Development of Osteopathic professions and education in Australia and internationally

- Past and Present

By Peter Baziotis

Keywords: Osteopathic Medicine, osteopathy, profession, education, history, policies, Australia, United Kingdom, United States, organizational theory

Abstract

Australian osteopathic education has endeavoured to produce health care practitioners but has been hampered by organizational issues relating to its development. This report reviews issues in Australian osteopathic education (like the lack of experienced leaders, resources and funding) and compares how American and British osteopathic professions have addressed equivalent issues. Organizational theory is used to examine osteopathic educational frameworks in American and British osteopathic professions and to determine how Australian osteopathic education can address changes required to improve the professional status of osteopathy in Australia.

The purpose of this paper is to propose that a strategic approach incorporating the experiences of its osteopathic colleagues overseas, of complementary and alternative health care professions is needed in advancing osteopathic education and the profession in Australia. This paper illustrates how the advancement of American and British osteopathic professions anecdotally has relied upon factors like the number and type of practitioner, the research profile of the profession, the educational institutions, and the informed management decisions undertaken in advancing their professional and educational status. These factors need to be considered in the development of Australian osteopathy and this report seeks to provide insight into strategies required to address these impeding factors.

Introduction

The Osteopathic profession around the world has developed from a number of different approaches. From its beginning, the osteopathic health care has been exposed to societal, government, educational and professional issues in its country of origin. In the United States of America (USA), the Osteopathic profession enjoys primary health care status with its educational facilities accessing all sectors of health care provision, development and training opportunities.[1-3] In the United Kingdom (UK) and Australia, the osteopathic profession exhibits features of a complementary health care provider. Educational professional preparation programs originated in privately funded and independent educational institutions, and osteopathic scope of practice is primarily conducted in private health care clinics.[1, 4]

This review of Australian Osteopathy examines grey literature using a sociological perspective based on organizational political, managerial and administrative structures. A future report of Australian Osteopathy will be presented using professionalisation perspectives of key authors in sociology: Karl Marx, Talbott Parsons, Eliot Freidson and Max Weber.[5] Grey literature [6-8] used provides succinct historical accounts of major events and issues that have influenced the development of osteopathy in the USA, UK and Australia. The grey literature used consists primarily of government reviews and commentaries by osteopaths and sociologists[4, 9-12] that describe the development of osteopathic educational programs, legislation and scope of practice in each of these countries [1, 2, 9, 13-15]. Common to all of the grey literature is a lack of comment and analysis in regards to the sociology of the discipline in each country. This report provides background for answering the research question “What is the current professional status of Australian Osteopathy?” by specifically filling a gap in the literature; namely the lack of delineation and identification of sociological processes that affect the osteopathic discipline. Future research is expected to conceptualize strategies in advancing the professional status of Australian Osteopathy.

Literature used in this report has originated from authors who have followed the development of osteopathy in Australia[1, 4, 9-13, 16-18] and the USA[2, 9, 10, 14, 19-21], from professional accounts of the profession in the UK[4, 9, 22], and from government reports in Australia.[15] These authors cite a number of strengths and weaknesses in the continual existence of the osteopathic discipline in Australia and internationally. This report summarises and identifies relevant issues relating to the status of the profession and the education of osteopaths, and evaluates the effects of these issues on the profession and its educational institutions.[23] A continuous cycle of quality assurance, with an understanding and commitment from within the Osteopathic profession is identified in these author's accounts. Personnel, procedural frameworks and support structures need to be employed in Australian osteopathy for change to occur in its professional status. Examples of these processes are found in the development of the Osteopathic profession of the USA and UK that have expanded and prospered. This literature identifies government policies, societal influences, educational and professional issues in the development of osteopathic education and professions in the USA and UK. Critical review of this literature identifies how issues facing Australian Osteopathic education may be considerable, yet not unmanageable. Rational and logical processes and frameworks for a realignment of Australian osteopathic education and its professional status are revealed for its continued future existence.

This report will also include *organisational change theory* in reviewing Australian osteopathic education, for the reason that Australian osteopathic education represents an organisational entity for professional status development. Normally, organizational theory would apply to a defined organization with aims, administrative and professional resources. Max Weber[24] (cited by Viljoen & Dann[25]) describes an ideal type of organization as a clearly defined hierarchical structure that is efficient and rational in relation to the group that it controls. This organization has delineated spheres of competence and responsibility in which a system of promotion exists based on seniority and/or competence, and where control and discipline are established.[24, 25] Osteopathic education however does not exist in Australia as any well defined organizational entity. Robbins and Barnwell state that 'an organisation is a consciously co-ordinated social entity, with a relatively identifiable boundary, that functions on a relatively continuous

basis to achieve a common goal or set of goals'.[26] Australian osteopathic education can be seen as an organisational entity for the development of osteopaths in Australia, thus being like many other organizations as defined by Robbins & Barnwell.[26] As an organizational entity within a specific environment, organisation change theories can be used to review issues affecting osteopathic education. Such theories are used to review the institutions, stakeholders, and policies that govern and influence osteopathic education as an entity. Issues become transparent from different 'lenses' or viewpoints; the organization as a whole with interdependent parts can be explored.

Defining organizational change theory

Organisations have been conceptualised using a number of descriptions[26]. These descriptions allow an organisational structure to be defined, identify how tasks are to be allocated, establish formal reporting and co-ordinating mechanisms between individuals. [26] As an organization can be viewed as a set of interrelated and interdependent parts arranged in a manner that produces a unified whole, interrelationships are created in the organizational structure between its parts. Interrelationships between its parts are characterised by two diverse forces: differentiation and integration[26]. Specialised functions within an organization are differentiated. In the human body, for instance, the lungs, heart and liver have distinct functions. Similarly, organisations have divisions and departments like units, each performing specialised activities. At the same time, in order to maintain unity among the differentiated parts and to form a complete whole, every system has a reciprocal process of integration. In organisations, this integration is typically achieved with co-ordinated levels of hierarchy, direct supervision, and rules, procedures and policies, to ensure that the organization does not break down into separate elements. Using this perspective, important insights into Australian osteopathy can be conceptualised into divisions performing specialised activities, and into levels of hierarchy, supervision, and policies in the provision and development of Australian osteopathic education.

Organizational change theory research literature distinguishes four types of organizational development (OD) [27]: lifecycle, teleological, dialectical, and evolutionary. Literature emphasizing these types of organizational change relate to three major periods or time zones: post-World War II, early 1980s, and after the 1980s (or current period). The basic processes of organizational change and development involve voluntary change and/or environmental determinism. Post-World War II OD processes involved primarily rational adaptation in response to an environmental change, and the organization adapting or adjusting to the environmental change.[27] OD in the early 1980s changed using primarily organic adaptation processes. Organic adaption allows an organization to adapt to environmental changes, while internal organizational dynamics occur providing vision and mechanisms in the pursuit of organizational interests and objectives, through cultural and political influences on society. Life-cycle model approaches to OD became apparent in the early 1970s, and more prolific in the late 1980s. Life-cycle model approaches to OD emphasize differences between states and forms of an organization over time. These approaches illustrate that OD occurs from links between environmental variables, organizational variables, strategic change and impact of change. OD is not prescribe a process or system of change in the life-cycle model because organizations may or may not become constrained by environmental and situational factors.[27] The relationship between organization and environment is a bidirectional, social interarctation that promotes legitimacy, and influential decision makers/managers within the organization have power to influence their environment, and choose the environment in which they want to evolve.[27]

Organizations and their systems can be classified typically as either closed or open. Closed organizations are characterized as self-contained; they ignore the effects of the environment.[26] A perfect closed organization is one that receives no support from an outside source, and from which no output is released to its surroundings. Osteopathic professional education programs have predominantly operated as self contained organizations, or closed organizations. This report therefore also intends to demonstrate how developing an open organization would have relevance to Australian osteopathic education in advancing its future professional status.

Organisations evolve through a proposed sequence of transitions defined as a *life cycle*. In a developing organization's lifecycle, distinct stages follow a consistent pattern, and the transitions from one stage to another are predictable rather than random occurrences.[26] The five predictable stages or transitions in organizational development[26] are as follows:

a) *Entrepreneurial stage* is synonymous with the beginning of an organization. Ambiguous goals transpire with high creativity. Progress requires the acquisition and maintenance of a continual supply of resources.

b) *Collectivity stage* is reached when the organisation's mission and goals are clarified. Informal communication and structure remains, as members maintain high workloads, demonstrating high levels of commitment.

c) *Formalisation-and-control stage* is attained when the organization's structure stabilises. Formal rules and procedures are emphasised, increasing efficiency and stability. Innovation diminishes, as decision makers and managers are confirmed and acquire control. Decision making becomes conservative, and the organisation does not rely on any one individual. Clarification of management roles allows a member's departure to present no severe threat.

d) *Elaboration-of-structure stage* diversifies an organization's product or service markets. New products and growth opportunities are decided by management. Organisational structure becomes more complex and elaborated, while decision making becomes decentralised.

e) *Decline stage* resulting from competition or forces like a shrinking market, and shrinking in the demand for an organization's products or services occurs.

The unique characteristics of each stage require modifications in the organization's functioning and structure. Currently as an organization, Australian osteopathic education possesses informal communication processes and structures, and places it in the collectivity stage of development. Osteopathic academic and research staff are putting in long hours and possess a high level of commitment to the organization they belong. Leaders and mentors though are few and far between and isolated from each other. A lack of success of Australian osteopathic educators and researchers has been propagated due to the lack of innovation, blurred organizational missions and visions, and lost opportunities. In order for osteopathic education to progress, management and leaders need to continually introduce changes and re-align the organization for long term growth and survival. Inherently, the organization deals with an increase in conflicts, as new people assume leadership, and as decision making becomes centralised within the new leadership, initially.[26] In the elaboration-of-structure stage, Australian osteopathic education becomes more elaborate and complex being able to come to terms with presenting opportunities and decentralised decision making.

History, origins and development of Osteopathy

American perspective

Health care in the early nineteenth century consisted of many groups of healers, neither well established nor well organized. In the post-civil war period, no licensing boards and few scattered state laws governing medical practice existed.[14] There was great diversity in the healing professions, and medicine as a major provider of health care in USA lagged behind developments in Europe. Gallagher and Humphery indicate that physician training across the USA lacked consistency and quality overall, and a unified definition of practice did not exist.[2] Physicians were struggling to make a livelihood. Medicine was divided, with guilds arguing and bickering between themselves in relation to their different origins, education and ideas on pharmacological and surgical treatment.[2, 19]

With medical licensing and regulatory agencies in a splintered state, medical training was primarily based on a guild system (apprenticeship approach). As the medical fraternity in the USA was establishing itself, allopaths and homeopaths were also seeking recognition as health care disciplines.[14, 19] Professional groups competed with each other, resulting in conflict in regard to what should constitute their respective domains and scopes of practice.[19] Eventually, in 1847, the American Medical Association (AmMA) was founded and standards of medical education were established in 1903.[14] The AmMA and its affiliate societies then began to strongly lobby the state regulatory boards to support the association in the advancement of its professional status. The AmMA became more stable, successfully asserting the medical profession as the primary provider and arbitrator of health care in the community. Complementary and alternative health care approaches that were not accepted by the AmMA, found it difficult to establish themselves in the short and long term.

Osteopathy as a health care system and discipline was founded by Andrew Taylor Still in 1889.[9, 10, 28] Around 1864, Still watched as the therapies of his medical colleagues failed, and three of his family died to meningitis. This incident was the precursor to the founding of the osteopathic discipline, that was to address health care where medicine had been unsuccessful. He was a medically trained practitioner to all intents and purposes, because of his medical apprenticeship training from his father and his self-directed learning in anatomy, physiology, surgery and *materia medica.* [2, 14, 19] In Kirksville, Missouri, Still practiced his style of health care using manipulative/manual medicine and physical therapies, while condoning the use of heroic therapies.[2] His physician colleagues criticised and distanced themselves from him. Still's practice did not flourish until he successfully treated a number of prominent people of the community, who had unsuccessful medical treatment for their conditions from other physicians.[2] These prominent individuals eventually became sponsors for Still's style of health care practice, and the American osteopathic profession. By 1889, Still's reputation as a healer had spread, his health care system was much sought after and eventually he established a school to teach and train others.

Hawkins and O'Neill claim the concept that the osteopathic discipline was institutionalized and secured with the establishment of the American School of Osteopathy (ASO) in May 1892.[14] The ASO increased the popularity of Osteopathy throughout the USA, and a number of self funded training institutions were established.[14] With the increasing popularity of Osteopathy and the establishment of the ASO, in 1893, the medical fraternity in Missouri endeavoured to legislate that those practicing osteopathy should be graduates of a reputable medical school.[19] Following a number of legal challenges by the medical fraternity and vigorous opposition from a number of osteopathic patients, sponsors, and profession, a separate osteopathic bill was proposed. This bill was vetoed by the Missouri governor, Governor William Stone, on the basis that osteopaths were insufficiently educated. Initially this event seemed to have been disadvantageous to the developing osteopathic profession. Between 1893 and 1896, the ASO realigned its training curriculum to be consistent with that of a standard medical teaching program, with the exclusion of *material medica* in the curriculum. In 1897, with Stone no longer the governor of Missouri, and his successor, an osteopathic patient, the Osteopathic bill was proclaimed into law. This law allowed the ASO to expand and prosper, as its teaching faculty grew, with the assistance and inclusion of new academics from law, political science, chemistry, medicine and surgery faculties.[19] The establishment of the ASO represented the *entrepreneurial stage* of osteopathic education development. Ambiguous goals transpired with high creativity. Progress of American osteopathic education as an entity continued with the acquisition and maintenance of a continual supply of resources.

The ASO was characterised as an education institution of considerable diversity in the profile of its staff and students. Gevitz describes how the ASO accepted students that included migrants, females and indigenous black people in higher proportion than that of medicine.[19] Hawkins and O'Neill provide evidence of the ASO advertising that 'the school is open to students of both sexes without distinction, and all have equal opportunities and privileges, and are held to the same requirements'.[13] This initiative

provided opportunities for all groups of people in the community to reach higher levels of self-development and critical judgement. These attributes provided the students with mental habits, and the ability to grasp basic laws and principles that could be applied to any particular situation. These ASO graduates inherently acquired leadership attributes for the field of osteopathy in the USA. Graduating osteopathic practitioners met the needs of the lower socio-economic populations, who were in great need of health care. Upper class populations who had sponsored the ASO and who could afford to study osteopathy at the ASO, were also provided with proficient Osteopathic practitioners. All populations of the USA were able to access osteopathic health care. The graduates from the ASO were therefore able to meet the demands of their immediate community and personal needs, and subsequently the needs of an expanding profession as leaders.[13] Their diverse and transferable skills were able to meet future demands for developing professional status in the American osteopathic profession.

Between 1897 and 1901, the American Osteopathic Association (AmOA) was formed by the alumni of the ASO and a number of other osteopathic schools. The executive of the AmOA consisted of dedicated and motivated osteopaths with leadership and management skills for the advancement of its professional status.[14] In 1901, the Committee on Legislation within the AmOA devised a standard model bill for every state of the USA. The bill's prime objective was to create independent boards for the examination and registration of osteopathic graduates, and eventually the accreditation of osteopathic institutions.[19] The values and powers of critical judgement and the imaginative insight of osteopathic graduates on this AmOA Committee provided leadership for the profession. These representatives were able to convince the government that members of medical profession on Osteopathic boards discriminated against the direction of osteopathic profession. The osteopathic profession won a considerable degree of autonomy and legal security as a professional entity from the work of AmOA representatives.[19] This period represented the collectivity stage of organizational development in osteopathic education where high commitment levels from osteopaths was demonstrated, without formal communication and structures having been established. By 1903, the AmOA had formed the Council on Medical Education. This council adopted standards for the approval of

osteopathic training institutions. Consequently, the effect was the demise or merger of a number of osteopathic institutions. This Council provided an informed, consensus and united view of an Osteopathic curriculum to meet the needs of the training institution, community and profession. As the AmOA evolved, the membership of its committees and councils continued to educate themselves and expound highly specialized knowledge and action plans in response to their environmental demands and constraints. Policies were developed that provided a framework for the continual re-assessment of the profession and the education of its practitioners.

In 1904 the AmMA formed its own Council on Medical Education, which also adopted standards for the approval of medical training institutions that also led to the demise or merger of a number of medical and osteopathic training institutions.[14] The AmMA inspected and surveyed medical training institutions, accrediting those institutions with appropriate standards. Often the accredited institutions that were affiliated with universities had included science faculties and stable funding. Surveying of osteopathic training institutions was not undertaken by the AmMA, and the AmOA placed itself in a privileged position, similar to that of the AmMA. In a similar way to the accreditation of medical training institutions by the AmMA, the AmOA accredited osteopathic training institutions, maintaining control and developing its future educational needs, institutions and scope of practice. American osteopathic education had arrived at the *formalisation-and-control stage* of organizational development. Formal rules and procedures for educational institutions accreditation are emphasised, with increasing efficiency and stability. Decision makers and managers were confirmed and acquired control.

In 1910, the Carnegie Foundation for the Advancement of Teaching in America and Canada commissioned Abraham Flexner to chair a review of medical education in America and Canada. The *Flexner* report was highly critical of the osteopathic training institutions.[29] The terms of reference of this report are not clearly defined, however the report stressed the importance of training for all health disciplines by stating,

'In making this study the schools of all medical sects have been included. It is clear that so long as a man is to practice medicine, the public is equally concerned in his right preparation for that profession, whatever he call himself, - allopath, homeopath, eclectic, osteopath or what not. It is equally clear that he should be grounded in the fundamental sciences upon which medicine rests, whether he practices under one name or under another.'[29]

A number of recommendations arose from the Flexner report, which were adopted over the next twenty five years by the AmMA.[29] The recommendations included that:

a) commercial and weak schools with poor medical education be closed down
b) each surviving medical college become a integral component of a major university, thus ensuring higher academic standards
c) hospital establishments be funded to support clinical teaching
d) the funding of medical colleges be altered.

The inclusion of eight osteopathic training institutions in the Flexner report was not guaranteed. The impetus behind the inclusion of eight osteopathic training institutions in the Flexner report arose from another sponsor of the osteopathic discipline, Henry Pritchett. Henry Pritchett was the head of the Carnegie Foundation and had experienced osteopathic treatment.[19] Flexner supported Pritchett in his view to review osteopathic institutions, as Flexner claimed that osteopathy was a complete health care system. Flexner also placed the osteopathic profession on an equal footing to medicine by stating that,

'... the osteopath needs to be trained to recognize disease and to differentiate one disease from another as carefully as any other medical practitioner.'[29]

Flexner then reported that,

'... no one of the eight osteopathic schools is in a position to give such training as osteopathy itself demands.'[29]

With the unfavourable comments and outcomes of the Flexner report towards the osteopathic training institutions, resentment arose within the AmOA Board of Trustees and accredited training institutions. This was because the AmOA Board of Trustees and accredited training institutions felt that educational reform for the osteopathic profession would be challenging,[19] though the AmOA Committee on Education agreed substantially with the Flexner report.[19] Further debate and disagreement in the AmOA, between the Board of Trustees, the accredited training institutions and the Committee on Education resulted.

The AmOA and osteopathic training institutions failed to embrace the recommendations in the Flexner report. However the medical fraternity adopted the Flexner report recommendations. This resulted in the medical profession expanding and consolidating its position as the primary health care provider and to accessing funding through taxes, public and private general university funds, and philanthropy.[19] As an organizational entity, American osteopathic profession failed to realign itself with government and community demands, and osteopathic education withered in the interim.

The critical Flexner report recommendations were addressed years later by American osteopathic educational institutions from a defensive position, as they struggled to establish their credibility as providers of quality health care education. In the late 1920s, with an emphasis on improving the osteopathic education standards and the eventual inclusion of obstetrics, pharmacy, and surgery into its curricula, American osteopathy moved towards expanded practice rights.[14] The American osteopathic educational institutions integrated specialist health care, research and science knowledge into the educational frameworks, responding to the demands of the government and population. The need for adequately trained health professionals was high, particularly after World War II. The integration of general practice and specialist skills into osteopathic education enabled osteopaths to be considered as equivalent to medical practitioners. Osteopaths undertook primary health care roles and responsibilities with the gradual expansion of their practice rights. The osteopathic profession was subsequently able to enjoy

professional health care status and opportunities similar to those provided to the medical profession. The professional status of osteopathy escalated with access to all health care sectors, with opinion in health care policy development, and with government funding provided for osteopathic research, educational and health care institutions. American osteopathic profession and education diversifying its services in the health care sector and research represented that the e*laboration-of-structure stage* had been attained in its organizational development. The organisational structure became more complex and elaborate, while decision making became decentralised.

The osteopathic profession had unconsciously built a continual process of quality assurance. The AmOA challenged their own discipline and position in American health care provision. Criticism from government regulators and the medical profession led to informed and motivated osteopathic leaders establishing procedural frameworks and support structures to challenge the government and medical criticism and to prosper in a competitive environment. AmOA lobby groups set an agenda to discredit the medical profession's dominance, to target and force government into providing laws for the acceptance of the osteopathic profession. Government accepted osteopathy's scope of practice, provided funding for research, education and health care facilities, and remunerated osteopathic services through government health care departments and private health insurance funds.[14]

Speciality health care training was adopted into osteopathic curricula to meet demand and to facilitate research in these specialities. Hospitals and health care training facilities were provided to facilitate for the integration and collaboration of the discipline of osteopathy with main stream health care. Research institutes were established[19], which facilitated the production of influential osteopathic research for professional credibility and identity. In summary, the strategic planning and quality assurance processes required and adopted by the AmOA, included the development of a professional association, educational and health care institutions, research councils and lobbying groups. Through collaboration and segregation of these professional and educational entities and activities, the osteopathic profession was protected in its continual growth.

The development of American osteopathy illustrates how osteopathic education has undergone four transitions in its organizational lifecycle. The entrepreneurial stage of the American osteopathic education organization began with Still in 1897 who not only founded osteopathy, but also established the ASO. In the 1910s, the collectivity stage was reached with the establishment of a small number of osteopathic educational training institutions, and informal communication between their graduates and the academic staff in developing osteopathic curricula and obtaining recognition as health care professionals. The growth of the AmOA in the 1920s instituting policies, accreditation and registration procedures, demonstrates how American osteopathic education had arrived at the formalization-and-control stage. Currently, American osteopathic education finds itself in the elaboration-of-structure stage. Its service markets have become diversified in a complex and elaborated organisational structure. Growth opportunities and decision making processes have decentralised, and are undertaken by informed, experienced and qualified individuals that represent the American osteopathy.

United Kingdom perspective

In 19th century complementary therapies were acceptable forms of health care in the UK. From the time of ancient Greece, European health care had developed a number of therapies and groups of healers, which were viewed as being effective and acceptable. Osteopathy in Europe, and particularly the UK, was entering a society with liberal views on the provision of health care. In the 19th century the European medical fraternity was able to distance itself from these therapies and healers, however they continue to survive. In ancient Greece, manual therapy was used to treat a wide range of ailments and was later adopted by the Romans.[19] French, German, and Scandinavian physicians promoted the use of manual therapy in their scope of practice.[19] Peter Henry Ling (1776-1839) further popularized his manual therapy approach known as 'Swedish Movements'. Initially this manual therapy was dismissed by the Swedish medical community, but later accepted as this manual therapy. Acceptance of this manual therapy resulted from successful outcomes in cases where medication was unsuccessful, and after the publication of hundreds of articles and books on this approach.[19] The acceptance of successful outcomes of manual therapy allowed disciplines like Osteopathy was able to establish themselves in the area of manual therapy.

The launch of Homeopathy in Germany by Samuel Hahnemann (1755-1843), also prospered through out Europe. This discipline was also integrated by a number of early American doctors into their scope of practice.[19] In summary, from these early times, the European health care scene accepted complementary and alternative forms of health care, and osteopathy in the UK was founded in parallel with firm societal views on the success of complementary and alternative disciplines.

The beginning of the 19th century was a fertile period of time for osteopathy to develop as a distinct profession in the UK. In 20th century, the first osteopathic college was established in the UK by a Scotsman, John Martin Littlejohn, who had studied under Dr Andrew Taylor Still at the ASO in the USA.[4] Littlejohn founded the British School of Osteopathy (BSO), the first osteopathic education institution outside the USA. At this

school, British osteopaths were taught the use of manipulative techniques based on the Still's principles and philosophy, but were not accepted as medical doctors. Other osteopathic schools were founded subsequently. The London College of Osteopathic Medicine (LCOM) founded in 1927, became a prominent osteopathic training establishment in pursuit of an American curriculum and recognition as medical practitioners. When LCOM's endeavours to be recognised as medical practitioners became unsuccessful, its curriculum became an avenue for British physicians to supplement their medical training with an osteopathic education.[15, 22] Unlike the situation in the USA, animosity between the medical fraternity and the osteopathic profession failed to eventuate. Animosity did not eventuate because the LCOM and the other British osteopathic training institutions provided the osteopathic profession with respect and integrity. Whether the American medical profession's failure to control the osteopathic profession affected the British medical fraternity's behaviour in avoiding confrontation with the British osteopathic profession is unknown. The result for the British Osteopathic profession was attaining independence as a distinct profession. A comparison with the American osteopathic profession illustrates how both the American and British osteopathic professions had attained the e*ntrepreneurial stage* of organizational development synonymous with the establishment of their respective educational institutions. Goals of educational institutions transpired with high individualized creativity. Progress continued with the acquisition and maintenance of a continual supply of resources and personnel.

Further recognition of the British osteopathic profession was slow. Laws governing the registration of osteopaths and scope of practice were not enacted until the professional status of osteopathy had increased. Osteopathy's professional status increased owing to raising of educational standards, and raising popularity and recognition in the primary health care departments. The National Health Service (NHS) and with the private health insurers accepted and remunerated osteopathic service providers. The British osteopathic profession developed the General Council for Registered Osteopaths (GCRO). This Council registered osteopaths who had trained at reputable privately-funded and charity osteopathic educational institutions. Government received proposals from the GCRO and

representatives of the osteopathic profession to register osteopaths from reputable establishments with high educational standards. This strategy would also force fledgling osteopathic institutions to improve their education or fade away. The GCRO clarifying missions and goals for the osteopathic profession represented the *collectivity stage* of organizational development. The GCRO being a self-regulating body maintained informal communication and structures with unrecognised educational institutions, who demonstrated high levels of commitment and were willing to meet demands placed on them by GCRO in achieving higher educational standards.

Statutory regulation of Osteopathy occurred with the passing of the Osteopathy Act in 1993. In the Act, there was provision for the formation of a professional self-regulatory body, the General Osteopathic Council (GOsC), which was formed from the GCRO. The Act established its purpose as regulating the profession, by protecting the public through maintaining a practitioner register, by investigating allegations of professional misconduct, and by ensuring the quality of training, by accrediting osteopathic institutions that met particular standards. The formal rules and procedures implemented by the GOsC increased efficiency and stability, confirmed decision makers and managers (who acquired control), and clarified management roles in the osteopathic profession and education. This stage of *formalisation-and-control* in the organizational development of British osteopathic education and profession provided recognition of these entities within the health care sector, and the Osteopathy Act (1993) was subsequently confirmed. It further increased the popularity and growth of osteopathy in public health, and osteopathic educational programs were established in government funded tertiary education institutions. The Osteopathy Act allowed government health care policy to accept osteopaths in health care policy and research. British Osteopathy, with limited research output and funding, participated in collaborative research that advanced its reputation in health care policy development.[30]

Currently seven approved British osteopathic training institutions have been established, and approximately 5000 registered British osteopaths exist. British osteopathy is a small but growing profession, when compared to the existence of approximately 36,000

physiotherapists in the United Kingdom. Within the European Union (EU) there is no standardized training or regulatory framework for the osteopathic profession, although attempts are being made to coordinate the profession within the EU. At present there is a conflict between the principle of free movement of labour and right to practice osteopathy in different member states. Little equivalency in training and regulation of the profession exists. Previously the practice of spinal manipulation by non-medically qualified practitioners was outlawed in many European countries. In the 1960s, a French osteopathic faculty was arrested and imprisoned, as osteopaths were unable to practice spinal manipulation under common law. On their release, the French osteopaths sought refuge in the UK and established the European School of Osteopathy.[22] Recently, the GOsC issued a position paper on pan-European regulation of the profession,[31] which aims to maintain osteopathy's status as a health care provider in the Britain, France and Switzerland. These countries wish to defend the practice and concept of osteopathy in the EU, as other EU countries initiate osteopathic schools, where the quality of training may not meet particular standards.

The development of osteopathy in the UK demonstrates how osteopathic education has undergone three transitions in its organizational lifecycle. The founding of the first osteopathic college early in the 19th century represented the entrepreneurial stage of osteopathic education as an organization. In the 1920s, the collectivity stage was reached with the establishment of numerous osteopathic educational training facilities, and informal communication between the facilities and the academic staff in developing osteopathic curricula. Since the late 1930s, osteopathic education in the UK is in the formalisation-and-control stage where its organizational structure has become more stable. Formal accreditation of educational institutions and establishment of specialized faculties to undertake research and clinical training are being emphasised. Efficiency of use of informed, experienced and qualified individuals that represent the osteopathy is increasing. Decision makers and managers are being confirmed as they acquire control. Enough osteopaths and educational institutions exist such that British osteopathic education organisation does not rely on a limited number of individuals or institutions. Clarification of management roles has occurred and has allowed policy development. Members of the British osteopathic education organizational structure who are not

informed and qualified in supporting policy and may depart, do not to present a severe threat to organizational stability.

Australian perspective

In 1909, the first osteopaths arrived in Australia from the USA. These osteopaths assumed that they would develop a profession with similar characteristics to those of their American counterparts. However, in 1910 when the Flexner report was produced in the USA, there were only five osteopaths in Victoria, and even fewer around Australia.[9, 10, 12, 13] Compared to the American Osteopathic profession, the Australian Osteopathic profession consisted of few practitioners capable of developing a proactive profession. There were no Australian osteopathic training institutions, and any osteopathic training that was undertaken used a guild system approach.[13] Compared to the American scene, the Australian Osteopathic profession was in its infancy, and grew slowly.

Osteopathy in Australia endured the adversity that the profession sustained in the USA. History has revealed continual opposition from the medical profession to accept osteopaths as primary health care professionals. Hawkins and O'Neill claim that opposition by the medical profession towards osteopathy has inhibited the development of the Australian osteopathic profession.[13] Evidence of the Australian medical profession's opposition was apparent as early as 1927, when three Australian Osteopaths accused by the Australian medical profession of calling themselves doctors. The Victorian Supreme Court convicted these osteopaths for practicing medicine illegally, even though they were trained in USA at the ASO and claimed to be Doctors of Osteopathy. The Victorian Supreme Court's verdict defined the scope of Australian osteopathic practice limiting it to the diagnosis, management and treatment of musculoskeletal conditions.[13] In this manner, the Australian medical profession was instrumental in preventing osteopaths diagnosing, managing and treating all health care conditions that affected members of the community.

Currently Australian osteopathic education is seen to be at the equivalent stage of educational program establishment to that of the American osteopathic scene of the 1940's, as osteopathic education has been established in Australian government funded tertiary institutions in the last twenty years. In regards to professional research, the Australian osteopathic profession resembles the American osteopathic scene of the 1910's, when research funding was provided by the AmOA; research funding being provided by the Australian Osteopathic Association (AuOA) only in recent years. Such funding has been integral for a profession to respond to demands academic credibility by the public and government.[14] The slow development of autonomous, independent and government funded institutional osteopathic programs with access to research facilities and funding has sacrificed academic credibility of the profession and its existence as a provider of health care.

The profession relied on osteopaths migrating from the UK initially, because of the limited scope of Australian osteopathic practice. Subsequently, Australians who wanted to study osteopathy found that the British School of Osteopathy (BSO) produced graduates with knowledge and skills for the Australian scope of practice. Instead of training in American osteopathic schools, many Australians went to train at the BSO.[13, 15] Chasms and rifts between local and overseas osteopaths surfaced.[13] Australian osteopaths did not belong to one association, but too many. One 'voice' was not apparent on professional and educational issues relating to their profession, and hostilities between osteopaths and their associations in Australia and the UK eventuated. Rivalry and unprofessional behaviour resulted between individuals and professional educational associations regarding the standard of Osteopathic practice.[13] This behaviour provided the Australian medical profession with ammunition to discredit the osteopathic profession, as was the case in the USA.[19] Owing to the lack of united professional direction and definition of the osteopathic scope of practice, the government and medical fraternity were forced to limit the practice of osteopathy.

As the number of complementary and alternative practitioners and their professions were increasing in Australia, the federal government in 1974 commissioned an inquiry to fully investigate and report on the practices of chiropractic, osteopathy, homeopathy and naturopathy.[12, 15] In 1977, what is commonly known as the *Webb* report was produced.[15] The directive from the minister was to assess the scientific basis of these practices, the desirability of registering practitioners (and if so, under what conditions), and the relationship of these practices to other medical services in the community.[15] This report further exemplified a number of issues of concern for the professions being reviewed, and recommendations were made to address these issues.

In relation to osteopathy, the report highlighted that osteopaths claimed to have a broad scope of practice treating a large range of conditions beyond the musculoskeletal system.[15] Differences between alternative health care groups and professions were not clear and were grouped together.[15] Practitioners claimed to belong to more than one discipline as studied more than one discipline at the same educational institution concurrently. The osteopathic profession was small with a large number of stakeholders in osteopathic education. The profession did not have consistent standards of practice between one osteopath and the other. The recommendations handed down in the Webb report included that chiropractic and osteopathy should not be given legal recognition in any form which would imply that they are alternative health systems. Chiropractors and osteopaths should be registered in each state and territory of Australia, and that the legislation throughout the Commonwealth be uniform for both. Minimum educational standards were to be adopted for registration of chiropractors and osteopaths which would be facilitated by having a single new course at a tertiary institution.[15] These recommendations would not have been surprising to the osteopathic profession, as it was seen to be closely aligned in development and practice to that of the chiropractic profession.

Based on the Webb report's recommendation, the chiropractic profession's proactive membership established an educational program at Preston Institute of Technology (PIT),

which amalgamated with Royal Melbourne Institute of Technology (RMIT) in the 1980s.[12, 13] The chiropractic profession then began to establish statutory regulations through each state of Australia. In a number of states, chiropractic and osteopathy were regulated by the same act, but there were also occasions where often only chiropractic acts were established. In these states, it was necessary for osteopaths to claim to be chiropractors rather than osteopaths to achieve registration.[13] The Webb report, statutory regulations and legislation confined the scope of practice of these professions to the treatment and management of musculoskeletal disorders using manual medicine.[15] The small number of osteopaths with a lack of resources to build up their professional status paralleled the osteopathic discipline with the progressive chiropractic profession. The more proactive chiropractic profession, with the advancement of their professional education in the tertiary sector, and with the establishment of statutory regulations in each Australian state can be viewed as having assisted osteopathy's professional status in the treatment and management of musculoskeletal disorders.

Osteopathic training was undertaken in privately funded institutions until 1985, when an osteopathic program was established at Phillip Institute of Technology (PIT), alongside the chiropractic program.[12, 13] Since the founding of the PIT osteopathic program, Australian osteopathic education in Australia has been developing, with varying success. Three university courses in Australia had been established over the last 25 years. In 2005, the University of Western Sydney (UWS) osteopathic program was terminated, and at Southern Cross University (SCU), a new osteopathic program was established, its first intake being in 2007. All osteopathic programs have been established with minimal direction from the profession and other health care disciplines. Accreditation procedures had been established by state registration boards in this period, and the development of a national accreditation committee has provided some direction for these osteopathic educational programs. However these university courses still do not have the support of experienced and informed osteopathic leaders to support their future direction and long term survival in a competitive health care and higher education environment.

Australian osteopathic education has primarily been developed in universities complementary to other health care education. At the Royal Melbourne Institute of Technology (RMIT), the osteopathic course has been developed in alignment with chiropractic and other health care disciplines. At Victoria University (VU), the osteopathic course has developed in affiliation with other health care disciplines, like Traditional Chinese Medicine (TCM) and nursing. The UWS osteopathic course developed in a school with podiatry, occupational therapy, TCM and Naturopathy, exposed to the educational needs of other professions. In an endeavour to establish its own sovereignty, osteopathy competed with the other programs for resources. Hostilities arose in each discipline towards each other, as one profession feared it would be submerged by the other. Yet with a very similar scope of practice, all disciplines would benefit from a common curriculum with shared resources. While it is not the aim of this manuscript to cover the lack of research (or 'gap') in literature that covers the issues affecting development of Australian osteopathic programs, there is a need for further research using a 'lens' from an insider researcher's perspective to ascertain how issues within these educational programs affect the professionalization of Australian Osteopathy. A small number of reports documenting issues that are affecting osteopathic professions and education have recently been published that will have relevance to the professionalization of osteopathy.[32-35]

Since the late 1920s, American osteopaths practised equivalent methods to those of orthodox medical practitioners; Australian osteopaths have accepted a drugless practice[13]. American Osteopaths adapted their scope of practice to meet the needs of society and subsequently integrated further knowledge into their practice and education that provided them with power and influence in the provision of health care. Australian osteopathic practice was similar to that of chiropractic practice, and osteopaths did not have the opportunity to practise otherwise since they were unregistered. Furthermore, osteopaths have had the opportunity to recommend over-the-counter analgesics and anti-inflammatory medication, but have been less likely to do so.[13] Australian Osteopaths also debated use of electro-physiological therapeutic equipment used primarily by physiotherapists[13], which had also entered chiropractic practice and their curriculum at

PIT. Manipulation was the principal therapy for both Australian osteopaths and chiropractors. The development of education programs for the chiropractic and osteopathic professions at the same institution was both advantageous and cost-effective, however the individual sovereignty of each discipline was compromised, as issues relating to distinctive professional existence, philosophy and scope of practice were challenged by the development of knowledge, attributes and skills in graduates that were seen to be similar and often identical. Registration boards (particularly in Victoria and New South Wales) accrediting educational programs for both chiropractic and osteopathy expected graduates of these programs to be of similar competence in the 1980s and 1990s. Universities were required to meet these requirements, that further challenged each profession's distinctive scope of practice.

Some comparative comments

In the UK and Australia, osteopathy bestrides the boundary between orthodox and complementary/alternative medicine. Osteopathy in Australia and the UK has a scope of practice limited mainly to the treatment of musculoskeletal conditions, and treatment of some other conditions, using manual therapy techniques. The use of drugs and surgery is avoided. In the USA, osteopathic practice emphasizes the use of drugs, surgery and medical technology to treat ailments. American Osteopathic practice implements a complementary use of manual therapy techniques. In Australia and UK, osteopaths hold a belief as being the 'real' osteopaths of the world, practising osteopathy complementary to the primary health care. There is an emphasis on both complementary and orthodox medicine in their scope of practice.[13, 22] In all three countries, osteopaths are trained in standard differential diagnosis and have diagnostic competencies similar to primary care physicians. The British and Australian osteopathic professions are situated in a privileged position to contend with the bounds of evidence-based and complementary medicine. This would result in an enhancement of their professional status, as their educational curricula and scope of practice would be informed from orthodox and complementary research. Osteopaths in the UK and Australia do not have prescribing rights. The UK Government has included osteopathy in the list of professions allied to medicine that may

be granted prescribing rights in the future. This possible expansion of scope of practice again illustrates how the British osteopathic profession is preparing to realign itself and progress into the *elaboration-of-structure stage* of organizational development. It is preparing to diversify its service market and accept growth opportunities, that will need to be are decided by the profession. Its organisational structure will need to become more complex and elaborated, and supported by its educational institutions.

Table 1 illustrates differences in numbers of osteopaths and physiotherapists, number of educational institutions and populations of each country. In reviewing the history of the osteopathic professions and educational development in the USA, UK and Australia, it is apparent that similar problems have plagued the profession in each of these countries. Differences between USA, UK and Australia osteopathic professions do not relate, however, to the time of origin of the profession in each country. Rather successful American and British osteopathic professions have relied upon factors like the number and type of practitioner, the research profile of the profession, the educational institutions and opportunities, and the informed management decisions undertaken. These mechanisms and resources have been instrumental in the osteopathic profession expanding and becoming a stakeholder in primary health care. This argument is further endorsed when comparisons are made with physiotherapy professions in these countries. Table 1 reveals that the Australian osteopathic profession has been the slowest to adopt this strategic approach in its development.

Discussion and Conclusions

This report has reviewed the UK, USA and Australian Osteopathic professions in their development as health care providers, by using organizational theory and defining osteopathic education as an organization. The American osteopathic profession has paralleled the development of its education. Both American medical and osteopathic professions have independently progressed by establishing registration boards and professional education in universities, that has integrated with the missions of the government and tertiary education providers. Their education has been established

through quality assurance and research strategies to support their professional programs. American medical and osteopathic graduate attributes have been integral to the advancement of these disciplines. American medical opposition to the acceptance of the osteopathic discipline acted as a catalyst to the improve osteopathy. Both groups governed their own advancement, relatively independent of one another. The situation differed to an extent in the UK. The UK and Europe accepted complementary health care, and provided an environment for osteopathy to establish itself. The slow regulation of UK osteopathy may have been the result of a lack of medical opposition. With numbers of osteopaths increasing, leaders in research and education were being produced. When registration eventuated in the UK, the osteopathic profession had a number of well-informed and experienced individuals to accept the diverse roles required in the advancement of the status of osteopathy.

Professional osteopathic literature in these countries supports the view that a realignment of osteopathic education and professions produces advancement in status and recognition as a health care provider. This occurs concurrently as professional education progresses from one stage to another in the lifecycle of an organization. This realignment requires an open organization approach to be adopted, rather than a closed organization approach that has operated within the Australian osteopathic profession. Australian medical opposition, along with a small numbers of osteopaths, limited resources and a restriction of osteopathic practice may be major contributing factors for the current position on Australian osteopathic research and education.

The Webb report commissioned by government occurred at a time when Australian Osteopathy was fragmented with no unified voice. In the report, osteopaths claimed a broad scope of practice that was not reflected in their training. As osteopathic education moved from private colleges to universities, where other established professional programs (like chiropractic, TCM, nursing and podiatry) existed, its evolution paralleled other professions. A lack of informed and experienced educators and leaders in the profession allowed osteopathic education and profession to be exposed to influences that could not be controlled. This resulted in both osteopathic and chiropractic professions

being considered as one profession. This opinion was further endorsed as the osteopathic profession relied on the chiropractic profession, with their large number of chiropractors and considerable resources, for recognition.

Both UK and Australian Osteopathic profession are well positioned between orthodox and complementary medicine to realign professional programs that can be supported by well informed educators and research. The limited number of osteopaths and resources may seem like a hindrance to the advancement of osteopathic educational programs, however the author believes that this is only a short term issue, as the number of osteopaths and resources increase in an open organization.

	United States of America	United Kingdom	Australia
Registered Osteopaths	59,000	5,000	1,200
Osteopathic training institutions (private & public)	23	7	3
First government funded osteopathic training program	American School of Osteopathy (1892)	British School of Osteopathy	Phillip Institute of Technology (1983)
Registered physiotherapists & Physical Therapists	203,261 (2004)	36,000	15,000
Country's population	301,000,000	61,000,000	21,000,000
Physiotherapy & Physical Therapy training schools	200	30	12

Table 1: Osteopathy in USA, UK & Australia: Comparative Data[13, 36-44]

References

1. Cameron M. A comparison of osteopathic history, education and practice in Australia and the United States of America. *Australasian Osteopathic Medicine Review* 1998; **2**(1): 6-12.
2. Gallagher RM, Humphery IFJ. *Osteopathic Medicine - A reformation in Progress*. Philadelphia: Churchill Livingstone; 2001.
3. Ross-Lee B, Weiser MA. Medicaid reform: An opportunity for osteopathic medical profession. *Journal of the American Osteopathic Association* 1994; **94**: 233-239.
4. Baer HA. The drive for professionalization in British Osteopathy. *Social Science and Medicine* 1984; **19**: 717-726.
5. Newman DM. *Sociology - Exploring the Architecture of Everyday Life*. 5th ed. Thousand Oaks: Sage Publications; 2004.
6. California State University Library. Subject Guides - Gray literature. http://www.csulb.edu/library/subj/gray_literature/ [accessed
7. Weintraub I. The Role of Grey Literature in the Sciences http://library.brooklyn.cuny.edu/access/greyliter.htm [accessed
8. University of New England Library. Grey literature. http://www.une.edu.au/library/eskillsplus/research/grey.php [accessed
9. Baer HA. Divergences in the Evolution of Osteopathy in Four Anglophone Countries: The United States, Canada, Britain and Australia. In: Oths KS, Hinojosa SZ, editors. *Healing by Hand*, Walnut Creek: AltaMira Press; 2004, p. 17.
10. Baer HA. The Drive for Legitimation by Osteopathy and Chiropractic in Australia: Between Heterodoxy and Orthodoxy. *Complementary Health Practice Review 2006* 2006; **11**(2): 77-94.
11. Baer HA. The Emergence of Integrative Medicine in Australia. *Medical Anthropology Quarterly* 2008; **22**(1): 52-66.
12. Baer HA. Osteopathy in Australasia: From marginality to a fully professionalised system of health care. *International Journal of Osteopathic Medicine* 2009; **12**: 25-31.
13. Hawkins P, O'Neill A. *Osteopathy in Australia*. Bundoora: Phillip Institute of Technology Press; 1990.
14. Peterson BE. Major events in Osteopathic History. In: Ward RC, editor. *Foundations of Osteopathic Medicine*, Philadelphia: Lippincott Williams & Wilkins; 2003, p. 19-29.
15. Webb EC. *Chiropractic, Osteopathy, Homoeopathy and Naturopathy: Report of Committee of Inquiry*. The Parliament of the Commonwealth of Australia. Canberra: The Acting Commonwealth Government Printer; 1977.
16. Jamison JR. Contemporary Issues in Osteopathy. *Australian Journal of Osteopathy* 1991; **3**(2): 7.
17. Jamison JR. Osteopathy in Australia. *Australian Journal of Osteopathy* 1991; **3**(2): 10.
18. O'Neill A. *Enemies within and without*. Bundoora: La Trobe University Press; 1994.

19. Gevitz N. *The DOs: Osteopathic Medicine in America*. 2nd ed. Baltimore: The John Hopkins University Press; 2004.
20. Seffinger MA, King HH, Ward RC, Jones III JM, Rogers FJ, Patterson MM. Osteopathic Philosophy. In: Ward RC, editor. *Foundations of Osteopathic Medicine,* Philadelphia: Lippincott Williams & Wilkins; 2003, p. 3-18.
21. Ward RC. *Foundations of Osteopathic Medicine*. 2nd ed. Philadelphia: Lippincott Williams & Wilkins; 2003.
22. McKone WL. *Osteopathic medicine: Philosophy, Principles and Practice*. Cornwall: Blackwell Science Ltd.; 2001.
23. Ross-Lee B, Weiser MA. Managed Care: An opportunity for osteopathic physicians. *Journal of the American Osteopathic Association* 1994; **94**: 149-156.
24. Weber M. *The Theory of Social and Economic Organization*. New York: : The Free Press; 1947.
25. Viljoen J, Dann S. *Strategic Management*. Frenchs Forest: Pearson Education Australia; 2003.
26. Robbins SP, Barnwell N. *Organisational Theory in Australia*. Sydney: Prentice Hall of Australia Pty. Ltd.; 1994.
27. Demers C. *Organizational Change Theories: A synthesis*. California: SAGE Publications Ltd.; 2007.
28. Still AT. *The philosophy and mechanical principles of Osteopathy*. Kansas City: Hudson-Kimberely Publishing Company; 1892.
29. Flexner A. *Medical Education in the United States and Canada*. New York: The Carnegie Foundation for the Advancement of Teaching. 1910.
30. UK Back pain Exercise And Manipulation (UK BEAM) Trial Team. UK Back pain Exercise And Manipulation (UK BEAM) trial – national randomised trial of physical treatments for back pain in primary care: objectives, design and interventions. *BMC Health Services Research* 2003; **3**: 16.
31. European Public Health Alliance. UK GOsC Position paper on pan-European regulation. http://www.epha.org/a/1673 [accessed 24th July 2007]
32. Fryer G. Teaching critical thinking in osteopathy - Integrating craft knowledge and evidence-informed approaches. *International Journal of Osteopathic Medicine* 2008; **11**: 56-61.
33. Licciardone JC. Educating osteopaths to be researchers - What role should research methods and statistics have in an undergraduate curriculum? *International Journal of Osteopathic Medicine* 2008; **11**: 62-68.
34. Nash K, Tyreman S. An account of the development of the conceptual basis of osteopathy course at the British School of Osteopathy. *International Journal of Osteopathic Medicine* 2005; **8**: 29-37.
35. Tyreman S. Valuaing osteopathy: What are (our) professional values and how do we teach them? *International Journal of Osteopathic Medicine* 2008; **11**: 90-95.
36. American Academy of Osteopathy. Home. http://www.academyofosteopathy.org/ [accessed 18 July 2007]
37. American Osteopathic Association. Colleges of Osteopathic Medicine. http://www.osteopathic.org/index.cfm?PageID=sir_college [accessed 18 July 2007]

38. American Physical Therapy Association. APTA Background Sheet 2007. http://www.apta.org/AM/PrinterTemplate.cfm?Section=Home&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=29384 [accessed 18 July 2007]
39. Australian Institute of Health and Welfare. Physiotherapy Labour Force 2002. http://www.aihw.gov.au/publications/hwl/physlf02/physlf02.pdf [accessed 24th July 2007]
40. Australian Physiotherapy Association. Australian Schools of Physiotherapy. http://apa.advsol.com.au/physio_and_health/workstudy/aus_physio_schools.cfm [accessed 24th July 2007]
41. US Department of Labor - Bureau of Labor Statistics. Occupational Outlook Handbook. http://www.bls.gov/oco/ocos080.htm [accessed 18 July 2007]
42. Wikipedia contributors. Osteopathy. http://en.wikipedia.org/w/index.php?title=Osteopathy&oldid=143939314 [accessed 17 July 2007]
43. Wikipedia contributors. Doctor of Osteopathic Medicine http://en.wikipedia.org/w/index.php?title=Doctor_of_Osteopathic_Medicine&oldid=144150735 [accessed 18 July 2007]
44. Wilson JF. Osteopathic medicine's growing pains. A boom in numbers is leading to criticism—and an identity crisis. http://www.acponline.org/journals/news/nov97/osteopat.htm [accessed 18 July 2007]