1.5	33.3	7.0	40.8	57.7	128.3	48.2	81.0	96.0	124.8	63.1	
Mobile, Ala.	38,469	21,402	25.9	21.9	.....	9.3	18.7	60.7	191.6	271.0	112.1	186.2	88.8	336.4	163.5
Nashville, Tenn.	80,865	50,796	25.3	20.8	5.9	68.9	49.2	45.3	167.3	222.5	51.2	106.3	208.7	271.7	84.7	
New Bedford, Mass.	62,442	60,633	18.5	18.6	3.3	24.7	18.1	24.7	196.3	186.4	82.5	146.8	179.8	273.8	110.5	
New Britain town, Conn.	28,202	28,067	17.1	17.2	3.6	74.8	110.4	3.6	178.1	149.6	39.2	89.1	188.8	199.5	67.7	
New Haven, Conn.	108,027	105,038	17.2	16.8	3.8	20.0	41.9	29.5	111.4	18						

Appendix 3

Newspaper reports about Palmer's magnetic healing practice in Iola ^{254, 465, 466}

Geo. Sutton, of Iola has been a constant sufferer from rheumatism for 21 years, he is entirely free from pain being relieved by Dr. Palmer now of this place who employs the Vital Magnetic Healing Process. Mr. Sutton received his last treatment on May 5. Dr. Palmer has rooms at Mr. Jennings.

The right of way for the Missouri Pa-

The Iola Register; July 2, 1886:8

NOT WEATHER COMFORT.

The many friends of Mrs. Ellen Miller, age 67, living 4½ miles north-west of Iola, will be pleased to learn that she has been cured of rheumatism in the shoulder and hip in four treatments also that she has been cured of asthma by Dr. Palmer, whose wonderful powers of healing is done by his hands. Dr. Palmer may be consulted free at the residence of Mr. Jennings.

OF INTEREST TO LADIES.

The Iola Register; July 9, 1886:4

R OF CHIROPRACTIC

**Palmer Passed Away In
ngeles a Few Days Ago.**

**a Former Resident of the City
Burlington—Was Born In
Canada In 1864.**

Palmer, a former Burlington discover of chiropractic father of E. J. Palmer, head of ner school of chiropractic at st, passed away Monday at

**OR SAID THIS
BABY MUST DIE**

When sending

Los Angeles, Calif. The Davenport Democrat said of him:
People of Davenport have occasion to remember D. D. Palmer for it was here that he first discovered the system of healing known as chiropractic and it was here that many things happened that are vivid in the minds of the people. Davenport is the birthplace of chiropractic and it is from this city that E. J. Palmer, the son, directed his campaign of development making chiropractic what it is to-day.
D. D. Palmer was sixty-eight years of age and was born in Ontario, Canada. He came to America in 1864 and settled at What Cheer, Iowa, where he conducted a little business for a number of years. Leaving What Cheer he went to Iola, Kans., and established himself as a magnetic healer. He remained there a short time and migrated to Burlington, Iowa. He remained there until 1885, when he came to Davenport and opened up offices here. For ten years he practiced as a magnetic healer and in 1895 made his discovery. He was then established in the South Putnam building. Chiropractors state there was a colored janitor in the building by the name of Harvey Lillard. Lillard was hard of hearing and consulted Palmer. The latter examined him and discovered a bump on his spine near the neck. He asked Lillard about it and Lillard told him he had had a fall several years back; that the bump had been there since and that he had become hard of hearing. Palmer reasoned it is said, that if the bump was the cause of Lillard's deafness, removing it

The Burlington Hawkeye; October 23, 1913

Appendix 4

Name change from *Magnetic Cure* to *The Chiropractic* ¹⁴⁹

PUBLISHED BY
PALMER'S
School of Magnetic Cure
(Incorporated under the laws of the State of Iowa)
FOR THE PURPOSE OF
Teaching How to Get Well and Keep Well
Without Taking Poisonous Drugs.

Office, School, and Place of Publication:
Fourth Floor, Ryan Block, Corner Second
and Brady Streets,
DAVENPORT, IOWA.

THE CHIROPRACTIC is issued by
Palmer's School of Magnetic Cure.
Subscription price, twelve numbers,
25 cents. This small amount can
be sent in postage stamps, and must
be paid in advance. Address Dr.
Palmer, Davenport, Iowa.

Appendix 5

Comparison of magnetic healing and chiropractic treatment rooms ^{149, 290}

The Chiropractic January 1897 p. 3

‘Magnetic manipulator’

Our healing is done entirely by the hands; there are no drugs used; you can eat or drink what you please within reason. We use no electrical batteries, no instruments. Any one can step into our treating rooms. There you will see in each a table, two stools, and the **magnetic manipulator**. The diagnosis and treatment is often done inside of five minutes. We find what is wrong—perhaps some bone, muscle, or ligament needs replacing, some nerve stretched, or blood vessel compressed. By having a knowledge of the anatomy of the human machine we can locate the exact spot where the wrong is which causes the trouble. Disease is only a result of inharmony, something wrong.

The Chiropractic March 1897 p. 3

‘Chiropractic manipulator’

Our healing is done entirely by the hands; there are no drugs used; you can eat or drink what you please within reason. We use no electrical batteries, no instruments. Any one can step into our treating rooms. There you will see in each a table, two stools, and the **chiropractic manipulator**. The diagnosis and treatment is often done inside of five minutes. We find what is wrong—perhaps some nerve stretched or blood vessel compressed, some bone, muscle, or ligament needs replacing. By having a knowledge of the anatomy of the human machine we can locate the exact spot where the wrong is which causes the trouble. Disease is only a result of inharmony, something wrong.

Appendix 6

Weed's list of Greek words ⁴⁶⁷

A List of Greek Words.

Χεῖρ, the hand. Cheir, Khire, in composition, χεῖρο-, kero-.

Χειρίζω, khirizo, kirizo, to handle, to perform an operation by hand (as in surgery), to kirize. This would answer to describe hand treatment for disease, and the following forms would come naturally from it: Chirism, kirism, handling, or performing an operation with the hand. Chirist, kirist, one who practices healing by hand, or advocates or believes in it.

Χειρουργός, ^{cheirourgós,} kirurgos, a hand-worker or hand-operator, a surgeon, which latter is the same word after passing through the French into English. This would be unsuitable, as it already has a fixed meaning in our language.

Θεραπεύω, ^{to cure, to attend} therapeuo, therapēō. Therapeutic, therapist, and therapeutics are from this word. As they stand, it is understood that they mean curing or nursing with medicines; but with Chiro- prefixed they could not mean that. A Chirotherapeutic would be one who cures with the hand; Chirotherapist, one versed in hand curing; Chirotherapeutics, the science of hand curing.

ἰατρός, iatros, iätros, a healer, a physician. A Chiriätros, Kiriätros, would be a hand healer or hand physician; a Chiriätic, one versed in, or adhering to, hand healing; Chiriätry, the science and art of hand healing.

καταρτίζω, catartizo, katartizo, to adjust, put in order again, restore. A Chirocatartist, or Chirocatartistter, is one who adjusts or puts right by hand, just the right meaning, but a jawbreaker.

ἔργον, ergon, praxos, done, to be done. ἔργον, practor, praktor, praktor, one who does or executes, a worker. Πράξις, praxis, praxis, doing, deed, practice. Chiropract or Chiropractic is, done by hand, or one that advocates or does hand practice; Chiropractor is a hand-practitioner; Chiropraxis or Chiropractice is the science and art of doing by hand, hand-practice.

Appendix 7

Palmer's death certificate ³⁴¹

STATE OF CALIFORNIA		BUREAU OF VITAL STATISTICS	
CERTIFICATION OF VITAL RECORD			
1. PLACE OF DEATH COUNTY OF LOS ANGELES		California State Board of Health BUREAU OF VITAL STATISTICS	
District of		State Index No. 499 549	
City of 20 W. Vernon Ave		Local Registered No. 5272	
2. FULL NAME Daniel David Palmer		Ward) (If the death occurred in a hospital or institution give its NAME instead of street and number and fill out NO. 18)	
3. PERSONAL AND STATISTICAL PARTICULARS			
3. SEX Male	4. COLOR White	5. Single <input type="checkbox"/> Married <input checked="" type="checkbox"/> Widowed <input type="checkbox"/> Divorced <input type="checkbox"/> (Write the Word)	
6. DATE OF BIRTH Mar 6 1845 [Month] [Day] [Year]			
7. AGE 68 years 7 mos. 14 ds. If less than 1 day ____ h. or ____ min.?			
8. OCCUPATION (a) Trade, profession or particular kind of work Chiropractic Physician (b) General nature of industry, business or establishment in which employed (or employer)			
9. BIRTHPLACE (State or County) Canada			
10. NAME OF FATHER Thomas Palmer			
11. BIRTHPLACE OF FATHER (State or County) Unknown			
12. LENGTH OF RESIDENCE At place of Death 2 years 6 months In California 2 years 6 months			
13. MEDICAL CERTIFICATE OF DEATH			
16. DATE OF DEATH Oct 20 [Month] [Day] [Year]			
17. I HEREBY CERTIFY That I attended the deceased from Oct 11 191 3 to Oct 20 191 3 that I last saw him alive on Oct 20 191 3 and that death occurred on the date stated above at 8 A.M.			
The CAUSE OF DEATH was as follows: Typhoid fever			
Contributory (Duration) Ludwig for years to brain (Secondary) Scurvy (Signed) M. H. McAndrews M. D. Oct 20 191 3 [Address] Room 10 Analyst Oct 20 1913			
18. SPECIAL INFORMATION only for Hospitals, Institutions Transients or recent Residents. Former or Usual Residence _____ How long at _____ Place of death _____ Days Where was disease contracted If not at place of death _____			
19. PLACE OF BURIAL OR REMOVAL L A Crematory			
20. UNDERTAKER PIERCE BROS. & CO.			
15. Filed OCT 21 1913 191 3 Subregistrar M. H. McAndrews Registrar or Deputy			
326590			