Recovering the clinical history of the vectis: the role of standardised medical education and changing obstetric practice

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

This thesis explores the use, and later non-use, of the vectis – an instrument invented in the seventeenth century by the Chamberlen family, along with its sister instrument, the forceps. Both instruments were designed to deliver a living baby when birth was obstructed by the head, but their histories were very different. In Britain, the forceps came into the public domain in 1733, the vectis in 1783, after which their respective merits were debated for over a century. Throughout that time, it was clear that both instruments were effective in sufficiently skilled hands, yet the forceps took over so decisively that by the early twentieth century the vectis had disappeared not only from clinical use, but also from the historiography of obstetric instruments. The central question addressed by the thesis is: why did the vectis disappear from clinical use?

The thesis argues that the answer to that question is to be sought in the characteristics of clinical practice, skills and training. The vectis required a subtle set of manual skills, and the teaching of such skills was best favoured by individual apprenticeship; the use of the forceps was more easily reduced to rigid rules, and could therefore be taught in large classes. Thus, the shift to such classes around the middle of the nineteenth century favoured the forceps. To reconstruct that shift, this thesis explores the developing debates around medical education in the first half of the nineteenth century, bringing out the hitherto-neglected theme of the importance of midwifery training as a desideratum for the reformers. The link between pedagogic processes and clinical practice reflects the co-construction of users and technology of the Social Construction of Technology (SCOT) model, but requires some modification of that model, not least because the technological consequences of pedagogic change were entirely unintended.

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Chapter 1: Introduction

In 1790, Thomas Denman wrote that

> at the present time, all who are engaged in the practice of midwifery would consider themselves as deficient, if they were not acquainted with the structure and manner of using the vectis; and some who, from education or habit, continue to use the forceps, are very willing to allow the equal, if not superior, value of the vectis.[1]

Despite the endorsement by the leading male midwife of his day, less than two hundred years later the vectis disappeared from use in clinical practice. It has also vanished from most (but not all) studies that discussed the use of instruments in childbirth, and indeed, from modern consciousness. It is on very limited display in some museums, and most extant examples of the instrument are held in museum storerooms.[2] This thesis seeks to understand why the vectis has disappeared so completely, when its sister instrument, the forceps, remains in clinical use today. It provides an original contribution to knowledge by mapping the changing use of the vectis across the period in which its use was discussed in published sources.

It is useful to introduce a brief outline of the obstetric instruments that were used to deliver a baby in obstructed childbirth that will feature in this thesis. The vectis, the central object in this thesis, was a metal instrument with a single fenestrated blade, used to deliver a baby presenting by the head when labour had become obstructed. The vectis was an important instrument that was an integral part of the Chamberlen family's legacy, as will be discussed in chapter two, yet its contribution has been largely forgotten. Following its invention by the family in the sixteenth or early seventeenth century, it continued to be used in clinical practice in increasingly specialised ways, until the beginning of the twentieth century.

The sister instrument to the vectis, the forceps, was similar in appearance but had two blades that fitted together around the head of the baby. Both instruments were invented by the Chamberlen family, although this fact was not established definitively until the nineteenth century. As I will demonstrate, it was known that the Chamberlen family could deliver live babies in cases of obstructed labour, but their method of doing this was kept secret; this will be discussed further in chapter two.[3] The family also used a third

instrument, known as a fillet. This was most commonly a simple strip of leather or cloth, although in the nineteenth century, a metal version of the instrument was briefly discussed in journals, but was not widely adopted in clinical practice. The final instrument that will briefly feature in this thesis is the lever. This was a solid strip of curved metal that worked on a similar principle to the vectis. It is best known as Roonhuysen's lever after its chief proponent and probable inventor, Rogier van Roonhuysen. Rather confusingly, some authors refer to the vectis as a lever, although they are two separate instruments. Where this is the case, I will make it clear.

In this introductory chapter, I will begin by reviewing the secondary literature and exploring the received view in that literature on midwifery instruments, with a focus on the vectis. Subsequently, sociological theories of technology, and literature on 'use' and 'non-use' as sociological concepts, will be critically analysed and their use justified as a theoretical framework to underpin analysis in this thesis. In the final part of this first chapter, I will outline the research methodology used to undertake this thesis, and provide rationale for methodological choices.

1.1 Review of secondary literature on the vectis

1.1.1 Chamberlen instruments in print

Thomas Denman gave the first mention of the vectis in an English printed source in 1783. He stated that three instruments, the vectis, fillet, and forceps could be used in cases of obstructed labour to 'preserve the lives of the mother and child',[4] although he did not describe the action of either the vectis or the fillet, nor say how they could be used, focussing instead on the forceps.[5] It was not until ten years later, after Denman had started to use the vectis in his practice, that he committed a description of the use of the vectis to print.[6]

Less than fifty years after the first emergence of the forceps and lever in print, practitioners began to write about the history of midwifery instruments, and the earliest instrument histories featured both the lever and the forceps with equal prominence. Camper's "Remarques sur les Accouchemens laborieux par l'enclavement de la tete, & sur l'usage du levier de Roonhuysen dans ce cas" [Remarks on laborious labour, by the obstruction of the head, and on the use of Roonhuysen's lever in this case] was published in 1774 in French and centred on the use of Roonhuysen's lever.[7]

A few years later in 1790, Robert Bland published an overview of the history of midwifery instruments in English, but again focussed on Roonhuysen's lever.[8] He speculated that there was a link between the Chamberlen family and the forceps, but could not prove it definitively. In the latter part of the eighteenth century, it was usual for English authors of midwifery treatises, such as Thomas Denman, to include a brief history of medicine, and particularly the use of instruments.[9] The purpose of these descriptions was seemingly to demonstrate to the reader the long history of male involvement in childbirth and add authority to their work, at a time when birth was still predominantly a female 'mystery' and male practitioners were a recent phenomenon with expertise in instrumental birth.[10] Practitioner and author, Thomas Denman, offered a different perspective to his contemporaries and postulated that it was not the forceps, but the vectis that was the secret.[11] This gave a distinguished past to his preferred instrument, giving weight to his choice, but Denman did not discuss alternative theories such as that of Bland.[12]

The use of the vectis was also discussed in the 1790s by two Dutch practitioners: first in 1791 by George Herbiniaux,[13] and subsequently in 1794 by Johannes Mulder. Although the vectis appeared in Mulder's title "Historia litteraria et critica forcipium et vectium obstetriciorum" [Literary and critical history of the obstetric forceps and vectis], this brief inclusion of the vectis in instrument histories was not to last. The forceps would come to dominate the historiography.

1.1.2 Dominance of the forceps in the historiography

As we shall see in chapter two, the Chamberlens had announced in 1673 their possession of a secret method for delivering a child that 'comes right, and yet because of some difficulty or disproportion cannot pass', but ever since then it had been unclear just what that secret was. Over a century later, the discovery of the hidden Chamberlen instruments settled that question: they possessed three instruments for delivering such births, at least two of which they had invented themselves: the fillet (which may not have been their invention), the forceps and the vectis. The discovery of the Chamberlen instruments was published by Dr Carwardine, and the instruments were eventually donated to the Medico-Chirurgical Society.[14] Despite interest in the history of male involvement in childbirth by male authors of treatises, such as that demonstrated by Denman, new instrument histories, particularly those that definitively linked the Chamberlens with the vectis and

forceps were not published separately for many years, despite the discovery of the Chamberlen instruments. In this section, I will outline the key works published on instrument histories, and as I will demonstrate, these were dominated by the forceps. In contrast, the vectis was barely mentioned.

Although the reason for undertaking the research was unclear, in 1861, Dr Robert Lee gave a paper to the Obstetrical Society of London into this discovery. [15] Lee's paper exemplified a growing veneration of the forceps, and he introduced it by saying that the midwifery forceps was one of three inventions that he considered to be 'the most important improvements which have hitherto been made in the practice of midwifery'.[16] He regarded the operation of turning,[17] and the induction of premature labour as the other two most significant events. Lee said of the forceps that

> every circumstance connected with their introduction cannot fail to excite interest with those who study and practice midwifery as one of the greatest departments of medical science.[18]

Lee reproduced the original paper given by Carwardine, when he presented the instruments to the Medico-Chirurgical society, and Hugh Chamberlen's introduction to Mauriceau's work. Although his paper was entitled "Observations on the discovery of the original obstetric instruments of the Chamberlens", the only instrument that Lee mentioned was the forceps. He used the remainder of his paper to attempt to unravel the relationships between members of the Chamberlen family, several of whom were named Peter or Hugh.[19] In his paper, Lee did not describe or explain the use of either the fillet, or the vectis. The only mention of the vectis in Lee's paper was to make the unsubstantiated statement that Hugh Chamberlen had sold the vectis to Roonhuysen when he visited Holland but kept possession of the forceps a secret.

Twenty years later, in 1882, James Hobson Aveling published *The Chamberlens and the Midwifery Forceps: Memorials of the family and an essay on the invention of the instrument.*[20] Aveling's book gave an overview of the history of the Chamberlen family, and described how they fled France as Huguenot refugees, before describing their subsequent practice as men-midwives in London. He detailed their growing reputation and practice and gave an account of the travels of the later members of the family. The only remark about the vectis and fillet was a brief mention that they were discovered in the attic of Woodham Mortimer Hall with the forceps, but those instruments were not discussed any further. The very title of Aveling's book showed that the forceps had started to dominate the historiography, while the vectis and fillet were becoming relegated to a footnote.

After this point the historiography is dominated by what had happened in clinical practice; attention focused on the forceps with minimal or non-existent reference to the vectis. Herbert R. Spencer delivered the Fitz-Patrick lecture at the Royal College of Physicians in 1927,[21] and then published a book based on this lecture entitled *The History of British Midwifery*. In these lectures Spencer outlined the achievements of notable medical practitioners between 1650 and 1800. He started his lecture, and the book, with an overview of the biography of the Chamberlen family, and their invention of the forceps, but the vectis was not mentioned in this section, or even acknowledged to be a Chamberlen instrument.

Spencer echoed Aveling, in attributing the invention of the forceps to Peter Chamberlen the elder. He then went on to give a biography of men-midwives between 1650 and 1800, that concluded with Thomas Denman. Denman was a leading advocate for the vectis, and argued with this good friend, and business partner, William Osborn over his preference for its use as I will discuss later in this thesis. Spencer mentioned this argument, and said of Denman that

> The fillet he condemns; but the vectis is, in his opinion, as good and in some respects better than the forceps.[22]

Spencer gave no further information, apart from a similar fleeting mention of Denman and Osborn's disagreement over the use of the forceps and vectis under the entry for Osborn.

A further notable work on the history of obstetric instruments was published by Kedarnath Das[23] from Calcutta in 1927, entitled *Obstetric Forceps: its history and evolution,* and focussed solely on the forceps. He produced a detailed book in which he detailed the many varieties of types of forceps that had been developed since the first set invented by the Chamberlen family, but did not describe how they were used. He described the different types of destructive midwifery instruments that were developed prior to the forceps and gave a brief discussion of the Roonhuysen lever as used in Holland, but again, Das did not discuss the vectis or recognise it to be a Chamberlen instrument.[24]

Following this, Walter Radcliffe wrote two books on elements of the history of midwifery. His first book, *The Secret Instrument (The Birth of the Midwifery Forceps),*[25] published in 1947, surprisingly did briefly discuss the vectis. He differentiated between Roonhuysen's lever and a 'true vectis',[26] and identified that the hinged vectis modified by Lowder was the most useful form of the instrument. Radcliffe stated that the vectis could

be used to provide leverage, traction, or a combination of rotation and flexion in occipto-posterior positions. He admitted that he had

> personal experience of using the vectis for this purpose, and was surprised how readily the occiput could be turned forwards, but I am of the opinion that, although it is safer to use the vectis that the forceps for this, manual rotation is the less risky method, and would probably have been as successful.[27]

Radcliffe devoted just three of the eighty pages in this book to discussion of the vectis, and reserved the remainder of his publication to discussing the dominance of the forceps. He stated in *The Secret Instrument* that

> Every doctor who practises midwifery employs the forceps […] To the Chamberlen family and to their successors the whole civilised world owes a debt of gratitude.[28]

His opinion of the outstanding value of the forceps was evident in his use of language.

In a *Historical Review of British Obstetrics and Gynaecology,*[29] Munro-Kerr and colleagues gave a very brief description of the vectis as having been in use at the beginning of the nineteenth century. They mentioned the utility of the vectis in occipito-posterior positions, with the entire discussion of the vectis taking half a page. They cited primary sources written by Ramsbotham in 1841 and Barnes in 1870 but did not use any other sources to discuss the vectis. They listed obstetric operations as being 'forceps - version – breech extraction – caesarean section – symphysiotomy – induction of labour – craniotomy – decapitation'[30] and the rest of the book was devoted to these other obstetric operations.

Milestones in Midwifery, Radcliffe's second book, was published in 1967,[31] and discussed the ten developments that he considered were the most important in midwifery. Unsurprisingly, given the title of his first book, the forceps were included in his list of important developments, but the vectis was not. Radcliffe coined the phrase that summed up the revered place of the forceps in twentieth century historiography, when he described the forceps as 'the key to the lying-in room'.[32] This phrase cemented a place in the history of childbirth for the forceps, as the tool that gave men access to the lying-in room, and changed the face of British midwifery, indeed midwifery in the developed world. Radcliffe reflected the esteemed position that the forceps held in academic debate, as well as popular culture of the time.

1.1.3 Emergence of feminist critiques of childbirth technologies

The revered place of the forceps in secondary literature did not last. From the 1970s onwards, many histories of childbirth were published that had a broadly feminist perspective.[33] This reflected the rise of feminism as a movement generally, with a focus on the rise of radical feminism. Radical feminism considered that the oppression of women by men was endemic; systematic throughout all cultures and historical periods. The leading feminist sociologist, Ann Oakley, maintained that achievements in obstetrics were argued from the 'premise of male and medical superiority'.[34] This feminist approach to the use of instruments in childbirth as a symbol of the patriarchy was perhaps best exemplified in Jean Donnison's seminal work *Midwives and Medical Men.*

While most of Donnison's work is richly supported by reference to historical sources, some of the evidence of patriarchal oppression and the use of instruments is less well referenced. In the second chapter of her book, entitled "The Decline of the Midwife",[35] Donnison attributed increasing professionalisation of occupations, such as the previously all female midwifery during the eighteenth century, to a male take-over of such roles; she argued that this contributed to the denigration and increasing exclusion of women. The evidence given to support this statement was a single, early twentieth century secondary source by Ivy Pinchbeck.[36] In turn, Pinchbeck devoted just one paragraph of discussion to this topic, with analysis that was not supported with reference to any primary sources.[37]

One reason cited by Donnison for the increasing number of male midwives was the reflected 'glory' of high-profile men-midwives such as William Smellie and William Hunter on all men-midwives, although notably, Donnison did not discuss the strong anti-interventionist stance taken by Smellie and Hunter. Donnison argued that it was 'probably the introduction of the midwifery forceps […] which precipitated the rapid acceleration in what was already an existing trend',[38] supported by reference to Radcliffe's work on the forceps as the 'key'. Donnison's work was punctuated with examples that disparaged the use of the forceps and depicted the instrument as a symbol of patriarchal male oppression of childbearing women, rather than as a heroic advance in the history of childbirth as Radcliffe had represented it. Unusually for historical academic writing, Donnison gave an example of this attitude, by referring to the portrayal of the doctor, 'Dr Slop', in the novel *Tristram Shandy* by Sterne. In this novel, the doctor was rude to the midwife attending the birth and questioned her competence. When she later required his assistance to manage a delay in labour; he applied the forceps to expedite birth, only to crush the bridge of the

infant Shandy's nose.[39] This allegory was given as an illustration of the incompetence of male practitioners.

Donnison only mentioned the vectis (which she referred to using the term lever) once in her book. She quoted Blundell, who said that some practitioners had an 'instinctive impulse to put the lever and forceps into the vagina'.[40] Despite this singular mention of the vectis, Donnison liberally used quotes about the forceps to illustrate male incompetence in attending childbirth. For example, she wrote that

> Looking back critically on his choice of speciality, [he] attributed this [choice] to his unconscious need to deal only with women, who he could control and dominate, expressing his male aggressiveness with forceps and scalpel.[41]

This powerfully written passage was taken from Konig's philosophical work *Zwischen technik und gefühl* [Between technology and feeling] rather than a historical source.[42] Although Donnison used this graphic quote to illustrate the control and domination of women using the forceps, as I will demonstrate in chapter five, this was not representative of the opinion of most medical men who authored publications describing the use of instruments in childbirth. Such practitioners expressed a marked reluctance to use instruments at the start of the nineteenth century,[43] an attitude that changed only gradually over several decades. Most practitioners appear to have been motivated to reduce the suffering of women in childbirth rather than add to it, and were extremely critical of practitioners who harmed women through the injudicious or hurried use of instruments. This topic will be discussed in greater depth in chapter 5.

Donnison also treated anti-male and anti-midwife testimonies differently in her book. She gave examples of some of the accusations made against midwives, such as that they were ignorant, uneducated, cruel and drunkards. While she acknowledged that these accusations may have had some basis in truth for a few midwives, she argued that these accusations could not be levelled at all midwives.[44] The same qualification was not applied to the attitudes that she described towards the use of instruments by men. Donnison listed many of the criticisms made during the seventeenth and eighteenth centuries as evidence to support her hypothesis. These criticisms stated that some men-midwives were too keen to apply instruments, and that this haste caused damage to women and babies.[45]

One such criticism cited by Donnison was levelled by the Deventerian John Maubray.[46] In his book *The Female Physician,* Maubray wrote that 'they do not (it may be) think themselves in their Duty, or proper Office, if they have not their cruel Accoutrements in Hand'.[47] Donnison also referred to a quote attributed to William Hunter 'where they

[midwifery instruments] may save one, they murder twenty'.[48] Sarah Stone's allegation that 'more mothers and children had died at the hands of raw recruits just out of their apprenticeship with the barber-surgeon than through the worst ignorance and stupidity of midwives'.[49] Although Donnison uses these quotes to illustrate an anti-male practitioner stance, in fact, the writers were anti-intervention rather than being against male practitioners. As I will discuss further in chapter five, accusations and cautions against the overuse of instruments in childbirth were common in the eighteenth century and early nineteenth century, and were made by a wide range of practitioners. It is simplistic to conflate, as Donnison did, anti-male sentiments with anti-instrument ones. The esteemed place held by the forceps was not firmly established until the second half of the nineteenth century, but the dominant narrative on instruments at the beginning of the century was one of caution. Donnison wrote a book that was innovative in many ways, and changed the perception of midwifery instruments among many feminist historians. Despite this, she also typified the tone of the overarching narrative of the historiography; the forceps dominated, and the vectis was a footnote.

1.1.4 Modern views on midwifery instruments

The exception to the relegation of the vectis to a passing mention was the book, the *Making of Man-midwifery* by Wilson published in 1995.[50] Wilson discussed the transmission of knowledge of both the forceps and the vectis as part of the wider story of the rise of man-midwifery. He argued that the vectis was in widespread use for several decades before Denman made it public.[51] Wilson summarised the mismatch between discussion regarding the vectis and the forceps in the historiography as follows:

> The silence surrounding the vectis stands in remarkable contrast to the sound and fury over its sister instrument, the midwifery forceps, in the early eighteenth century.[52]

This thesis explores that silence and shows clearly how the vectis was used in clinical practice, and discusses why it disappeared from practice and the midwifery literature. The historiography shows a lack of detailed analysis of the vectis and relies on descriptions of its use.

Five years later, in 2000, Bryan Hibbard published *The Obstetricians Armamentarium: Historic obstetric instruments and their inventors.*[53] It consolidated the marginal position of the vectis, and, as Donnison had done, Hibbard referred to the vectis

as a lever throughout the book. He began his book by discussing the discovery of the box of Chamberlen instruments at Woodham Mortimer Hall, where he listed the contents of the box to include forceps, levers and fillets. The forceps dominated most other chapters of the book, with chapter titles such as 'The Evolution of European Forceps from the Late Eighteenth century to the Mid Nineteenth Century' and 'Tarnier Axis-Traction Forceps and Their Modifications'. The vectis was included in a chapter entitled 'fillets, levers, and other non-destructive extractors' with only limited discussion.[54]

In summary, this section has given an overview of the secondary literature on instruments, with a focus on the vectis. Although the vectis was included by some authors at the end of the eighteenth, and beginning of the nineteenth centuries in general discussion of the history of instruments; this did not continue, and the story of the vectis in the historiography echoed its story in clinical practice. What became clear from this review is that increased acceptance of the use of instruments has often been conflated with the acceptance of male practitioners in midwifery. Authors, such as Radcliffe, acclaimed the forceps as the 'key to the lying-in room', responsible for the growing influence of male practitioners,[55] while feminist writers such as Donnison attributed the use of forceps by men to a patriarchal desire for control over childbirth.[56]

The intertwined themes of male midwifery practice and the use of instruments will be explored further throughout this thesis; particularly in chapters three and five. Loudon argued that the rise of man-midwifery was likely to be due to several simultaneous factors.[57] Likewise, in this thesis, I will argue that the decline of the vectis is also the result of a complex interaction of multiple factors. These complexities cannot be explained simply in terms of the superiority of an alternative instrument, but need to be explored as notions that are socially constructed. In the next section, theoretical sociological concepts of technology will be discussed.

1.2 Sociological theories of technology

The forceps and the vectis were subjected to numerous amendments during the nineteenth century, both in their design and their use, with the forceps particularly being available in a huge variety of sizes and shapes.[58] The development of these technologies was not a fixed linear process with an inevitable single outcome. It was instead a dialogue between users and manufacturers; since manufacturers responded to feedback from users to improve or adapt their products.[59] This dialogue between users and instrument

manufacturers can be understood as a sociological process since there were multiple influences on the development of the instruments. Indeed, Bijker et al wrote that their book explained 'the need and possibility of synthesising ideas and method from the disciplines of sociology and history for studying technology'.[60] This thesis will explore the vectis as a piece of technology from a sociological and historical perspective to give structure, and a greater depth of analysis of the disappearance of the vectis. In the next section, the leading sociological theories of technological development and adoption will be critically discussed.

1.2.1 Critique of Sociological theories of technology

The political context of 1980s Britain brought pressure on academics to apply their research to the 'real world', and sociologists started to seek to understand the role of technology.[61] They sought to understand the place of technology: both how society influences technology, and how technology influences society. One of the earliest models that attempted to comprehend the sociology of scientific knowledge, that was later used in the sociology of technology, was the Empirical Programme of Relativism (EPOR) model.[62] The model had three phases; firstly, interpretive flexibility of scientific findings, then in the second stage of the model, it was identified that social mechanisms limited interpretive flexibility and resulted in the termination of controversies, while in the third stage, 'closure mechanisms' were related to wider society.[63]

Feminist approaches to technology that emerged at the same time as EPOR, were extensively debated by authors such as Oakley, Wajcman and Faulkner,[64] although they did not develop separate theoretical models to explain the sociology of technology. Many of the feminist debates centred on the use of technology to oppress or control women, and particularly so for debates regarding reproductive technologies. Wajcman argued that 'technology itself embodies patriarchal values',[65] although Harding was critical of this feminist approach since it homogenised women's experience, as many of the writers were white, middle class women.[66] This approach also denied the agency or influence of women as 'users' of technology, such as their influence over the popularity of male attendance at childbirth that Wilson would later postulate.[67] This thesis will not use a feminist perspective, since this viewpoint has not been supported by the primary sources used during research. As discussed earlier, leading feminist discourse on childbirth, such as that by Donnison, also lacked robust support from primary sources. Nevertheless, some of the

issues raised by this viewpoint, such as attitudes towards the use of technology, will be considered.

Basalla viewed technological development from a historical rather than a sociological or philosophical perspective.[68] Although he acknowledged that technology can be developed as a way of meeting a biological imperative such as food or shelter, he recognised the dichotomy that existed since many technologies that are invented and spread are driven by factors other than biological need. He proposed an evolutionary model with human intervention contributing to the 'natural selection' of technology with a 'survival of the fittest'.[69] Since different modifications were made that resulted in a proliferation of types of both the forceps and the vectis, it could be argued that this is a sound theoretical model, however it does not allow for the interrogation of use and non-use in sufficient detail and reduces understanding of technology to the view that the forceps were the superior instrument and so came to dominate the narrative. It does not allow the complex influences on this position to be interrogated and could not therefore help to explain why the vectis disappeared, or what factors contributed to this.

This evolutionary perspective is exemplified by traditional historical interpretations of midwifery instruments, such as those by Hibbard. In his chapter on 'fillets, levers, and other non-destructive extractors' he concluded that

> In the face of more skilled obstetricians, better appreciation of the mechanics of delivery, and the ascendancy of the forceps, the days of the lever (vectis) were numbered.[70]

If Hibbard's argument that the forceps were in the ascendancy is accepted, and that the 'days of the lever [vectis] were numbered', the 'face value' argument for the exclusion of the vectis from the historiography supports Basalla's theory. It is of a preference for successful innovations: the forceps were the better instrument, and since the vectis and fillet disappeared from use, they were not as effective. This argument is supported by the modern interpretation of midwifery instruments by the Royal College of Obstetricians and Gynaecologists (RCOG), who continue to recognise the dominance of the forceps. In the introduction of the contribution of the forceps to the heritage of the College, they stated that 'the importance of the forceps can barely be overstated'.[71] Nevertheless, these books and entries tell only a part of the Chamberlen's story, and as will be suggested during later chapters of this thesis, the evidence does not support such a view. Pinch and Bijker criticised such histories of technology for exploring a single technology without seeking to understand patterns that help to develop deeper understanding of technology.[72] They also

discussed the preference for discussion of successful technologies, and identified that it is prevalent in the sociology of technology.[73]

The vectis **was** an effective instrument that had been developed by the Chamberlen family, and used, we can speculate, by them for approaching one hundred and fifty years. When Dr Peter Chamberlen's wife hid his instruments under the floor boards at Woodham Mortimer house, **all** his instruments were hidden, not just the forceps. The family did not discard either the vectis or the fillet, so these instruments must have been considered important or at least interesting enough to keep. Regardless of which it was, they attached value to these instruments, and did not discard them. The clinical use of the vectis, did not finish with the death of the Chamberlen family. The use of the forceps and vectis, was shared with other practitioners who continued to use them, and they shared their knowledge about how to practice with them for centuries after the death of the last member of the Chamberlen family. Despite its omission from the historiography, the vectis must have had clinical value and effectiveness to continue to be used. Clearly, if the vectis was ineffective, practitioners would not have shared its use with others, or published books that described the use of it, for nearly two centuries after the last of the Chamberlen line.[74]

Although the EPOR model was supported by significant empirical research by sociologists of knowledge, criticisms were levelled at it when applied to technology by sociologists studying that field. In addition to the emerging feminist perspective, three leading schools of thought evolved to address these criticisms, and to further develop the field of the sociology of technology; Actor-Network Theory (ANT), Large-Scale Technological Systems (LTS), and Social Construction of Technology (SCOT).[75] Bijker and colleagues acknowledged that there were areas of overlap between these themes, as well as later 'cross-fertilisation' as the themes developed, but nonetheless, they still considered them to be distinct.[76] Actor-Network Theory considered that the social and natural worlds interacted through a series of inter-related networks, and considered both humans, and non-humans, to be actors with in it. This perspective attracted significant criticism since actors must have their roles defined or translated.[77] Large-Scale Technological Systems explored the impact of large-scale technologies such as the internet, and so would not be appropriate for analysing a specialist instrument such as the vectis. Meanwhile, Social Construction of Technology considered the influence of different relevant social groups and the multiple ways in which they use technology.

Pinch and Bijker described an early version of the SCOT model in 1984,[78] and they went on to further develop the model both together, and with other collaborators.[79] The first stage of the SCOT model was interpretive flexibility of use, not only in the way that technology was used, but in the ways that it was altered and designed.[80] In the initial stages of use of a technology, different 'relevant social groups' experimented with it.[81] This flexibility of use may be different to the way in which the technology was intended for use by its inventor, and contribute to the rejection of the technology by users. In addition to the changes in method of use, users can also modify the design of the technology. The second stage of the SCOT model allowed for stabilisation of the artefact, that is, a narrowing of the design of the technology and the ways in which it was used. This resulted in reduced flexibility in the ways that the technology was used. Meanwhile, the third, and final stage of the model are the closure mechanisms that situate an artefact in its wider societal and political context,[82] thereby allowing an agreed way of using, or not using, the technology to emerge.

The model can be simplified in the following way:

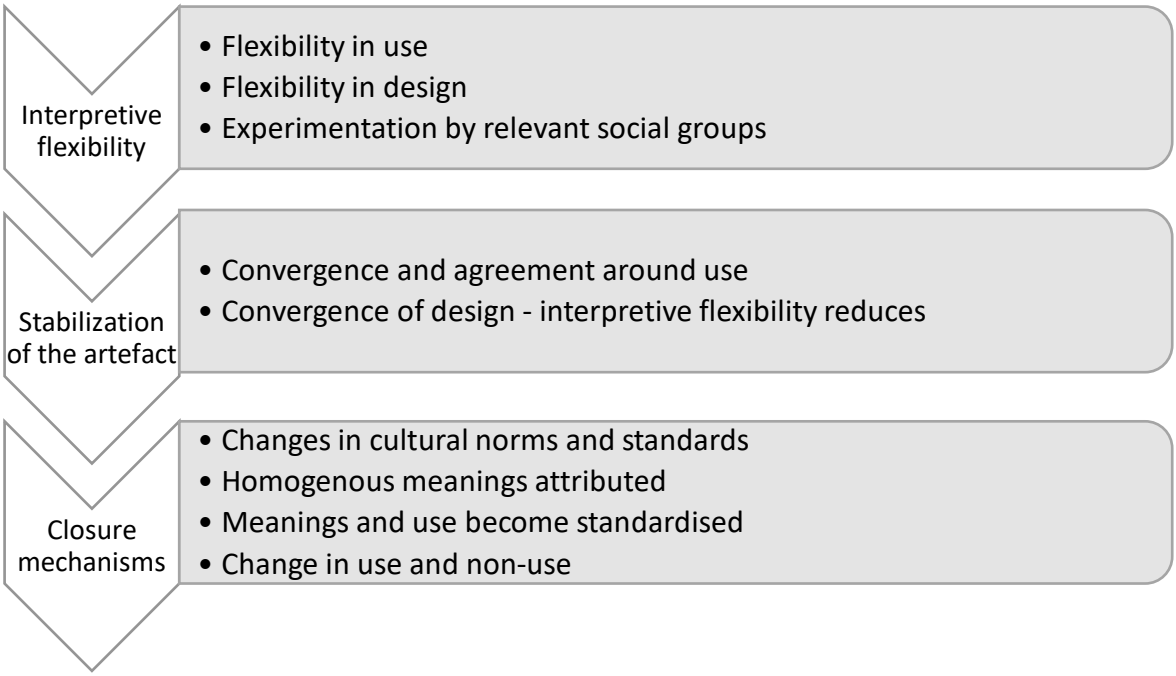

Figure 1: Representation of the Social Construction of Technology (SCOT) model [83]

In the model above, closure mechanisms were initially used to mean that the 'use' of technology had become settled, however they can also result in the 'non-use' of a technology, as happened with the vectis. Although use of the SCOT model would facilitate

the interrogation of the complex social factors that influenced the use, and non-use of the vectis, it was essential to understand the limitations of the model as described in the wider literature of the sociology of technology. At face-value, the SCOT model appeared to 'fit' with the evidence that had emerged during initial research for this thesis, but the model also required further critical review to establish it as an appropriate theoretical framework to scaffold analysis in this thesis.

1.2.2 Critical discussion of the SCOT model

As has been outlined above, the Social Construction of Technology (SCOT) model evolved from EPOR after the study of the sociology of technology emerged as a distinct discipline. The model remains the leading model in contemporary scholarship on the sociology of technology.[84] The decline of the use of the vectis in clinical practice and its absence in the historiography, reflects a change from 'use' to 'non-use'.[85] For the purposes of this thesis, the word 'use' will refer to both the way in which the vectis was used, and the skill required to use it.

The concept of 'users' of technology is a recent phenomenon, and the call to include the voices of users into the SCOT model became evident with the contribution of Oudshoorn to the subject.[86] She criticised early versions of the SCOT model, since it allowed users to choose technologies, but excluded the role that users of technology play in shaping the development of them.[87] The term 'user' is complex. The dictionary defines a user as a 'person who has or makes use of a thing, esp. regularly; a person who employs or practices something'.[88] In both sociological theory and modern midwifery practice, the term 'user' could also refer to the women that are the centre of the care, who the instruments were deployed on; known in early twenty-first century midwifery practice as 'service users'. The person who made use of the vectis was the medical practitioner who utilised it as part of their clinical practice, therefore the medical men who used the vectis in practice are the relevant social group of users in this thesis. The people who use technology play a part in the construction and development of it.[89] In an early version of the SCOT model, Pinch and Bijker identified that different users constructed different meanings of a technology, as happened with the vectis, but acknowledged that some historians have often assumed that the success of an artefact was viewed as evidence of development and utility, without the need for further explanation; that lack of use could

also infer lack of value.[90] Later work highlighted that the social, cultural and political context in which that relevant social group operated shapes its values and group 'norms'.[91]

The role of users, and the notion of the co-construction of users and technology, was most notably explored in work by Oudshoorn and Pinch.[92] This new approach particularly addressed some of the criticisms of early versions of the SCOT model levelled by feminist scholars regarding the passive role played by users. Oudshoorn's interest in reproductive technologies influenced this change, and this is most clearly apparent in the discussion of the role of feminist approaches, and gender studies, in changing the role of users from 'passive recipients' to 'active participants'.[93] However, Winner criticised the methodology of the SCOT model since it did not include consideration of those users who do not have agency to influence the design of a technology yet are affected by the technology,[94] such as the women on which the vectis was used. It is problematic when using the SCOT model from a historical perspective, such as in this thesis, to include the voices of women retrospectively when these were not considered or recorded by sources at the time.

There is limited discussion in Pinch and Oudshoorn's work on the reasons for wholesale rejection of a technology. The main discussion is one on non-use and the internet, in which Wyatt *et al* identified several reasons that individuals as users could choose not to use technology. These included resisting its use altogether, rejecting its use after trying it, and being excluded from it due to the cost, or accessibility of the technology.[95] They acknowledged that 'rejecters' of technology stop using it for a number of reasons, possibly because they do not find it interesting, because of the cost, or because they prefer alternative technologies.[96] While this interpretation of non-use can be applied to individual users, it does not allow the complexity of analysis needed to explain the complete disappearance of a technology, such as the vectis.

In a critique of the SCOT model, Russell identified that early work by Pinch and Bijker described identified relevant social groups rather than being locating them within their historical context.[97] He also criticised the use of the term 'relevant social group' since it implied a homogeneity that rarely exists in large groups. Russell went on to argue that understanding of political processes and context was not simply 'interesting background' but was essential to analysis.[98]

Despite the limitations discussed above, Social Construction of Technology (SCOT) is the most appropriate model, of all those described by sociologists of technology, to use

as a framework to explore the vectis, since it is best placed to facilitate the interrogation of the complex social factors that influenced the use, and non-use, of the vectis. The criticisms applied to the model will be addressed in this thesis with the analysis of the user group of male medical practitioners. This thesis will look at both the development and use of the vectis as a piece of technology, and seek to understand the nuanced use and non-use of the vectis. SCOT will therefore be used in this thesis as a framework to support discussion of both the technical skill required to use the vectis, and the reasons that it disappeared from clinical practice. By exploring the historical context for medical men as a user group, the SCOT model will be further used to explore how technology co-constructs the identity of a user group. This will also contribute another strand of originality to the thesis by expanding interpretation of the SCOT model. Its use provides a sound theoretical underpinning for the historical picture that emerged during research for this thesis.

1.3 Research methodology and rationale

So far in this chapter, the vectis has been introduced and its representation in published historical narrative explored. As outlined earlier in this chapter, Wilson identified in his book that the vectis was a subject worthy of further investigation,[99] since he had seen some discussion of its use in primary sources, yet there had been little written about it as part of the wider historiography. The vectis had not only disappeared from the clinical use, but also from most museum displays of midwifery instruments with most instruments held in storage. Consequently, a project was designed to explore the *Competing rivalries of nineteenth century midwifery instruments; the forceps and vectis* and was funded by the Arts and Humanities Research Council (AHRC) as a Collaborative Doctoral award between the University of Leeds and the Thackray Museum in Leeds.

At the start of the project, questions for research were identified regarding the adoption, use and non-use of technology. Early searches of primary sources revealed vociferous advocacy for the exclusive use of either the vectis **or** the forceps, rather than practice using a combination of the forceps and vectis, as the Chamberlen family had done. As the project continued, the research question developed from focusing explicitly on the competing rivalries, to exploring why the vectis had disappeared from clinical use when there were such passionate advocates for it. This thesis then evolved to explore the wider sociological context of the success or failure of technology and the importance of the context of practice in which technology is used. As the research process continued,

medical education became key to understanding the context of clinical practice. This led to the thesis title 'Recovering the clinical history of the vectis: the role of standardised medical education and changing obstetric practice'.

During this introductory chapter, it has been argued that there are a series of complex, interdependent, factors that influenced the blossoming male practice of midwifery, and rationale given as to why it is appropriate to consider the context of these socially constructed concepts. In the final section of this introductory chapter, the rationale for the research choices taken as part of this thesis will be explained, as well as giving an outline of the limitations of the study in terms of both chronology and geography.

1.3.1 Research and archival sources

The initial starting point for this research was to understand how the vectis was used in clinical practice. While the forceps were familiar to many modern practitioners and historians, the vectis was not. In order to undertake the research, a clearer understanding of the use of the vectis was needed, but this became a much larger element of the thesis than was originally envisioned, since the ways in which the vectis could be used were more complex than had been suggested in the initial search of secondary sources. A variety of primary sources were consulted to inform this element of the research, including midwifery treatises and text books, medical journals, and manuscript sources such as lecture notes and case books.

As a convenience sample, the Special Collection of the Brotherton Library at the University of Leeds was initially searched in its entirety to identify relevant treatises and textbooks, followed by the library of the Thackray Museum, and the Wellcome Library in London. These libraries held a broad collection of treatises, but subsequently the COPAC database was also used to identify treatises and textbooks that met the search criteria but were held in other places. Books held in libraries such as Kings College, the British Library, The Royal College of Surgeons Library, The Royal College of Physicians Library, The Royal College of Obstetricians and Gynaecologists Library, and the John Rylands Library at the University of Manchester were consulted. During the period of research for this thesis, increasing numbers of resources from around the world were digitised, and so 'Google books' was later searched for relevant sources.

The search terms 'midwif*' and 'obstetr*' were used in these library search engines to identify relevant textual sources, with the search limited to sources printed between 1800 and 1900, printed in English, published in England. The time frame was later expanded to between 1783 and 1914 as it became clear that the vectis was discussed in sources over a longer time frame than was originally thought. The search criteria focused on books that were printed in more than one edition,[100] since it was reasoned to be more likely that these books would be more widely read by practitioners and were consequently more representative of practice at the time. Nevertheless, some books printed in a single edition were utilised such as that by Copeman,[101] where they were deemed relevant with that limitation acknowledged. However, books printed in a single edition were less likely to have been bought and therefore read in extensive numbers since the publishers did not reprint a second or subsequent edition and were less likely to have influenced the practice of a broad range of practitioners.

In addition to treatises and textbooks, journals that were published intended for a nationwide audience of the period were searched for mention of the vectis and midwifery/obstetric forceps. The *British Medical Journal* (and its predecessor the *Provincial Medical and Chirurgical Journal*) and *The Lancet* provided a rich range of primary sources in the form of articles, case studies, letters, obituaries, advertisements and book reviews. Newspapers were searched to identify alternative sources of information about individual practitioners to supplement the standard biographical information that was available from Munk's Roll,[102] Plarr's Lives of the Fellows[103] and the Oxford Dictionary of National Biography.[104] Newspaper advertisements proved invaluable in ascertaining the range of lectures in Midwifery and Anatomy that were available at the beginning of the nineteenth century.

In attempting to look for richer sources of biographical information and insights into clinical practice during the time frame of the thesis, relevant manuscript sources were identified and consulted. A variety of manuscript sources were consulted to inform this thesis, such as lecture notes, case notes, pupil registers, biographies, and letters, identified using the National Register of Archives database. These archival sources were held at the Wellcome Library, Kings College, The Royal London Hospital, The National Archives, The Royal College of Surgeons, The Royal College of Physicians, The Royal College of Obstetricians and Gynaecologists, and electronic copies of lecture notes were consulted from the Clendening History of Medicine Library, University of Kansas Medical Center, in America.[105]

During this research, it became clear that a range of practitioners had used the vectis in a variety of ways and therefore biographical information was collected on those practitioners. This revealed a variation in the way in which they practised, but also where they were educated. Newspapers and journal articles published in the nineteenth century, in addition to secondary source material, revealed a massive change in the education, regulation and practice of medical men, and it became clear that this had had a profound impact on clinical practice. The transactions of the Houses of Parliament, *Hansard*, was then consulted to look for evidence of the debate that surrounded the passage of legislation, while newspaper and journal reports reflected how this was disseminated to the wider medical profession. The journal *The Lancet*, published by medical campaigner Thomas Wakley, reported weekly updates on the campaign for reform, and so was a useful source of evidence, despite the clear pro-reform perspective of the man who was the owner and editor.

Finally, the collection of printed instrument catalogues held by the Thackray Museum provided a valuable range of supporting source material. The range of instruments for sale were tracked, and research demonstrated that it was likely that the vectis continued to be used into the twentieth century, since it continued to be advertised for sale.[106] The examples of extant instruments held by the Thackray Museum and Royal College of Obstetricians and Gynaecologists helped to visualise the instruments as part of the research. It also opened another avenue of investigation since the instruments held by the museums, with one or two notable exceptions, are not on display to museum visitors, rather they are held in store rooms, catalogued, boxed and hidden away from view.

In addition to the primary sources used to inform this thesis, secondary sources were identified using a combination of a variety of search terms such as childbirth, midwif*, obstetr*, man-midwifery and women with terms such history, society, sociology, technology and instruments. Again, the searches were limited to books published in the English language, but not confined as to place of publication, since several American and other authors have written on the practice in England. Reference lists and bibliographies from these sources were also searched to identify all appropriate primary and secondary sources to inform this research.

1.3.2 Chronological and geographical boundaries

During the research for this thesis, it emerged that the use of the vectis could not be strictly confined to the nineteenth century as had been originally intended, since it was mentioned in the published sources, both before and after this time. An early decision was made to follow the primary sources and include all mention of the vectis in publications such as treatises and instrument manufacturers trade catalogues, rather than be confined by an arbitrary time frame. This thesis consequently better fits with a 'long' nineteenth century and begins in 1783 when the first description of the vectis was published, and ends in 1914, when the vectis finally disappeared from such publications. In seeking to understand the disappearance of the vectis, its depiction, or lack of, in the historiography has been considered up until the time of writing.

Although the COPAC search revealed some treatises that were published in America, Scotland and Ireland, a decision was taken to confine search terms to works published in England. This decision was taken to ensure that the research project remained manageable, but also to allow exploration of the sources in appropriate depth. Since most of the medical publishing trade and medical education was centralised in London, and many of the authors who wrote treatises practised also in London, much of the discussion in this thesis centres on practice in the capital. Despite this, provincial practice was considered where source material indicated that this was appropriate.

1.3.3 Childbearing women as a user group

Practitioners left numerous printed and manuscript sources that allows their views and use to be interrogated, both in terms of their behaviours towards instrument use of both the forceps and the vectis, as well as the way in which they physically used the instruments. These aspects of use for both the vectis and forceps will be explored in chapters four and five of this thesis.

In contrast, it is virtually impossible to establish the views of the women on whom the instruments were used. Over the last thirty years, there have been a select number of authors who built on Donnison's work to re-establish the voice of both the midwife and women as part of our understanding of 'use'. For example, Leap & Hunter were instrumental in introducing the use of oral testimony into the history of childbirth. During the 1980s and early 1990s, they interviewed a number of midwives who had practised, and

women who had had babies, at the beginning of the twentieth century about their experience of midwifery.[107] Although studying a slightly later time period, Allison built on this methodology by combining interviews with archival sources such as birth registers, letters and photographs.[108] Subsequently, McIntosh provided a detailed social history of childbirth and the maternity services during the twentieth century using a combination of oral testimony, memoirs and archival sources, and used a combination of midwives' voices with those of doctors and women to build a more complete picture,[109] so the voices of women as users is slowly re-emerging in the historiography.

Regrettably, it has been impossible to find source material during the period covered by this thesis that recorded the attitudes and experiences of the women on whom the vectis was used. Discussion of the attitudes of these women was likely to have taken place between close friends or family members and was not published for others to read.[110] Where medical men referred to cases in their publications, and often in manuscript case records, the woman's name was often anonymised, which makes these women impossible to trace. There are a few well publicised cases, where aristocratic or royal women gave birth, and some of their experiences and attitudes were recorded. A notable example of this was Queen Victoria's dislike of the pain of childbirth and her ready acceptance of the use of chloroform.[111] The use and non-use of instruments also significantly influenced public opinion in cases such as the 'Triple Obstetric Tragedy' where Princess Charlotte died after a prolonged labour of a stillborn son in 1817. One of the male practitioners present at the birth, Sir Richard Croft, committed suicide three months later.[112] The impact of this case will be explored further in chapter five.

The voices of women are silent in this thesis due to the subject area and the source material explored, despite an attempt to bring their voices back into the discussion. It was not possible to gain oral testimony from women regarding the use of the vectis due to the disappearance from use by the beginning of the twentieth century. The voices of women are not purposely excluded from this thesis, rather since archival evidence has not been found during research that allows the use of primary sources to elucidate their views, it has been necessary to listen through those who cared for them. It is acknowledged that this is a limitation of the thesis.

1.3.4 Structure of the thesis

This thesis will begin by exploring the story of the family who invented the forceps and the vectis, the Chamberlens, in greater depth in chapter two. It will then look at the context in which medical education developed, and the changes that took place in medical education and regulation during the nineteenth century in chapter three. Chapters four and five will examine clinical practice using the vectis and the forceps and examine how each instrument was interpreted in both use and design, and how agreed usage developed. Finally, the thesis will conclude with further exploration of the implications of this research, and discuss how users and technology co-construct meaning for each other and what impact this has had on male midwifery practitioners.

Chapter 2: An expanded Chamberlen legacy

The vectis, sister instrument to the forceps, was developed by the Chamberlen family. As identified in the introductory chapter, the Chamberlen family are principally remembered in modern obstetrics as the inventors of the forceps.[113] The invention of the forceps has typically been regarded as a significant contribution to modern obstetric practice, with the forceps being the subject of several books.[114] As demonstrated in the introductory chapter of this thesis, the forceps have come to dominate much of the narrative surrounding birth; one hospital has even named its maternity ward after the Chamberlen family.[115] Nevertheless, this is not the whole story, and this thesis seeks to recover the vectis as part of their story. This chapter summarises existing scholarship on male involvement in childbirth in England. It aims to understand the context of the development of male practice, and explores how the Chamberlen family changed that. Finally, this chapter looks at descriptions of their instruments in greater depth and retells the true, more extensive, legacy of the Chamberlen family that sets the scene for the rest of this thesis.

2.1 The changing character of male involvement in childbirth

2.1.1 'A female mystery'[116]

The ability of the Chamberlen family to deliver a live baby was highly unusual, and differed from their contemporaries. In England, as in the rest of the world at that time, midwifery was an entirely female occupation from which men were completely excluded.[117] Midwives learned by experience, both by observing births led by other midwives and from their own experience. They had skills in delivering normal births and would also have been able to manage breech births as a variant of normal.[118] The traditional role of the midwife was that of 'women's doctor, and perhaps the women's confidante of early modern England',[119] and included acting as nutritionists, herbalists, healers and counsellors.[120] Midwives educated women about birth control, childbirth and abortion. In addition to tending women who were giving birth and people who were dying, they advised on child health in most communities.[121] Midwives were usually responsible for providing care and advice during the antenatal, intrapartum and postnatal period.[122] Nevertheless, the work undertaken by midwives across Europe varied greatly, with differing laws and customs throughout the

continent, with additional diversity in the role of the midwife in each country and between urban and rural communities.[123]

The midwife was an integral part of the culture and tradition that surrounded birth and the immediate postnatal or 'lying in' period. Childbirth was seen as ' a female 'mystery', of which women alone had special knowledge and understanding',[124] and since the attendance of a midwife at childbirth was not a formal or legal requirement, the existence of midwives was sustained by the demand of women; and women must have had confidence in the skills of their midwives.[125] Evenden argued that midwives held a position of respect in their communities and were usually either the wives of artisans, or affluent widows; respect for their position crossed class divides with midwives attending working-class women and upper-class women alike, with the midwives taking charge of the labouring woman and her supporters.[126] In contrast, Hess argued that seventeenth century midwives could be drawn from all sections of society.[127]

Although the attendance of a midwife at a birth was not a legal requirement, female midwives were briefly subjected to a degree of regulation as a by-product of episcopal licensing.[128] This had been introduced to regulate physicians and surgeons in the third Parliament of Henry VIII's reign in 1512.[129] Licensing was designed to ensure that medical practitioners who practised within the 7 miles of the City of London were examined by a panel of physicians overseen by the Bishop of London; while outside the City of London, the Bishop of the diocese examined physicians.[130] Forbes identified that midwives were subject to this episcopal licencing between 1512 and 1642,[131] but Wilson described a longer period of licensing that was enforced differently depending on the geographical location. He identified that it was not until the 1630s that more than half of dioceses in England were enforcing it, but after 1640 this stopped subsequent to the closure of Church courts. After the Restoration in 1660, episcopal licencing was introduced more consistently, with all twenty-four dioceses conforming. It continued sporadically in London until 1690, more consistently in Norwich in the 1720s, but was rarely enforced in some places such as Lichfield.[132] Forbes has claimed that this was 'not a bad beginning' on the path towards midwifery regulation,[133] but Donnison argued that midwives were vulnerable to false allegations of 'witchcraft' or 'bawderie' by male competitors before the episcopal courts to attempt to drive them out of practice.[134]

Midwives usually agreed to be licensed under pressure from officers of the Court, but the process did not require their knowledge and skills to be assessed. The midwife was

required to give a testimonial to affirm that she was of good character, and that she had already practised midwifery successfully. Often local women supported her testimony. The midwife also had to pay a fee to the court, and this could be equivalent to several weeks' wages. A similar process was applied to physicians and schoolmasters. Finally, the midwives had to swear an oath, the wording of which varied according to the diocese,[135] but the licencing of midwives would not have affected their skills or remit of practice.

2.1.2 Traditional male medical practice

While midwifery was a female domain, male practitioners who provided medical care were divided into three groups: physicians, surgeons, and apothecaries. The groups were subject to a division of both labour, and of social standing. This division of labour was typical of the social stratification that dominated England prior to the Industrial Revolution. Occupation did not confer status at that time; rather the social stratum to which one belonged restricted the type of work that a man was eligible to perform. Regulation was local, not national; the remit of these corporations was limited to London, with no compulsory regulation of practitioners outside the capital.[136] Physicians consulted on internal disorders, while surgeons performed surgical procedures that physicians considered to be manual labour, and carried a social stigma for men of good background.[137] Apothecaries dispensed medications as prescribed by the physicians. Not only was there a professional and social separation, but the professions were also recognised to be three separate groups, regulated, by three separate corporations that regulated practice in London.

The physicians were the longest established of these groups. They were incorporated after the College of Physicians was granted a royal charter by Henry VIII in 1518.[138] The College was a new type of organisation that was distinct from the London Corporations that regulated apprenticeships and had more in common with the Colleges of Oxford and Cambridge.[139] An Act of Parliament first affirmed the Charter of the College of Physicians in 1523, but it was periodically revised after that.[140] The Royal College of Physicians governed practice within a seven-mile radius of London.[141] Members of the Royal College of Physicians were gentlemen, and were usually educated at either Oxford or Cambridge. This lack of medical education was considered secondary to the more important classical education that those whom they cared for would also have received.[142]

The surgeons had originally been allied with the barbers in 1540 as the Company of Barbers and Surgeons, but split from them in 1745 to form the Company of Surgeons. The status of surgeons gradually increased after this split. They were still viewed as being of lower status than the physicians since they worked with their hands; they undertook an apprenticeship style education and were equivalent to craftsmen rather than gentlemen.[143] The Company of Surgeons later faced some financial irregularities and was eventually dissolved, to be reborn at the start of the nineteenth century, in 1800 with a Royal Charter conferred by George III, as the Royal College of Surgeons of London.[144] The status of the Surgeons increased rapidly after this point, particularly after the acquisition of John Hunter's collection of anatomical and pathological specimens during the negotiations for the new Charter,[145] and the resulting duty of the College to preserve and use these on behalf of the nation. By the middle of the nineteenth century members of the Royal College of Surgeons held an equally high status with members of the Royal College of Physicians.[146]

Apothecaries had originally been allied with the Company of Grocers, but split away from them in 1617 when James I granted a Charter for the formation of the Worshipful Society of Apothecaries.[147] They dispensed medications, usually from their shop, under the instruction of a physician. Initially the Society of Apothecaries was a trade organisation concerned with the supply of quality ingredients, rather than a professional organisation,[148] but the role of the apothecary evolved, as they started to provide limited medical advice to the poor. A ruling in 1704, in the case of Rose v Royal College of Physicians, confirmed what was already starting to happen in clinical practice, rather than conferring new rights to the Apothecaries. The House of Lords confirmed the right of an apothecary to 'practise physic', or to dispense medical advice, in addition to dispensing medicines, although they were not permitted to charge for such advice.[149] Many critics viewed apothecaries as tradesmen, selling 'cures' to the poorer members of society, the lowest status of all three branches of the tripartite system.[150]

The limited scope of practice of midwives that was confined to 'normal' childbirth created a niche role for male practitioners; to deliver a dead baby to save the mother's life. Surgeons were the group of male practitioners that were invited into the birthing chamber by the midwife to undertake this task. This only took place when there was no hope that the baby would be delivered alive, since while there was hope that the baby lived, the midwife would deliver the baby. In the seventeenth century, calling a male surgeon was a last resort to remove a dead baby. It was an essential role to attempt to save a mother

who was dying from the obstructed labour and the sequelae of infection and haemorrhage that accompanied it.[151]

Practitioners such as Percival Willughby who wrote in the 1660s were more typical of male practice in the seventeenth century than the Chamberlen family. [152] Willughby was typically called in an emergency to a case of obstructed labour where the mother had been in labour for many days and he was required to use his crotchet or hooks to deliver a dead baby.[153] In one such typical case he wrote

> Goodwife Ann Frith, a woman in Derby, 1646, having a hard a long labour, was much haled and pulled by her midwife, … I was sent for. I found the child dead. I drew it with the crotchet.[154]

The crotchet was a large metal hook with a sharp point that would be used to remove a baby that had died. It could not be used to deliver a live baby since it most usually penetrated the head of the baby while it was being removed.

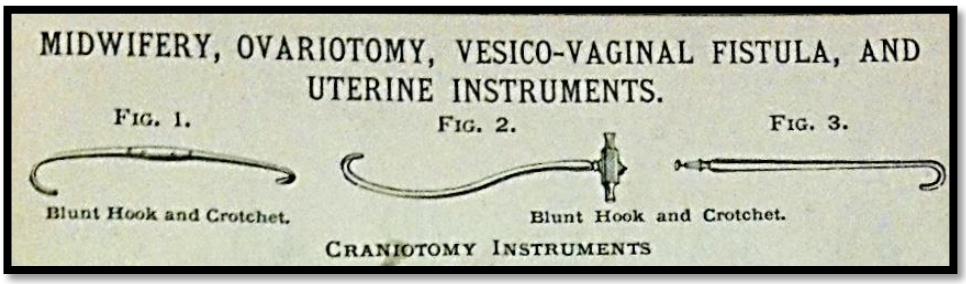

Figure 2: Blunt hooks and crotchets – Image from Maw & Sons Catalogue, 1869 [155]

Surgeons would also carry other instruments such as small toothed forceps to assist with the delivery of a dead baby.

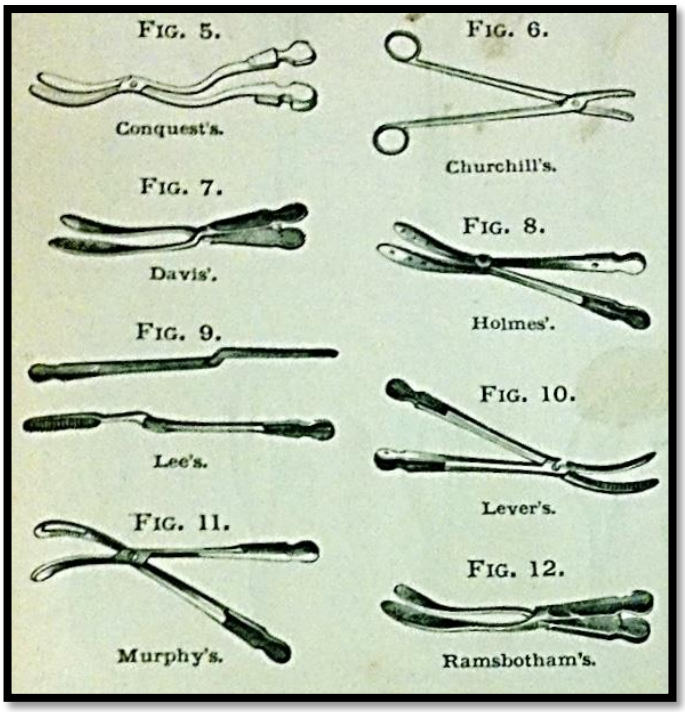

Figure 3: Craniotomy instruments – Image from Maw & Sons Catalogue, 1869 [156]

There were some limited options available to the surgeon to allow them to attempt to deliver a live baby. In one, surgeons could perform a manoeuvre, often known as 'turning', to rotate the baby from a head-first position to one where it presented by the feet. This was usually undertaken by inserting a hand into the uterus after rupturing the membranes and attempting to turn the baby inside the uterus. They could then apply traction while holding the feet to enable delivery of the baby. Although it was a possibility, it was a difficult manoeuvre since the head of the baby was often impacted in the pelvis after days of labour.

The fillet was one of the instruments discovered along with the vectis and forceps under the floorboards of Woodham Mortimer Hall. It is uncertain whether it was a Chamberlen invention, but they certainly kept it as part of their armamentarium. King argues that the fillet could not have been a Chamberlen invention since it was described by writers such as Avicenna and Aristotle as an instrument that could be used in cases of obstructed childbirth.[157]

It was a 'noose' of fabric, horsehair or leather, introduced as a loop over the baby's chin, or possibly around its feet where there was a breech presentation. The ends were then passed through a rigid handle that allowed traction to be exerted and the baby to be pulled into an altered position.[158] Despite this ancient use, by the eighteenth century, the

fillet was seldom deployed. Thomas Denman acknowledged it in a lecture in 1777, but said that by that time it was virtually obsolete. One of Denman's pupils wrote in his lecture notes that:

> The fillets are now out of use, amongst good practitioners, and are now thought to be useless, in London, but they are made use of, by some old practitioners, … They thought that 1st you might apply it in a presentation when you could not apply any other instrument 2nd In any presentation of the head 3rd not to hurt the soft parts or the child's head. D.D. [Dr Denman] says they can't be applied, till the head is low down, and as to hurting the soft parts or the child's head, that must be according to the force made off (sic); and they are very apt to slip, or to make an alteration in the position of the child's head and they are apt to do great mischief if pulled with violence.[159]

The fillet did enjoy a brief re-birth and revival as a metal instrument in the late nineteenth century,[160] but despite this, the fillet was not widely discussed in midwifery textbooks or journals of the period.

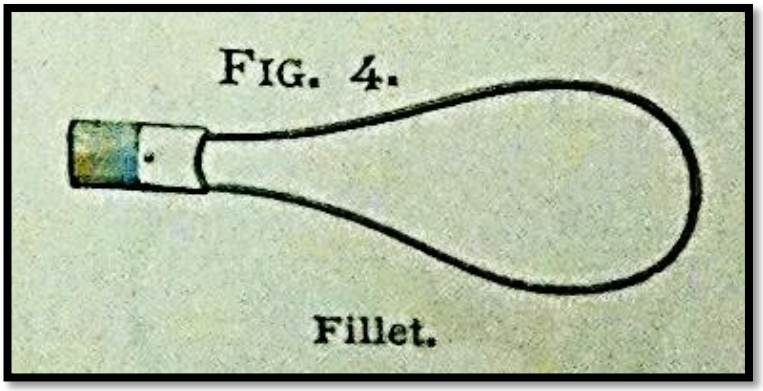

Figure 4: Fillet - Image from Maw & Sons Catologue, 1869 [161]

Although the need for a high degree of clinical knowledge, skill, and manual dexterity is common to all midwifery instruments, this needed to be of an extraordinarily high standard to use the fillet effectively. It was prone to slipping out of position and had the potential to cause significant harm to the mother and baby if not used with caution. There are limited eighteenth and nineteenth-century sources that describe the use of the fillet, but it is reasonable to hypothesise that the high degree of skill required to use the fillet contributed to its obsolescence. Although they were all discovered together under the floorboards in Woodham Mortimer House, while the forceps and vectis can be assumed to be Chamberlens instruments, as they were the earliest known examples of the

instruments, the fillet cannot be considered to be a Chamberlen invention if the instrument if it had been used since ancient times.

It was traditional in the seventeenth century for women in labour, not only to be attended by a midwife, but accompanied by many of her closest friends and female relatives who were known collectively as gossips. The term gossip derives from the phrase 'god sibs' since these female friends and relatives would later act as godparents.[162] Since birth was a female mystery, women would have been familiar with the potential outcomes of birth, and the consequences of calling a male surgeon to attend, since they were likely to have seen this first hand. Wilson explored the documentary evidence for fear in childbirth, and concluded that women were not particularly afraid of childbirth itself, they were afraid of the need to call male practitioners into the birthing chamber.[163] This male presence would not only have involved physical pain and danger for the woman, but would also have been emotionally traumatic.[164] The alternative method developed by the Chamberlen family to deliver live babies in obstructed labour was kept a closely guarded secret within the family and their contemporary practitioners such as Willughby had no knowledge of it.

2.1.3 An increasing reputation

As I described in the introductory chapter, the method that the Chamberlen family used to deliver a live baby was the subject of much speculation until their instruments were discovered under the floorboards of their former home at Woodham Mortimer Hall. That discovery showed that they possessed three instruments to use in the case of an obstructed labour, at least two of which they had invented: the vectis (which was probably not their invention), the forceps and the vectis. The practice of the Chamberlen family presented a change to the traditional bleak alternatives traditionally associated with male surgical practice in maternity. The section will explain how Chamberlen family arrived in England, and how their secret came into the public domain.

Surgeon William Chamberlen and his wife, Genevieve Vignon, had been Huguenot refugees who fled religious persecution in France and arrived with their children in England in 1569.[165] They brought with them their three children who were born in France, Pierre, Simon and Jane, and had a further two sons after they arrived in Southampton, Jacques and Peter.[166] Pierre Chamberlen was the eldest of the children and was around nine years

old when he moved to England,[167] and followed in his father's footsteps to become a surgeon. He moved to London in 1596, twenty-seven years after arriving in England, when he was thirty-six years old. He became a member of the Barber-Surgeons Guild and attended women having complex births as part of his work. Pierre's younger brother, Peter, also became a surgeon, and the pair rapidly gained the reputation for being men-midwives.

Despite being a surgeon and member of the Barber-Surgeons Guild, in 1611 Peter Chamberlaine (sic),[168] was described as a 'physician, and in nature of a midwife'.[169] Pierre and Peter were both censured by the Royal College of Physicians for practising physic and dispensing prescriptions which was outside their sphere of practice as surgeons, since it breached the terms of the charter of the Royal College of Physicians.[170] It can be argued that there were two possible explanations that Chamberlen was known as 'in nature a midwife'. Either he had the ability to deliver live babies, the same ability that a female midwife possessed, although his contemporaries did not know how he did so, or that he specialised in difficult births. This was a revolutionary change to the nature of male involvement in childbirth, and the ability to deliver a live, rather than a dead baby, meant that the Chamberlen brothers quickly rose to prominence in London, to the extent that the elder brother, Pierre, attended Queen Anne, the wife of James I.[171]

The younger brother Peter followed the use of the preferred family name, and named his eldest son Peter. Born in 1601, the future physician entered Emmanuel College, part of the University of Cambridge, in 1615. After some study at Cambridge, he travelled abroad to study at the University of Heidelberg, before moving to the University of Padua. In 1619, while aged 18, studying at Padua, he obtained the degree of MD, and gained the title of doctor that differentiated him from his father and uncle. Practice would have varied considerably between these places with medical men going on to certify midwives (known as *Wärme-Frauen* or warming-women) in Germany,[172] while in Italy female midwives dominated care into the eighteenth century.[173] When he returned to England that year, he continued to study for a year at the University of Oxford, before returning to the University of Cambridge in 1620. Dr Peter first applied for his licence from the Royal College of Physicians in 1621, aged 20. He passed his first examination in January of that year, and his second a month later. He was unsuccessful in his third examination on the 22nd March, and the censors advised him to try again at another time. He eventually re-took his third examination on 26th July 1626 and was successfully admitted to the College.[174] In 1628 he was elected to the Fellowship of the Royal College of Physicians. Dr Peter continued the

family association with the Royal Family and midwifery by attending Queen Henrietta Maria at the birth of her son, the future king, Charles II.

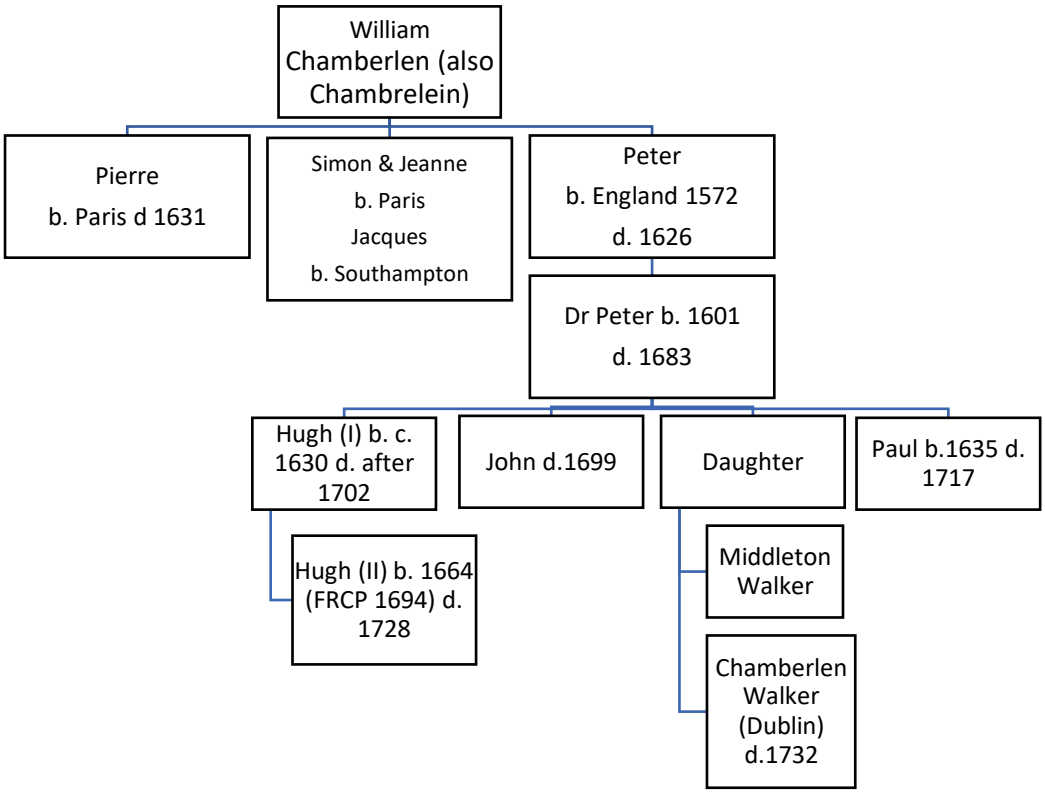

Figure 5: Chamberlen family relationships [175]

In 1634, Dr Peter petitioned the king to ask for permission to incorporate London midwives.[176] Had this been successful, it would have meant that all female midwives practising in the City of London would be required to attend lectures given by Dr Peter and to call him if they required assistance at a birth. Unsurprisingly, the London midwives, led by Mrs Shaw and Mrs Whipp, objected to this plan, and argued that Chamberlen was driven by a financial interest rather than a desire to improve the situation for women and midwives.[177] Since Dr Peter was a member of the Royal College of Physicians the midwives petitioned them, and a committee led by the Physician's President, Dr Argent, investigated the midwives' claims and reported their conclusions to the House of Lords.[178] The Royal College of Physicians stated that

> Wee [sic] the College of Physicians conceiving the said complaint to be grounded upon just grievance … he [Dr Peter] is *not otherwise able to instruct them than any other the meanest Fellow* of our College unless he understand it by the use of iron instruments which Physicians and Chirurgions may practice if they please and do

> and have done with as good success and dexterity as himself and therefore there is no necessity of a sole dependence upon him.[179]

Although Pierre, Peter, and Dr Peter were known as men-midwives and highly skilled, their use of instruments was assumed by their contemporaries to be no different to the usual use of instruments.

2.1.4 Sharing the secret

Dr Peter's son, Hugh Chamberlen,[180] followed in his father's footsteps and practised midwifery. He held a licence in midwifery from the Bishop of London, but although he was often referred to as Dr Hugh, and was recorded as being M.D. by the Royal Society, there is no archival evidence that he attended university or gained a degree.[181] In 1670, Hugh visited Paris to attempt to sell his secret to the French Crown, and the French King asked the leading French accoucheur, François Mauriceau, to test Chamberlen's claim.[182] Chamberlen was tasked to deliver a woman of very short stature, whom Mauriceau said could not be delivered. Although Mauriceau did not describe it as such, the woman had a severely contracted rachitic pelvis.[183] Chamberlen was confident that he could deliver her with his secret method, but when he inevitably failed, and the woman died, Hugh left Paris without making a sale.

The trip was not a complete failure, since Chamberlen bought a copy of Mauriceau's *Traité des Maladies des Femmes Grosses et Accouchées* [Treatise of illnesses of pregnant and lying-in women] home with him to translate into English. Chamberlen published his translation of Mauriceau's book, which proved to be very popular. In the introduction, he alluded to a secret method of delivery that he revealed in the introduction. The secret that allowed him to deliver a live baby without injury to either mother or baby

> was known to my Father, Brothers, and myself (tho' none else in Europe as I know) have, by God's blessing and our industry, attained to, and long practised a way to deliver women **in this case**, without any prejudice to them or their infants; tho [sic] all others (being obliged, for want of such an expedient, to use the common way) do, and must endanger, if not destroy one or both with hooks. … I will now take leave to offer an apology for not publishing the secret I mention we have, to extract children without hooks where other artists use them; viz., there being my father and two brothers living that practice this art, I cannot esteem it my own to dispose of nor publish it without injury to them.[184]

The use of the phrase 'in this case' was important since he was referring to a cephalic presentation that would not deliver due to disproportion or other difficulty. This was the first public acknowledgement by the Chamberlen family that they had a secret technique, but Hugh Chamberlen was not willing to share this because it would have jeopardised the livelihood of his father and brothers as well as himself.[185] Their financial interests were more important than sharing their method for delivering a live baby. The Chamberlen secret was not to be glimpsed in print again for over sixty years.

Dr Peter had petitioned the king for the appointment of Hugh as Physician in Ordinary to King Charles II. This was granted, and so Hugh continued the family tradition of attending the Royal family. In the political upheaval that followed the death of Charles II, combined with his support for a failed Land Bank system, Hugh Chamberlen left England in a self-imposed exile, and travelled to Scotland and Holland.[186] While in Holland, Hugh made the acquaintance of Rogier van Roonhuysen.[187] Aveling made the unsubstantiated supposition that while Hugh was in Holland, he sold the family secret which Aveling assumed to be the forceps, to Roonhuysen. Roonhuysen later became well known for using a lever, which he sold to a small number of students who paid handsomely for the knowledge. It is an issue for debate outside this thesis as to whether Roonhuysen invented the lever himself, or whether it was adapted from a Chamberlen instrument as Aveling suggested.[188] Roonhuysen's lever was a flat strip of metal of equal width along its length and some degree of curvature, but it looked very different from examples of either the forceps or the vectis that were in use by the Chamberlen family at the end of the seventeenth century in England which would later be discovered in Woodham Mortimer Hall.[189]

Figure 6: Roonhuysen's lever – Image from Murphy, 1845[190]

Hugh sold the forceps to practitioner James Douglas, and to other practitioners. He seemed to be careful that they did not compete with each other's geographical area of practice. He sold the forceps to Nally Woods who practised in Oxford, John Drinkwater

who practised in Middlesex, William Giffard who practised in Brentwood in Essex, Edmund Chapman who practised in Halsted in Essex, and possibly also John Freke who practised in the City of London.[191] He also sold to several practitioners in France, and in addition to selling the secret of the forceps, his son, Hugh II, sold the secret of the vectis to John Bamber who practised in the City of London.[192]

Hugh Chamberlen remained in Holland until his death sometime after 1702,[193] but his son Hugh II, brother Paul, and nephews Chamberlen and Middleton Walker continued to practise midwifery in England. The younger Hugh Chamberlen, Hugh II, entered Trinity College at the University of Cambridge, before studying medicine in Leiden. He became a Fellow of the Royal College of Physicians in 1694 and served as Censor three times.[194] Hugh II extended the custom of sharing the family secret with a small number of practitioners who paid for the privilege. It is probable that ongoing instruction and supervision were included in the sale price when the family secret was sold, since a high degree of skill was necessary to use all the Chamberlen instruments. In 1702, James Douglas wrote of a case where he struggled to use the forceps due to a lack of both supervision, and skill. It is likely that the instrument had been sold to him by Hugh I, but as has been suggested, he was in Holland at the time.[195] Douglas wrote

> I went to work *a modo nostro* [in our way] but could never fasten the thing so as to be able to pull by reason they were not made right and after three operations or an hour's endeavour to bring away the child one of them yielded so as to become straight whereby it was rendered useless. I was forced to leave the woman unlayed […].[196]

So, without ongoing instruction, lack of experience and skill meant that the instrument was difficult to use, and in that case, he was unable to deliver the woman since he did not have the help and support he needed to use the forceps.

Although Hugh II had shared knowledge of the family secret with other practitioners, they all maintained the secret of the instruments until after the death of Chamberlen Walker, the last member of the family who practised midwifery, in 1732.[197] The first emergence of the forceps occurred just a year later, in 1733 when Edmund Chapman described the forceps in print, saying that they were 'now well known by all the principal men of the profession, both in the town and country'.[198] Chapman indicated that he had been using the forceps for around ten years but did not describe the instrument or provide a picture of it.

Later the same year, an illustration of the forceps was included in a book of case studies by William Giffard that was edited, and then published posthumously, by Edward Hody.[199] An illustration of the forceps was included on the first page of the book and was a recognisable pair of forceps with a blunt hook at the bottom of the handle. It is unclear who named the instrument the forceps since Giffard referred to it as an extractor. Giffard's instrument is virtually identical to a pair of Chamberlen forceps discovered at Woodham Mortimer Hall, except that the blunt hooks curve inward rather than outward.

Giffard described the use of the forceps, or extractor, saying

> I therefore at first took one side of the Extractor, and I passed it up between the Os Pubis of the woman and the head of the child; and fixing it on the lower part of the occiput, near the nape of the neck, I endeavoured to move the head … but I could not move it by this method: wherefore I withdrew my instrument, and then took both sides of it, and passing up one on each side of the head, I fixed them, as I thought near the ears, when taking hold of the ends of my extractor, I drew boldly towards me … .[200]

So, although Giffard despite the confusing nomenclature, he was using the forceps. His illustration made it clear that the instrument had two blades, as shown in the picture below.

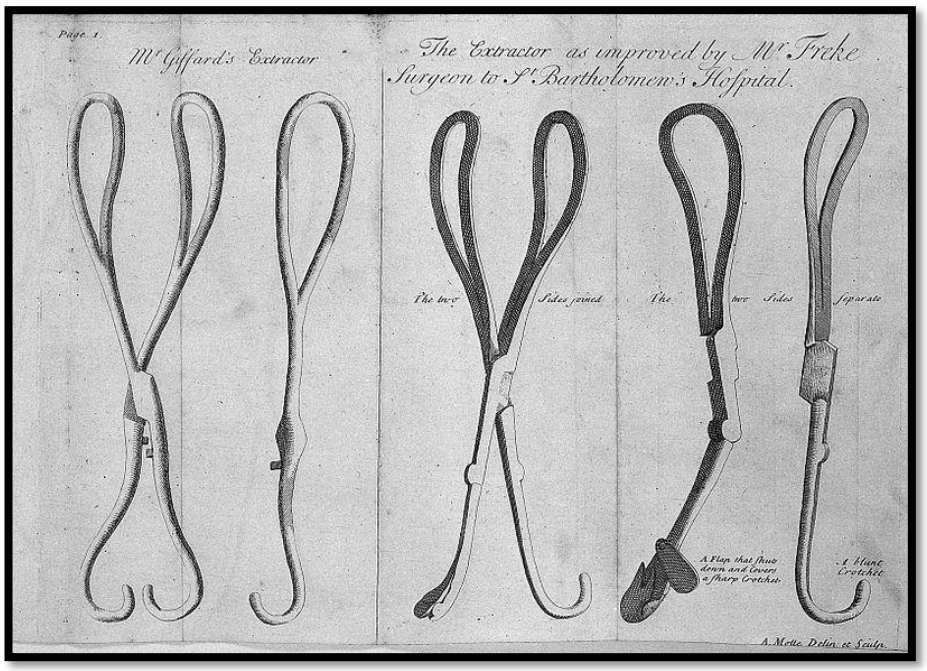

Figure 7: Giffard's 'Extractor'. 1734 - Image from the Wellcome Library, London [201]

Even though the forceps had been described in print and were 'well known' by practitioners, the other Chamberlen instruments were not discussed in the same manner. Roonhuysen's secret had been published in 1743 by de Preville, the author of the French translation of William Smellie's treatise, including a print.[202] but no link was made to the Chamberlen family. Smellie[203] acknowledged that de Preville had made an important contribution in revealing Roonhuysen's secret, and although Smellie had experimented with a single blade of the forceps, he had limited success with this method and continued to use both blades of the forceps.[204]

It is uncertain which of the Chamberlens 'invented' their instruments, although it was likely to have been one of the older Chamberlens, Pierre or Peter. It is also probable that the instruments were refined by each subsequent generation of the family since several versions of the instruments were found in Woodham Mortimer Hall that each contained incremental improvements. Dr Peter was certainly proficient in using the instruments, and it is probable that members of the Chamberlen family practiced midwifery for over one hundred and fifty years. The family shared a secret that allowed them to deliver a live baby when labour was obstructed, which was something that none of their contemporaries could do. They controlled their skills and knowledge tightly, and initially the secret was only shared between family members.[205]

Sixty years later, by the end of the eighteenth century, it was widely accepted that the 'art' that the Chamberlens had kept secret for so long was the use of the midwifery forceps, and in 1795, when discussing the forceps, John Aitken asserted that 'Chamberlain [sic] is the first modern who introduced the instrument into modern use'.[206] Aitken did not discuss the vectis, but did mention that the lever was introduced by Roonhuysen. There was some debate in treatises published in the late eighteenth, and early nineteenth century about whether the lever and the vectis were the same or different instruments,[207] and some authors such William Nisbet used the terms vectis and lever interchangeably.[208] John Burns also referred to the fenestrated vectis by the term lever.[209]

Figure 8: Chamberlen forceps found at Woodham Mortimer Hall – Image from the Science Museum [210]

Thomas Denman first made mention of the vectis in print in 1783, when he named the instrument as being of use in delivering births obstructed by the head. As I will discuss in chapter four, it was not until 1790 that Denman gave a detailed description of the instrument, and declared his preference for the instrument.[211] Until 1813, it had remained unclear whether the Chamberlen secret had been the forceps or the vectis. In that year, a fortuitous discovery dramatically resolved the issue. The mother-in-law of the owner of Woodham Mortimer Hall at Woodham Mortimer, near Maldon in Essex, a Mrs Codd, discovered a box hidden under a trapdoor in the attic of the house. In the box was a family Bible, some teeth with a note identifying them as belonging to Dr Peter Chamberlen, and three different types of instrument to help to deliver babies during an obstructed labour. Instead of one secret, the Chamberlen secret was finally revealed to be all three instruments that could be used to deliver a live baby in obstructed labour: the fillet, the forceps and the vectis.[212] Mrs Codd called a family friend, Mr Carwardine, who was a medical practitioner, and presented the instruments to him.

Carwardine recognised the significance of the instruments that had come into his possession, and corresponded with William Munk, the librarian at the Royal College of Physicians who dedicated his tenure to compiling extensive biographies of Fellows of the Physicians, regarding the instruments.[213] Carwardine presented the instruments to the Medico-Chirurgical Society in 1818,[214] and gave a brief paper outlining their discovery. He said that

> they appear to me to contain within themselves the, most direct and conclusive evidence of originality of invention [… and concluding that] from the roughness of the workmanship, I am led to conclude that Chamberlin (sic) was his own artificer.[215]

2.2 The Chamberlen instruments

The secret method that the Chamberlen family had cultivated which enabled them to deliver a live baby in a case of obstructed labour, was in fact the use of two instruments: their inventions, the vectis and the forceps. The forceps remain in modern clinical use, and the instrument is instantly recognisable to a contemporary practitioner. As previously discussed, many authors have extensively covered the story of that instrument, and their arguments have been summarised in the introductory chapter, [216] but for the sake of completeness the forceps will be described in the following section. Meanwhile, the vectis has disappeared from contemporary consciousness, so will be introduced in greater depth.

2.2.1 Forceps

As I have already demonstrated, members of the Chamberlen family, most likely one of the brothers Pierre or Peter, invented the forceps. The instrument consisted of two spoon shaped metal blades that were used to assist delivery of the baby when delivery by the head became obstructed, and fitted around either side of the baby's head, where the blades would usually lock together. Although forceps were usually made of metal,[217] William Smellie did experiment with a pair of wooden forceps to make the instrument more amenable to women; he later reverted to metal forceps covered in cloth or leather. These metal forceps had often had wooden handles attached and they were fenestrated to spread the pressure applied across a broader area of the head of the baby. The forceps allowed the practitioner to apply traction and rotation to the baby's head, while the mother pushed, to assist with the delivery of the baby.

Early forceps practitioners such as the Chamberlens and Smellie made changes to the curvature of the forceps and the mechanism that locked the forceps together.[218] He also found the long handles on the forceps unwieldy to use. From the time that a description of the forceps was published, practitioners sought to adapt the instrument and improve it. Many hundreds of practitioners went on to make modifications to the forceps since that time, yet the instrument remains recognisable, both as the instrument invented

by the Chamberlen family, and as the instrument that remains in use by practitioners in the twenty-first century.[219] As I will discuss in greater depth in chapter five, the forceps could broadly be divided into two types: long and short forceps. Long forceps were used when the head of the baby was high up in the pelvis, and sometimes when it needed a degree of rotation. Barnes described using the long forceps for the 'high operation' when the cervix was not fully dilated, but recognised that this carried many risks for the mother and baby.[220] The short forceps were used when the head was lower in the pelvis and a more straightforward form of assisted delivery was required, for example when the mother was exhausted.[221]

Trade catalogues had been published since the early nineteenth century, but became available more widely towards the end of the century. Instrument manufacturers updated their catalogues regularly and removed practitioners from their distribution lists if they did not order from them; new catalogues were issued every two to six years. Manufacturers amended trade catalogues with each edition to reflect current and new innovations in clinical practice, and generally removed instruments that were not selling well. Trade catalogues devoted pages to the many varieties of forceps that they offered for sale. One of the earliest companies to utilise trade catalogues, was Maw & Sons who were based in London. They published and distributed catalogues of their instruments to doctors every quarter.

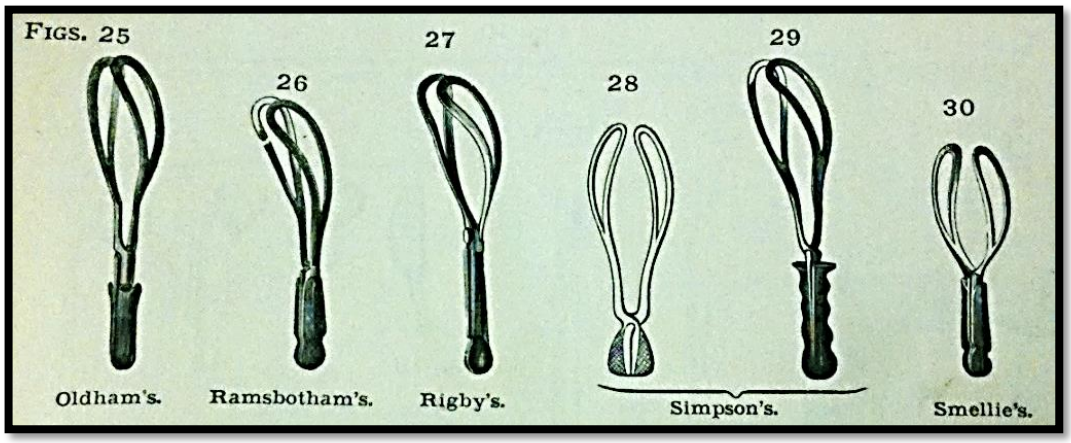

Figure 9: Forceps advertised for sale – Image from S. Maw & Sons catalogue, 1869 [222]

In 1869, they offered over thirty different types of forceps for sale individually, with similar numbers of varieties in later editions.[223] In addition to the separate instruments available for sale, they offered bags and cases of midwifery instruments.

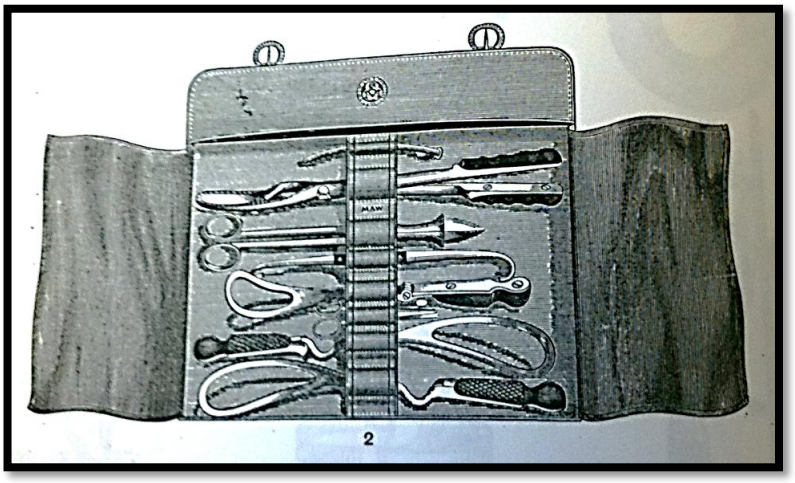

Figure 10: Obstetric case – Image from Maw & Sons catalogue, 1882 [224]

The contents of the bags varied according to the price charged, but usually contained both forceps and a vectis, scissors and a urinary catheter, as well as destructive instruments such as a crotchet or blunt hook and a perforator.[225]

The different types of forceps available have influenced the history of the instrument, and became a focus of some of the scholarship on the subject. As discussed in the introductory chapter, two notable instrument histories written in the twentieth century sought to chronicle the variety of forceps available. Kedarnath Das listed over 600 types of forceps in his book published in 1929,[226] and the 1866 *Conversazione* of obstetric instruments by the Obstetrical Society exhibited over 150 different types of forceps from around the world.[227] Bryan Hibbard acknowledged in 2000 that 'I would not attempt to compete with Das',[228] he also provided a comprehensive list of types of forceps, with each chapter in his book devoted to different types of forceps. The use of the forceps will be discussed further in chapter five.

2.2.3 Vectis

The vectis was a spoon shaped instrument, with a fenestration, or 'window-like' opening that was used to disperse pressure more widely across the head of the baby. The instrument was designed to fit over one part of the baby's head, rather than grasping the whole head as the forceps did. It was made from metal, although in the early part of the nineteenth century the vectis was often covered in leather or silk to prevent damage to

the mother in the same way as the forceps were. The vectis also often had a wooden handle. Most examples of the instrument were just over twelve inches long, and one and three-quarter inches wide.[229]

In contrast to the proliferation of modifications to the forceps, the vectis was not subjected to the same number of changes. In contrast, to the numerous examples of forceps at the Obstetrical Society's *Conversazione*, there were only nine different types of vectis, which included examples of what was labelled a vectis of 'ordinary form', a curved fenestrated vectis.[230] One of the major alterations to the vectis was made at the end of the eighteenth century by practitioner William Lowder.[231] He modified his vectis to include a hinge, making it easier to store in a coat pocket for transportation. There is a possibility that this would also have enabled the instrument to be used without the knowledge or consent of the woman, however, this type of secretive practice was widely condemned by many authors as I will argue later in this thesis.

Towards the end of the nineteenth century, many catalogues that sold midwifery instruments continued to sell both the forceps and the vectis, and although a variety of types of forceps were offered, generally the types of vectis were restricted. These were of two types, one with a fixed handle, and one with a folding handle.[232] One manufacturer was Weiss and Son who operated in London. They offered two types of vectis that they named 'levers' in their 1863 catalogue, although they did not give a designer's name as was common in other catalogues. One was a folding vectis and one had a fixed handle.

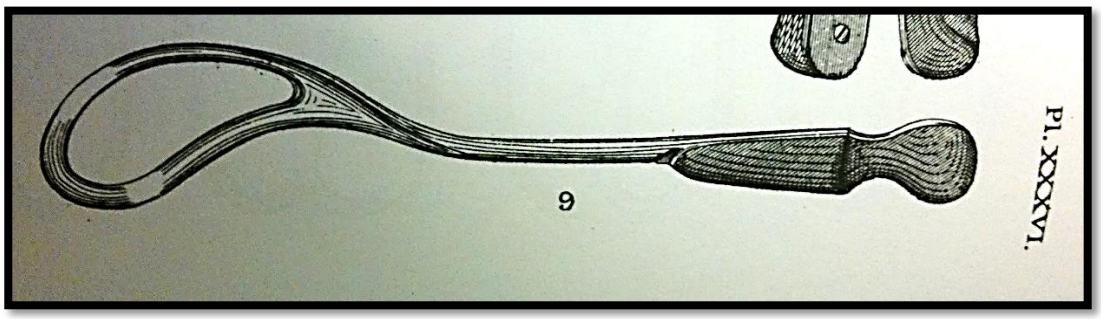

Figure 11: Fixed handle vectis – Image from Weiss & Son Catalogue 1863, plate XXXVI [233]

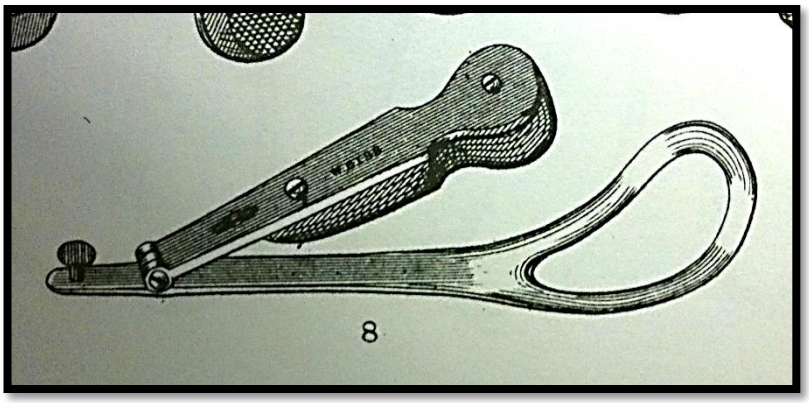

Figure 12: Folding handle vectis - Image from Weiss & Son Catalogue 1863, plate XXXVI [234]

As discussed in the introductory chapter, and will be seen in greater depth in chapter four of this thesis when the use of the vectis is explored, the vectis was vanishing from clinical use towards the end of the nineteenth century. Nevertheless, in an apparent anomaly, Maw and Sons increased the types of vectis that were sold in 1882,[235] and gave the names of the designers, something they had not done in earlier editions.[236] They sold the Lever and Symond's vectes that were both made of metal with wooden handles and a fixed blade, while "Lownd's" (Lowder's) vectis was a folding one like that sold in their earlier catalogue. Since instrument makers responded to market pressures from practitioners,[237] this was likely to be in response to demand from practitioners.

Nine years later in 1891, the Maw, Son & Thompsons catalogue contained five different bags with sets of obstetric instruments, and three of these five contained a vectis, while all five contained forceps. In addition to the bags, the catalogue also listed three types of individual vectis for sale: Lowder's folding vectis, and Lever's and Symond's fixed handled vectis.

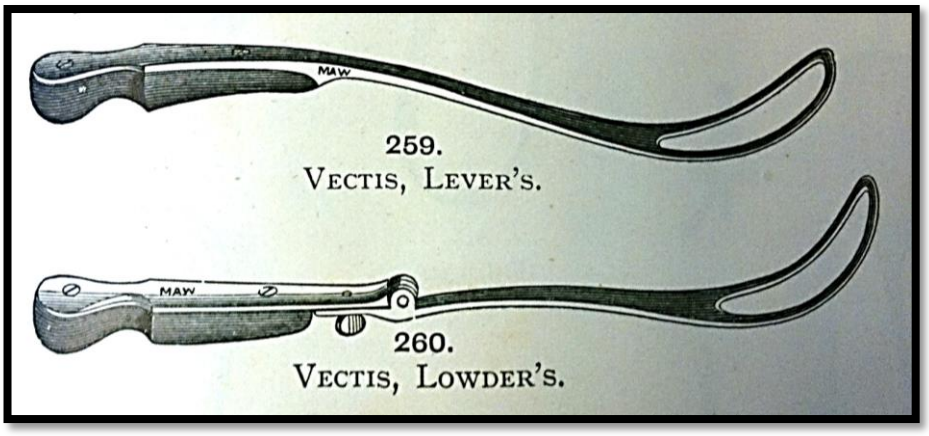

Figure 13: Lever's and Lowder's vectis – Image from Maw & Sons Instrument Catalogue, 1891 [238]

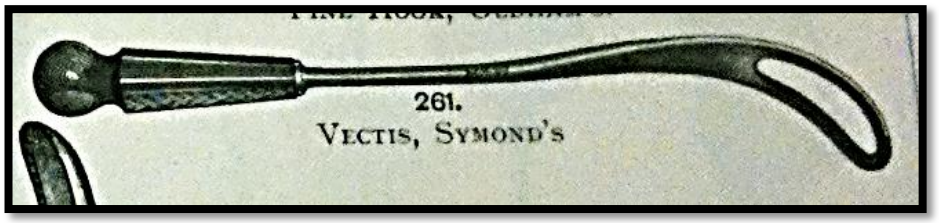

Figure 14: Symond's vectis – Image from Maw & Sons Instrument Catalogue, 1891 [239]

These instruments had a wooden handle screwed to the metal blade, but this type of instrument was rapidly becoming obsolete.[240] The use of carbolic acid or heat to sterilise instruments became widespread during the 1890s, and metal handles replaced the wooden handles on surgical instruments that had been used until that time.[241] During the 1890s the London Hospital was among many who replaced their wooden handled instruments.[242] The cost of changing to metal handles may have contributed to the decline in the number of vectes being offered for sale, and by 1905, the S. Maw, Son & Son's catalogue contained only one vectis; a Lever's vectis with a fixed blade and a metal handle, which cost 8s 6d.[243] In the 1913 catalogue, Lowder's fixed blade, metal handled vectis was available, for the reduced price of 7s 6d.[244] This was the last Maw & Son catalogue that contained the vectis. Catalogues were not published during the 1914-1918 World War, and so the subsequent issue of the catalogue was not published until 1925. It did not contain the vectis.[245] Instrument manufacturers would not have continued to include instruments in their catalogues unless practitioners had ordered them, and practitioners would not have ordered the instrument unless they were intending to use it. It is therefore likely that

since the vectis continued to be available for sale until around 1914, that some practitioners continued to order it, and so would have continued to use it in their practice.

2.3 A reimagined legacy

Until now, the legacy of the Chamberlen family has centred around the forceps. The forceps are an example of a remarkable piece of technology that has existed in a recognisable form for over four hundred years. It is undeniable that it has had a significant impact on human existence both in the length of time over which it has been used, and in the number of times it has been used. The use of the forceps continues in modern obstetric practice. Every modern doctor who practices obstetrics uses the forceps, centuries after they were developed by the Chamberlen family. In England, for the financial year 2016-7, the instrumental delivery rate was 12.7%, which meant that 79,806 babies were born using instruments.[246] The instruments that are used in these cases would be either the forceps, or a vacuum extraction machine known as a ventouse,[247] with numbers equally split between the two. That means that, over four hundred years since their invention, the forceps are still used in approximately 40,000 deliveries in England alone each year. This figure will have been multiplied many times over in countries around the world and over many hundreds of years, so the forceps is an instrument worthy of many of the plaudits given to it.

As has been argued, the legacy of the Chamberlen family is not limited to the forceps alone. The family developed a second instrument, the vectis, that complemented the forceps, and was used with the same aim: to deliver a live baby when labour had been obstructed. As will be argued in chapter four, the use of the vectis required considerable clinical skill and underpinning knowledge, and it continued to be used for hundreds of years. This means that the Chamberlen family were even more remarkable than has been presented in most secondary sources to date. They imagined and invented not one, but two, instruments that were able to deliver a live baby in obstructed labour when their contemporaries could not envisage even one way to do so.

This expanded legacy raises several questions. Why did the Chamberlen family develop both instruments and what were they used for? The Chamberlen family recognised a need to use both the forceps and the vectis, since they invented both instruments, so why has only the forceps survived into contemporary clinical use? Why did

practitioners stop using the vectis when the Chamberlen family had considered it to be useful for over a century? Furthermore, since no other instrument emerged at that time to take the place of the vectis, other than the forceps, and the forceps had been available to practitioners for the whole of the time that the vectis was in use. What factors contributed the disappearance of the vectis? These questions will be considered during subsequent chapters of this thesis. The first step is to identify the relevant social group that were using the vectis. The next chapter will explore the development of this social group by investigating the changing circumstances of medical education during the 'long' nineteenth century.

Chapter 3: The impact of the changing context of medical education and regulation

In this thesis so far, the lives and significance of the Chamberlen family have been explored, and it has been argued that instead of a legacy that is confined to the familiar tale of the forceps, it should instead be retold to include their other invention: the vectis. While later chapters of this thesis will explore the use of the vectis and forceps, this chapter seeks to locate the users of that technology, male practitioners of midwifery, in their historical context. In doing this, it is essential to understand how the relevant social groups[248] that used the instruments developed and changed over the late eighteenth and nineteenth centuries, before the vectis ultimately disappeared from use. Medical education and regulation of male-midwifery has not been considered in published secondary literature to date, therefore this is another original contribution to knowledge in this thesis.

There were two broad groups of men who practised midwifery. The first group consisted of prominent practitioners who specialised in midwifery, usually in large urban cities such as London. It included notable figures such as Thomas Denman and William Osborn, who were based in London, specialised in midwifery, and became the first man-midwives to be recognised by the Royal College of Physicians in 1783.[249] The second group, that was more representative of most male midwifery practice during the nineteenth century, were the surgeon-apothecaries who combined the dispensation of medical advice and remedies with surgery and midwifery. In the nineteenth century this group would become known as general practitioners.

Male practitioners of midwifery needed clinical skills, and therefore training, in various aspects of manual operations involved in attending deliveries. These included (but were not limited to) the use of instruments. The form of that training changed dramatically during the nineteenth century and was one of the issues in a wider campaign for medical reform. Eventually, general practitioners gained political representation before the specialist practitioners, who by the end of the nineteenth century were known as obstetricians. This chapter charts the long battle for recognition and regulation of midwifery practice throughout the later eighteenth and nineteenth century that culminated with the passage of the 1886 Medical Act Amendment Act. The chapter

Chapter 3: The impact of the changing context of medical education and regulation concludes by reflecting on how the changes in medical education and regulation affected clinical practice, and particularly the use of instruments.

3.1 An anomaly in the tripartite system

3.1.1 A crumbling tripartite system of medical care

As chapter two argued, from the sixteenth century onwards, three distinct groups of male practitioners were formally recognised, and each provided different elements of medical care. Despite the incorporation of these London-based Colleges, there was no nationally agreed legal enforcement of the roles and responsibilities for the different groups.[250] During the eighteenth century, despite the legal framework of the traditional tripartite system, some practitioners started to cross professional boundaries.

London physician, Samuel Foart Simmons compiled a medical register in 1783. He identified that the 3,000 male practitioners in England described themselves in one of six different categories: physicians, surgeons, apothecaries, surgeon-apothecaries, men-midwives (although only two men described themselves as such), and those who practised a mixture of skills. 82.3% of the practitioners listed in Simmons register were identified as surgeon-apothecaries.[251] Unfortunately, these self-appointed labels are not a clear guide to practitioner roles, and many of these "mixed" labels included midwifery. Although only two men described themselves as men-midwives, midwifery was an ordinary part of the job for the surgeon-apothecary, and it provided a steady stream of patients[252]. Surgeon-apothecaries dispensed medical advice and medications but combined that work with surgery that included midwifery practice. These practitioners would have incorporated the use of instruments into their practice, since the need for instruments in obstructed labours was most often the primary reason for calling for male attendance.[253] 'Onset calls', where men were engaged to attend labouring women from the onset of labour, also became becoming increasingly common during the eighteenth century.[254]

All branches of medicine, the physicians, surgeons, and apothecaries, were concerned with maintaining their own sphere of influence, and in identifying the elements that made them distinct from each other. The Royal College of Physicians and the College, later Royal College, of Surgeons, eschewed all forms of combined practice, and particularly midwifery, for voting members of the councils.[255] Midwifery presented a problem for the Colleges since it contained elements of internal medicine that were the remit of the

Physicians, and to a lesser degree the Apothecaries, but combined with elements of 'manual labour' that was the province of the Surgeons. This meant that both the Royal College of Physicians and the College of Surgeons ignored midwifery, and for anyone hoping to obtain a position of influence on the councils of the Colleges, midwifery was to be avoided.[256] Although the traditional tripartite divisions were maintained by the London Colleges of the Physicians and Surgeons, and the Corporation of the Worshipful Society of Apothecaries, they did not reflect the realities of clinical practice by the end of the eighteenth century.

3.1.2 The birth of Man-midwifery

In chapter two, I outlined that Peter Chamberlen had been described as a 'physician, and in nature of a midwife' as early as 1611,[257] and that later members of the Chamberlen family shared the knowledge and skills that they had developed with other practitioners. The use of the term man-midwife, and male attendance at births, grew during the eighteenth century[258] although rates of male attendance varied between geographical areas, between urban and rural practice, and especially between the different social classes.[259] Unlike the Physicians, Surgeons, and Apothecaries there was no College or Corporation to represent either male or female midwives' interests or regulate practice.[260] The call to regulate and educate practitioners in midwifery had first been proposed by Pierre Chamberlen in 1616, and again by his nephew Dr Peter Chamberlen in 1634, although female midwives and the influential Royal College of Physicians vehemently opposed these proposals.[261]

Although many surgeon-apothecaries practised midwifery, there were some practitioners, especially in London, for whom midwifery was their main area of practice. The refusal of the Royal College of Physicians and the Royal College of Surgeons to recognise those who practiced midwifery, led to a curious situation. Highly influential London practitioners, such as Thomas Denman[262] and his colleague William Osborn,[263] held hospital positions, and had thriving private practices. In addition to this they also taught midwifery to large numbers of students, but were excluded from the membership of the prestigious Colleges. At that time Denman and Osborn used the forceps as part of their practice, but Denman later became a strong advocate for the vectis which led to a public disagreement with Osborn that would eventually cause their partnership to end.

In an apparent response to the anomaly of midwifery,[264] the Royal College of Physicians briefly agreed to offer an examination in midwifery, although the College archive does not hold any documents that explain the rationale behind this decision, or what had prompted it at that time. On the 3rd October 1783, the College of Physicians carried a motion to grant licences in midwifery.[265] Three weeks later, on the 7th November, it was recorded in the Annals that Dr Warren reported that a committee had reviewed the statute, and it was agreed with a few amendments.[266] The process for approval is not explained clearly in the Annals of the Royal College of Physicians, but whichever committee the licences were referred to, approved them, and licenses in midwifery began to be granted a few weeks later.

On the 5th December that year, Thomas Denman and William Osborn appeared before Dr Pitcairn, the President of the Royal College of Physicians, Dr Gisborne, Dr Reynolds who appeared for Dr Wright, Dr Budd, and Dr Hervey, for their first examination in physiology to gain their licence in midwifery from the Physicians. They passed, and were required to return on Saturday 13th December at 6pm for their second examination. When they returned, Denman and Osborn were examined in pathology, and Denman produced his Diploma from the University of Aberdeen that showed that he had been created a 'Doctor of Physic' by that University, while Osborn produced his Diploma from St. Andrew's University.[267] Again, Denman and Osborn passed their examinations and were instructed to return on Monday 22nd of December at 2pm.

Their final examination on treatment, was held before the *Comitus minoribus extraordinariis*, and again, they passed,[268] so the committee approved Denman and Osborn's licences.

> The President proposed Dr Thomas Denman to be admitted a Licentiate in Midwifery, who being baloted (sic) for was accepted. And having given his faith to the College was admitted, and the College Seal was set to his diploma.[269]

The granting of licences to Denman and Osborn was reported in the *Whitehall Evening Post* newspaper. 'Dr Denman and Dr Osborn, two gentlemen of great reputation in that branch of medicine both as practitioners and lecturers, have been the first to avail themselves of this new regulation, and were last week admitted to the College of Physicians as Licentiates in Midwifery'.[270] Denman and Osborn became the first of only ten practitioners to be granted licences in midwifery, and there were long gaps between the granting of the licences.[271] Below is a table to demonstrate how rarely the licences were granted.

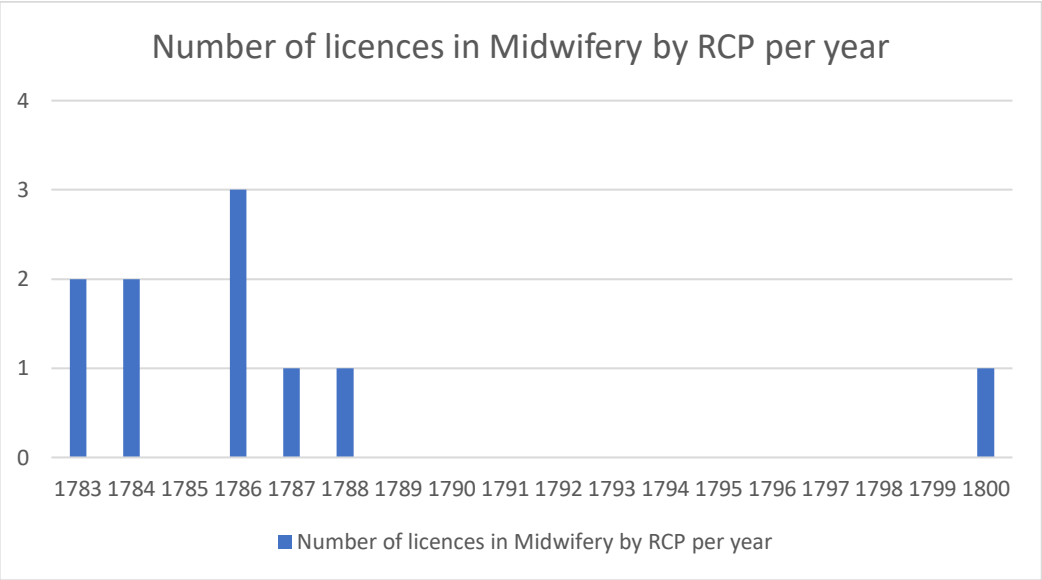

Figure 15: Chart to illustrate the number of licences in Midwifery awarded

The decision by the College to grant licences in midwifery had strengthened it by widening its remit, and honouring leading male midwives.[272]In 1800, once again the College ceased to license midwifery practice. No explanation for this retreat was recorded in the Annals, and the statute granting licences was not officially repealed until December 1804, after the election of Sir Lucas Pepys as President.[273]

As has already been discussed, towards the end of the eighteenth century there had been a change in the way that the medical profession practised, but the legislative and professional bodies did not keep pace with the new way of working. Most medical men practised a combination of medicine and surgery, often with some midwifery, but were excluded from any political power in the Colleges. A result of this exclusion was that groups began to organise to campaign for the Colleges to change. Concerted attempts to effect medical reform, and particularly the attempt to control the practice of surgeon-apothecaries, began in earnest from 1793, and continued into the nineteenth century.[274] Despite the burgeoning influence of the College of Surgeons, pressure regarding legislation remained the domain of the Royal College of Physicians. The College of Physicians were resistant to reform, and objected to any proposals for the reform of medicine that did not give them overall control, so they ensured that the early bills failed. When it became more difficult to block Bills outright, the Physicians formulated proposals that gave them control of regulation for all branches of medicine including physicians, surgeons, midwives, apothecaries, veterinarians, and chemists, such as the Bill proposed by Dr John Latham in

1804.[275] This Bill would have given the Physicians power over every medical practitioner in England, and the idea was rejected.[276]

3.1.3 Secret proposals for an Obstetric College

Following the abolition of the licence in midwifery by the Physicians in December 1804, some 'gentlemen practising midwifery' held a meeting on 27th October 1807 with a view to raising the standards of midwifery practice.[277] This meeting has not been discussed in the secondary literature to date, and is therefore a further original contribution to knowledge in this thesis. The men who met were specialist practitioners of midwifery, part of the elite group of practitioners rather than the more common surgeon-apothecaries. Thomas Denman chaired the meeting and several of his fellow holders of the RCP licence in midwifery were also present, namely Dr Batty, Dr Combe, Dr Poignard, Dr John Clark, and Dr Underwood.[278] The missing licentiates in Midwifery were William Osborn, who by that time had retired to the country, Thomas Savage who had died in 1804, John Cooper whose dates and reasons for absence are unknown, and John Squire (1732-1816) whose reason for absence is also unknown.[279] In addition to those who held the RCP licence in midwifery, there were also licentiates of the Royal College of Physicians who practiced midwifery: Dr Blegborough, Dr Washman, Dr Dennison,[280] Dr Garthshore, Dr Knighton, Dr Sims, and Dr Thynne.[281] The final attendees were members of the Royal College of Surgeons that practiced Midwifery: Mr (later Sir) Richard Croft, and Mr (later Sir) Charles Mansfield Clarke. The 'gentlemen practising midwifery' resolved that they would present a memorial to their respective Colleges. As Chair of their group, Denman would present one to the President of the Royal College of Physicians, and Croft would present a copy of the same memorial to the Master and Court of Assistants of the Royal College of Surgeons.

Denman posted the memorial to the President of the Royal College of Physicians, Sir Lucas Pepys, two days later with a covering letter, on 29th October 1807.[282] The gentlemen wrote that they were aware of frequent examples of 'great detriment and danger' that arose from 'malpractice of many ignorant and audacious persons' who cared for women during pregnancy and childbirth.[283] The memorial went on to request that the Royal College of Physicians use their power to find a way that;

> the evils above stated maybe prevented, and the audacity of the ignorant may be repressed by subjecting all persons male and female, who undertake the practice of the art of midwifery to an authorized examination before they offer themselves

> as competent to the said practice, so that the health and lives of his Majesty's subjects may no longer be endangered or lost, nor disgrace be longer reflected on the practice of medicine in general.[284]

So, Denman and colleagues were concerned with the lack of knowledge and skills of both male and female midwives and the harm they could cause, and sought to make it a requirement that any aspiring practitioner of midwifery should be subject to examination.

On the same day, Croft called upon Sir Lucas Pepys to explain to him the background to the request, but since Pepys was not at home, Croft left a letter. In the letter, Croft clarified that this memorial was to be sent to both the Physicians and Surgeons since the group had thought this to be the most respectful approach. The final paragraph of Croft's letter sent a warning to Pepys that if the Colleges would not act on their recommendations an alternative course of action was being considered. They would 'go to Parliament for a new and distinct College'.[285]

A 'new and distinct college' was a revolutionary idea in 1807, which emphasises how strongly the pre-eminent men-midwives practising in London felt about the education and regulation of those practising midwifery. An undated document in the Royal College of Physicians Archive, stored in the same folder as Denman and Croft's letters, and the memorial, demonstrates that this was more than an idle threat to push the Physicians and Surgeons into action. The 'gentlemen practising midwifery' drafted a paper that set out a range of proposals for different versions of an Obstetric College ranging from complete independence to a variety of levels of oversight by existing regulatory bodies. It does not appear that this proposal was shared with the Committee of the Royal College of Physicians, since it was not discussed in the Annals when the memorial was, although it did end up being stored in the archives of the Royal College of Physicians at some point.

The paper proposed as alternatives:

1. That a charter be obtained for the establishment of an obstetric college, possessing full powers for its regulation and conduct, and independent of the Royal Colleges of Physicians and Surgeons.
2. That a Charter be obtained for the establishment of an obstetric college, leaving to the Royal College of Physicians, the power of nominating and appointing an annual president and a court of examiners.[286]

These were radical proposals that would have facilitated the founding of a rival College of obstetricians. Given the numbers of surgeon-apothecaries and men-midwives, the College would have had an enormous number of members that may well have outstripped those of both the Physicians and Surgeons. The sheer number of members would have made the

proposed College a powerful institution. This first proposal, for a College that was independent of the Physicians and Surgeons would have limited the influence of both Colleges over most medical men. A College that looked to regulate and educate its members would not be constrained by the limitations on reputation that came from the corporation status of the Apothecaries and would give men-midwives equal status with Physicians and Surgeons, rather than as a lower grade of medical practitioner that needed to be overseen by their betters. The second proposal was essentially a dilution of the first that allowed the Royal College of Physicians to retain some control over an independent obstetric college by appointing the president and court of examiners.

The paper went on to offer other, less radical alternatives to these proposals:

3. That the College of Physicians be requested to nominate a court of examiners, for the express purpose of examining all persons male and female, practicing or intending to practice midwifery.
4. That the Royal Colleges of Physicians and Surgeons, may jointly form and nominate a Court of examiners, subjecting all persons practicing or intending to practice the art of midwifery to be examined; which Court shall consist of two licentiates in Midwifery, or one Licentiate, general, practicing midwifery and one licentiate in midwifery, two surgeons practicing midwifery, with one Fellow of the College of Physicians, always acting as President of the said Court of Examiners. [287]

Although these alternatives were less sweeping than the proposal for a separate College, they were still innovative. They would have required both males and females who practised, or intended to practise, midwifery to be both educated and examined. This was designed to improve outcomes for women and protect them from uneducated practitioners.

They concluded their proposals by adding:

5. That whichsoever of these modes be approved, or whatever other mode may be preferred, it will be expedient for [there to be] separate lists; one of all those gentlemen who may be licenced to practice the art of midwifery by the said court of examiners; and another list of all women, now practicing, or intending to practice midwifery; which two lists shall be printed annually and distinctly from the list published by the College of Physicians of their body, and of all persons licenced to act by their authority.[288]

So, in addition to the examination of both men and women practising midwifery, the gentlemen intended that lists of approved practitioners were maintained.

In summary, the 'Gentlemen practicing Midwifery' were considering options that ranged from a completely independent College, to remaining as part of the College of Physicians. This comprised of a range of options with varying levels of independence and control. It was perhaps evidence that male midwifery at the time did not have a clearly established sense of professional identity, and their leaders were testing the acceptability of their proposals. The 'gentlemen' did stipulate that examination of candidates and the maintenance of a register were their minimum requirements.

There was also a note at the bottom of the page that indicated they considered that examination of competence should extend beyond the 'bills of mortality', although they resolved to address these concerns at a future date. The term 'bills of mortality' referred to the geographical area, that comprised of the City of London, Westminster, Southwark, and some 'out' parishes in Surrey and Middlesex. Each week, a list of the reasons that people had died in that area was published. Examination of competence beyond this area meant regulation beyond the city limits of London, the reach of the Royal College of Physicians and the Royal College of Surgeons. This was an imaginative proposal that transcended traditional boundaries. It is possible that the proposals were too radical, since they do not appear to have been presented to the Council of the Royal College of Physicians since there is no discussion of this in the *Annals*, despite a copy of the proposal surviving in the Physicians archives.

Although the proposals for a separate college were not presented to the Physicians, the memorial written by the 'gentlemen', and signed by Denman, was presented, and the *Comitiis Majoribis Ordinariis* of the Royal College of Physicians debated the letter on 22nd December 1807. They moved, and seconded, that a committee was formed consisting of the President and College Officers, along with two other Fellows to receive a deputation from the Licentiates, Licentiates in Midwifery, and Members of the Royal College of Surgeons practicing Midwifery to 'hear from them the proofs of malpractice and other matters they deem of importance to state to the College'.[289] The President, Sir Lucas Pepys, nominated Dr John Hunter[290] and Dr Christopher Pemberton as members of the committee.[291]

Almost five months later, on the 10th May 1808, the committee appointed to consider the memorial from the men-midwives reported back.[292] They submitted a draft letter to the *Comitiis Majoribis Extraordinariis* to be discussed, which was later approved, addressed to the Thomas Denman on behalf of the group of men-midwives, that stated

> The President and Fellows of the Royal College of Physicians, having duly deliberated on the application made by you … are of the opinion that, though the jurisdiction of the College over all persons professionally prescribing medicine is unquestionable, yet that they are not authorized by law to compel such as practice only an operative or manual part of the Profession to undergo examination or to submit to any regulations whatsoever.[293]

So, when given time to consider their position, the Royal College of Physicians decided that they would confine their activity to 'physic', and not seek to regulate other groups of medical men. The Physicians were concerned to make sure that they did not step outside the terms of their charter, and made the decision to admit only those who practised internal medicine as members. The meeting then moved on to consider a report on the statutes of the College that had been compiled by lawyers and Fellows where they were very careful to review the statutes and gave a clear opinion about what constituted the remit of the Physicians.[294] Unfortunately, there are no records held by the Royal College of Physicians to show what action the 'gentlemen' took next. It seems that they accepted the decision of the College, and did not push any further for regulation of midwifery practice. It would be over a century later before a separate College of Obstetrics and Gynaecology was formed.

3.1.4 Emerging 'General Practitioners'

As has already been discussed, by around 1800, men-midwives were of two kinds; the small group of specialists (found mainly in London) and the much larger group of surgeon-apothecaries (who practised all over the kingdom, including London). The episode of 1807-8 showed that the specialists were unhappy with existing arrangements for training and regulation; two decades later, in the late 1820s, it became apparent that both the specialists and the surgeon-apothecaries group – by this time were starting to be known as general practitioners – were concerned over precisely the same issues. This time, the relevant campaign was waged in public, as part of a wider more for medical reform; but as we shall see, it was no more successful than the 1807 initiative of Denman *et al* had been. Despite the Royal College of Physicians briefly recognising the expertise of a small, select, number of practitioners, the cause of the surgeon-apothecary went unrecognised. The surgeon-apothecary combined elements of the role of the surgeon, and that of apothecary, with man-midwifery,[295] but they were excluded from positions of influence in the Royal College of Surgeons, who insisted on 'pure' surgical experience for membership

of their Court of Assistants, or Examiners. Practitioners who identified as surgeon-apothecaries were the largest single professional group of medical men, and displeased with this exclusion and the resulting lack of political influence, they continued to organise themselves to campaign for regulatory reform.

In the 1820s the term 'general practitioner' emerged to describe surgeon-apothecaries, a significant time after the role had gradually emerged in practice, and included elements of medicine, surgery, midwifery, and pharmacy.[296] Correspondents writing in *The Lancet* first used the term in 1828.[297] Different groups used the term general practitioner to have different meanings. Members of the elite Royal Colleges used the term to mean 'not a specialist' and to entail a lower status, since the fellows of the colleges had to be specialists and practice 'pure' medicine or surgery.[298] Conversely, supporters of general practitioners used the term with the implication 'someone who does everything', and therefore the term meant that they undertook medicine, surgery, pharmacy and – last, but not least – midwifery.[299]

Separate incorporated bodies protected the interests of the physicians, surgeons, and apothecaries when reform was advocated, but despite the ideas of Denman and colleagues twenty years before, there was no incorporated body or college representing the interests of those practicing midwifery. The themes of education and regulation are intertwined, since the registration or regulation of practitioners was dependent upon certifying that they had achieved a certain level of knowledge, and had therefore received an appropriate education. For male practitioners of midwifery, clinical practice included the use of instruments to deliver a baby when labour was obstructed. The next section of this thesis will continue to explore the midwifery education of medical practitioners, and consider the impact of the battle for regulation on this. It will also examine the emergence of the general practitioner and the merging of their cause with that of men-midwives.

3.2 Pressure for legislative regulation

3.2.1 Medical training as a theme of medical reform

By the end of the 1820s, although the old tripartite system was legally still in place, it did not reflect the realities of practice. There had been brief attempts at regulation, but the passage of the Apothecaries Act in 1815 gave regulatory power to a body that was enforced nationally for the first time. The sphere of influence of the Royal College of

Physicians, and Royal College of Surgeons was limited to London. The remit of the Act was restricted to apothecaries, and meant that physicians and surgeons were still not subject to such national regulation, although Edinburgh, Glasgow and Dublin Colleges regulated practice in their localities. The 1815 Apothecaries Act had marked the beginning of the legal requirement for medical education, although the Act made no provision for the regulation or education of practitioners of midwifery, as they were outside the tripartite system.

At the start of 1826, a group of practitioners calling themselves the *Obstetric Society,* met to discuss the ongoing issue of midwifery, and press for both education and regulation.[300] The society was chaired by Charles Clark, who appears to have been a general practitioner[301] and John Ramsbotham acted as secretary.[302] Membership included specialist practitioners Dr Granville[303] and Dr Merriman, midwifery teachers Mr. Jewell, Mr. Stone and Dr Ley.[304] Dr Kerrison was a surgeon apothecary,[305] and although membership also included Dr Locock, Dr A. T. Thompson, and Mr. Sweatman, [306] it is unclear whether they were specialist or general practitioners of midwifery, although later all members were describes as 'physicians and surgeons of obstetrical institutions, and lecturers on midwifery in London'.[307] This was an attempt to address the lack of influence of a collective voice since there was no incorporated body for midwifery. The Obstetric Society wrote to the Royal Colleges of Physicians and Surgeons and the Worshipful Society of Apothecaries to complain about

> the evils which … result from the indiscriminate practice of midwifery, and requesting to know how far the said corporate bodies were willing to co-operate in remedying the abuse, and whether they possessed the power and inclination of doing so.[308]

These were the very issues that Denman and the 'gentlemen practising midwifery' had tried to raise nearly twenty years earlier. The Royal College of Physicians responded to their letter that the act of delivery of a baby was 'merely a manual art'[309] and therefore the remit of the surgeon. The Physicians did acknowledge that diseases that occurred as part of the puerperium were part of the physician's role, but claimed that the current system of examination of this was satisfactory. The Court of Examiners of the Royal College of Surgeons believed they did not possess any legal authority to compel candidates to be examined in midwifery, and the Worshipful Society of Apothecaries concurred with this. The Apothecaries did acknowledge that the legislature should consider regulating midwifery, and if they did, the Apothecaries would 'discharge their duty with fidelity'.[310]

However, it appeared that neither the Apothecaries, Physicians nor Surgeons possessed the 'inclination' to lobby for change and were satisfied with the *status quo* for regulation of midwifery education.

When nothing had changed, despite waiting for the remainder of the year, the Obstetric Society started to increase their campaign for reform. At the beginning of 1827 they wrote for a second time to the Apothecaries, Physicians, and Surgeons, all of whom once again, refused to lobby for change. The Obstetric Society then wrote to Robert Peel MP, the Home Secretary, in July 1827. Peel wrote to the Apothecaries, Physicians, and Surgeons to ask for their comments. The Physicians refused to be moved, and maintained that their examination as it stood was sufficient. The Surgeons maintained that they did not have the skills to examine candidates in midwifery, but that they had passed a resolution at council that required attendance at two courses of lectures in midwifery. The Apothecaries asked Peel to consider amending the legislation to reassure the public that midwifery practitioners were 'well educated in that branch of the medical profession, and fully competent to the practice of it'.[311]

Less than two months later, on 14th September 1827, the Court of Examiners of the Worshipful Society of Apothecaries published a letter in *The Lancet* that stated that in addition to the lecture requirements stated in the Apothecaries Act of 1815, candidates for examination were

> earnestly recommended to attend one or more courses of lectures on midwifery, and the diseases of women and children, on the latter of which subjects, as an important part of medical practice, they will be examined.[312]

This was an attempt to mollify the reformers by using the reformers' own journal to publish a response. The phrasing of this statement was cleverly worded, since although the Apothecaries had recommended that candidates for examination undertake a course of lectures, there remained no compulsion to do so. Although candidates would be examined on the *diseases* of women and children, *midwifery* was not examined, therefore no assessment of competence or knowledge was made. Yet again, a compromise had been proposed that did not satisfy the demands of the reformers. The Royal College of Surgeons council also agreed to recommend that candidates for membership attended lectures on midwifery.[313] So, midwifery was still not a legal requirement, and was not examined, but some small amount of progress had been made with the recommendation that candidates attend a course of lectures before undertaking the LSA and MRCS examinations.

Junior members continued pressure on the Royal College of Surgeons, and in 1829 William Lawrence[314] was elected to the Council of the Royal College of Surgeons. Just six months later, the regulations regarding lectures delivered outside London was relaxed. The Council resolved to recognise

> several towns in England possessing properly constituted hospitals, together with such means and opportunities of teaching anatomy and physiology and surgery by lectures, demonstrations and dissections as shall be approved by the Court of Examiners.[315]

This relaxation of the rules of the Royal College of Surgeons meant that pupils who wished to attend lectures to prepare for the MRCS examination could again do so in a variety of ways in London. Students could attend lectures at the newly formed University College[316] or Kings College, or private lectures such as those at Webb Street, Windmill Street,[317] Aldersgate Street, Mr. Tuson's, Mr Carpue's, or Mr. Dermott's. In addition, students could attend at hospital medical schools based at St. Bartholomew's Hospital, Guy's Hospital, St. Thomas' Hospital, The London Hospital, and St. George's Hospital, where students could attend lectures and receive clinical instruction.[318] The provincial hospitals also took advantage of this change in guidance and by 1831, medical schools had been established in Leeds, Sheffield, Manchester, Bristol, and Liverpool.[319] In addition, both the Worshipful Society of Apothecaries and the Royal College of Surgeons had recommended that practitioners who wished to practice midwifery, which in practice meant all general practitioners, should undertake a course of lectures in midwifery and the diseases of children.[320] But, since no compulsion or obligation underpinned this recommendation, in effect, midwifery practice remained unlicensed and un-regulated.

Dissatisfaction with medical education and regulation was not limited to the concerns regarding the lack of midwifery education and examination on midwifery competence, that had been raised by the Obstetric Society at the end of the 1820s. The editor of *The Lancet*, Thomas Wakley,[321] was a vocal critic of the Royal Colleges of Physicians and Surgeons, and of the Worshipful Society of Apothecaries, and had several very public clashes with the incorporated bodies.[322] One notable example of this was in 1831, when Wakley attended a public lecture at the Royal College of Surgeons, but used it to rally support from members of the College against a circular that had been sent out. The circular had been sent, allegedly in error, to naval surgeons that they were not to attend the King's levees.[323] Wakley was forcibly evicted by Bow Street (police) Officers and later attempted to take legal action against the officers.[324] With such political manoeuvring, the ideals of the Obstetric Society had been forgotten.

Wakley had become friendly with Henry Warburton, MP for Bridport, an industrialist who had campaigned for medical reform in the House of Commons from the time of his election in 1832.[325] By 1833, both Houses of Parliament, were being flooded with petitions that requested revision of the Apothecaries Act.[326] Letters from correspondents calling for medical reform also appeared almost weekly in medical journals such as *The Lancet* and the *London Medical and Surgical Journal*.

Following the petitions for amendment of the Apothecaries Act, Warburton presented a Bill for this amendment to Parliament at the end of May 1833.[327] *The Lancet* published a copy of the Bill for its readers to review.[328] The key provision of the Bill was to allow Scottish practitioners to practise as an apothecary or general medical practitioner in England without having to meet the requirements of the Apothecaries Act in undertaking an examination by the Court of Examiners of the Worshipful Society of Apothecaries. The Bill defined Scottish practitioners as those who had attended University in Edinburgh, Glasgow or Aberdeen or had undertaken the examination for membership of the Royal College of Surgeons of Edinburgh or the Faculty of Physicians and Surgeons of Glasgow. *The Lancet* took pains to point out to its readers that although the Bill only discussed Scottish practitioners, the

> Tenor of the preamble, and the liberal spirit evident in the other sections of the bill, clearly show that the omission of the words "England and Ireland" has been accidental, and not intentional.[329]

The Lancet did not provide any evidence to support this assertion, but it is plausible that Wakley's friendship with Warburton, a key proponent for medical reform and sponsor of the Bill, was behind the statement.

During the second reading of the Bill at the beginning of June 1833, further amendments were proposed including the recognition of attendance at provincial medical schools, and that the Physicians ceased to write prescriptions in Latin. The inequality that was inherent in the Bill by the discussion of Scots graduates and the omission of the same rights for graduates of English and Irish Universities was also debated.[330] The Bill was not universally welcomed as reformers felt that it did not meet their aims. In a letter to the *London Medical and Surgical Journal,* an unnamed correspondent wrote, in 1833, that;

> There is something truly absurd in our mode of legislation in this country. No subject is deeply enquired into and discussed before an Act of Parliament is obtained. … We are now to have some new enactments to amend a certain

> portion of the Apothecaries Act, but instead of taking a general view of the state of the medical profession, some little alterations are to be made, which by no means satisfy the wants or wishes of the public. All that is to be done is to allow a Scotch graduate to act as an apothecary while we forbid the English surgeon, who undergoes nearly the same line of education, to enjoy the same advantages.[331]

By the end of that June it appeared to be an 'absolute certainty' that the Bill would pass with a few amendments.[332] The proposed amendments were that the granting of a degree of medicine would be notified directly to the Master and Wardens of the Apothecaries Company; any person with a diploma from either Royal College in London, Dublin or Edinburgh, or the Faculty of Physicians and Surgeons of Glasgow after 12 months clinical practice with a surgeon, apothecary or in a public hospital or dispensary would be eligible to be examined by the Master and Wardens of the Apothecaries; examination by the Apothecaries was confined to the theory and practice of physic, pharmaceutical chemistry, materia medica and botany.[333]

These amendments were not agreed, and a week later, it was reported that the Bill would not pass in that session of Parliament.[334] On the 6th July 1833, *The Lancet* reported that the Apothecaries Bill contained 'so many conflicting interests'[335] that the Committee to whom it had been referred, intended to resign their role to a Royal Commission into the matter. If the Government declined their advice, they would then recommend a Parliamentary Committee into medical reform. *The Lancet* had taken this quote from an unnamed source and declined to elucidate further on the reasons as to why the Committee members thought this way.[336]

The collapse of the Apothecaries Act Amendment Bill left the reformers dissatisfied, with the result that medical reform remained a topic for debate in Parliament, and petitioners began to call for 'An inquiry into the State of the Profession'.[337] On the 11th February 1834, Warburton proposed to the House of Commons that a Select Committee be instituted to enquire into the 'various branches of the profession'.[338] Warburton argued that the by-laws of the Royal College of Physicians led to 'variance' between fellows and licentiates, and that the by-laws disadvantaged those educated in Scotland. In the debate that followed this proposal, Mr William Gillon MP complained that 'the Apothecaries Act, as it now stood, prevented licentiates of Scotland and Ireland from practising in the Sister Kingdom'.[339] He gave the example that a registered practitioner who had qualified in Ireland or Scotland would have to undergo a five-year apprenticeship before they could practice in England. Mr Joseph Hume MP agreed with this, and said that 'he was sorry to

say, that with respect to medical science, this country [England] was in a state of barbarism as compared with France'.[340]

The suitability of the Worshipful Society of Apothecaries, referred to as the Apothecaries Company by MPs, to act as a regulatory body was also questioned in the debate in Parliament. Mr Andrew O'Dwyer MP raised concerns that the Apothecaries were not a professional organisation but were instead a trading company.[341] Warburton concluded the debate by pointing out that a licence from the Worshipful Society of Apothecaries or membership of the Royal College of Surgeons did not necessarily guarantee fitness for practice since the Army and Naval board examined candidates for commissions regardless of their memberships, as did the East India Company. He also stated that the Apothecaries Company had done 'all that men could do, under the difficult circumstances in which they were placed';[342] that is within the limitations of the 1815 Apothecaries Act. The motion to hold a Select Committee into Medical Education was agreed and a committee, chaired by Warburton, was appointed.[343]

3.2.2 Select Committee into Medical Education 1834

The Select Committee into Medical Education held in 1834, chaired by Henry Warburton, challenged the dominance of both Royal Colleges and of the Worshipful Society of Apothecaries.[344] The Committee was ordered to

> inquire into, and consider, of the Laws, Regulations and Usages regarding the Education and Practice of the various Branches of the Medical Profession in the United Kingdom.[345]

It interviewed witnesses between 13th March and 12th June 1834. The main interest of the committee was to examine representatives of the Colleges of Physicians, and of Surgeons, and of the Worshipful Society of Apothecaries, regarding the nature of medical practice and particularly the overlaps between the roles. Although midwifery was a recurrent theme, of a total of 4,447 questions asked by the Select Committee, only 134 related to midwifery. These were raised predominantly with the Surgeons, and a few questions directed at the Physicians and Apothecaries, but it was central to the discussion before the committee.[346] Despite this, the questions asked gave a clear picture of the position of midwifery.

The President of the College of Physicians, Sir Henry Halford, was only the second witness to be called to give evidence before the committee, and appeared on 18th March 1834, behind Francis Hawkins, the Royal College of Physicians Registrar. Halford answered nearly four hundred questions on a range of topics, including the inconsistency of the length, and pre-requisites, for examinations for extra-licentiates (those who practised outside London) as compared to those who practised within London, and the inclusion of midwifery as a subject for examination. He gave testimony that the 'very act of delivery is not considered as falling within the province of the Physician' but did state that candidates were examined on the diseases of women and children.[347] The use of instruments in midwifery was not discussed explicitly by Halford or others who gave testimony.

The term General Practitioner was in common parlance by that time and was used by those giving testimony to the Select Committee.[348] The practice of midwifery was essential for the financial security of general practitioners, and Sir George Guthrie, President of the Royal College of Surgeons, gave evidence to the Select Committee that midwifery was 'one of the most lucrative branches of the profession in London'.[349] The Select Committee looked at the differences between the branches of the medical profession and at the similarities and differences of their education systems. Numerous witnesses from all branches of the profession gave testimony to the changes in practice and stated that it was no longer possible to distinguish clearly between physicians, surgeons, and apothecaries. There was an increasing trend to hold the dual qualification of Membership of the Royal College of Surgeons (MRCS) and Licensure of the Worshipful Society of Apothecaries (LSA), known colloquially as 'the College and Hall',[350] and it became the standard entry route for general practice. Guthrie estimated that, of the 8,000 members of the Royal College of Surgeons who lived in England or Wales, only two hundred practised 'pure' surgery, while the rest were general practitioners.[351] Despite the inclusion of some lectures on midwifery in the curricula for surgeon-apothecaries, midwifery remained a contentious issue for those appearing before the Select Committee.

Sir Henry Halford faced questions on the exclusion of midwifery practitioners from the Council of the Physicians. Guthrie also faced questions on the exclusion of practitioners of midwifery from the Council of the Royal College of Surgeons. He voiced the opinion that, to have the depth of knowledge that was required for Fellowship of the Surgeons and membership of the Council, a practitioner must practice surgery exclusively. If the practitioner also practiced midwifery, he would not achieve this.[352] Other surgeons, including William Lawrence, James Wardrop, Joseph Henry Green and Joseph Constantine

Carpue, were also questioned on the suitability of those who practiced midwifery to stand as Council members. Sir Anthony Carlisle agreed with Guthrie's stance, and expressed the opinion that surgery was introduced into midwifery more often than was strictly necessary, and 'the less surgeons have to do with it the better'.[353]

Witnesses to the enquiry were particularly critical of the lack of inclusion of midwifery in the examinations for membership of the Royal Colleges. They argued that there were a great many physicians and surgeons, particularly those who practised in the provinces, whose practice included both surgery and midwifery. Those summoned before the Select Committee, including Sir Benjamin Collins Brodie and James Wardrop, also debated not only the existing curriculum of the Colleges, but the value of apprenticeship,[354] because in addition to attendance at lectures, apprenticeship was a requirement to be examined for the LSA.

> Guthrie was in favour of examinations in midwifery and stated that
>
> I am clearly of opinion that if any one single examination be necessary, one in midwifery is so. A man's qualifications should be as rigorously scrutinized in midwifery as in physic, surgery, or pharmacy.[355]

Guthrie stated that the Royal College of Surgeons had attempted to bring Bills on surgery before Parliament on six occasions with a clause requiring examination on midwifery, the first being in 1796. Despite this, all attempts at reform had been defeated. They had also tried to pass motions in Council to facilitate this but a minority of Council members blocked it, 'for there are some gentlemen who are very obstinate upon the subject of midwifery'.[356] In his evidence before the Select Committee, Guthrie recommended that the responsibility for examination should be handed over to the Apothecaries. Guthrie did acknowledge that there was some call for a single board of examiners comprised of physicians, surgeons, men-midwives, and apothecaries, but did not consider this to be necessary. 'I do not think it would be for the advantage either of the public or of the candidate that it should be so'.[357]

Sir Astley Cooper, member of the Court of Examiners at the Royal College of Surgeons, Sergeant-Surgeon to the King and consulting surgeon to Guy's Hospital, gave evidence that he was in favour of a board examining midwifery that was connected to the Royal College of Surgeons.[358] Sir Benjamin Collins Brodie, Council Member of the Royal College of Surgeons, and Surgeon to St Thomas's Hospital, argued that midwifery practitioners should not be eligible to be Council members of the Royal College of

Surgeons.[359] He argued that there should be a subcommittee of the General Board of Examiners, or a separate committee to examine midwifery.[360] Benjamin Travers, member of the Council of the Royal College of Surgeons and Surgeon to St. Thomas' Hospital, supported this, but went further by arguing that midwifery should be a separate entity and should have its own college.

> I do not see how, otherwise, to provide for that very important body, the accoucheurs; who, though their business belongs more strictly to surgery than to medicine or pharmacy, yet, from the great importance of their occupation, their conventional habits of study and practice, their almost exclusive practice among females, and their having separate and detached hospitals, at least in great cities, are quite worthy to be formed into a faculty or college of themselves.[361]

Not every witness concurred with these views. John Scott, a surgeon and lecturer on surgery at the London Hospital, expressed the view that all bodies should be amalgamated into one. He proposed that each branch of the profession would then examine candidates on their own speciality, with the Apothecaries examining midwifery.[362]

The report of the Select Committee into Medical Education was ordered to be published on 13 August 1834, but confined itself to giving a transcript of the evidence that had been presented by representatives of the Royal College of Physicians, Royal College of Surgeons, and the Worshipful Society of Apothecaries over three volumes. The committee did not subject the evidence to analysis, or make any recommendations. Instead they stated that they recommended that the committee be reappointed in the next session.[363] The committee was not re-appointed, and in 1835, Thomas Wakley, who by that time had been elected as the MP for Finsbury,[364] asked Warburton to bring forward a recommendation in the next session of Parliament that would put 'the profession on an entirely new footing'.[365] Warburton replied that he would have done so already but for two interruptions; the burning down of Parliament that led to the destruction of evidence and required it to be re-written from the short-hand notes, and the 'breaking up of the ministry',[366] referring to the dismissal of Viscount Melbourne as Prime Minister by King George IV, before appointing his successor, Robert Peel. Broader political events had delayed medical reform. Although the advocates for medical reform had succeeded in lobbying for a Select Committee into medical education, the old tripartite system remained in place officially, despite clear evidence presented to the Select Committee that it did not reflect the realities of practice. The campaign for medical reform continued, as did the arguments for compulsory examination on midwifery.

3.2.3 Midwifery lectures

Until 1836 with the foundation of the University of London, Cambridge and Oxford had been the only options for a university education in England.[367] One aspect of the development of the University of London that has not attracted comment in secondary sources was the inclusion of midwifery in medical education from its foundation as a part of its Charter. MP Henry Warburton, who had chaired the 1834 Select Committee into Medical Education, was among those appointed to the senate of the university. The Charter required that the university granted both bachelor degrees and doctorates in medicine, and should work 'for the improvement of medical education in all its branches, as well in medicine as in surgery, midwifery, and pharmacy'.[368] So, from its inception, the University of London was required to teach all branches of medicine, including midwifery, in direct opposition to the wishes of the Royal Colleges; and under the terms of its charter, the university placed knowledge of midwifery on an equal footing with medicine, surgery, and pharmacy.[369] Interestingly, The Lancet restricted its reporting to reproducing the Charter for the interest of its readers, but did not comment on it.

In 1837 at University College London, lectures in midwifery were delivered by the eminent obstetric physician, Dr David Daniel Davis. Davis lectured daily at 9am and a fee of £5 was charged for the terms lectures, or £7 for perpetual (unlimited) attendance at midwifery lectures. He saw patients every morning, and students were also able to attend.[370] At King's College midwifery was taught on Monday, Wednesday and Friday by Professor Robert Ferguson who charged a fee of £4 4s for lectures. Alternatively, students at King's could pay a combined fee of £57 15s for all lectures required by 'the College and the Hall', to prepare them for the examinations of both the Apothecaries, and the Surgeons, with an additional matriculation fee of £1 1s.[371] Although examination in midwifery did not form part of the LSA MRCS examinations, attendance at lectures on midwifery, with attendance on some cases, was now required.[372]

Midwifery was also taught in medical schools that were attached to many of the London hospitals, and in several private schools. Dr Francis Henry Ramsbotham taught both at the London Hospital, and at the private Grainger's Medical School in Southwark. Dr Ashwell taught at Guy's Hospital, Dr Cape at St. Thomas' Hospital, Dr Rigby at St Bartholomew's Hospital, Dr Ley at the Middlesex Hospital School, while Mr Stone and Mr Gream shared the teaching at St George's Hospital in Grosvenor Place. In addition to the

medical schools attached to hospitals, students could also attend lectures at private medical schools with Mr Walford teaching at Aldersgate Street, Dr Ryan at the North London School in Bloomsbury Square, Dr Heming at Sydenham College in Gower Street, Dr Jewel at the Little Windmill Street School, Mr North and Mr Griffith at the Westminster School in Dean Street, while students at the Hunterian School in Great Windmill Street could attend any lectures on midwifery in the neighbourhood as part of their fee.[373]

Towards the end of the 1830s, midwifery was taught at the University of London in both University College and King's College, at the medical schools that were attached to hospitals, and by private teachers around London. It is likely that this education was driven in part by the demands of practice, since for general practitioners' midwifery provided a steady source of income. Although both the Apothecaries and Surgeons had recommended that candidates presenting for examination had attended a course of lectures on midwifery, there was still no compulsion for examination of competence in midwifery.

3.2.4 Increasing pressure for Medical Reform

By 1839, despite the order for publication having been given five years before, the evidence given to the Select Committee on Medical Education had still not been published in full. Wakley questioned Lord Russell, the Home Secretary, on the point in Parliament. Russell referred him to Warburton, but Wakley pushed for the evidence to be printed 'in order that a good medical reform bill might be founded upon it'.[374] Warburton responded to say that no efforts would be spared to achieve this. Pressure for medical reform continued to grow, and in the same year, 173 petitions containing signatures of over 5,000 medical men were presented to Parliament in favour of reform, which amounted to approximately 1/3 of medical practitioners calling for change.[375] Medical reform began in earnest, with a private member's Bill being presented to Parliament in August 1840. The Bill was defeated, as were several other private members' Bills in quick succession.

The move for medical reform put pressure on the Royal College of Surgeons to reform themselves before the government forced change upon them. The Surgeons wanted to implement a system of fellowship, or recognition, of experienced teachers and practitioners. That meant that the terms of their charter needed to be re-negotiated with the Home Secretary, Sir James Graham,[376] on behalf of the government. Graham 'suggested' that the College consider changing its name from the College of Surgeons of

London, to the Royal College of Surgeons of England, as part of this negotiation, but made it clear that there was little choice in the matter.[377] Finally, from 1843, the Surgeons were a national body, rather than their official remit being London.

In August 1844, the first medical reform Bill was sponsored by the Government and presented to Parliament by Sir James Graham. The Bill was criticized by Wakley among others who argued that the Government were not listening to most of the medical profession.[378] He introduced his own medical reform Bill in April 1847 in which he proposed a medical register that contained a list of all medical practitioners irrespective of whether they were physicians, surgeons, or apothecaries. This proposal would have legally ended the traditional structure of a tripartite system that had become outmoded in practice by the emergence of general practitioners who combined medicine, surgery, physic, and midwifery. Unsurprisingly, the Royal Colleges of Physicians and of Surgeons, both petitioned strongly against Wakley's Bill, and Wakley eventually withdrew it.[379] But before agreeing to withdraw his Bill, he secured the establishment of a Select Committee on Medical Regulation in May 1847.[380]

The Select Committee was chaired by Mr Thomas Macaulay, and committee members included Thomas Wakley, and former Home Secretary Sir James Graham. Wakley's knowledge on medical reform was evident throughout the committee's questioning, and it exposed many of the flaws in the old tripartite system.[381] The committee was re-appointed in 1848 with a new Chair since Macaulay had lost his parliamentary seat, and the Lord Advocate of Scotland, Lord Rutherford took his place.[382] In the testimony given to the Select Committee, there was no longer any suggestion that midwifery should be incorporated separately as had been seen in 1834. Despite an increase in the places available that offered midwifery education, midwifery was not now being discussed as a separate entity, but rather as part of general practice. The cause of the man-midwife had been subsumed into the cause of the general practitioner, meanwhile the elite men-midwives were being absorbed into the Royal College of Physicians, as I will discuss further in Section 3.3.2.

The Select Committee, again, did not lead to action. As a result of the complex relationships between the Colleges of Physicians and of Surgeons, the Apothecaries, and various groups calling for reform, it was over five years before attempts at reform legislation were renewed.[383] On 3rd July 1853, Lord Dudley Stuart raised a question in the Commons, and asked whether the government had any intention 'for the better regulation of the laws relating to the profession of physic and

surgery'.[384] The Home Secretary Lord Palmerston replied that the matter was extremely complicated, and that he had 'no hopes of being able to bring forward a measure which would embrace the whole subject this year'.[385]

Between 1854 and 1856, several private members' medical reform Bills once again appeared before Parliament, and remained the subject of much debate, some competing against each other. In 1856, the lack of agreement led to the appointment of yet another Select Committee on the subject led by the President of the Board of Health, Mr Cowper.[386] The outcome of the committee was increased agreement, and they went on to draft a Bill on medical reform. That Bill did not gain assent in Parliament, but it was becoming inevitable that medical reform would eventually succeed.

In 1856, the Royal College of Physicians drafted a resolution that prepared them to work under the auspices of the impending medical act. They proposed that the Surgeons would examine surgery, the Physicians would examine medicine, and joint representatives from the Physicians, Surgeons, and Apothecaries would examine midwifery. They proposed that midwifery examinations be conducted the Royal College of Surgeons by a conjoint board with representatives from the Physicians and Apothecaries having an equal voice on the examination board.[387] So, at this point the Physicians had accepted that the future education would include elements of midwifery as well as medicine and surgery, but did not consider it to be a separate speciality.

3.3 Medical regulation and midwifery practice

3.3.1 Medical Act 1858

After the failure of fourteen reform Bills, the drive for medical reform culminated in the passage of the Medical Act on the 2nd August 1858.[388] By that time, all parties had accepted the registration of practitioners on a central register, but debate centred around whether there would continue to be separate grades of practitioners or whether they would be amalgamated into one group.[389] The demands of the general practitioners can be summarised as; political representation, education, and registration.[390] There were no separate demands by that time for midwifery. By that stage the reformers appeared content to agree a compromise, rather than a revolution.

The 1858 Medical Act established the General Council of Medical Education and Registration,[391] which was later shortened to the General Medical Council (GMC). The GMC was answerable to the Privy Council rather than the government.[392] Representatives to the GMC were nominated from each of the licensing bodies: Colleges, Halls, and Universities, and included representatives from England, Scotland, and Ireland. In addition, the Crown nominated six representatives: four from England, one from Scotland, and one from Ireland.[393] General practitioners were not given the direct representation on the General Medical Council that they had petitioned for.

As well as establishing the Council of representatives of the licensing bodies, the Act required the GMC to maintain one common register of all medical practitioners, rather than one with the separate grades of practitioners, physicians, surgeons, and apothecaries, that had been recognised prior to the Act. This was a success for the reformers, since it ended the varying degrees of status between grades of practitioners. During the committee stages of the Bill the Royal Colleges exerted significant influence on the government and managed to reduce some of the impact of education reform for medical practitioners.[394] The Act gave no requirement for practitioners to be examined in both medicine and surgery, and a requirement for a midwifery education was not included either. If reformers had campaigned for political representation, education, and registration, they only succeeded in achieving registration.

The Act received a muted welcome, but most reformers considered it to be a satisfactory beginning.[395] *The Lancet* summarised the sections of the Act, writing that the Act

> provides for reciprocity of practice, and gives to every man who has qualified in any part of the kingdom, the right of practice in every other. It enjoins a system of registration of the whole profession of England, Ireland, and Scotland, not in classes, but according to an alphabetical arrangement; and is, in this respect, an approximation to the one-faculty system. It also enacts that no man shall practice medicine or surgery, except under heavy penalties, unless his name shall be contained in the Medical Register, which is to be corrected to the 1st of January in every year.[396]

So, although the 1858 Medical Act did not meet all the reformers' demands, it did successfully establish a national register of medical practitioners for the first time, that applied to all medical practitioners in England, Wales, Scotland, and Ireland. It was perhaps the shortcomings of the act that led to the formation of the Obstetrical Society in the same year.

3.3.2 The Obstetrical Society

Barely four months after the Medical Act was passed, the *Obstetrical Society of London* was established, to ensure that midwifery remained on the political agenda despite being divided into general practice, and a small number of elite practitioners. The Obstetrical Society was distinct from the *Obstetric Society* that had been formed in 1826. The inaugural meeting was held on Thursday 16th December 1858 in the Freemasons Tavern.

They stated that,

> … all legally-qualified medical practitioners shall be eligible for election as ordinary Fellows of the Society.[397]

From the outset, the Obstetrical Society set out to be a more inclusive organisation than the Royal Colleges. The group was open both to those who worked both in London and to their provincial colleagues, and anyone who was a legally qualified practitioner was eligible to join. Sir Charles Locock was elected as Honorary President, with Edward Rigby as President and ten Vice Presidents; all of whom were specialist rather than general practitioners.[398] The aims of the Obstetrical Society were twofold. Firstly, they detailed that

> that it is expedient to institute a Society for the promotion of knowledge in all that relates to obstetrics and the diseases of women and children, in which practitioners resident in the metropolis and the provinces shall be invited to take an active part.[399]

They aimed to share knowledge and experience to improve outcomes for women and children. Secondly, they agreed to continue the work of the earlier Obstetric Society to campaign for political change where they saw the need to do so.[400] In their inaugural meeting, the lack of education for female midwives was identified as a pressing need of the society.[401] Despite this, they acted predominantly as a professional society and avoided political campaigning for the first decade. The cause of midwifery education had drifted out of focus in the preceding twenty or so years, perhaps displaced by other demands or undermined by the gap that had developed between the general and elite practitioners. The founding of the Obstetrical Society, evidently precipitated by the Medical Act, might look like a revival of interest in that cause, but, as I will discuss in the next section, the Society took ten years to rouse itself in that direction. Most of the reports on Obstetrical Society meetings consisted solely of case studies and clinical reports.[402]

3.3.3 Renewed calls for compulsory midwifery examination

One of the hopes of those who negotiated the passage of the Medical Act of 1858, had been that some form of conjoint examination would be developed so that candidates would have to demonstrate competence in both surgery and medicine, although this had not been made compulsory under the terms of the Act.[403] The Royal College of Surgeons approached the Royal College of Physicians to begin negotiations for a joint examination in 1859, a year after the Act. It was proposed that the Physicians should examine medicine, while the Surgeons were to examine surgery and midwifery. Unfortunately, the Surgeons objected to some of the terms of the Physicians, and the proposal did not proceed.[404]

In 1861, the General Council of Medical Education and Regulation issued recommendations on medical education. Students were not admitted to the Register of Students without proving that they had graduated with a certain level of general education. A Degree in the Arts from any UK University (or one from the 'Colonies'), or by the Oxford or Cambridge 'Middle Class Examinations' would meet these requirements.[405] The certificate of general education needed to include proficiency in Latin. Students needed to have completed at least four years of medical education before they could register with the General Council, and needed to be at least twenty-one years old.[406]

Since the failure of the proposal for a conjoint examination scheme several years before, the Royal College of Surgeons had left itself open to continued criticism that the MRCS did not prepare general practitioners for practice. A small measure of progress was made in March 1868, the Council of the Royal College of Surgeons agreed in principle that midwifery should form part of the membership examination of the College. Regulations were drawn up in April that were to be enforced from October the following year.[407] Although this was a measure of progress, since the examination of the Royal College of Surgeons was still accepted as desirable for medical men who wished to become general practitioners, there remained no compulsory element of midwifery education since alternative routes to registration with the GMC existed.

In the same year, 1868, the General Medical Council ordered a review of midwifery teaching, although it is unclear what prompted this. They asked representatives from the medical schools in London to investigate the matter.[408] They informed Mr James Syme,[409] the Chairman of the Committee on Medical Education to the General Medical Council, of their findings, and their recommendations were reported in *The Lancet.* The lecturers

emphasised the importance of a sound knowledge of midwifery and the value that the public placed upon it.

> … it is of paramount importance to the comfort and success of the young practitioner to possess sound theoretical and clinical training in it [the lecturers] are unanimously of opinion that the actual means of study, and the share devoted to it in the present curriculum, are insufficient.[410]

The lecturers recommended that every hospital had at least one, if not two obstetric physicians to facilitate better clinical teaching. They also recommended that pupils attend at least two courses of lectures, one on midwifery, and one on the diseases of women and children. Finally, their recommendation was that all pupils attend at least twenty cases.[411] The GMC did not act on these recommendations.

The General Medical Council had been established under the terms of the Medical Act to administer the register of medical practitioners, although there were, in fact, nineteen bodies that offered examinations that could lead to registration with the GMC.[412] These included the Royal College of Physicians and the Royal College of Surgeons, as well as their counterparts in Glasgow, Edinburgh, and Dublin, and the Worshipful Society of Apothecaries. The problem with such diversity was that it gave the potential for candidates to qualify in one or other branches of medicine, yet be eligible to practice in any other branch, without having to demonstrate a minimum standard of knowledge across all branches of medicine.

The Obstetrical Society began to increase their political activity after this time, perhaps prompted into action by the GMC review of 1868. They used the influence that their growing status and increasing number of members gave them to petition to raise the profile of midwifery as a separate entity to general practice. [413] On the 11th May 1869, a delegation from the Obstetrical Society petitioned the Home Secretary, Henry Bruce, to highlight the 'want of adequate medical representation in that body [i.e. the GMC] of obstetric medicine'.[414] The GMC consisted of seventeen members appointed to represent the licensing bodies and the Crown, but since the Colleges excluded those who practised midwifery from positions on their Councils, the result was that no member of the GMC taught or practised obstetrics. The delegation argued that the education and regulation of midwives, the development of obstetric science, and the regulation of obstetric practice were 'of undeniable importance to the public interest'.[415] Bruce agreed with the delegation that the matter was important, and assured them that he would give it his 'best

consideration',[416] although no changes were made to the constitution of the GMC because of the delegation.

Medical reformers had started to introduce Bills to Parliament to attempt to reform the Medical Act. One of the first of many such Bills to attempt to reform was recommended to Parliament in 1870 by Earl De Gray and Ripon,[417] but between 1870 and 1881 there were twenty Bills presented to Parliament with the aim of reform but none of these passed into law.[418] In addition to the debate in Parliament, the General Medical Council regularly debated the topic of midwifery. In 1880, the Council considered whether a special case regarding minimum specified time for attendance on lectures should be instituted, since by that time the GMC had instituted a sub-committee on Ophthalmology and Midwifery in recognition of the growing specialities. The Obstetrical Society petitioned this committee regarding the issue of a recommended number of hours attendance at lectures. The Committee presented their thoughts on the petition to the General Medical Council (GMC) detailing the differences in the requirements of midwifery education between the licensing bodies, but since the Council had not recommended a set amount of study for any other subject, they did not advise that the council 'follow an exceptional course with regard to Midwifery'.[419] After this setback, the appeared to reduce its political activities again.

There were several on the council who disagreed with this approach and argued that midwifery regulation was needed. Dr Haughton asked the council to follow the University of Dublin's approach to midwifery teaching, that required pupils to undertake a six-month long course of lectures, with six months' attendance on midwifery cases; each student was to personally attend no less than thirty cases. Dr Macnamara seconded Haughton's proposal and argued that there 'should be a special examination in a subject of such importance'.[420] The motion was put to a vote of the council, but they did not pass the motion, so there was still no specific number of lectures that a student was required to attend, nor a minimum amount of clinical experience necessary for midwifery, or any other branch of medical practice.

The move towards a single examination for entry to the register that covered both medicine and surgery had continued sporadically since 1859, but it proved impossible for the numerous medical bodies to reach agreement. By 1880, the Royal College of Physicians and Royal College of Surgeons agreed to begin again to explore a 'conjoint scheme' even if the other licensing bodies did not join them. Unfortunately, an agreement that they had

made in 1877 prohibited the Physicians from continuing this, so further negotiations on the scheme could not continue for another two years, but by 1882 work began again on a joint examination.[421]

In March 1883, the Surgeons drew up a plan for the conjoint examination that was accepted by the Physicians the following month. They had proposed a joint management committee of six members; three from each College, none of whom were to be examiners. The examiners were appointed from each College. It was proposed that candidates undertake three examinations that examined chemistry, chemical physics, materia medica, medical botany, pharmacy, anatomy, physiology, medicine, surgery, midwifery, and forensic medicine.[422] So, although the Surgeons had examined on midwifery since 1868, this proposal would have widened the number of students being examined in midwifery. Unfortunately, there was still no element of compulsion.

By March the following year, the scheme for conjoint examination had progressed enough to allow the Council of the Surgeons to formally request permission from the GMC to implement the scheme. It was delayed due to a Bill on Medical Reform that was before Parliament, but when that Bill failed, permission was granted to implement the examination in October 1884. The first examinations began in January 1885.[423] To be registered as a medical practitioner by the GMC, candidates could undertake the joint examination of the Royal College of Physicians and Royal College of Surgeons, the LRCP MRCS which meant that they had successfully passed a series of examinations that incorporated midwifery, medicine, and surgery. Regrettably, this was not compulsory and there was still the option for practitioners to undertake cheaper alternatives to the conjoint examination of the Colleges, and be examined in only a single branch of medicine. The need for compulsory midwifery training was by now even greater than it had been at the beginning of the nineteenth century, yet nothing had been done to bring it about. In this respect, not only was the Medical Act a failure but so too were the reforming moves that followed it in the next three decades.

3.3.4 Medical Act Amendment Act 1886

The original demands of reformers in the first half of the nineteenth century had been political representation, education, and registration[424] for general practitioners of medicine, surgery, pharmacy and midwifery, but the 1858 Act had provided only registration. Finally, with the passage of the 1886 Medical Act Amendment Act, the

demand of the reformers for representation and education were granted. At last, after nearly a century of campaign for medical reform, midwifery had become a compulsory element of the medical education for all medical practitioners. The 1886 Medical Act Amendment Act extended the remit of its predecessor and specified which elements of education were compulsory. Doctors were finally required by law, to be examined for all areas of practice: medicine, surgery, and midwifery.[425] In addition to the requirement for examination, the General Medical Council was given responsibility for monitoring the quality of these examinations. If they found it to be substandard it was to be reported to the Privy Council who had the power to revoke the power of the organisation to administer examinations.[426]

Furthermore, the Amendment Act made provision for directly elected members of the medical profession to join representatives from the Medial Corporations, Universities, and Government nominees, on the General Medical Council; three who were resident in England, one who was resident in Scotland, one who was resident in Ireland.[427] They had to be registered medical practitioners and were eligible for election for a five-year term. Since most of the medical profession, was by that time working as general practitioners combining all elements of medicine, including midwifery, some political representation had finally been achieved.

3.3.5 The impact of medical education and reform on male practice of midwifery

This chapter has argued that the move towards a single medical profession made gradual progress over the nineteenth century, despite huge opposition from the Royal Colleges of Physicians and Surgeons. The passage of the 1886 Medical Act Amendment Act meant that the medical profession finally had nationally agreed legal standards for the content of education for medical men that included midwifery. It had also resulted in general practitioner representation on the governing council, the GMC. The passage of the Medical Act Amendment Act, led to increasingly stringent requirements on the level of knowledge required to pass the examinations that led to registration.[428] Nevertheless, it ensured that midwifery practice was taught and examined for every doctor. The convergence of separate professional groups in to one recognisable medical profession allowed the single relevant social group[429] of doctors to emerge, along with a shared professional identity. Nevertheless, doctors did start to subdivide again with emerging branches of specialities. There were doctors who specialised in midwifery, known as obstetricians towards the end

of the century,[430] although there also remained a large proportion of doctors who practised as general practitioners and combined midwifery with other elements of practice.

Although the story of men-midwives during the nineteenth century has hitherto been subsumed into the historiography of general practitioners, it deserves to be told as a distinct story. This chapter has illuminated lost elements of that story, including calls for a separate College for Midwifery at the beginning of the nineteenth century. The campaign for the education and regulation of men-midwives during the nineteenth century facilitated the development of a professional group, and it is this context which is essential to understand the changing use of the vectis as a piece of technology.[431] The second half of this thesis will argue that the changes in medical education and regulation had unintended consequences, and those directly affected the ability of lecturers to teach the use of instruments such as the vectis that required significant clinical skill and manual dexterity. The next chapter of this thesis will explore how these changes in medical education affected the education and practice of male practitioners, and will use two practitioners as case studies to examine the impact of these changes on their use of the vectis.

Chapter 4: The clinical use of the vectis

The previous chapter argued that the importance of midwifery was increasingly recognised during the nineteenth century as an integral part of medical practice, but it was not until the Medical Act Amendment Act of 1886 that all doctors in England were compulsorily educated and examined in midwifery. In this chapter, the use of the vectis will be set against that changing landscape of regulation and education during the late eighteenth and nineteenth centuries. Two case studies will be used to illustrate changes in education, and the subsequent impact on the clinical use of the vectis. I have chosen to examine the first man, and the last man, to write about the vectis in midwifery treatises; Thomas Denman and Alfred Lewis Galabin. They practised at the beginning, and end, of the nineteenth century, and their education and clinical practice will be compared and contrasted. Since there were diverse and flexible ways in which the vectis was used during the nineteenth century, discussion will be supplemented with examples of other practitioners. This chapter will argue that there was an emerging consensus view during the latter half of the nineteenth century that resulted in stabilisation of use of the vectis that was an unintended consequence of the changes in education of practitioners following regulatory changes. Practitioners came to agree that the vectis was most useful for a very specific function that allowed rotation of the baby into a more favourable position for delivery.

The descriptions of the use of the vectis in this chapter will be illustrated by diagrams of the placement of the position of the vectis, relative to the position of the pelvis and fetal head. Many original sources did not contain drawings or illustrations to explain the use of instruments more clearly to the reader. It was likely that this was due to the prohibitive cost of such illustrations at the time. The drawings in this chapter are original. They were developed as a personal visual aid during research, and later refined as a mechanism to enhance the more complex technical descriptions for the reader.

As some of the descriptions in this chapter involve some technical understanding of the mechanisms of birth, it is worth pausing to understand the usual process by which a baby is delivered. A normal female pelvis has different diameters at the top, middle and bottom; it is not simply a cylindrical tube that the baby passes through. It has a wide transverse diameter at the top, while at the bottom, the pelvis is wider in the anterior-

posterior diameter. Since the pelvis is widest in the transverse diameter where the baby enters, the baby enters the pelvis sideways, and as it descends through the pelvis the head of the baby flexes (moves into an attitude of flexion), and the occiput rotates forward towards the maternal symphysis pubis. Instead of the baby being sideways, the baby will have rotated so that it's face is looking towards the mothers back. This process is aided my uterine contractions and some movement in the joints of the pelvis which have been softened by the hormones of pregnancy. A combination of uterine contractions and maternal effort moves the baby through the pelvis.

This process happens spontaneously for most births, but is occasionally interrupted by an issue with either the power or efficacy of the contractions or the shape of the pelvis. Uterine inertia, whereby contractions cease, can occur if the mother has been in labour for a very long time and has become very tired. Contractions can also become irregular or uncoordinated if the baby is not in the correct position. Cephalopelvic disproportion can occur if the baby is too big to navigate the mother's pelvis; either because the baby is very large or the mother's pelvis is misshapen or small due to diseases such as rickets. The birth of a baby cannot be simply reduced to the need for mechanical power to push (or pull) a baby from its mother.

4.1 Thomas Denman

4.1.1 Denman's medical education and midwifery practice

Following education at his local free school, and an introductory medical education from his father and elder brother Joseph who were apothecaries, Thomas Denman moved to London in September 1754, when he was twenty-one, intending to attend St. George's Hospital.[432] At the time, there was no medical school attached to the hospital, and students learned by observing the physicians and surgeons as they saw patients on the wards. One advantage of attending St George's, was that the eminent William Hunter made his lectures on surgery free,[433] so Denman would have been able to attend these. It was while he was at St George's that he met his friend, and later colleague, William Osborn.[434]

Life in London was expensive, and by early 1755, only six months after moving to London, Denman had spent all the money he had brought with him to subsidise his

training. He avoided returning home in disgrace by applying to become a surgeon's mate in the Royal Navy, where he learned the role of a surgeon, treating battle wounds during wartime. In practice, the role was a combination of surgeon and apothecary, as the surgeons treated the general ailments of the crew during peacetime in addition to injuries during wartime. Denman earned promotion to the position of surgeon by early 1757.[435] After leaving the Navy, Denman returned to London to attend lectures in anatomy and midwifery, as well as dissections, although in his autobiography he stated neither where those lectures were held, nor who delivered them. It was highly unusual for Denman not to record this information since most practitioners documented the name of their teachers in order to verify the quality of their education.[436] It is most likely that Denman chose to return to his former teacher, and attended lectures by William Hunter.[437] Although Hunter was strongly against intervention, he was a forceps practitioner and gave detailed instructions on how to use the instrument during his lectures, so it is likely that Denman received instruction in the use of the forceps during those lectures.[438]

Denman was awarded the qualification of Doctor of Medicine, an MD, from the University of Aberdeen in July 1764 only a year after he had returned to London,[439] but he would not have had time to attend a complete medical degree in Scotland, since that usually took four years and he was known to be in London the year before. Fortunately for Denman, at the time, both St. Andrews University, and Aberdeen University, in Scotland, offered postal medical degrees. These were granted on the written recommendation of fellow medical practitioner, and payment of a fee.[440] Denman took advantage of this: he provided proof of his competence from the practical clinical experience that he had gained in the Navy and his attendance at courses of lectures. He gained the recommendation of Dr Kelly and Dr Kirkpatrick as his two referees, and paid his fee to complete the process.[441] Denman chose to gain a medical degree, although there was no requirement him to do so. For the ambitious Denman, it is likely that he did this as the title of doctor gave his position gravitas, since university graduates and members of the prestigious College of Physicians used the term. This would have been particularly important as membership of the Colleges of Physicians and of Surgeons was to be denied to him in the early part of his career due to his chosen specialism of midwifery.[442]

Denman was concerned with earning a good income, probably because he did not wish to repeat the experience of being penniless, as he had been in his early twenties. Denman measured success in terms of financial turnover from his clinical practice, and he strove to build a sufficiently successful business to allow him to live comfortably. When he

struggled to do this, he briefly considered returning to sea but was unable to secure a commission. Denman reminisced that

> thinking my chance in midwifery the most promising, I published my essay on Puerperal fever, which I believe gained me some credit, and procured me some business.[443]

He sought to capitalise on this improvement in his reputation, and this subsequently increased his clinical practice, and thereby the income that was gained from it and a commensurate increased record of publication.[444] Therefore, it appeared to be financial motives and the desire for recognition that persuaded Denman to specialise in midwifery, rather than a passion for the subject and work.[445] Midwifery was a specialism that would afford Denman many opportunities, and by the end of his career, he had built his reputation to such an extent that he became the leading male practitioner who 'dominated London midwifery in the Regency period'.[446] Despite learning how to use the forceps during his initial education, Denman would go on to become a leading advocate for the use of the vectis. In the next section I will discuss how the transition in preference and practice occurred.

4.1.2 Denman's conversion to the use of the vectis

During the time that Denman was being educated and building his reputation, the only midwifery instrument to allow delivery of a live baby that was discussed in print was the forceps. Denman's practice reflected this, and he used and modified the forceps, as was common practice.[447] During this section, I will demonstrate that during the early part of his career, Denman used the forceps in his practice, and seemed not to be aware of the vectis. His conversion to a preference for, and later strong advocacy for, the vectis was a gradual process that took place over many years.

In 1769, Denman and his friend and colleague, William Osborn, purchased some midwifery teaching apparatus for £120, following the death of Dr Cooper, the man-midwife at the Middlesex Hospital.[448] They began to use the equipment they had purchased and started providing lectures in midwifery at Denman's home in Oxendon Street, Leicester Fields, at nine in the morning, on the 21st May 1770.[449] Since at the time, there were limited hospitals with co-located medical schools,[450] private lectures, such as those offered by Hunter, and Denman and Osborn, were a standard way of gaining medical

education for aspiring medical practitioners, and provided a lucrative source of income for the teachers.[451] Denman appeared to use the forceps, and be unaware of the vectis before 1774.[452] Despite his preference for the forceps,[453] it is probable that Denman had had the opportunity to observe the vectis in use in clinical practice during the middle years of the 1770s, because in 1776, Denman acknowledged the existence of both the vectis and fillet as Chamberlen instruments in a lecture, although he did not discuss the use of the vectis further at that time.[454]

Whilst giving a lecture just two years later in 1778, Denman named Dr Cowper, Dr Lord, Dr Jonathan (John) Wathen, and Dr Thomas Cogan to be 'eminent men'[455] who, he said, only used the vectis, and never the forceps. Denman had observed Wathen using the vectis on numerous occasions, and later described him as

> a man of great ingenuity and most pleasing manners, who reduced the size of the vectis, and frequently used it with a dexterity that has astonished me.[456]

Student, Francis Kingston,[457] documented the discussion in the lecture room where Denman expressed concerns that some practitioners used the vectis with great force. He concluded his lecture by advising the use of the forceps, rather than the vectis, because since students could not be certain about the action of the vectis, and the instrument 'hurt the mother or child by the force and quickness that is used'.[458] Even though he advised his students not to use it, Denman was actively contemplating the mechanism of action of the forceps and comparing this to the action of the vectis. Kingston wrote that

> Dr Den[man] says [...] the woman is delivered by the anterior blade and the posterior blade only guides the other.[459]

This means that Denman was questioning whether the second blade was a necessary part of the action of the forceps. So, although he still recommended the use of the forceps, Denman was open to new ideas, and willing to consider alternatives in his clinical practice.

Denman's 1778 lectures are likely to have mirrored his clinical practice at the time, since he used the experience that he gained in practice to inform his teaching. That allowed him to debate the benefits and disadvantages of both the forceps and vectis, even though he concluded that the forceps were a superior instrument to both the vectis and fillet in practice. [460] Osborn did not share Denman's experimentation with the vectis, and during lectures, recommended that students read 'Dr Denman's excellent little pamphlet entitled Directions for the application of the forceps'.[461]

Dr Denman's 'excellent little pamphlet' published in 1780 was the forerunner of his publication 'Aphorisms on the use of the forceps'.[462] These aphorisms consisted of two parts; *Aphorisms respecting the distinction and management of preternatural presentations* followed by *Directions for the application of the forceps.*[463] This publication would have easily fitted in a coat pocket, measuring approximately six inches by four inches with a hard cover. Very few copies of this pamphlet remain in libraries, and this makes it possible that they were not printed in large numbers, although considering the large number of students Denman and Osborn taught, it is a more likely situation that the copies that were printed were well used. Since they were not kept in mint condition, they could not be donated to libraries later. The success of the leaflet was likely to have encouraged Denman to further develop his publication record.

By 1780, despite publishing his pamphlet on the forceps, Denman had not only observed the use of the vectis but had also started to experiment with it in his own clinical practice. This was a key turning point in his conversion from recommending the forceps, to his later position as the leading advocate for the vectis. During lectures given that year, Denman described how to use the vectis,[464] and entreated the students to take care not to put too much pressure on the 'soft parts' (labia and perineum) of the mother.[465] Denman also recognised that using the vectis could stimulate the uterus to contract where there had previously been uterine inertia, or even complete cessation of uterine contractions. Despite this, Denman gave no hint of his practice with the vectis in work published that year, and continued to give instruction about how to use the forceps.[466]

In 1782, Denman again described the use of the vectis in his lectures, and said that several practitioners in London preferred to use the vectis rather than the forceps.[467] Denman described the use of both the forceps and vectis. The unknown student who took notes during the lecture concluded his entry for the use of instruments by stating that

> Dr D[enman] do[es] not care which instrument you use so [long as you] do not hurt the mother.[468]

So, Denman was open to the use of both the vectis, and the forceps in his lectures and in clinical practice, but he remained cautious about discussing the use of the vectis in his published works.

A year later, in 1783 Denman expanded upon the 'excellent little pamphlet' that he had written for his students on the use of the forceps,[469] and produced the first edition of

his *Aphorisms on the applications and use of the forceps* that was aimed at both practitioners and students. These *Aphorisms* gave Denman his first taste of success from his published works; and they went on to be published in many editions both in England and abroad. In these 1783 *Aphorisms,* Denman named the vectis as an instrument that could be used in obstructed labour, but described only the benefits, and use, of the forceps, not the vectis, in any detail. This was the first mention of the vectis in a book printed in English. Although Denman discussed the vectis during his lectures, was using it in clinical practice, and was willing to teach his students how to use it, he was not yet ready to commit instruction on the use of the vectis to print. Denman discussed the more widely known instrument, the forceps, instead.

In 1783, Denman and Osborn resumed lectures in Denman's property in Queen Street, Golden Square. Until that time, Denman and Osborn had lectured at Denman's house: first Oxendon Street, then in Queen Street, Golden Square,[470] but in January 1781, a fire in Denman's neighbour's house had badly damaged his own house[471] and their lectures temporarily moved to Leicester Street,[472] while Denman, and his family, moved to live in Old-Burlington Street.[473] Although the house had suffered severe fire damage, Denman rebuilt it, but for the first time since the pair had begun to lecture, the lecture rooms remained separated from Denman's house. Denman and Osborn were prosperous enough to maintain the cost of separate homes and lecture rooms.[474]

Any high-profile business that Denman developed could only hope to compete with the established and high-profile clinical practice of William Hunter which centred around the west end of London. Hunter's clientele included members of the aristocracy such as Lady Ossory, and the Earl of Sandwich,[475] and he combined his fashionable practice with a successful teaching business at his premises on Great Windmill Street. Hunter continued to lecture until his death on 30th March 1783.[476] After Hunter's death, Denman took over the care of some of Hunter's fashionable clientele, including Georgiana Cavendish, the Duchess of Devonshire. The Duchess was a close advisor to the Prince of Wales and the centre of fashionable London society.[477] Denman acted as accoucheur to the Duchess, although he was not appointed as physician to that family, with Dr Ford being appointed instead.[478] Denman looked after the Duchess during the delivery of her daughter on the 12th July 1783,[479] and was booked to attend her second confinement two years later[480] where she was delivered of a second daughter.[481] That same year Denman resigned his post at the Middlesex Hospital to concentrate on his increasingly high-profile private business.[482]

With Denman's increasing reputation and thriving practice, Denman and Osborn needed help with their teaching business and so incorporated their former student,[483] Mr John Clarke[484] of Chancery Lane, surgeon, and man-midwife, in their teaching business from 1785. Prospective applicants for lectures could apply for a place to Denman, Osborn, or to Clarke.[485] Over the next year, Clarke continued in this role while Denman gradually withdrew from lecturing. On 16th March 1786, Osborn began to give lectures without Denman,[486] but with continued support from Clarke.[487] During the sixteen years when Denman and Osborn gave lectures together between May 1770 and January 1886, they advertised 177 times and gave 89 courses of lectures on Midwifery. Even if these courses ran with a minimum of ten students, during their time together, Denman and Osborn would have taught a minimum of nine hundred students - a massive number of protégés, and a similar number to William Smellie in the 1740s.

Even though Denman had stopped teaching with Osborn, this appears to have been an amicable and planned arrangement with Osborn. Their friendship remained intact after many years of working together, and in the first of many editions of his bestselling book *An Introduction to the Practice of Midwifery,* that was published in 1788, Denman addressed the dedication to Osborn saying

> I beg you will accept this first volume of my introduction to the practice of midwifery, as a proof of the very affectionate regard I have ever entertained for you; which, as it began with our first studies, may, I earnestly wish, remain uninterrupted to the end of our lives.
>
> I am, DEAR SIR, Your very faithful, affectionate, and most humble servant[488]

Denman regarded Osborn as a friend still, and appeared confident that their relationship would continue as such for many years.

4.1.3 The vectis described in print

Although Denman had come to use the vectis in his clinical practice, and had named the instrument in print, he had not yet described the instrument or its use in his printed works. As his preference for the instrument grew, he started to discuss the instrument in his books. In 1790, four years after he left his partnership with Osborn, Denman published the second part of his book *An Essay on difficult labours.*[489] Section VIII of his *Essay*, entitled 'on the vectis', contained a history of the vectis. Denman suspected that it should be

attributed to the Chamberlen family, but had no proof of this, and discussed the clinical use of the vectis by Dutch practitioners. In subsequent sections of the essay, Denman described different forms of the vectis comparing the English vectis and Dutch lever.

An Essay on difficult labours, was the first printed work in which Denman had detailed his thoughts about the advantages of using the vectis. After describing the history of the vectis, Denman stated that

> At the present time, all who are engaged in the practice of midwifery would consider themselves as deficient, if they were not acquainted with the structure and manner of using the vectis; and some who, from education or habit, continue to use the forceps, are very willing to allow the equal, if not superior, value of the vectis.[490]

Denman was starting to display the passion for the vectis for which he later became renowned.

In the first physical description of the vectis in a book published in England, Denman described the instrument that was being used by Wathen and others, as having had the following dimensions:

> The whole length of the instrument, before it is curved, is twelve inches and a half.
> The length of the blade, before it is curved is seven inches and a half.
> The length of the blade, when curved, is six inches and a half.
> The widest part of the blade is one inch and three quarters.
> The weight of the vectis is six ounces and a half.
> The handle is fixed in wood.[491]

Denman omitted some key details that would have enabled reader of his book to build a replica of his vectis. For example, he did not identify whether the blade was fenestrated or not, and the type of materials that had been used to make the instrument, although he did give some clues with the phrase ‘a single blade of the forceps might, in many cases, be used not inconveniently, instead of any other vectis’.[492]

This implied that the vectis was made of similar materials, and was fenestrated, as were the types of forceps that were widely used, such as those designed by Smellie. It is therefore reasonable to assume that Denman's vectis was a spoon-like fenestrated instrument with a graduated width, rather than the solid lever that Roonhuysen had used in Holland. A vectis with similar dimensions is stored in the collection of the Thackray Museum. It was manufactured in 1820 by an unknown maker, and was made from carbon

steel, with a lignum vitae handle, over thirty years after Denman published his description. So, unlike the forceps, that was altered regularly by practitioners, the vectis remained virtually unchanged from Denman's description in 1790.

Figure 16: Vectis 180403 (temp) - Image from the collection of the Thackray Museum photographed by L. Jenkins with permission

Figure 17: Vectis 180403 (temp) – Image from the collection of the Thackray Museum photographed by L. Jenkins with permission

4.1.4 Deterioration of Denman's relationship with Osborn

In the second part of his book *Essay on difficult labours*, published in 1790, Denman not only described how to use the vectis, but outlined a comparison of the advantages and disadvantages of the forceps and the vectis, which he had not done three years earlier. He concluded these by saying

> it may be presumed, that the vectis, prudently used, is, in every case, an equally safe and efficacious instrument with the forceps and a better adapted instrument in many cases which occur in practice. It is with this persuasion that several

> teachers of the art of midwifery in London, at the present time, never use the forceps, or speak of them in their lectures.[493]

He did not expand on this statement further, and the inference was that the vectis was the superior instrument, and many unnamed teachers agreed with him. It became clear that Osborn did not agree with this assessment of the situation. Over the next few years, he felt compelled to engage in a dispute with Denman through his own published works. It is probable that they had had this disagreement in private over many years, but it became public thanks to the publication of Osborn's work. In the introduction to *Essays on the Practice of Midwifery in Natural and Difficult labours,*[494] Osborn took the opportunity to refute the advocacy that Denman had displayed in the second part of his *Essay on Difficult Labours.*[495]

On the second page of the preface of *Essays on the Practice of Midwifery in Natural and Difficult labours,*[496] Osborn referred to Denman's comparison of the forceps and the vectis, and then spent the next seven pages denouncing Denman's conversion to the preference and advocacy of the vectis, using phrases such as

> I was therefore astonished, and mortified, at reading the account of the vectis, by my old friend and colleague,[497]

Again, on the next page, Osborn wrote 'I was mortified',[498] and later in the book that Denman recommended the vectis 'much to my surprise and regret…'.[499] These sentiments seem to make it clear that Osborn was not impressed by Denman's use of the vectis, and did not want to be seen to be collaborating with Denman by advocating the vectis. Osborn remained implacable about Denman's conversion to the vectis, and the preface to the second edition of his *Essays* published in 1795[500] was virtually unchanged from the first. William Osborn did not publish any further essays after this, and after retiring to the country, died in 1808.[501]

Osborn had been content for Denman to discuss the benefits and use of the vectis with their students during their joint lectures for several years,[502] but he appeared to object to Denman committing his preference to print; this seems to have been the event that ended their long friendship. It seems unlikely that if Osborn really had a concern about Denman's use of the vectis, he would have continued his teaching partnership with Denman for so long. Denman had begun experimenting with the vectis in 1780, and had taught his students about its use since 1782, three years before he started to withdraw from lectures, and eight years before he committed his preference to print. It is possible

that it was the statement about 'teachers of the art of midwifery' not using the forceps enraged Osborn, who was on record as doing the exact opposite. With one sentence, it seems, Denman had belittled his former partner.

It is interesting to consider the question as to why Denman was reluctant to discuss publicly his preference for the vectis. There are two factors that could have contributed to his reluctance. Firstly, Denman's likely teacher, the leading man-midwife of the time, William Hunter, used the forceps. Denman had already publicly disagreed with his teacher, and it is unlikely that he revered his teacher so much that he wanted to avoid conflict with him out of loyalty. It is more likely that he was concerned about the regard in which fellow practitioners held his former teacher, and since he had come away poorly following the public debate with his former teacher before.[503] Denman may have wished to avoid the damage to his reputation that would have resulted from further disagreement. A second public clash would have damaged his carefully built, and increasingly successful and fashionable, clinical practice, and Denman would have been anxious not to further antagonise his teacher while he was still alive in his published work. The preface to his Aphorisms was written on 23 Feb 1783, so the Aphorisms would have been in press for a few months after this. William Hunter was still actively practising and giving lectures, until his sudden death on the 30th March 1783.[504]

The other major event in Denman's life during 1783 was the granting of his licence in midwifery by the Royal College of Physicians in December of that year. If Denman had prior knowledge that the Physicians were about to institute such an examination, or was actively campaigning for such an examination, he may have been doubly anxious to avoid controversy, and so mentioned rather than discussed the vectis in 1783. Secondly, Denman's teaching partner William Osborn vehemently disagreed with the use of the vectis and preferred the forceps.[505] There may have been some formal, or informal, agreement, that prohibited either one from publicly disagreeing on an element of clinical practice, for the duration of their teaching partnership, but Denman waited for a further four years after their partnership dissolved before he expressed a strong preference for the vectis. Thomas Denman was a remarkable man who started life as the son of an apothecary in provincial Derbyshire and rose through the ranks of his profession to become the leading man-midwife in London of his time 'with very high reputation and the unbounded confidence of the public'.[506] This rise in social position demonstrated Denman's capacity for hard work, for self-improvement, and his determination to build a successful

business that consisted of teaching and later, publishing, in addition to his thriving fashionable clinical practice. [507]

So far in this chapter, I have shown how Denman came to practise midwifery and began to experiment with the use of the vectis. He had most likely been exposed to the use of the forceps during his lectures by William Hunter and initially advocated the use of the forceps in his own lectures. Despite the unregulated approach to his education, Denman had an expansive network of fellow practitioners and it was clearly common for them to attend cases with each other, despite there being no formal or legal requirement to call for assistance. It was these networks that allowed practitioners to experiment with their practice and share knowledge and skills, in a way that became more difficult as hierarchical structures regulating practice were put into place. This allowed Denman the opportunity to develop his clinical skills and experiment with the use of the vectis. In the next section, I will explore in more depth how the vectis was used, and will begin by describing Denman's method of using it to provide traction.

4.1.5 Denman's use of the vectis: traction

As the first person to describe the use of the vectis in print in English, Denman's use of the vectis reflected his roots as a forceps practitioner. He described using the vectis to provide traction. Traction can be described as 'the action of drawing or pulling',[508] so when the vectis was used to provide traction, the instrument was being used to attempt to draw or pull the baby from the mother. This would be most effective when used in conjunction with the mother's contractions. Forceps practitioners commonly used this action, and it is perhaps easier to envisage how this would work with the forceps than the vectis. The two blades of the forceps would counter balance each other, and so that when downwards pressure was applied, the blades would grasp the head of the baby, and traction could be achieved. With one blade, when using the vectis, this would be more difficult to achieve, since pressure from a single blade would have no counterbalance, consequently the argument that the vectis could be used to provide traction would later meet with resistance from other practitioners such as Robert Barnes.[509]

Denman identified the major problem with using the vectis in this way.

> When the pain ceases, let the instrument rest, and when it returns repeat the same kind of action; and every time of acting endeavour to lessen the pressure on the soft parts of the mother […].[510]

The urethra, labia, and perineum are very delicate and sensitive structures, the soft parts of the mother that Denman referred to, and pressure would be at the very least, very uncomfortable, or at worst, extremely painful, for the woman. Denman advised using the fingers of the left hand or a cushion of folded linen to relieve this pressure.[511] Denman continued in his essay, that the pressure should be continued, so the child would be perceived to descend, and the 'face to turn gradually towards the hollow of the sacrum'.[512] The difficulty with this manoeuvre to provide traction, and so rotate the head towards the sacrum, as Denman described it, is that pressure is also applied directly from the vectis on to the chin of the baby, since that is where the instrument rests if any traction is to be gained.

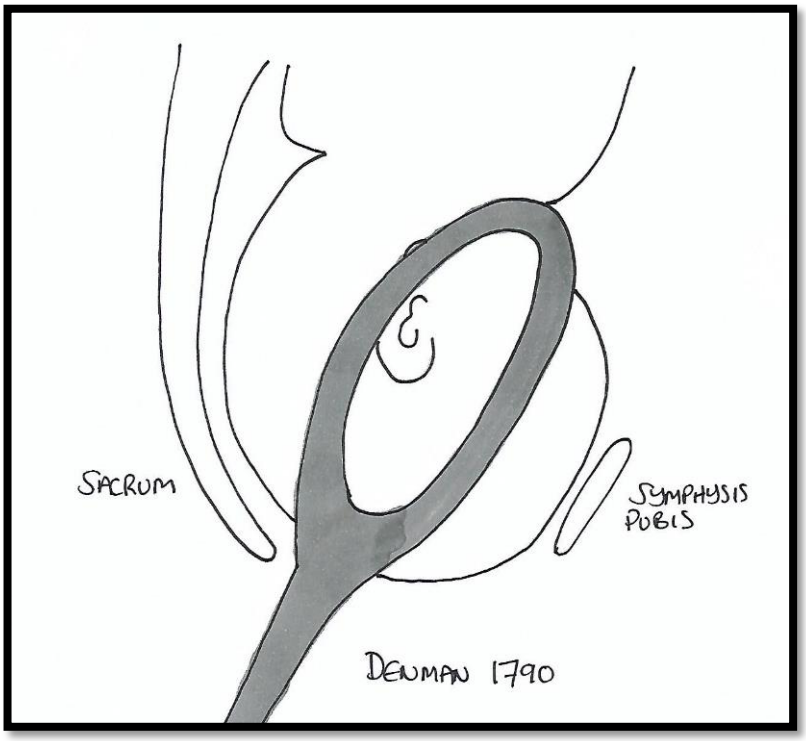

Figure 18: The use of the vectis as described by Thomas Denman, 1790[513] with the baby in an occipito-posterior position - Drawing by L. Jenkins.

Although Denman did not articulate it as such, he was describing the use of the vectis in an occipito-posterior position. A baby in that position has its face turned towards the pubic bone of the mother, rather than the more usual position that a baby adopts in

the womb, with its face towards the mother's back (known as an occipito-anterior position). When a baby presents in an occipito-posterior position, the head of the baby is usually less well flexed (where the baby's chin is touching its chest), and so a larger diameter of the baby's head must navigate through the pelvis. The result of this is that the labour is slower, and more painful for the mother, and it is a common reason for delay in labour.[514] Denman's description of use of the vectis in the first edition of his best-selling *Introduction to the Practice of Midwifery*, published in 1795, was unchanged. His *Introduction* went on to be published in seven editions in England, with further editions published in America. Denman concluded his description of the use of the vectis in that book by stating that the vectis contained a 'considerable degree of extracting force even when the curvature is but small'.[515] So, although the name of the instrument might have indicated that it be used to provide leverage, Denman was adamant that it was used to provide traction, in the same way as he had used the forceps.[516]

4.2 Increasing flexibility in the use of the vectis

Denman warned against the use of the vectis to provide leverage. Since there was only one blade, it is easy to imagine how the vectis could act as a lever, but the problem with this action is that a fulcrum, or leverage point, would be required. If leverage was applied, it is likely that the fulcrum would be the 'soft parts' of the woman, with potentially devastating consequences for her. A survey of works by authors who published midwifery treatises in England between 1783 and 1914 did not reveal anyone who recommended using the vectis as a lever. A table that summarises methods of using the vectis in works published between 1783 and 1914 is included in appendix C. Nonetheless, there were occasional cases of such use, and in the next section, one such powerful case will be discussed that was often cited as evidence to support such concerns.

4.2.1 Caution in the use of the vectis: leverage

In 1823, William Gaitskell[517] published details of a case history where a woman had been left with lasting damage following delivery with a vectis.[518] It was exactly the type of situation that Denman had warned against. The preceding year, Gaitskell had been called to a thirty-one-year-old woman who had sustained a serious injury following the delivery

of her third baby, and required advice. Mrs. A. had been supported by a midwife through two previous normal deliveries of full-term infants. For her third delivery, she had engaged the services of an un-named accoucheur. The accoucheur had visited several times during the day, and since her contractions had slowed, he decided to use

> Such strong mechanical power for the extraction of the child, as to require her being held firmly on the bed, and this he continued for the space of three hours, with only short intervals of rest: she often called out for time and patience, declaring to him, from her feelings, that the pains were not natural, but artificial; and stating that she had a frequent and strong desire to make water.[519]

Not only did Mrs. A state that her contractions were not strong during delivery, but she complained that she had a full bladder. This combination would have been hazardous during labour, since a full bladder would prevent descent of the fetal head, and make it prone to rupture during an instrumental delivery. The accoucheur continued, and left Mrs. A with a tear to her perineum that extended into her anal sphincter, in addition to injuring her urethra, so that she was incontinent of both urine and faeces.[520]

Gaitskell provided some treatment to her wounds, and passed a urinary catheter to allow her bladder to heal. Fortunately, his plan worked and she re-gained control of her bladder, but a year later, he reported that she remained incontinent of faeces and was 'totally deprived of sexual sensation'.[521] In this case, an inexperienced accoucheur who had no understanding of the normal mechanisms of labour, or possibly much experience in caring for women in labour, had caused significant, lasting damage to the woman. Following such a powerful story, Gaitskell identified that the vectis had been the instrument that had been used to cause such damage, but he said of the vectis

> I know of no instrument in the practice of midwifery so useful, and none so dangerous when injudiciously employed. With me it supersedes every other as a simple mechanical power.[522]

Gaitskell concluded his remarks by saying

> These injuries were evidently the result of too much mechanical violence, of a neglect of the axis of the pelvis, of the absence of natural pains to co-operate with the artificial power, and of a loaded urinary bladder.[523]

Gaitskell blamed the practitioner for the damage to the woman, and his lack of skill and knowledge, rather than any deficiency in the instrument, but Gaitskell's tale was used as an example of the dangers of the vectis, particularly in inexperienced hands.[524]

4.2.2 Interpretive flexibility: innovative use of the vectis

Denman had advised using the vectis to provide traction, but this was not the only way that the vectis could be used. As I will discuss, several authors published case studies and treatises after his death that demonstrated even greater flexibility in the ways that the vectis could be used. In this section, I will explore this increasingly flexible use of the vectis, as described by practitioners whose practice spanned the nineteenth century, including Gaitskell, John Tricker Conquest, Edward Copeman and Joseph Griffiths Swayne.[525]

Although Gaitskell had described the severe case of trauma to Mrs A., he argued that this was because of the use of the vectis by an inexperienced practitioner. Gaitskell did not argue against the use of the vectis; he was also a vectis practitioner and preferred that instrument to the forceps.[526] In the second half of his journal article he described how to use the vectis, and gave pre-requisites for use. Importantly these included the full dilation of the cervix and emptying the bladder prior to introducing the instrument; advice that mirrored that of Denman. Gaitskell advised that the vectis was introduced over the occiput, and used to increase flexion.[527] Then it was inserted alternately over the occiput, and then the chin of the baby to provide traction and so assist with the birth of the baby. The use of the vectis to provide flexion, as described by Gaitskell, was a new way of using the instrument but one that was later echoed by other authors. This was a change from Denman since he advocated that the vectis be used to provide traction rather than flexion.

Writing just after Denman's death, John Tricker Conquest's book *Outlines of midwifery* was published between 1820 and 1837 in six editions. Conquest[528] intended his text book as a practical guide, and refrained from engaging in debate as to the comparative value of the vectis and forceps such as Denman had. He believed that the truth lay somewhere between the two positions.[529] It is likely that Conquest used both the forceps, and vectis, on different occasions. He recognised the potential dangers of the vectis being used by inexperienced practitioners, but acknowledged that one advantage of the vectis was that it could be used flexibly on 'any part of the head', but recommended that it should more safely be used on the occiput or chin.[530]

Unlike Denman and Burns, Conquest explicitly stated that the vectis was useful in correcting malpositions and identified that the vectis was helpful in correcting face presentations when the presentation was discovered early. Nevertheless, he was still

essentially portraying the vectis as being used to provide traction.[531] A face presentation would have added difficulty to the delivery of the baby; although the diameter that moved through the pelvis was the same as when the head was in an occipito-anterior position, it was more difficult for the baby to complete the rotation in the pelvis, and the extension of its head, that was needed for it to be born. Conquest advised that the practitioner used the vectis as a hook, in combination with his fingers, to alter the face presentation to a vertex presentation. If the face was well descended into the pelvis, the vectis could be placed over the face, and then hooked onto the chin which allowed the chin to deliver first.[532]

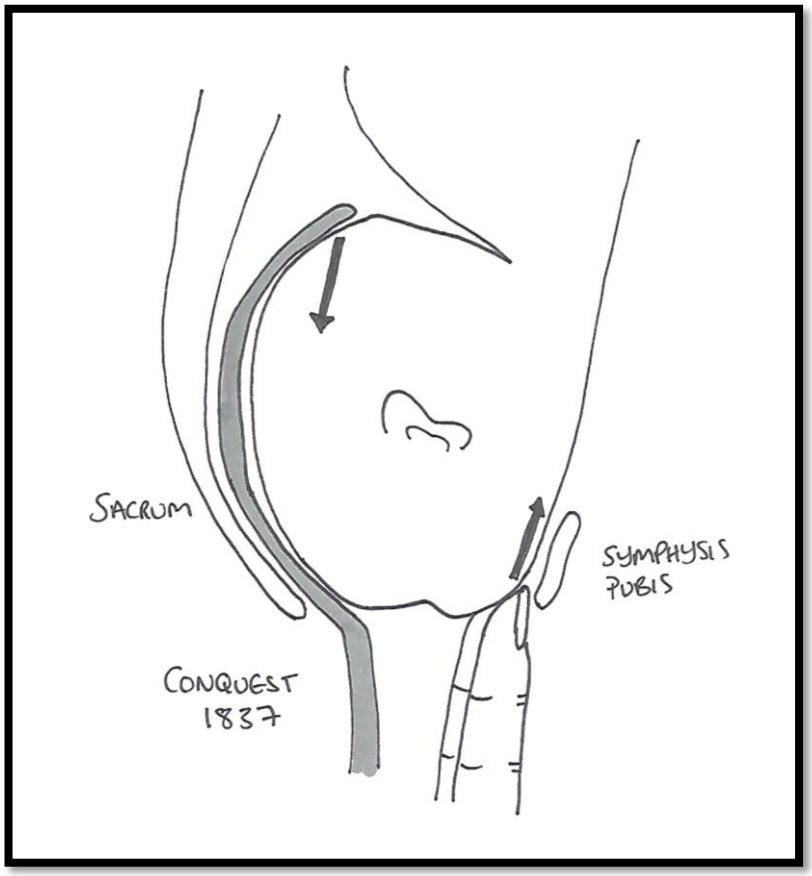

Figure 19: The use of the vectis to correct a face presentation as described by John Tricker Conquest, 1837[533] - Drawing by L. Jenkins.

Edward Copeman's education and practice will be explored in greater depth in the next chapter that looks at attitudes towards the use of instruments in midwifery.[534] Copeman had been using the vectis as part of his general practice and had delivered 68 babies with the vectis since the start of his general practice in 1835[535] but first described its application in print in 1841. His advice on insertion of the vectis differed from Denman in

that he advised that the practitioner should pass the instrument into the vagina posteriorly, so that the convex curve corresponded to the concavity of the maternal sacrum. This demonstrated Copeman's excellent understanding of the anatomy, since it is the placement that would have allowed the most room for the practitioner to work in. He warned that the tip of the vectis should be kept in close contact with the head of the baby to avoid trapping maternal tissue. If the head of the baby was high in the pelvis the handle of the vectis could be raised slightly, and could be used as a hook for traction, rather than as a lever. The vectis could then be applied to the necessary part of the head of the baby as was needed, or moved during the delivery. So, Copeman's advice differed from that of Denman, since he was much more flexible in the placement of the blade of the vectis, as well as in the introduction of the instrument, but echoed Denman's use of the vectis to provide traction. He did not relate the use of the vectis to the position of the baby, or describe which positions allowed the vectis to be most effective.

Despite starting his career as a general practitioner, Copeman was later elected as a consultant in midwifery to the Norfolk and Norwich Hospital.[536] He utilised his experience as a consultant to develop his knowledge and skills, and continued to publish on midwifery, and in 1856, he published *Records of Obstetric Consultation Practice.* In his *Records,* Copeman wrote about several subjects, including the vectis, and gave cases as examples to support his views. With his increased clinical experience and level of skill, he expanded on his recommendations of fifteen years before, of a single position of the vectis related only to the position of the mother. His new recommendation was that the vectis could be applied over the 'occiput, sometimes the brow, or the mastoid process, or the chin',[537] so during his extensive clinical practice he continued to develop and refine his use of the vectis.

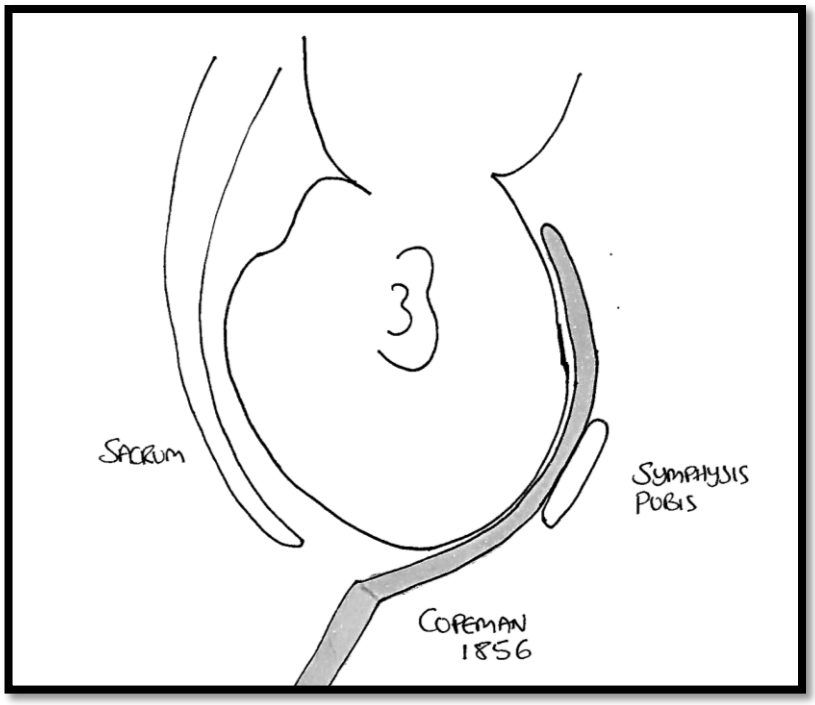

Figure 20: The use of the vectis over the occiput as described by Edward Copeman, 1856[538] with the baby in an occipito-anterior position – Drawing by L. Jenkins.

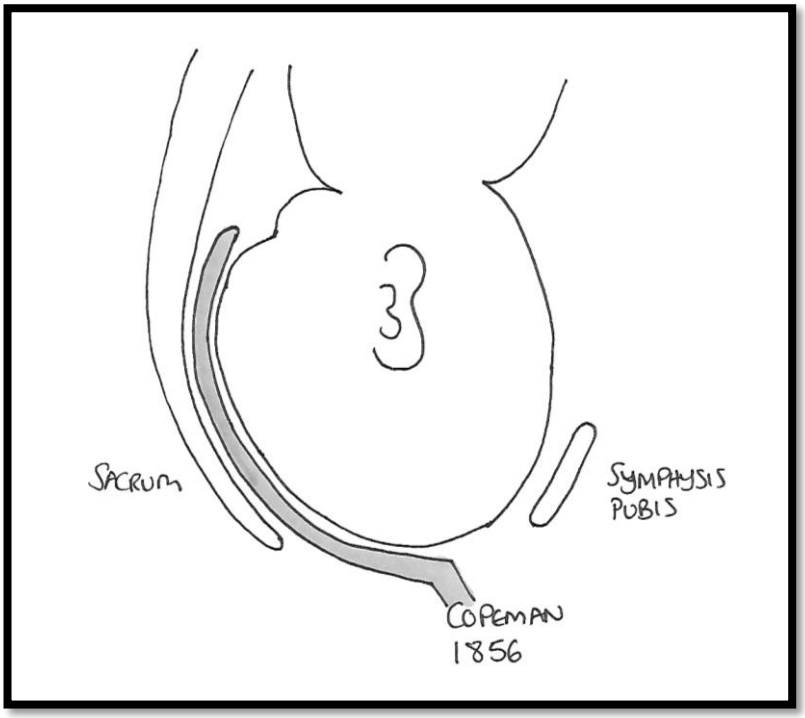

Figure 21: The use of the vectis over the brow as described by Edward Copeman, 1856[539] with the baby in an occipito-anterior position - Drawing by L. Jenkins.

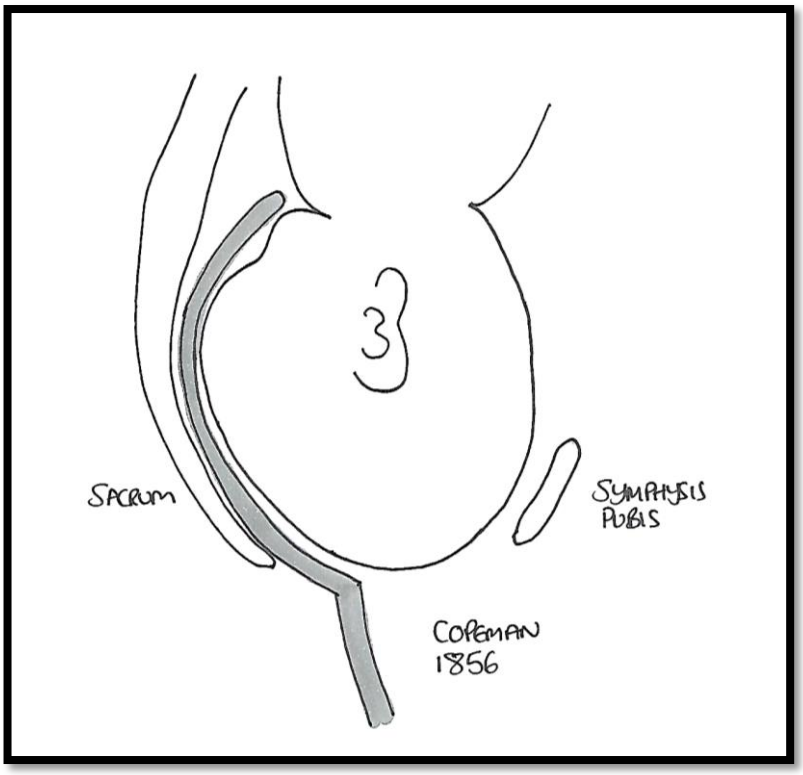

Figure 22: The use of the vectis over the chin as described by Edward Copeman, 1856[540] with the baby in an occipito-anterior position - Drawing by L. Jenkins

Copeman advocated that practitioners combine their knowledge of the position of the head, with previous knowledge and experience, to determine the position of the baby, and determine how it could most easily be delivered. He suggested that the vectis should be used almost as though it were an extension of the hand of the practitioner.[541] Copeman suggested that the vectis was particularly useful for occipito-posterior positions, or where the head was deflexed.[542] He gave examples of how the practitioner could use the vectis most effectively in these circumstances.

As has been previously discussed, Copeman used the vectis to provide traction in his early career. He recognised that the vectis should be used to provide traction and not leverage saying 'let it be remembered that the vectis is a hook to *pull* with, not a lever to "prise" with',[543] but instead of limiting his advice to use the vectis to provide traction, Copeman was aware of multiple ways of using the vectis. In an occipito-posterior position, Copeman advised using the vectis, in the absence of contractions, to provide flexion of the

occiput. Whilst doing this, the practitioner's fingers were placed on the forehead of the baby, as a point to pivot against. Then during a contraction, the vectis was used to provide traction to draw down the occiput in a combination of flexion and traction.

In contrast, Bristol practitioner Joseph Griffiths Swayne[544] referred to the use of the vectis using flexion for the correction of face and brow presentations. His treatise, *Obstetric Aphorisms,* published between 1856 and 1911, was intended for use by students. Swayne informed the student that the occiput could not be bought down easily in brow presentations, but that the chin could be converted to a face presentation which has a smaller diameter and consequently can be delivered more easily, either manually using the fingers or using the vectis.[545]

To summarise, these practitioners described the use of the vectis in a variety of different ways. The common feature, although not discussed explicitly by these authors, was the need for considerable skill and manual dexterity by the practitioner. For example, Conquest's combination of the vectis and the fingers would have been incredibly difficult to learn. He would have needed support while he was learning or developing this technique, as well as considerable knowledge and clinical experience of the appropriate time to use such a technique, and many opportunities to refine his skill. Despite the flexibility of ways in which the vectis could be used, particularly to correct malpositions, its use declined towards the end of the nineteenth century. Chapter six will conclude that the changes in regulation and education of medical men had unintended consequences that affected the use of the vectis. The instrument was increasingly recommended for a limited set of circumstances, and as I will show in the next section, an increasing number of practitioners described the instrument as obsolete in practice. In the final section of this chapter, the case study of another practitioner with a very different route to midwifery practice than Denman will be explored; Alfred Galabin.

4.3 Alfred Lewis Galabin

4.3.1 Galabin's medical education and midwifery practice

Alfred Lewis Galabin was born on the 10th January 1843 to Thomas Galabin, who was a civil servant descended from Huguenot refugees, and his wife Margaret Woods. In 1857, Galabin entered Marlborough College,[546] aged fourteen. When he left Marlborough in

1862, aged nineteen, he read Mathematics and Classics at Trinity College, Cambridge. Galabin was an academically gifted student, winning a scholarship in 1864 and achieving a double first in 1866 aged twenty-three. Two years later he was elected as a Fellow of Trinity, and in 1869 he was awarded a Master of Arts (MA).[547] After his graduation, he decided on a career in medicine.[548] Guidance by the General Medical Council in 1861 stated that anyone who wished to undertake a medical education, needed to hold a degree in the arts from a UK university,[549] and Galabin's previous classical and mathematical education afforded him this.

Under the regulations of Cambridge University, Galabin was not required to undertake his initial medical training there for his medical degree to be awarded by Cambridge University, since he already held the degree of Master of Arts. He could instead gain his practical experience elsewhere. Galabin chose to attend lectures, and to gain practical experience, at Guy's Hospital. He paid a total fee of £100[550] for his medical education there. Guy's was one of the leading medical schools in London with nearly six hundred beds, twenty-six of which were reserved for the 'diseases of women', where students were taught by physicians in wards that contained 'the most interesting cases'.[551]

Midwifery was incorporated into Galabin's initial medical training, and during his medical education Galabin attended 50 lectures on midwifery, in addition to 106 lectures in Anatomy and Morbid Anatomy, 110 lectures in physiology, 78 lectures in surgery, and 99 lectures in medicine.[552] When Galabin commenced his medical training in 1869, the Consulting Obstetric Physician was Henry Oldham M.D., but the Obstetric Physician John Braxton Hicks M.D., F.R.S.,[553] or his assistant, John Jones Phillips M.D., delivered most of the lectures that Galabin attended. Obstetric lectures were delivered at 8.45am promptly every morning from Tuesday to Friday.[554] It can be surmised that Galabin learned how to use the vectis from his teachers, either Braxton Hicks, or Phillips, since he had limited exposure to clinical practice outside Guy's, but this cannot be identified definitively.[555]

The Medical Examining Council at Guy's Hospital allowed some of the students to consolidate their experience in different areas during their training by awarding 'Pupils Appointments' in roles such as clerks and dressers. Clerks were appointed to work with physicians, while dressers worked under the surgeons, so called because they 'dressed' wounds. Pupil [student] appointments were given 'according to the respective merits of the Candidates, and without payment'.[556] Galabin held several of these appointments, both medical and surgical posts, as well as a role as an external obstetric attendant in

October 1871 and resident obstetric clerk in late 1872/3. The pupil returns at Guy's recorded his conduct as being 'good' or 'very good' in all his appointments.[557]

In 1872 Galabin took his diploma to become a Member of the Royal College of Surgeons,[558] and a year later in 1873, his final examinations for his Degree of Bachelor of Medicine (MB) at Cambridge.[559] In the same year Galabin also published his first journal article on alterations of the pulse in *The Journal of Anatomy and Physiology*. He was initially keen to follow a path as a physician, but following the sudden death of the incumbent, Dr J.J. Phillips, in 1874, he was offered the post of assistant obstetric physician at Guys. He accepted this and thereby changed his career path.[560] Galabin had written a series of articles on cardiac disease early in his career that were published between 1873 and 1876 in the *Journal of Anatomy and Physiology* and the *Medical and Chirurgical Transactions.* From 1875, following his decision to specialise in midwifery, Galabin wrote several articles that were published on different topics in midwifery, including puerperal fever, and case reports on unusual cases.

Galabin co-authored an analysis of 23,591 cases of the Guy's Hospital Lying-in charity,[561] that was published in *Guy's Hospital Reports* in 1888. He made good use of this analysis by using it as the basis of much of his later work. Galabin used his mathematical education to analyse statistical information to support his discussion over the rate of use of instruments. He used the statistics from his own organisation Guy's Lying-in Charity, and compared them to its neighbour St. Thomas's. The use of forceps at St. Thomas's was over ten times as common as it was at Guy's,[562] while the still birth rates for the optimal head-down (vertex) positions were comparable between the two charities, with a rate of 2.7% at Guy's, and 2.8% at St. Thomas's. Galabin concluded that despite the high rate of use of the forceps at St. Thomas's, their use was safe since there were no maternal deaths among this group; long term maternal morbidity was not considered. He also compared the statistics of the Rotunda Hospital in Dublin, Ireland, and noted that the rate of use of forceps varied widely under different practitioners.

In 1874, Galabin was elected to the council of the Obstetrical Society of London and he went on to hold all the major positions on the council within that organisation.[563] And in 1876 he participated in a joint delegation by the British Medical Association, the Obstetrical Society of London, and the Infant Life Protection Association, to the Privy Council to argue that skilled attendance at birth improved outcomes for mothers and babies.[564] At the time, the Privy Council did not act upon this delegation, but assured the deputation that their concerns were noted. He went on to build his formidable reputation

as an obstetrician and gynaecologist. He edited the *Obstetrical Journal of Great Britain and Ireland*[565] from 1876 for three years, and in 1878 he was elected as a Fellow of the Royal College of Physicians, just six years after obtaining his membership.[566] Four years later, Galabin was appointed as Obstetric Physician at Guy's Hospital after the retirement of his teacher Dr John Braxton-Hicks. This role was as a Consultant, the pinnacle of the hospital hierarchy for medical practitioners. Galabin's opinion was also sought in complex or unusual cases. In 1880, he performed an autopsy in a case of murder where death was suspected to have been caused by an unsafe abortion.[567]

Galabin secured his growing reputation with the publication of textbooks that were published in many editions. His book *Diseases of Women* had first been published in 1879 and a total of six editions were published, with the last in 1903. His treatise *Manual of Midwifery* was first published in 1886, and became the standard text for medical students. The final edition of this *Manual* was co-edited by George Blacker and Galabin in 1910. He was elected as the President of both the Obstetrical Society of London and the Hunterian Society between 1889 and 1890.[568] In addition to his political appointments within the profession, his clinical and teaching roles, and his publications, Galabin also held several positions as an examiner in midwifery to several universities. He was examiner of obstetric medicine at Oxford, an examiner of midwifery at the University of London, and examiner of midwifery and the diseases of women at the University of Cambridge. In addition to the kudos that was attached to these roles they also came with a significant salary in addition to his salary from Guy's Hospital. In 1891, he was paid by the University of London, a salary of £75[569] as an examiner, but in the following and subsequent years this was increased to £105 per annum.[570] Galabin was presented to the Prince of Wales when he visited Guy's Hospital in 1897,[571] while his wife and daughter were presented to Princess Christian of Schleswig-Holstein a year later.[572]

Galabin retired from his post at Guy's in 1903 and was given the honorary title of Consulting Obstetric Physician, as Copeman had also been given when he retired. He lived in London for several years after his retirement before moving to his grandfather's former home at Tapley, in Bishopsteignton in South Devon. He died from pneumonia, under his favourite tree in his garden, on the 25th March 1913 aged 70 years. In his obituary, published in the British Medical Journal, concluded with a quote from James Matthews Duncan 'everything Galabin says is worth listening to, everything Galabin writes is worth reading twice'.[573] In the next section, I will explore how Galabin used the vectis.

4.3.2 Galabin's use of the vectis: rotation

Galabin had only discussed the use of the forceps, and not the vectis, in his analysis of statistics at Guy's Hospital.[574] Nevertheless, in his treatise he also discussed the use of the vectis and advised that it was useful to provide for rotation of the baby's head where it had not occurred spontaneously. He applied the vectis with the patient in the left lateral position and introduced the left hand into the vagina with the tips of the fingers placed on the occiput inside the rim of the cervix if it was not already fully dilated.[575] He recommended that ideally the cervix should be fully dilated but, as a minimum requirement, it should be dilated enough for the blade to pass through. The vectis blade would then be passed up towards the sacro-iliac joint. Galabin advocated using the vectis over the occiput with traction applied along the pelvic curve, as far forward as possible, since the vectis would then provide enough force to turn the occiput forward to aid rotation, and/or cause flexion.

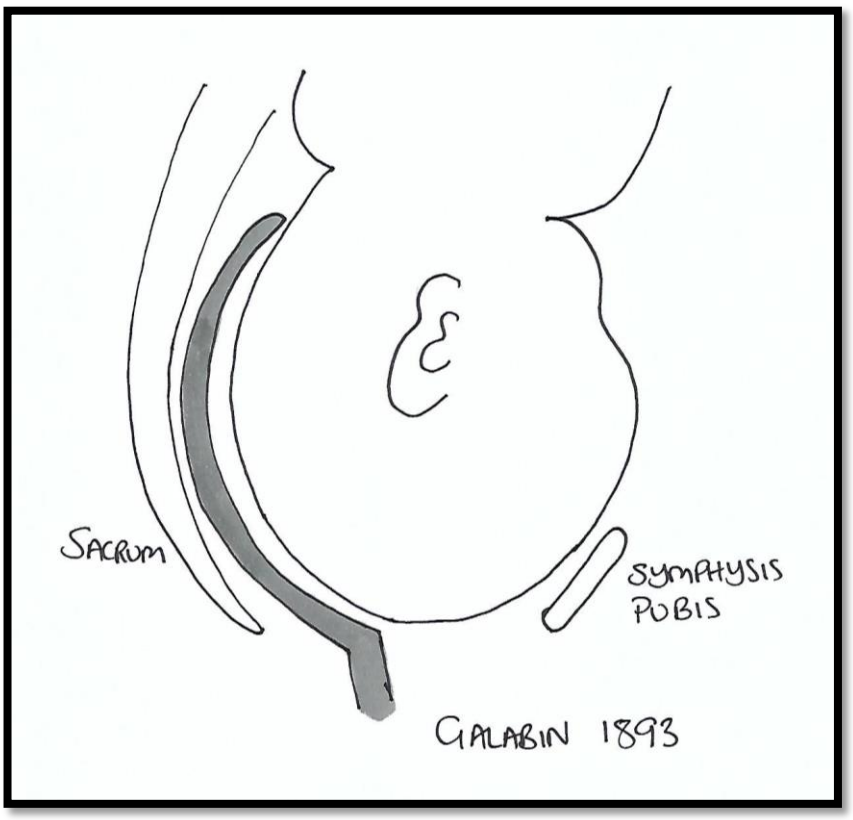

Figure 23: The use of the vectis in an occipito- posterior position, as described by Galabin, 1893[576] - Drawing by L. Jenkins.

Galabin advised that the vectis was also useful in brow presentations. The vectis could be applied over the occiput to encourage flexion and convert it into a vertex presentation. Failing that, it could be applied over the chin to convert it to a face presentation.[577] After the malposition had been corrected using the vectis, management would depend on the condition of the mother. If there was no indication for immediate delivery, the practitioner could wait for the mother to deliver spontaneously, but where immediate delivery was indicated, he recommended that the forceps were the most effective way to complete the delivery.[578]

Galabin did not display that same passion and advocacy for the vectis that Denman had done. He regarded the vectis as being useful in the correction of malpositions and used it to complement his use of the forceps, in much the same way as I have conjectured that the Chamberlen family had done. He used both instruments, but the vectis was only used in a restricted set of circumstances, whereas as I will describe in chapter five, the forceps could be used as a compressor and lever, although their main action was to provide traction.[579]

4.3.3 The impact of education on clinical practice

In this chapter, two case studies have been used to examine the clinical use of the vectis. The first example looked at the practice of Thomas Denman, the first person to write about the use of the vectis in work published in England. Denman followed an apprenticeship style education that combined clinical practice with attendance at lectures, although this was not compulsory. Although Denman was not exposed to the vectis during his medical education, the inherent flexibility in both his education and clinical practice meant that he was able to seek out a range of opportunities to expand his knowledge and skills, and developed informal networks of practice to continue his learning.

In contrast, Alfred Lewis Galabin was educated after the passage of the 1858 Medical Act and received a much more structured medical education. As prescribed by the General Medical Council, he undertook hospital appointments as a clerk and dresser during his training. After he had completed his training at Guy's Hospital, Galabin accepted a role as assistant obstetric physician at the same place. He remained at Guy's for his entire career and eventually gained a consulting role as an Obstetric Physician. Galabin's practice had a more limited exposure to new ways of working and ideas than that of Denman; he would have observed colleagues, but did not have the same informal

networks of practice that Denman had. It can therefore be surmised that Galabin was exposed to a single way of using the vectis during his education and did not witness alternatives to this from his more rigid networks. His published works did not change over many years, so it is unlikely that he experimented with the use of the vectis in the way that Denman did.

Clinical skill was essential in using the vectis. Denman, who later came to favour the vectis over the forceps, took over five years from the time he first witnessed the use of the vectis in around 1775, to the time that he started to experiment with it, by 1780. It then took another ten years until he felt confident in his use, and committed his preference for the vectis, with a description, to print. The high degree of skill needed to use the vectis was recognised by contemporaries of Edward Copeman too, with one practitioner arguing that it was likely to be more effective in Copeman's hands than it would be for others.[580]

The seismic nineteenth-century changes in medical education and regulation (charted in Chapter 3) affected clinical practice, by creating a formalised structure for education and practice that limited opportunities to experiment and develop new innovative uses for technology. This is one of the key factors that contributed to the decline in use of the vectis, and will be examined in greater depth in chapter six. A further effect of these changes was that increasing numbers of medical students educated would have influenced what could be taught to them and how they could learn clinical skills. When Denman was educated, he received lectures in small groups of students which would have given the opportunity for questions and discussion to a greater extent than Galabin would have had in the larger groups that he was educated in. When Galabin attended Guy's Medical School, he was one of a much larger group of students to attend lectures. 78 students were recorded on the roll at Guy's in 1872/3 during Galabin's second year, and by the end of his education this had increased to over a hundred students being admitted each year, between the academic years of 1875/6 and 1880/1.[581]

During the nineteenth century, practitioners such as Denman, Gaitskell, Copeman and Conquest had experimented with the use of the vectis, but by the end of that time, the use of the vectis had converged. Instead of being used to deliver babies in obstructed labour, Galabin used the vectis solely to correct malpositions; the only use by then recommended for the vectis in midwifery treatises. The forceps had come to be the dominant instrument in obstructed childbirth while the vectis was rapidly becoming

considered obsolete. The oblivion that would later engulf the vectis was not a foregone conclusion in the first half of the nineteenth century. In this chapter, I have demonstrated the interpretive flexibility evident in the use of the vectis during the nineteenth century, yet the decision to use instruments is not limited to the ability or clinical skill needed to use the instrument. To understand the longer picture for the vectis, and its eventual neglect, I will situate the diminishing use of the vectis against the increasing pattern of acceptance of the forceps, and explore the place of this in the professional identity of obstetricians and midwives.

Chapter 5: The rise of the forceps

In the previous chapter it has been argued that the clinical use of the vectis was shaped by the changes in the education and regulation of medical men during the late eighteenth and early nineteenth centuries, and that the impact of those changes was twofold. Firstly, the emerging regulation of that education changed both what could be taught, and how it was taught. The vectis, despite its relatively simple design was complex to use. It required a high degree of clinical skill to use it, and close supervision to learn to use it effectively. Towards the end of the nineteenth century, larger groups of students meant that it was more difficult for such complex clinical skills to be taught by close one-to-one supervision. Secondly, the inherent flexibility of the earlier educational system and the very lack of formal controls, meant that informal networks of practice facilitated innovation and experimentation, but these opportunities reduced with the tighter regulation that developed after 1858.

Although there was decreasing use of the vectis, the same fate was not to be shared by its sister instrument, the forceps. Contrary to the fate of the vectis, the use of the forceps increased since it was accepted as the instrument of choice for instrumental delivery over the vectis. This choice developed in the context of increased acceptance of the use of instruments in childbirth. In this chapter, the impact of educational and regulatory reform on the use of the forceps will be discussed, and the eventual dominance of the forceps in clinical practice considered. Rather than regarding the rise of the forceps as somehow inevitable, it should be noted that there was a reticence to use instruments during the latter part of the eighteenth century and early nineteenth century. This chapter starts by examining the general reserve about the use of instruments and uses one case study as an example of the tragic consequences of this reluctance. The types of forceps that were used during the nineteenth century will be discussed, and their use considered to seek to understand how they became the dominant instrument used in childbirth.

5.1 Reticence in instrument use

The dominant narrative in much of the history of the use of the forceps showed that they dominated clinical practice as the superior instrument, and provided either ‘the key to the

lying-in room'[582] or a means with which to subjugate women and dominate midwives.[583] Despite these narratives, the widespread acceptance of instruments was not a foregone conclusion. This section shows how practitioners in the late eighteenth and early nineteenth century demonstrated a marked reluctance to intervene with instruments.

The forceps had been discussed in print since 1733, and were used by the two notable male practitioners of midwifery in the second half of the eighteenth century, William Smellie[584] and William Hunter.[585] Although they both used the forceps, both Smellie nor Hunter advocated great caution in their use of the instrument, trusting instead to the powers of nature.[586] Despite this reticence, Smellie also experimented with the design of the forceps and modified the Chamberlen forceps, introducing the 'English lock' to their design. Nevertheless, he was still cautious in applying them, and used the forceps in only 1% of cases that he attended.[587]

Smellie's pupil William Hunter succeeded him as the leading man-midwife in London, and although Hunter also used the forceps, and taught their use to his students, he advised caution in their application, saying

> I am convinced they have killed … I may say ten women to one they have saved and therefore we shall never use them on any [woman], but where they are absolutely necessary.[588]

So, despite the forceps being discussed in print since 1734, leading practitioners advised that the instrument be used with caution in the second half of the eighteenth century. Since Smellie and Hunter were both highly influential practitioners, their caution was likely to have influenced other practitioners, and particularly their pupils, to avoid unnecessary instrument use.

5.1.1 Denman and his contemporaries

Denman succeeded Hunter as the leading man-midwife of his generation. Despite his flexibility in experimenting with the vectis in his practice, Denman's attitude and behaviour towards to the use of instruments echoed those of Smellie and Hunter. Although he had become known for his publications on the use of the forceps, and later particularly as an advocate for the use of the vectis, he did, in fact, share Hunter's strong aversion to the use of instruments. Denman advocated that practitioners trusted instead in the natural powers of the woman's body, and in a recurrent theme throughout his publications, Denman

warned the practitioner about the dangers of overuse of instruments, and particularly the dangers of inexperience when using instruments. He cautioned that while the woman continued to have contractions there was no need to use instruments, since hope remained that she would go on to deliver without assistance. Denman must have used instruments sparingly, but he did not keep detailed records that documented how frequently he used them to compare his rate of use to Smellie's.

In his *Aphorisms on the application and use of the vectis*, published in 1783, Denman summarised his opinion on instruments, that, at the time, was limited in print to the forceps, by writing that

> the intention in the use of the forceps [that is, instruments in general] is, to preserve the lives of the mother and child; but the necessity of using them must be decided by the circumstances of the mother only.[589]

So, although the forceps could be used to save both the mother and baby, Denman considered only the condition of the mother, for example in a very prolonged labour, as an indication for the use of instruments.[590] This is in stark contrast with modern indications for use, where fetal compromise is a more common indication for instrumental delivery.[591] This is likely part of a twentieth century move that bought the fetus firmly to the foreground of maternity care, and it is probable that the inclusion of auscultation of the fetal heart (particularly electronic fetal monitoring) and ultrasound scans that made the baby 'visible' played a part in this change[592]. It is a subject worthy of future research.

Denman consistently argued in his published works that the pre-requisites for using both the vectis and the forceps were that the cervix had to be completely dilated and the membranes surrounding the amniotic fluid had to be ruptured, with the head engaged in the pelvis. The delivery would be more successful, the lower the head was in the pelvis. Because of this belief, Denman advised that practitioners should wait until 'the head of a child shall have rested for six hours, as low as the perineum',[593] even after the cessation of contractions, before instruments were applied.[594] That means that in the second stage of labour, even with the head low in the pelvis, he advised that practitioners waited to apply instruments. Denman continued to reiterate his opinion unchanged throughout both editions of his *Aphorisms*[595] and all editions of his midwifery *Treatise;*[596] the editor in an edition published posthumously did not alter the representation of Denman's opinions.[597]

The judgement as to the appropriate time to use instruments rested with the practitioner, and Denman offered advice on the dilemma about when it was appropriate to use instruments;

> ... when, from any cause, the parent becomes unequal to the expulsion of the child, the assistance of art, by whatever means it can be afforded, is justifiable and necessary; because without such assistance the parent would die undelivered, and with her life, that of the child would also be inevitably lost. *Yet it behoveth every person, who may use instruments in the practice of midwifery, to be well convinced of this necessity before they are used, and to be extremely careful in their use; that he may not create new evils, or aggravate those which might be existing.*[598]

This quote neatly summarises the dilemma faced by practitioners to balance caution regarding the over-use of instruments and the necessity of the art of using instruments effectively when they were necessary to save the life of the mother. The above language used by Denman makes his view of the need for caution extremely clear.

As well as the decision on whether or not to use an instrument, the practitioner also needed to make a decision as to which was the more appropriate instrument to use. As I suggested in chapter two, the Chamberlen family probably used both the vectis and the forceps, but later practitioners seemed compelled to express a preference for one instrument or the other. Denman was willing to engage in very public, occasionally acrimonious, debates about his opinions. In 1773, he wrote a pamphlet criticising a paper by a colleague with a neighbouring practice: John Leake. Leake was Physician to the Westminster Lying-in Hospital, and taught midwifery in Craven Street, off the Strand, in London,[599] less than a mile from where Denman and Osborn were teaching in Golden Square. Denman criticised Leake's recommendation that the forceps should be applied when the head was high in the pelvis, and his rebuttal of Leake's paper insinuated that Leake applied the forceps injudiciously, which caused errors and harmed women.[600]

One of Leake's pupils anonymously responded to Denman to return his criticism and answer Denman's objections.[601] The pupil replied to Denman that if the practitioner waited until the head was low in the pelvis, as was Denman's usual practice, the forceps would rarely be needed except in emergency situations. The student conceded that Leake admitted that there was a danger to the mother when the forceps were applied early; but the danger was greater if delivery was delayed, or if the baby's head needed to be perforated. This dilemma was central to the debate between interventionists such as Leake who pressed for the early use of forceps, and practitioners such as Denman, who

advocated that the woman should be given every chance to deliver before instruments were applied cautiously.

Denman's teaching partner, William Osborn, agreed with the need for caution. In his book *Essays on the practice of Midwifery, in natural and difficult labours*, Osborn agreed with Denman that the practitioner should wait until all hope of a spontaneous delivery had passed, and cautioned that

> for if we did not so long wait, we should frequently have recourse to an operation which was unnecessary, and might be hazardous, and therefore would be most unjustifiable.[602]

So, despite their public disagreement about their conflicting preferences for the vectis and forceps, they did at least agree that instruments should only be used where there was no alternative.

Most of Denman and Osborn's contemporaries, apart from Leake, agreed with their reluctance to use instruments too quickly,[603] but some felt that Denman's advice to wait for six hours was excessive. In his treatise *The Clinical Guide*, published in 1800, William Nisbet[604] advised that practitioners should not use instruments too readily.[605] Nisbet advised that practitioners should make a thorough examination of the fetal head and the shape of the pelvis before the decision was taken to use instruments, and advised against using instruments when the descent of the head through the pelvis was delayed because of a contracted pelvis.[606] Nisbet disagreed with the extent of Denman's reluctance to use instruments before six hours had passed, despite broadly agreeing with him, although in the quote below he misspelt Denman's name. Nisbet wrote

> the rule of Dr DENHAM [sic], that every case in which they are required is to be considered as an exception to the established practice of midwifery, is perhaps going too far, for we have instances of patients suffering from too long trusting the efforts of nature, as well as from too early an interference of art.[607]

Nisbet considered that the late application of instruments was as dangerous as the early application of instruments.

John Burns, another contemporary of Denman's, also advised caution in the use of instruments, particularly when the pelvis was narrowed or contracted.[608] He warned that attempts to gauge the dimensions of the pelvis before the fetal head had attempted to negotiate it during labour were likely to prove ineffective. Burns advised that the

practitioner should allow nature to accomplish what it can before using instruments, yet he also criticised the teaching of Denman and Osborn that the head should rest on the perineum for six hours. Instead, he advised that the complete clinical picture should be considered to inform the decision-making process, rather than adhering to a set rule such as Denman's.

To summarise, by the early part of the nineteenth century, there was a consensus among medical men that instruments be used in childbirth with caution, with occasional exceptions such as Leake. Denman was among the most conservative of practitioners in advising that the head rest on the perineum for up to six hours before instruments were applied. His pupils, protégés and members of his network of practice are likely to have practised in a similar way to Denman and have been influenced by his views. One of the most public and high-profile cases attended by these practitioners was that of Princess Charlotte of Wales in November 1817, less than two years after Denman's death.

5.1.2 The case of Princess Charlotte of Wales

Born in 1796, Princess Charlotte was the daughter of the Prince of Wales, who would later become George IV, and the German Princess Caroline of Brunswick. Although her father had six brothers and five sisters, Charlotte had no legitimate cousins or siblings; she was an only child, since her parents separated when she was three months old.[609] She was the only legitimate grandchild of George III, and as the only heir, was first in line for the throne. Charlotte was married, aged twenty, to Prince Leopold of Saxe-Coburg, and became pregnant within the first year of marriage. She went on to have an uneventful pregnancy.[610]

She went into labour at on 3rd November 1817 at a gestation of forty-two weeks and one day, just over two weeks overdue. She had a very slow first stage of labour, lasting 26 hours, before her cervix reached full dilation. Her second stage of labour was nearly as long again, and a stillborn baby boy was delivered at 9pm on the 5th November. The head of the baby had been distending the vulva for six hours before the baby was born. The third stage of labour was completed when the partially adhered placenta was manually removed just over half an hour later by her accoucheur. Some haemorrhage was noted before, and after, the delivery of the placenta, and then again as the placenta finally left the vagina.[611] Princess Charlotte initially appeared well, but became unwell just before midnight.[612] She died at 2.30am on 6th November, and a post mortem examination

revealed a large clot in her uterus, which was also affected by an 'hourglass constriction'.[613]

Charlotte was attended in labour by the accoucheur Sir Richard Croft, who was Thomas Denman's protégé, professional heir, and son-in-law, having married Denman's daughter Margaret.[614] He was supported by his brother-in-law, Matthew Baillie, who was married to Margaret's twin sister, Sophia, and was the Royal Physician. Baillie was also nephew to William and John Hunter and had studied under Hunter, as well as under Thomas Denman. A further two male practitioners were present at the labour. Sir Everard Home was Sergeant Surgeon to the king, and was likewise related to Baillie, since Baillie's uncle John Hunter had married Home's sister Anne. Like Baillie, Home had also studied under John Hunter.[615] Finally, Dr John Sims was the consulting accoucheur. Although he was not a relative of any of the three practitioners it is probable that Sims knew the others well. Sims had bought his practice in Paternoster Row from Thomas Cogan[616] in 1779, and Cogan was part of Denman's informal network of practitioners. Denman described him as part of a group of 'eminent men'[617] who he said, only used the vectis, and never the forceps.[618]

Consequently, all four of the practitioners who attended Princess Charlotte had close links to Thomas Denman, and would have been heavily influenced by his strong anti-interventionist practice, compounded by the prevailing anti-interventionist view of the time. At no point during Charlotte's labour, and particularly during her day long second stage of labour, does it appear to have been suggested that instruments be considered to expedite the labour. Indeed, for the duration of the labour, Croft was alone in the room with the nurse (midwife) Mrs Griffiths and left the room when he needed to consult with the others who did not actually see her.[619]

The public outpouring of grief following Princess Charlotte's death was intense. The Morning Chronicle reported that

> The shock which this unexpected and afflicting event gave yesterday morning to the loyal and affectionate inhabitants of the Metropolis, cannot be adequately described, and it will be felt throughout every part of His Majesty's dominions.[620]

Initially reporting was complimentary regarding the management of her death, and the practitioners were not criticised for their conservative approach to her management.[621] Following her death, very limited information was released to the public, and this meant that was intense speculation regarding the circumstances surrounding her death in the

newspapers. The consequences of Princess Charlotte's death were far reaching, not only for the British monarchy,[622] but for anti-interventionist medical practitioners as well. A report on the death was published in the *London Medical Repository*, that glossed over the death and did not interrogate the decisions made about her care. The report attracted significant criticism from both Britain and around the world. A British publication responded to the report and was critical of the medical practitioners,[623] while an American publication by William Ireland reproduced the *London Medical Repository* report, but then proceeded to critique both the report and the actions of Croft and colleagues.[624] Perhaps the highest price was paid by Sir Richard Croft. When he was faced with a similar case, just three months after the death of the princess, the pressure was too great for Croft and he committed suicide.[625]

5.1.3 Changing attitudes

Despite the criticism the medical practitioners attracted, the general prevailing caution of medical practitioners regarding instrumental intervention in births did not change immediately following the death of Princess Charlotte. Treatises by anti-interventionist authors remained popular for many years, with the last edition of Denman's treatise being published in 1832,[626] while the tenth edition of Burns' treatise was published in 1843.[627] Nevertheless, after the death of Princess Charlotte, practitioners began to emerge who saw the dangers in the delay of the application of instruments, as well as in injudicious haste. In his treatise *Outlines of Midwifery*, published in 1821, John Tricker Conquest[628] started his discussion about the use of instruments with the familiar notes of caution against 'incessant meddling', 'officiously interfering' and allowing 'laborious parturition' in a case of a malposition.[629] Nevertheless, Conquest went on to signal the start of a shift in attitude towards instruments. He gave a further example of an irresponsible practitioner that moved away from the traditional caution. Conquest cited the practitioner who was 'altogether unconcerned about the condition of the parts, until the head has been so long, and so firmly wedged in the superior aperture of the pelvis, that mortification follows'.[630]

The move away from anti-interventionist practice was gradual, and many continued to advocate caution. David Daniel Davis, who would become the first Professor of Midwifery in England,[631] continued to advise care in the 1825 edition of his treatise. He advised that practitioners should be cautious and ensure that they had undertaken a complete evaluation of the woman and the circumstances of her labour before using

instruments.[632] Davis' contemporary James Blundell,[633] also advised care. In one of his lectures published in *The Lancet*, he stated that

> The lever and forceps may, perhaps, be now and then employed in lingering labours; but the judicious use of them must be rare. … Instruments in the best hands are evils, and great ones, and you ought never to have resort to those obstetric evils, until there is an absolute necessity for them.[634]

But Conquest became more convinced of the dangers of an anti-interventionist approach over the course of his career and recognised that failing to intervene with instruments in a timely fashion was a cause for reproach in the same way as was their unnecessary use. He summarised the complexities faced by practitioners in the decision as to when it was appropriate to use instruments. He wrote

> Whilst the unnecessary employment of instruments can not be too strongly reprobated, no conduct ought to be more deprecated than that timid and cruel mismanagement which permits an interesting female to struggle under fruitless efforts, till she sinks exhausted from such exertions … the victim of criminal procrastination.[635]

He gave examples of this procrastination such as allowing the head of the baby to rest on the perineum for a prolonged period, as Denman had previously recommended, although he did not name Denman specifically. Other practitioners were also starting to agree with Conquest's approach to the use of instruments.

John Ramsbotham[636] and his son Francis Henry Ramsbotham[637] also published prolifically in the middle part of the nineteenth century. John published *Practical observations in midwifery, with a selection of cases* otherwise known as *Ramsbotham on midwifery* in two editions between 1821 and 1842. Meanwhile Francis became a leading practitioner and teacher to rival the conservative David Daniel Davis. In 1834, Francis published a journal article which warned that instruments should never be used clandestinely or unless absolutely necessary.[638] Nonetheless, he went on to publish his treatise *The Principles and Practice of Obstetric Medicine and Surgery* in five editions between 1841 and 1867 in both England and America, in which he took issue with the teachings of Hunter, Denman and Osborn, and recommended that practitioners used the symptoms of the woman to guide the necessity of the use of instruments rather than artificial time limits, concluding that there must be a middle course between allowing nature time to complete labour, and intervention where necessary, but on balance he felt that it was better to intervene too early than too late.[639] Despite his pro-intervention

stance, he had initially continued to reiterate some of the previous caution about the unnecessary use of obstetric instruments in general. Thirty years later in 1867, Francis did not give the same warnings against obstetric instruments, but confined his discussion to the way in which instruments should be used and a discussion of the comparative benefits of both the vectis and forceps.[640]

In his *Lectures on Obstetric Operations*, Robert Barnes[641] urged caution, before writing that 'the cases are many in which pain, agony, may be averted' by the use of instruments.[642] Similarly, by the end of the nineteenth century both William Leishman[643] and Alfred Meadows[644] reflected the move of practitioners towards a widespread pro-interventionist behaviour, and discussed the use of the instruments without the messages of caution regarding their use. Joseph Griffiths Swayne[645] exemplified this move in an article he wrote for the *British Medical Journal*. He began the article, in which addressed the impact of instruments on neonates, by saying

> The more frequent use of the forceps in difficult labour is one of the features which especially distinguish the midwifery of the present time from that of the past; and, of late years, there has been a growing accumulation of facts to prove that women in labour are thus saved from a vast amount of suffering, and that their safety is thereby materially increased.[646]

Meanwhile, Alfred Meadows used mortality data as evidence to postulate that the death rate for women in obstructed labour was reduced with earlier resort to forceps such as was seen on the Continent.[647]

By the end of the nineteenth century, there was a prevailing view that the forceps saved labouring women from suffering. This was supported by the story told in the historiography by authors such Aveling, that the forceps were a central part of midwifery practice.[648] The next section explores developments in the use and design of the forceps that would come to dominate midwifery practice.

5.2 The clinical application of the forceps

Previous chapters have shown how flexibility in the use of the vectis was expressed in the variety of ways in which the instrument was used with only minimal experimentation in the design of the instrument, and that use of the vectis was eventually confined to the correction of malpositions. In this section, I will show that the case was different for the

forceps. In contrast to the vectis, the use of the forceps became settled quite quickly, while the design of the instrument continued to change significantly over the course of the nineteenth century. In this section I will consider the ways in which the both use and design of the forceps evolved during the nineteenth century.

The forceps could be divided into two main forms; short forceps and long forceps. Short forceps were most commonly discussed by authors in nineteenth century treatises and were used when the head of the baby was low in the pelvis and the contractions had ceased or were ineffective. They were around eleven or twelve inches in length, while long forceps were over twelve inches in length, and designed to be used when the head of the baby was much higher, at or above the brim of the pelvis.[649] This was a much more complicated operation, and the method of application of these instruments will be explored further in the following section.

5.2.1 The short forceps

Thomas Denman first published his guide on how to use the short forceps in 1780,[650] which he built upon in his *Aphorisms on the application and use of the forceps* three years later.[651] Denman's Aphorisms were intended as a guide for students, and he limited his remarks

> on the presumption that the head of the child presents with the face inclined towards the *sacrum* and that the common short *forceps* are intended to be used'.[652]

These presumptions mean that Denman's advice was not intended to be used in cases of malposition, since if the face presented towards the sacrum the baby was in an occipito-anterior position which is the optimal, and most common, position for birth.

Denman described the forceps he used as being twelve inches long, reducing to eleven inches when the curve had been applied, and the handles being five inches long. At its widest the blade was one and five eighths of an inch.[653] Denman recommended that this design was 'simple in their construction, applicable without difficulty, and equal to the management of every case in which the forceps ought to be used'.[654]

Figure 24: Denman's forceps – Image from Maw & Sons catalogue, 1869[655]

Denman advised that the head of the baby should be low enough to allow an ear to be felt to help to guide the practitioner in the application of the forceps. The woman should lie on her left side at the edge of the bed and the practitioner introduce one blade of the forceps to the point of the ear. The second blade was then introduced over the other side in a mirror image, and it should be 'an exact antagonist to the first'.[656] Denman cautioned that there should be no attempt to manually change the position of the head of the baby before beginning to extract it, and if the practitioner used the forceps slowly, natural rotation of the head would take place. The action of the forceps was to provide traction to replace the natural action of contractions but that 'the action with them should be exerted gently, and by intervals'.[657]

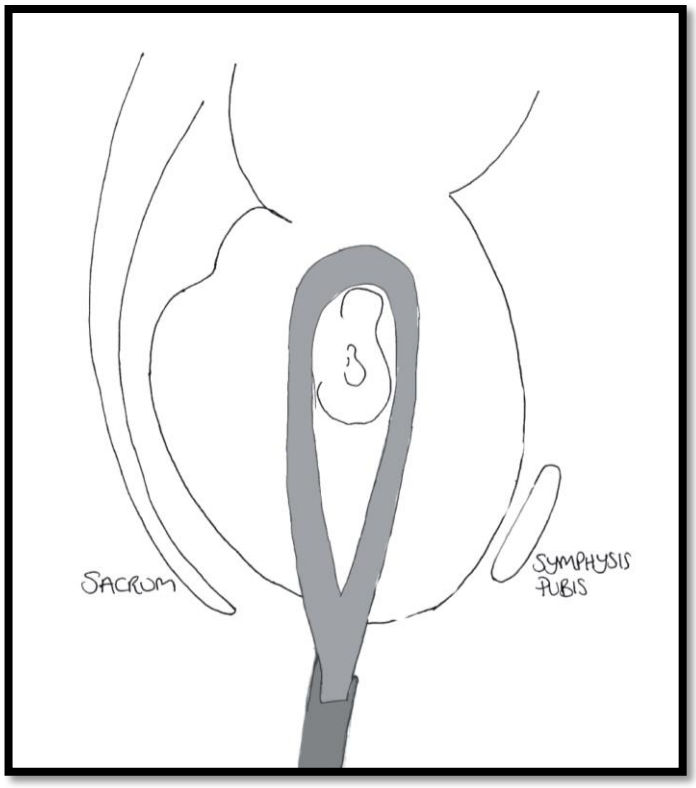

Figure 25: The use of the straight forceps by Denman, 1783, with the baby in an occipito-anterior position – Drawing by L.Jenkins

Denman's description of the use of the forceps in an occipito-anterior position was followed by discussion about the use of the forceps in cases of malposition. He warned that in an occipito-posterior position or face presentation, the forceps were liable to slip and that they were likely to be less successful than in an occipito-anterior position. He cautioned that 'we should be clear as to the necessity and propriety of applying the *forceps*, and be prepared for disappointment'.[658] At the time, Denman had started to experiment with the vectis in his practice and did not rely on the forceps alone, although he had not committed a description of the use of the vectis to print at that point. It was clear that he felt that the forceps had some limitations in practice. Ten years later, Denman's advice was unchanged.[659] This method of applying the short forceps remained virtually unchanged during the nineteenth century. Davis also advised using the ear of the baby as a landmark when applying the short forceps and used the forceps to compress the head as well as to apply traction.[660]

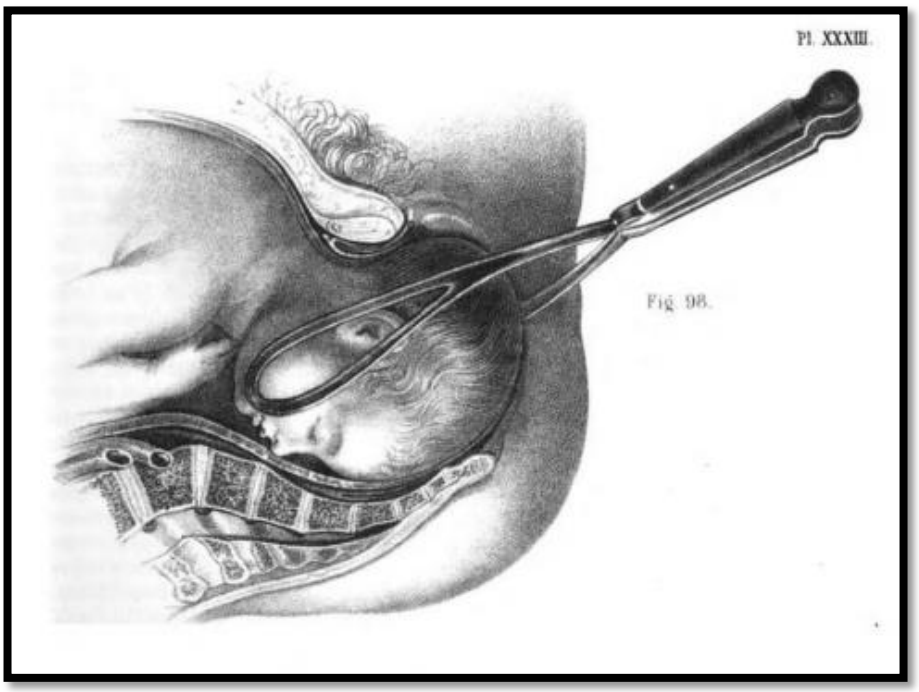

Figure 26: Application of the straight short forceps with the baby in an occipito-anterior position – Image from Ramsbotham, 1844[661]

As illustrated above, Francis Ramsbotham also used the same approach with the ear as a landmark nearly twenty years after Davis,[662] as did Alfred Meadows twenty years after that.[663] Meanwhile, Robert Barnes argued that the forceps were used to provide a combination of traction and leverage with the added advantage that the forceps compressed the head of the baby. Like Denman, Barnes advised using the ear of the baby as a marker to correctly position the forceps.[664] By the end of the nineteenth century, Galabin acknowledged that although the forceps could be used as a compressor and lever, the main action of the forceps was as a tractor.[665] Although Galabin used the ear as a marker for the placement of the forceps, he advised against feeling for the ear since he said that this would cause discomfort to the woman, but advised that the practitioner should determine position through feeling suture lines and fontanelles on the head of the baby instead.[666] Essentially the method for applying the short forceps remained unchanged throughout the nineteenth century. The ear was used as a landmark, and the blades were positioned either side of the baby's head. The forceps provided some degree of

compression of the head, and then traction was applied to facilitate delivery. In sharp contrast to the vectis, the use of the short forceps had stabilised early in its use.

5.2.2 The long forceps

The long forceps were similar in appearance to the short forceps but were marginally larger. Ramsbotham identified that his long forceps were

> From the extreme of the handle to the tip, twelve inches and three-quarters, of which four inches and a quarter form the handles, and eight and a half the blades, being one inch and a half longer in the blade than the short forceps, and a quarter of an inch longer in the handles.[667]

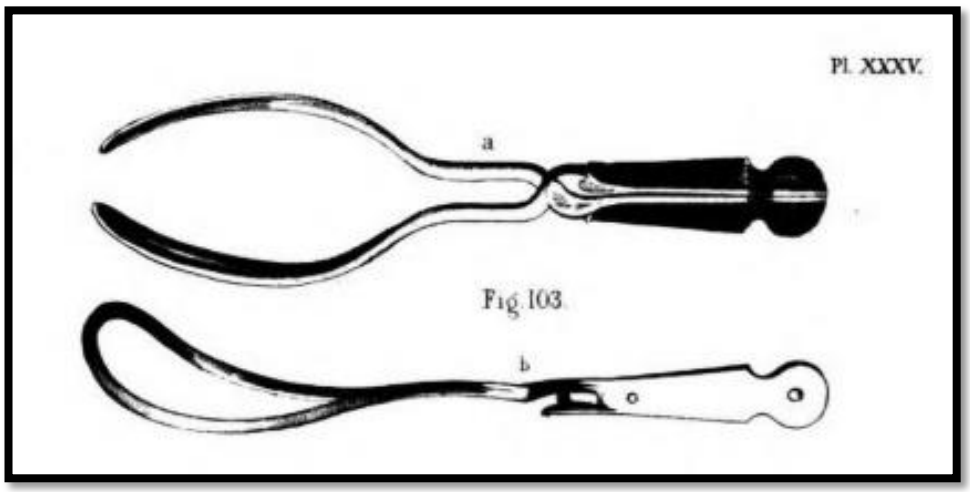

Figure 27: Long forceps – Image from Ramsbotham, 1844[668]

Whilst practitioners in the eighteenth century, such as Smellie, did own a pair of long forceps, Smellie considered them dangerous to use, and did not demonstrate their use in his lectures. He used the long forceps in the same way as he did the short forceps, and positioned the blades over the ears, although this approach was criticised by later authors who considered it to be unrealistic to feel for an ear as a landmark when the head was above the pelvic brim without causing significant discomfort to the woman.[669] Although Denman had identified that he used the short forceps, he did not discuss the use of the long forceps in his published work.[670]

Denman's contemporary, John Burns, advised that the long forceps were an alternative to craniotomy if the baby's head remained high in the pelvis due to maternal exhaustion and a lack of contractions that enabled descent. The second reason that the

head would not descend was when the pelvis was severely contracted after the mother had contracted rickets, and in such cases, Burns considered that it was foolish to attempt to apply the long forceps.[671] Burns advised applying the long forceps over the occiput and brow of the child rather than over the ears. He also advised that long forceps needed to have some degree of lateral pelvic curve to allow them to navigate the curve of the pelvis and be positioned correctly.[672]

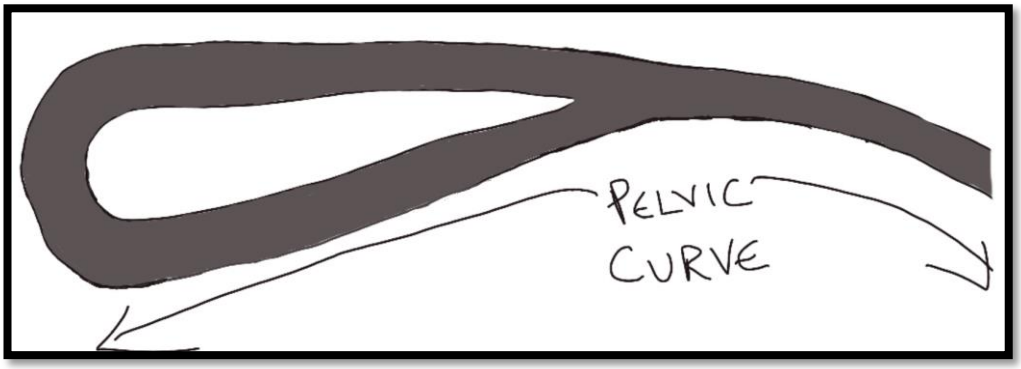

Figure 28: Illustration of the pelvic curve on forceps – Drawing by L. Jenkins

Ramsbotham agreed with this advice and gave detailed instructions and illustrations on the use of the long forceps in his treatise.[673]

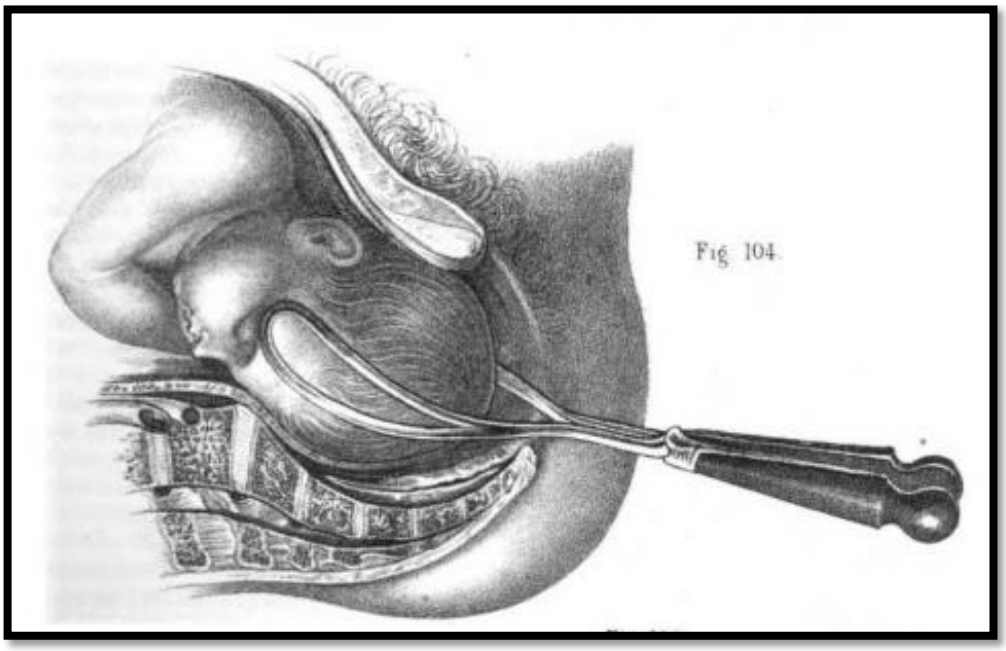

Figure 29: Application of the Long Forceps over the occiput and brow – Image from Ramsbotham, 1844[674]

Ramsbotham did acknowledge that this positioning of the long forceps over the occiput and brow had the potential to damage the face of the baby, and for this reason, he said that some of his contemporaries applied padding to the blade that covered the face of the baby. Ramsbotham stated that despite this concern, he did not see the need to cover the blade and had never caused damage or bruising to the face of a baby.[675]

Like Ramsbotham, Barnes also used the long forceps, and he also acknowledged the difficulty in feeling the position of the baby's head when it was above the brim of the pelvis. As a consequence of this, he advised applying the instrument laterally, rather than in an antero-posterior diameter in relation to the pelvis.[676] Meanwhile, Galabin argued that the use of the long forceps had reduced the need for craniotomy. He gave statistics from the Rotunda hospital in Dublin that suggested that the need for craniotomy had reduced from between 7.2 and 7.9 per 1,000 cases to 3.5 per 1,000 cases after the use of the instrument had been introduced. Similarly, in Guy's Lying-in Charity craniotomy fell from 3.6 per 1,000 cases in 1854 to 0.7 per 1,000 cases between 1863 and 1875 after the introduction of long forceps.[677]

While the short forceps were generally reasonably safe to use since the blades of the forceps acted as a fulcrum against each other, so that there were not the same opportunities to use the instrument for leverage as there were with the vectis, the long forceps were a more complex instrument. Ramsbotham summarised the dangers of the long forceps by saying

> One of the most valuable instruments employed in midwifery, under careful management, is the long forceps … although it must certainly be regarded as more capable of inflicting injury than the shorter kind, inasmuch as it is introduced much higher within the woman's person.[678]

Although the blades still acted as a fulcrum against each other, it was possible to lean the longer shaft of the instrument against maternal tissues, or to misplace the blades. These were problems since it was more difficult for the practitioner to be able to know for certain where the blades had been placed as the head was higher in the pelvis.

During the nineteenth century, the advice of the leading practitioners in the application of long forceps stabilised to use landmarks of the pelvis rather than the fetal head, and often meant applying the forceps over the occiput and brow since the head was high in the pelvis and had not rotated to navigate the pelvis. Therefore, the use of both the long and the short forceps had stabilised quickly. There was broad agreement by authors in

both cases, as detailed above, that the forceps be used to provide traction. Nevertheless, there was also recognition that the compression provided by the forceps assisted delivery.

The method of using the forceps stabilised quickly, although there remained a high degree of interpretive flexibility in the design of the instrument. During the late eighteenth and nineteenth centuries, the number of different designs of forceps multiplied dramatically. There were several principal features of the forceps that varied, including the length of the instrument, the degree of cephalic curvature to fit over the baby's head, the presence or absence of a pelvic curve to facilitate delivery. Instrument catalogues contained many examples of the forceps, all named after their inventors.

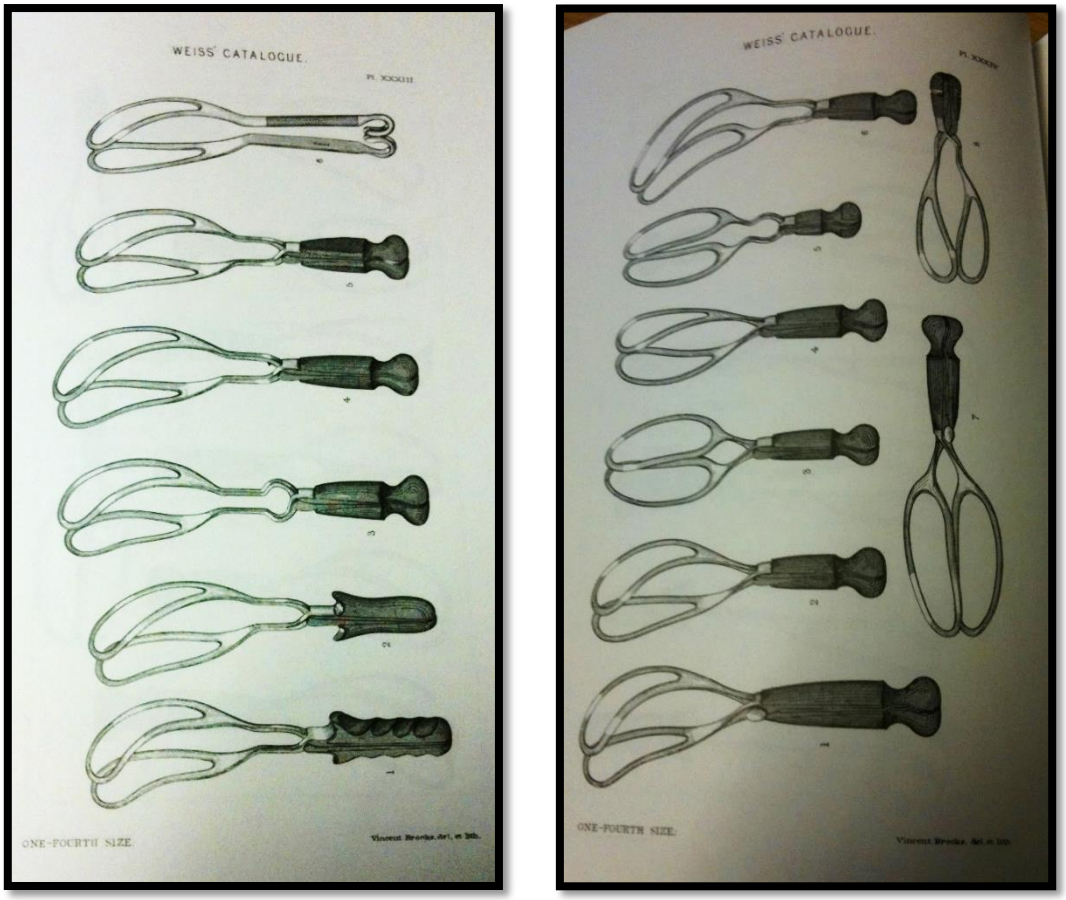

Figure 30: Various forceps – Images from Weiss & Sons Catalogue 1863, Plate XXXIII (L) and Plate XXXIV (R) [679]

This pattern of variety in the design of the forceps continued throughout the nineteenth century, and as I shall demonstrate in the next section, was celebrated as evidence of the strides that had been made in the advancement of obstetrics. Swayne's acceptance that the forceps be used as the sole instrument in obstructed labour was much

more typical in published sources than advocacy of the vectis by authors such as Denman and Copeman. In published sources such as those by Swayne's contemporaries such as Leishman and Meadows, the forceps were accepted by practitioners as the superior instrument. Leishman, writing in 1888, summarised this by stating that despite the vectis being 'an extractor of considerable power and efficiency'[680] it had fallen into neglect. He maintained that this was due to the superiority of the forceps. Nevertheless, in the same way that there were multiple reasons for the closure mechanisms that resulted in the obsolescence of the vectis, there are also multiple closure mechanisms responsible for the ascendancy of the forceps. In the final section of this chapter I will explore these mechanisms in greater depth.

5.3 Ascendancy of the forceps

The final section of this chapter, will explore some of the closure mechanisms that cemented the position of the forceps. As we have seen, the forceps were accepted as the superior instrument to deliver a child in obstructed childbirth, and there was an agreed method of using it. This standardisation of clinical practice consolidated the position of the forceps.

5.3.1 Impact of regulation and education on the use of the forceps

As suggested in chapter three, there was a massive increase in the numbers of medical students, arising from population growth, urbanisation and expanding wealth. Alongside this, medical education was increasingly regulated. These influences combined meant that the typical medical student of the late nineteenth century was trained in large classes which were a very far cry from the kind of personal training – akin to apprenticeship – that someone like Denman (half a century or more before) had both received and imparted. This would have influenced what could be taught to them, and how they learnt clinical skills. Although the use of the forceps did require a good level of knowledge and clinical skill, it was more straightforward to use than the vectis. This would have been easier to teach to large lecture groups of students. It was also easier to write about the use of the forceps in publications since the method of their application was easier to describe for authors.

Although informal opportunities for networks of practice, such as those described by Denman, diminished with the more formal regulation of practice, they were replaced by professional societies such as the Obstetrical Society of London that had formed in 1858. These formal societies encouraged networks between practitioners that had shared goals and objectives,[681] and facilitated the development of a shared professional identity and values. Instruments, in particular the forceps, were at the forefront of this collective professional identity.

5.3.2 Veneration of technology

Although it was usual for medical lectures to contain instruction on the use of instruments such as the forceps and vectis to students, it became increasingly common in the second half of the nineteenth century to exhibit scientific and medical instruments for the interest of registered medical practitioners. The fashion for exhibitions during the Victorian era had commenced with the Great Exhibition that opened on 1st May 1851, commissioned by the Prince Consort, Prince Albert.[682] The purpose of that exhibition was to showcase the industrial and scientific advances by Britain and its Colonies.

Conversaziones were organised by scientific societies, such as the Royal Society and the Royal College of Surgeons. They consisted of a display of instruments, and lectures for members.[683] In 1867, the Obstetrical Society hosted their exhibition of obstetric instruments at their *Conversazione.*[684] The purpose of the exhibition was to collect 'specimens illustrating the history of obstetric medicine' by a 'young but important' Society.[685] A catalogue of the exhibition was collated, and published by the Royal College of Physicians and on the first page stated that

> by bringing together the instruments that have been used in different ages and in different countries … we shall be able to read by these most tangible symbols the most important chapter in the history of obstetrics.[686]

The Obstetrical Society sent invitations to leading practitioners from across Britain and abroad, and attracted exhibitors from Russia, Sweden, Denmark, Germany, France, Italy, and Belgium.[687] The exhibition differed from previous ones since it was practitioners who were invited with their instruments, rather than manufacturers attempting to sell new instruments. In this way it was a more accurate representation of the instruments that were actually used by practitioners of the time.[688] The original Chamberlen instruments

were also displayed, on loan from the Royal Medical and Chirurgical Society in a glass case, 'preserved with all the care which the deepest respect for their inventor could dictate'.[689]

The *Conversazione* included a wide range of instruments used by medical practitioners in childbirth. The forceps were a highlight of the exhibition, with coverage on the instrument in *The Lancet* covering the first full page of coverage of the event.[690] There were sixty-seven pairs of long forceps on display,[691] and forty-two different examples of British short forceps, as well as thirty-seven examples of 'Continental' forceps, and eight forceps of unknown origin;[692] over one hundred and fifty examples of forceps. The catalogue of the Conversazione listed sixteen examples of the vectis that were exhibited,[693] but the instrument was not discussed in the article published in *The Lancet.*[694] In addition to the forceps and vectis, there were sixty other types of instruments exhibited including blunt hooks, destructive instruments such as cephalotribes, crotchets, perforators, and tire-têtes, as well as obstetric bags and cases, scissors and stethoscopes. Instruments were arranged by type and laid out chronologically to allow delegates to observe the evolution of the instruments over time, and to compare and contrast instruments from around the world.

The instruments that the medical practitioners used had become tangible symbols of the rise of the obstetrician and therefore worthy of celebration and study. In the same way that the Great Exhibition celebrated the ingenuity of the British Empire, the *Conversazione* celebrated the ingenuity of male practitioners in obstetrics. Although all instruments were celebrated as evidence of the achievement of obstetricians, the sheer variety of forceps meant that the instrument took a central place in this celebration. The use of instruments in general, but the forceps in particular, had become central to the role and identity of obstetricians, and the display of instruments was a physical expression of this. In the final part of this chapter, I will explore how the use of instruments, and especially the forceps, co-constructed the professional identity of obstetricians.

5.3.3 Instruments and professional identity

In this chapter, it has been argued that instrument use in childbirth had become integral to male obstetric practice by the end of the nineteenth century, however in contrast to this, female practitioners were confined to normal birth. This separation had been evident in practice for many years, but was consolidated by the regulation of practice that was

introduced in 1858 for doctors and amended in 1886, and subsequently introduced for midwives in 1902. The 1902 Midwives Act made it clear that the role of a midwife was separate from that of a medical practitioner since the Act did not

> confer upon any woman any right or title to be registered under the Medical Acts or to assume any name, title, or designation implying that she is by law recognized as a medical practitioner'.[695]

It limited the sphere of practice of midwives to normal cases, since they were required to call for the assistance of a medical practitioner where there was a deviation from the normal.

The Midwives Act did not explicitly prohibit midwives from using instruments, but it did set up the Central Midwives Board (CMB) to oversee the register of midwives and 'frame rules … regulating, supervising, and restricting within *due limits* the practice of midwives'.[696] The Board was constituted independently of the General Medical Council (GMC), which was a complete departure from previous bills that had proposed the Board to be a subordinate of the GMC. The CMB membership consisted of representatives from the Royal Colleges of Physicians and Surgeons, the Society of Apothecaries, the Incorporated Midwives Institute (later to be known as the Royal College of Midwives), the Association of County Councils, the Queen Victoria Jubilee Institute for Nurses, the Royal British Nurses Association, and two lay members.[697]

The Central Midwives Board published the first edition of the rules for midwifery practice in 1907. Any midwife found to breach these rules was liable to be removed from the register. Rule 18 stated that

> In all cases of abortion, of illness of the patient or child, or of any abnormality occurring during pregnancy, labour, or lying-in, a midwife must explain that the case is one in which the attendance of a medical practitioner is required […].[698]

Midwives were responsible for normal labour and birth,[699] and for any deviation from this they were required by statute to call a doctor for assistance. If they had done so, then 'the midwife will not incur any legal liability',[700] with the implied threat that they would incur liability if they failed to do so.

The Midwives Act 1902 had established the Central Midwives Board (CMB) and the principle of supervision of midwives. The CMB published the first set of Midwives Rules in 1905, and they formed the basis for midwifery practice. Midwives were occasionally struck

off the CMB register for failing to comply with the expected standards of morality, such as when they gave birth to a child outside marriage,[701] but instrument use by midwives was not reported as an issue.[702] Female midwives' practice centred around normal birth and they did not use obstetric instruments. The passage of the 1902 Midwives Act confined midwifery practice to normal birth, and required them to call for assistance from doctors when there was any deviation from this.

Essentially, childbirth had been legally divided into two categories; normal and complicated. The flexibility that had existed at the beginning of the century had settled into clear, legally defined responsibilities, although the debate as to which practices and conditions fell in to each category changed over time and continues to be the subject of debate to the current day. In essence, doctors specialised in complicated cases, as surgeons had traditionally done, with the use of instruments had been accepted as integral to their responsibilities. The cautious approach of Smellie, Hunter and Denman had been replaced by the conviction that instrument use prevented suffering and should not be delayed.

The historical context in which doctors and midwives practised helped to construct the use and non-use of obstetric instruments, since the changing landscape of clinical practice, education and regulation influenced how these instruments were used. Equally, the use and non-use of obstetric instruments co-constructed the professional identity of practitioners. The next, and final, chapter of this thesis, will conclude by examining the intertwining strands of medical education and regulation, clinical use of the vectis and forceps, and changing behaviour in the frequency of use of instruments set against the SCOT model, to summarise the argument and findings.

Chapter 6: Conclusions

This thesis set out to understand how the vectis came to be used in clinical practice, and to determine why it disappeared from clinical use. It has used the SCOT model as a framework for analysis to draw conclusions as to why this happened. It is impossible to understand the decisions and actions of users of technology without comprehending the context in which they live and work, as is evident from criticism of the model.[703] It is unsurprising that context was not included in the early use of the SCOT model since many of the technologies that were analysed were modern technologies,[704] and understanding of the context of use was implicitly understood by the authors. Understanding context has required exploration of the use of obstetric instruments, both the vectis and the forceps, and the environment in which this took place. As part of this story, it was essential to understand the place held by the forceps, since it emerged as the dominant technology in managing obstructed childbirth.[705]

The biggest change in the context of medical practice during the nineteenth century was in the regulation of practice. At the beginning of the nineteenth century, medical practitioners were comprised of three legally and socially separate groups: physicians, surgeons and apothecaries. The 1858 Medical Act combined these branches into one: the doctor that modern patients would recognise. Medical education also changed dramatically during the nineteenth century. At the beginning, students attended a variety of series of lectures by eminent teachers of the day. The lectures were arranged separately from the practical training. For apothecaries or surgeons, this was most commonly some form of apprenticeship, while the same training was not required for a physician. The Royal College of Physicians examined theoretical knowledge but did not specify requirements for the attendance of lectures prior to examination for membership since education at University in Oxford or Cambridge was enough.[706] After the passage of the 1858 Medical Act, doctors were educated at medical schools attached to large teaching hospitals, and large numbers of students attended these.[707]

Changing pedagogic practices had unintended consequences such as the reduced opportunities for informal networks of practice, and the increasing size of student groups changed what could be taught. This affected the use of the vectis, since it required a high level of skill to use, and this was more difficult to teach in large groups. Regulation of both

male and female midwifery practice meant that female midwives were confined by law to normal childbirth, while male doctors were legally responsible for more complicated cases that they resolved using instruments.[708]

This final chapter summarises the arguments set out in this thesis, and discusses the key findings and the original contributions to knowledge made in the thesis. These include the changing use of the vectis, the historical and political context of male midwifery practice in the nineteenth century, but also the co-construction of professional identity and use of technology. Finally, it will discuss the implications of this research, and identify areas for future investigation.

6.1 Thesis findings

This thesis set out the historical evidence to explain why the vectis disappeared from clinical use. Intersecting with this narrative is the use of the SCOT model as a theoretical framework to provide a sociological understanding of the use of the vectis as a piece of technology. This is an original approach to historical research that has not been used by other authors. The use of detailed case studies of two selected practitioners, Thomas Denman and Alfred Galabin, with supporting biographical research, has allowed a greater depth of understanding of the context of their practice. It has also revealed extra elements of originality that strengthens the existing history such as the 1807 call by 'Gentlemen practising midwifery' for a separate college of midwifery, or the links between all four practitioners who attended the confinement of Princess Charlotte of Wales. The triangulation of published sources, manuscript sources, newspaper and journal articles and secondary sources, especially when combined with studying the extant instruments in the museum context, has added a richness and detail to this research.

This section will summarise the key findings of this thesis that set out to recover the clinical history of the vectis, and understand the role of standardised medical education and changing obstetric practice in this. The first key finding of this thesis that will be explored is the expanded legacy of the Chamberlen family. Secondly the flexible use of the vectis and forceps will be considered. The final key finding that will be discussed is the impact of the changes in medical regulation and education, and the unintended consequences that reform had in practice, on informal networks of practice, on teaching methods, and in the transmission of skills knowledge and teaching.

6.1.1 Expanded legacy of the Chamberlen Family

In contrast to the received historiography, which concentrates on the forceps, this thesis has argued that the legacy of the Chamberlen family is more extensive, and their tale more remarkable, than has previously been suggested. They were responsible for the invention of not one, but two instruments: the forceps and the vectis. These instruments had a significant impact, both on midwifery practice, and on the lives of the women and babies on which the instruments were used over many centuries. The Chamberlens were unique in imagining instruments that could deliver a live baby in an obstructed labour, when their contemporaries were limited to using destructive instruments to deliver babies after they had died because of such circumstances. They protected their secret method of delivery, and only shared it with family members, or selected individuals who paid handsomely for the privilege. While the forceps remain in use in modern clinical practice, the vectis has disappeared from clinical use, and from both the historiography of the Chamberlen family, and the tale of obstetric instruments.

This thesis has suggested that the Chamberlen family used both the vectis and the forceps. They are likely to have used these instruments to complement each other, with each instrument perhaps being better suited to certain situations. This would explain the development of both instruments by the same family with a shared ultimate purpose of delivering a live baby. Despite this, when they sold their secret, they sold only one instrument, not both.[709] Unfortunately, there are no written sources that allow their motives or clinical practice to be interrogated, but it is reasonable to hypothesize that this would have continued to give them an advantage in practice over those to whom they had sold the instruments. Those practitioners who had purchased one of the Chamberlen instruments would only have recourse to one, not both, despite those practitioners imagining that they were privy to the entire Chamberlen secret. This scheme would have given the family income from the sale of the instruments, while ensuring that they maintained both a practical and an economic advantage over their competitors.

6.1.2 Interpretive flexibility in the use of the vectis and forceps

It has been argued in this thesis that there was flexibility in both the clinical use of the vectis, as well as flexibility in the design of the vectis. This flexibility in interpretation was

not limited to the family who invented the instruments. As the vectis and forceps were shared with other practitioners, the relevant social group of users increased. Since interpretive flexibility occurs when technology is used, altered and designed by the groups who experiment with it,[710] the larger this social group is, the greater the variety of experimentation is likely to be. Once the formerly secret instruments had been disseminated, users were able to experiment with the instruments and conceive new ways of using the instruments, but also to add modifications to the design. This interpretive flexibility was likely to have been different to the way in which the technology was intended for use by its inventors.

6.1.2.1 Flexibility in use

The recorded use of the vectis in England started with Thomas Denman, whose route into practice and into the use of the vectis has therefore been used as a case study in this thesis. Denman had initially favoured the use of the forceps in clinical practice, and incorporated recommendation of the forceps during the early lectures that he gave in conjunction with his friend and colleague, William Osborn. Despite this, Denman was exposed to a wide network of practitioners who exposed him to new practices and ideas.[711] It was thanks to these contacts that Denman became aware of the vectis at all, and in all probability, that he acquired the skill to use it. Strikingly, it took him several years to hone that skill – an early indication of what was to be a key factor in the subsequent history of the instrument.

The way in which the vectis was used changed as practitioners experimented with it over time. At the end of the eighteenth, and first half of the nineteenth century, the vectis was used to provide traction. Despite being a concern expressed by many authors, a search of treatises that were published at the time, did not reveal any authors or practitioners who advocated the use of the vectis as a lever.[712] Indeed, warnings were published that gave accounts of the damage that this method of use caused.[713] By the second half of the nineteenth century, the vectis was used to facilitate both flexion and rotation of the baby's head, and was recognised to be particularly useful in correcting malpositions.

In contrast to the vectis, clinical use of the forceps stabilised quickly with an agreed method of using the short forceps that used the ear as a landmark for insertion of the instrument. The long forceps took a little longer, but again, an agreed method of use emerged during the nineteenth century where the instrument was applied in relation to

the pelvis. In contrast to this closure mechanism of agreed usage, flexibility in design was celebrated.

6.1.2.2 Flexibility in design

In addition to experimenting with the mechanism for using the vectis, practitioners experimented with the design of the instrument, although they did this less often with the vectis than they did with the forceps. Flexibility was expressed in the multiple designs of the forceps which varied enormously, and the variety of designs was fêted and embraced as a feature of the instrument. One example of this was in the *Conversazione* organised by the Obstetrical Society of London in 1866, with over 150 pairs of forceps exhibited, compared to nine types of vectis.[714]

There were different designs of vectis made available in instrument catalogues, such as those offered by Maw & Sons. Instrument catalogues were modified over time, as instrument sales changed. Their catalogue had offered versions of the vectis in earlier editions, but they had been named only 'vectis',[715] but by the end of the nineteenth century, the Maw and Sons catalogues offered three types of vectis: two straight examples, one by Lever, and one by Symonds, and a folding vectis by Lowder.[716] Although the two types of vectis were named differently, after the practitioners Lever, and Symonds, the instruments were visually very like each other, even though Lever's vectis had a more pronounced curve. A slightly modified design was also available, named after Lowder, that had the addition of a hinge, so the instrument folded in half and could be carried in the coat pocket of a practitioner. The design of Lever's and Symonds' vectis was like that described by Denman in 1787.[717] When using the vectis, practitioners were all effectively using the same instrument; the flexibility of the use of the vectis was more typically in the mechanism of use, rather than in altering its design.

One of the key concepts of the SCOT model is that the relevant social groups that experiment with an artefact share the same interpretation of it.[718] For the forceps, the use of both the short and the long forceps stabilised early in the nineteenth century with an agreed method of application, as identified in chapter five. In contrast, it took a long time, until the end of the nineteenth century for the use of the vectis to stabilise and converge. In 1893, Galabin's use of the vectis was typical of his contemporaries: he used the vectis to provide flexion and rotation in malpositions, but the forceps in most cases of obstructed labour. Despite recommending it for malpositions, even Galabin acknowledged that the

vectis was acknowledged by most to be obsolete.[719] This was still a significant recommendation for use, since malpositions were a significant cause of delay in labour where practitioners felt compelled to intervene to resolve long, painful labours with potentially poor outcomes for both mother and baby. So, by the end of the nineteenth century, there were two conflicting accounts of the vectis. Firstly, that it was obsolete for the purposes of traction, but secondly, that it was useful in cases where there was a malposition. This contradiction raises the question as to why the vectis stopped being used to correct malpositions if it was useful. Despite the utility of the vectis, alternative actions were also available to correct malpositions, such as Herman's recommendation for manual rotation of the baby.[720] So, although the vectis could be still useful in correcting malpositions, this could also be undertaken by manual rotation less invasively, with less financial cost to the practitioner.

6.1.3 Unintended consequences of changes in medical regulation

In addition to analysing the flexibility in design and use of the vectis using the SCOT model, this thesis has also situated the nineteenth-century clinical use of the vectis and forceps in the relevant historical context, namely the changing modes of medical education in that period. This has addressed a criticism of the SCOT model by Russell, that Pinch & Bijker needed to locate relevant social groups in their structure or hierarchy and in their historical context, rather than being content merely to describe the group.[721] Analysis of these changes has illuminated several foreseen consequences of these changes, which will be summarised next.

6.1.3.1 Networks of practice

Denman was educated with strong elements of apprenticeship. He was informally apprenticed, first to his father and brother, and then more formally as an assistant surgeon in the Navy. This apprenticeship was supported by some attendance at lectures, but he also worked closely with an experienced practitioner to learn his craft. Denman would not have learned midwifery in the Navy, but instead continued to seek out support from more experienced practitioners when he returned to London. Denman was one of the practitioners that experimented most widely with the use of the vectis. Most importantly, he had a wide network of practitioner colleagues on whom he could call for help, and who called him. In this way he was exposed to new ideas and ways of working, and experimented in practice. This allowed him to develop and refine his practice.

In contrast to Denman, Alfred Lewis Galabin was educated very differently. After leaving school, he had attended Trinity College, at the University of Cambridge, and read Mathematics and Classics, before completing an MA.[722] He then attended Guy's Hospital, where his education combined attendance at a series of lectures, with practical clinical experience. Galabin did gain ward experience as part of his medical education, but often this was gained in a more independent manner than apprenticeship offered, with Galabin undertaking positions such as external obstetric attendant, surgical ward clerk, medical ward clerk, assistant surgical dresser, dresser in surgery, and resident obstetric clerk as part of his education.[723] Following qualification at Guy's, Galabin stayed there to work, where it is probable that he learned to use the vectis during this time from a colleague or teacher, such as Braxton Hicks or Philips. Galabin used the vectis to provide flexion and rotation in occipito -posterior positions, and continued to use the vectis in the same way during the entirety of his career. Galabin was part of more formal rigid networks of practice. By the time that Galabin came to use the vectis, networks were less flexible, and the agreed ways in which the vectis was used had stabilised, rather than being subject to experimentation and flexible use.

Innovative and flexible networks enabled innovative and flexible practice, while the increasingly rigid and limited networks resulted in more rigid and limited practice. The drive to improve practice with increased regulation and education actually had the unintended consequence of reducing variation in practice. Although it raised the standards expected of practitioners so that there was a move away from unqualified practitioners, the inadvertent converse of this was to reduce the opportunities for sharing practice knowledge with specialised instruments such as the vectis. It is therefore probable that the regulation of doctors negatively affected learning in informal networks of practice and contributed to the disappearance of the vectis. These networks were important mechanisms for sharing practice experience and innovation. This is supported by modern scholarship on 'communities of practice' as formal or informal networks that facilitate knowledge exchange, innovation and sharing of good practice.[724] Formal structures alone are not enough to learn how to be effective in a job, particularly in such a complex role as the practice of medicine.

6.1.3.2 Changes in teaching methods

Although networks of practice were important to the development of Denman's clinical practice, the limitation of these networks cannot explain the disappearance of the vectis

on its own. A further unintended consequence of the changes in regulation and education of doctors was the sheer size of the groups that they learnt in. When Denman attended lectures, he was part of a relatively small group of students of ten or fifteen pupils. One of the advantages of small groups such as these, was that it is easier to get attention from the lecturer, to ask questions and develop an active learning style. By contrast, the passage of the 1858 Medical Act, combined with the move towards recognised courses to prepare for the mandatory examinations that led to entry to the register of the General Medical Council (GMC), meant that Galabin was one of a much larger group of students when he attended lectures with over a hundred students being admitted each year between the academic years of 1875/6 and 1880/1.[725]

Although the move towards such large groups of students was not legally mandated, the political context was of a single profession with examinations required for the entry to the GMC register. This led to a standardised entry route to the medical profession. In stark contrast, one hundred years before, there was huge diversity in entry routes to medical practice. Instead of student numbers being diffused widely between universities for those wishing to become physicians, or apprenticeships and private lectures for those wishing to become apothecaries or surgeons, student numbers were concentrated into relatively few medical schools. These large teaching groups would have changed what, and how, students learned. In modern literature, large group teaching has been subject to critique, as an ineffective way for students to learn since students learn by what they 'do' (what activities they undertake) rather than what they are told.[726]

Lectures encourage passive rather than active learning since it is more difficult to encourage group interaction in large groups.[727] Lectures centre around transmission of knowledge from the lecturer to the students, rather than necessarily centring on student learning. A further issue with large group teaching, is that it is difficult to meet the needs of a diverse group of students, with a range of existing knowledge and skills. Complex concepts are challenging to learn in large groups, but the main problem in teaching medical students, is that large group lectures make the effective teaching a complex clinical skill virtually impossible. The same principle would apply to any profession that combines knowledge with a high level of manual skill or dexterity.

6.1.3.3 Transmission of skills knowledge

To use midwifery instruments effectively, the practitioner required a high level of knowledge of anatomy, physiology, and the mechanisms of labour, combined with highly developed manual dexterity and skill. This thesis has argued that these requirements were magnified when it came to the use of the vectis. Instruction in use was two-fold, with a requirement for the practitioner to be shown how to use the instrument, and then to use it while being closely supervised. That means that some degree of apprenticeship was required to learn a skill, that could not be gained from lectures, or be self-taught. This required much smaller groups, or individual supervision, to facilitate learning rather than large group teaching. It is possible to deliver the theoretical knowledge on anatomy and physiology, and mechanisms of labour that underpin clinical skills teaching in a large group, but the higher order parts of the skill acquisition require practical clinical experience and supervision.

When members of the Chamberlen family sold their secret to other practitioners, ongoing instruction and supervision were included in the sale price. In 1702, James Douglas wrote of a case where he struggled to use the forceps due to a lack of both supervision, and skill.[728] Although Douglas blamed his instrument, he was new in using the forceps, and was not supported by a more experienced practitioner. Similarly, over one hundred years later, Denman used the vectis for over ten years before he shared his knowledge in print. Subsequently, Francis Ramsbotham attempted to teach himself to use the vectis, but without a teacher to demonstrate its use, he was unsuccessful. Even though Ramsbotham was an experienced practitioner and author who appeared, from his published works, to have a good understanding of anatomy, physiology, and the mechanisms of normal labour, he struggled to use the vectis without instruction and support to learn the skill. He was not able to teach himself. Technical skill and manual dexterity were essential in the use of both the vectis and the forceps. Although the use of the forceps was undoubtedly a complex skill to learn, as demonstrated by Douglas, the vectis appears to have been an even more complex instrument to learn to use.

Since the vectis required significant clinical experience and a high degree of skill to be able to use it effectively, there would have been difficulties in incorporating it into the lectures given to the large groups of medical students by the end of the nineteenth century. Although the forceps also required a good level of skill and experience, it appears to have been a slightly easier instrument to learn to use than the vectis. It is probable that this issue was a contributory factor to the convergence of views concerning the vectis:

medical teaching had become more structured and regulated, and as difficult as the vectis was to use, it was even more difficult to teach. The instrument was simply not taught to the newly enlarged groups of medical students. As suggested by the example of Thomas Denman's use of the vectis, early education was not an absolute requirement in a practitioner going on to use the vectis, but nonetheless, it was often a strong influence. Ramsbotham summarised this saying

> We must recollect that early instruction is likely to prejudice one in favour of any particular instrument, and that a certain degree of acquired dexterity in its use would probably attach him to it.[729]

In other words, students are influenced by their early education.

The large groups teaching that followed the 1858 Medical Act led to the forceps being taught to all medical students, and ultimately this led to a prevailing view of practitioners, that the vectis was obsolete, and the forceps were the superior instrument. This thesis has argued that the influence of changes in the education and regulation of medical practitioners saw the vectis restricted to the management of malpositions, but despite this recommendation, the nuance to this, that the vectis was valuable in correcting malpositions, was lost. In addition, there were also alternatives methods available to managing malpositions with the vectis since practitioners could also use manual rotation.[730]

Large group education did have benefits to the medical students though. Sharing education with fellow students in a large group allowed experiences and knowledge to be shared. Ideas about clinical practice and use of instruments were shared, and meanings and behaviours attributed to this were made concrete. This resulted in a collective professional identity: locally, nationally, and sometimes internationally.[731] This growing sense of a professional identity for doctors, rather than physicians, surgeons, or apothecaries, would have contributed to closure mechanisms for the use of the vectis since it would, as has been shown, have given rise to convergence in the use of, and ideas about the obsolescence of the vectis.

The mass production of medical textbooks and midwifery treatises also allowed knowledge and ideas to be shared nationally, and internationally, and would have contributed to the convergence in use, and disappearance of the vectis. Many of the best-selling midwifery treatises such as those by Denman, Burns, Ramsbotham and later Churchill and Galabin were published in multiple editions in London, with further editions published in America, often with an American editor.[732] The production of Midwifery

Treatises not only allowed knowledge to be shared between practitioners, but also allowed practitioners' presence to be advertised, and the reputations of teachers and practitioners to be built. Many of the textbooks that were written were written by lecturers in midwifery, and aimed at their students or junior practitioners. Teachers would not have written something in their text book that they did not teach. So, if teachers were unable to teach the use of the vectis, they would not have written about the use of the vectis in their textbooks either.

The change in the process of producing medical men had moved away from the local control inherent in apprenticeship, to large centralised medical schools that were limited in number. As has been suggested, the large numbers of medical students would have limited the individual tuition available, that was necessary for learning clinical skills since highly specialised skills need time and practice to perfect expertise. The large group sizes necessarily limited the time available to permit students to sufficiently develop their skills, and the vectis disappeared from medical education. The next section of this chapter will look at the implications of this research.

6.2 Thesis implications

6.2.1 Forceps use and professional identity

As was argued in section 6.1.2, the standardisation of practice that took place with the changes in regulation and education of doctors resulted in convergence of opinion being in favour of the forceps as the dominant technology for use in obstructed birth. The esteemed position of the forceps, was exemplified in the words of Radcliffe, who stated in *The Secret Instrument* that

> Every doctor who practices midwifery employs the forceps … To the Chamberlen family and to their successors the whole civilised world owes a debt of gratitude.[733]

Subsequently, Radcliffe summarised the revered place that he considered the forceps held most succinctly by referring to the forceps as 'the key to the lying-in room' in his book *Milestones in Midwifery*.[734] Although Radcliffe refers to the forceps as the 'key' that gave men-midwives entry into the birthing chamber, authors such as Loudon[735] and Wilson[736] argued that this was a simplistic explanation of rapid spread of man-midwifery. Wilson provided an alternative explanation, that it was in fact demand from the newly literate upper-class women that drove demand for male attendance at childbirth as a matter of

course.[737] Subsequently, Loudon argued instead that the rise of man-midwifery was likely to be due to a combination of several factors, rather than a single one. He included the rise in scientific knowledge and understanding, particularly the understanding of anatomy, in addition to increased demand from a changing female culture as postulated by Wilson, and 'success of men-midwives at all levels in persuading women to accept attendance by a medical practitioner instead of a midwife'.[738]

That success in persuasion was in part due to the combination of advantages that men-midwives held over their female counterparts. Firstly, they had exposure to significant clinical experience as mandated by the Worshipful Society of Apothecaries that was necessary for licensure. Secondly, they also had a systematic medical education, that was increasingly important during the nineteenth century, and later the compulsory national standard of education as set out in the 1886 Medical Act Amendment Act. Thirdly, they also had the option of recourse to the use of instruments to deliver women in obstructed labour without having to call in another practitioner. Female midwives had not traditionally used instruments,[739] and the 1902 Midwives Act enshrined the requirement to call in a doctor in cases where there was a complication in law, so if instruments were required at an obstructed birth, a midwife could not use them since she had to ask for assistance. The use of instruments to assist childbirth was exclusively the province of male practitioners using forceps. The use of instruments was symbolic of the division been female midwives and male obstetricians.[740]

The SCOT model has been extensively used to interpret the role of users in the creation and co-creation of technology, and in this thesis, I have explored the role of practitioners as users who constructed the use and non-use of the vectis. However, I would argue that the converse is also true, and that obstetric instruments co-constructed the professional identity of obstetricians. The historiography of this professional group is intertwined with the historiography of the instruments, not because it gave them a 'key' into the birthing chamber, but because instruments were central to the purpose and professional identity of obstetricians. Without instruments there would be no obstetricians, and without obstetricians there would be no instruments; the users and the technology co-constructed use and identity. This expands the modified use of the SCOT model which has been to explore the impact of users on technology, and the use of technology on user groups,[741] but is the first time that this model has been applied to the male practice of midwifery.

6.3.2 Use and non-use of the vectis

This thesis set out to understand how the vectis was used in clinical practice, and to understand why it disappeared from use. The vectis was used flexibly in four main ways: for traction, leverage, flexion, and for rotation. During the nineteenth century, changes in medical education and regulation led to the emergence of a distinct medical profession with shared values and ideas. This led to stabilization, and convergence in ideas, surrounding the use of the vectis, so that it was considered obsolete when used for traction, but useful in managing malpositions, although this advantage was later lost to alternative techniques for management.

The changes in both the education and regulation of medical practitioners during the nineteenth century had two effects on the way that practitioners learnt. Firstly, the large groups of medical students that attended lectures at medical schools, meant that it was difficult to teach an object that required a high degree of clinical skill. The vectis disappeared from lectures. The midwifery lecturers, many of whom also wrote text books, did not write about an instrument that they could not teach, so it not only disappeared from lecture halls, but from text books, and ultimately from the historiography. Secondly, the informal networks of practice that were so influential on Denman's practice, also disappeared. The opportunities for practitioners to experiment and learn from a wide range of colleagues vanished to be replaced by a more formal structure where networks were more often confined to a single institution.

Although this thesis has explored nineteenth century historical context and practice, there are implications from the research that reach beyond this time. Regulation of practice had several advantages in establishing a minimum standard of education and experience necessary for safe practice, but it also has unforeseen consequences for practitioners. Unregulated practice has extremes of standards, from very high to very low. For the vectis, this meant that there were highly skilled practitioners such as Denman, and highly dangerous practitioners such as the one described by Gaitskell. In striving to eradicate such unskilled practitioners, opportunities to develop networks of practice were also diminished.

The result of these changes for the vectis has been that very few contemporary practitioners, doctors, or midwives, are aware that it even existed. Despite this, although the vectis has disappeared from clinical use, it has moved into museum collections. Nonetheless, limited display space and a smaller variety of types of the vectis compared to

the forceps, has resulted in only small numbers of the artefacts being displayed. In this thesis, I have demonstrated that the vectis holds an important, hitherto unacknowledged, part in the story of the male practice of midwifery. For this reason, it should be included on the display shelf rather than relegated to the store room.

6.3 Final thoughts

6.3.1 Areas of future research

Amongst the implications of the present findings is the identification of additional research topics.

1. The Licence in Midwifery granted by the Royal College of Physicians between 1783 and 1800, discussed in chapter three, warrants further research. It would be particularly interesting to establish the motivation for awarding, and then ceasing to award, the licence in midwifery.
2. The call by Thomas Denman and the 'Gentlemen practising Midwifery' for a separate College of Midwifery, also discussed in chapter three, merits further research in sources such as the personal papers of the practitioners involved, to understand what happened to the proposals, and why the gentlemen did not continue to push for this course of action.
3. There is the apparent contradiction of the obsolescence of the vectis with the continued recommendation for its use in the management of occipito-posterior positions in labour. It would be worthwhile exploring the management of such malpositions in printed and manuscript sources to understand how such management changed during the nineteenth and twentieth centuries, and augment the understanding gained during this thesis.
4. One of the most noticeable differences between modern midwifery practice and that of the nineteenth century is in the condition of the baby as an indicator for the need to intervene with instruments. In contemporary practice, the wellbeing of the baby is the main indication for instrumental delivery. The Royal College of Obstetricians and Gynaecologists identified that 'presumed fetal compromise', along with maternal indications and inadequate progress were all reasons for instrumental delivery.[742] As discussed in chapter four and five, in contrast, Denman used instruments when there was inadequate progress or there was a maternal

indication. The entry of the condition of the baby into decision making warrants further enquiry.

This thesis has used the SCOT model to explore the use of the vectis and its disappearance from clinical practice, but it would be worthwhile to explore the use of this model in the exploration of other medical instruments in future research. In particular, it would be useful to understand how technology continues to influence and co-construct the professional identity of doctors and midwives in the twentieth century. For example, the introduction of electronic fetal monitoring has become widespread since its introduction in the 1970s and has had a significant influence on practice. Anecdotally, technical skills, such as those involving the use of technology are highly prized by students and practitioners alike. It would be an interesting area of research to consider the reciprocal influence on professional identity and perceived competence or skill.

Finally, it has not been possible during archival research to recreate the voices of the women on whom the instruments were used and understand their viewpoint on the use of instruments, since it has not been recorded in any of the archival sources that I have consulted. This is an important strand of the story of the use of instruments in childbirth and has been acknowledged as a limitation of this thesis. Further exploration of archival sources including personal letters could illuminate this further. Although the thoughts and feelings of working-class women in the nineteenth century were unlikely to have been written down in letters or deposited in an archive, letters of wealthier women may have been. It would be worthwhile exploring whether there are any records of women's views on instrument use, despite initial searches as part of this thesis have not proved fruitful.

6.3.2 The forgotten instrument

This thesis set out to understand how the vectis was used, and why it disappeared from clinical use. The answer has been complex, and has required understanding of the context of clinical practice in the late eighteenth and nineteenth century. There were multiple factors that contributed to the disappearance of the vectis, including multiple unintended consequences of the changes in medical regulation and education. In contrast, the impact of these changes on the forceps was different due to the earlier acceptance of an agreed method of best using the forceps. The huge variety in the types of forceps available was celebrated as a manifestation of the ingenuity of the medical profession in delivering babies during obstructed labour, and the forceps became symbolic of the profession; the identity of the instrument and profession were co-constructed.

The vectis faded into obscurity, both from clinical practice, and from the historiography. This has been explained as part of closure mechanisms of the story of the vectis. The dominant narrative of the relevant social group, medical men, told that the vectis was obsolete and the forceps dominant. The historiography echoed this narrative, thereby reinforcing it. In addition to disappearing from clinical practice, and from the history books, the vectis ultimately disappeared from the collective professional consciousness and was forgotten. The postscript to this thesis will look at the only left for the vectis: the museum.

Postscript: Life after the clinical use of the vectis

This thesis has explored the clinical use of the vectis as documented in written sources: these included treatises, journal articles, letters, manuscripts, and trade catalogues to document the use, and eventual disappearance from use, of the vectis. By the start of the First World War, mention of the vectis in midwifery treatises, and trade catalogues, had disappeared completely. Non-use of the vectis was complete, but the instruments that were used did not disappear; they instead moved into museum collections. Even though the vectis was not used in clinical practice any more, the object itself retained some value as a museum artefact.

Museum collections, by their nature, cannot be representative of all aspects of life in the past. What objects survive limit museum collections, often objects that have been in everyday use are simply thrown away at the end of their useful life, because they are damaged and worn, rather than kept or donated to a museum. For an object to be donated to a museum the donor must have valued it. It must also be valued by the museum, since storage space is limited, so most museums have clear acquisition policies to guide what objects are of interest to them. There is a further issue for the museum about what can be displayed, since only a fraction of the museum collection is on display at one time, and this is often dictated by what items will appeal to a broad audience. The vectis does not appeal to a broad audience, since it is not part of the professional, or public, consciousness.

The largest collection of extant vectes in Britain, at the time of writing, is held by the Science Museum group. This group of museums includes the Science Museum in London, the National Media Museum, and the National Railway Museum. A search of the Science Museum website, using the search term 'vectis', produced 121 records. [743] The website only shows photographs of four of these instruments, not all of them. [744] Some are recorded as being badly rusted, so are held in storage, rather than being on display. The Science Museum website lists records of five instruments that were donated to them by the Wellcome trust when that organisation refined their acquisition policy. The Wellcome Museum no longer lists the vectis among its collection.

The collection of the Royal College of Obstetrics and Gynaecology (RCOG) in London, houses over twenty examples of the vectis, although the museum uses the term 'lever' to catalogue them. The RCOG holds the original Chamberlen instruments that were

discovered under floorboards in the attic of Woodham Mortimer Hall before being donated to the Medico-chirurgical Society, [745] and later to the Royal Society of Medicine. The instruments were given as a gift by the Royal Society of Medicine, to the Royal Society of Obstetrics and Gynaecology in 1957. [746] The only examples of the vectis that are visible to the public are part of the display of original Chamberlen instruments, while the remaining collection is held in storage.

The Thackray Medical Museum in Leeds also holds five extant instruments. All five are dated as being manufactured between 1820 and 1840. Only one of those is currently on permanent display in the museum, although another was included as part of a handling collection of Chamberlen instruments, developed as part of this thesis, in fulfilment of part of my Collaborative Doctoral Award, to be used by gallery attendants with the public.

The vectis is held in very few museum collections, and is most commonly held in storage, rather than being displayed. Even where photographs of the instruments are available on the internet, there is limited text that explains the instrument and its use. Such text is necessary for members of the public to be able to understand what they are looking at, since it would not be familiar to them. Although some value must be placed on the extant examples of the vectis for the museums to collect any examples, the fact that the instruments are held in storage, rather than placed on display, consolidates the general story of the vectis that has emerged: a story of obscurity.

Footnotes

Chapter 1: Introduction

1 Denman, T. *An Essay on Difficult Labours. Part Second.* (1790). London: J. Johnson.p. 39-40.

2 This thesis was undertaken with the assistance of a Collaborative Doctoral Award funded by the Arts and Humanities Council, the University of Leeds, and the Thackray Museum in Leeds. The place of the vectis in museums is discussed in a postscript to this thesis after chapter 6.

3 Radcliffe, W. *Milestones in Midwifery* (1967) and *The Secret Instrument (The Birth of the Midwifery Forceps)* (1947), (San Francisco: Norman Publishing, 1989).

4 Denman, T. (1783). Aphorisms on the application and use of the forceps, On preternatural labours and On labours attended with Haemorrhage. London. p. 6.

5 Denman, T. (1783). *Aphorisms on the application and use of the forceps, On preternatural labours and On labours attended with Haemorrhage.* London.

6 Denman, T. (1793). *Aphorisms on the application and use of the forceps and vectis; on preternatural labours, on labours attended with haemorrhage, and with convulsions* (Fourth ed.). J. Johnson, St Pauls Churchyard.

7 Camper, M. (1774). Remarques sur les Accouchemens laborieux par l'enclavement de la tete, & sur l'usage du levier de Roonhuysen dans ce cas. *Memoires Academie Royale de Chirurgie*, 729-746.

8 Bland, R. (1790). Some account of the invention and use of the Lever of Roonhuysen. In *Medical Communications.* (pp. 397-462). London: Joseph Johnson.

9 Denman, T. *An Introduction to the Practice of Midwifery* (London: T. Bensley for J. Johnson, 1788), VOLUME THE FIRST.; Thomas Denman, *An Introduction to the practice of Midwifery in two volumes* (London: J. Johnson, 1795).

10 King, H. (2007). *Midwifery, Obstetrics and the Rise of Gynaecology: The uses of a sixteenth century Compendium*. Abingdon: Routledge.

11 Denman, T. (1788) *Introduction to the Practice of Midwifery*. Volume 1, page xxxvi

12 See Bland, R. (1790). Some account of the invention and use of the Lever of Roonhuysen.

13 Herbiniaux, M. G. (1791). Histoire raisonée du Levier de Roonhuysen, et de ses Usages. In M. G. Herbiniaux, *Traite sur divers accouchemens laborieux et sur les polypes de la matrice.* Bruxelles: Lemaire.

14 See Cansardine (Carwardine), H. H. (1818). Brief notice presented to the Medico-Chirurgical Society with the Original Obstetric Instruments of the Chamberlins. *Transactions of the Medico-Chirurgical Society*. The paper given by Carwardine was mis-attributed to Cansardine when an account was published in the Transactions of the Medico-Chirurgical Society.

15 Lee, R. 'Observations on the discovery of the original obstetric instruments of the Chamberlens', *Medico-Chirurgical Transactions*, 45 (1862 (Read 12th November 1861)), 1 - 24.

16 *Ibid*. p. 1.

17 Turning is also known as internal podalic version. This is performed when the baby is in a transverse position in utero. The practitioner reaches into the uterus and grasps the baby by the feet to turn it into a breech position to facilitate the delivery of the baby.

18 Lee, R. 'Observations on the discovery of the original obstetric instruments of the Chamberlens', (1862), 1.

19 *Ibid*.

20 Aveling, J. H. *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument* (London: J & A Churchil reprinted by AMS Press 1977, 1882).

21 Spencer, H. R. *The History of British Midwifery from 1650 to 1800* (London: John Bale & Sons, 1927).

22 *Ibid.* p. 141.

23 Das, K. *Obstetric Forceps: its history and evolution (1929)* (Leeds: Medical Museum Publishing, 1993). Das was an Indian Obstetrician, and his history of the forceps is a seminal piece of work on the subject. See Hibbard, B. (2000). *The Obstetrician's Armamentarium. Historical Obstetric Instruments and their Inventors.* San Anselmo: Norman Publishing.

24 Das' book has a section entitled *The Chamberlens (1601-1818),* but this section only discusses the forceps, and not the vectis. Even the entry for Thomas Denman, a leading advocate for the vectis mentions some forceps that Denman designed and did not mention the vectis. Kedarnath Das, *Obstetric Forceps*.

25 Radcliffe, W. *Milestones in Midwifery (1967) and The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989).

26 Radcliffe, The secret instrument. (1947) p. 67.

27 *Ibid*. p. 69.

28 Radcliffe, W. *The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989). pp. 65-66.

29 J.M. Munro-Kerr, R.W. Johnstone and Miles H. Phillips, *Historical Review of British Obstetrics and Gynaecology 1800 - 1950* (Edinburgh: E & S Livingstone Ltd. , 1954).

30 *Ibid*. p. 121.

31 Radcliffe, Milestones in Midwifery, (1967).

32 This is the title of the fourth chapter in Radcliffe's *Milestones in Midwifery.*

33 See Towler, J. and Bramall, J. *Midwives in History & Society* (London: Croon Helm, 1986).; Jean Donnison, *Midwives and Medical Men*, 2nd edn (London: Historical Publications Ltd, 1988).; Moscucci, O. *The Science of Woman: Gynaecology and gender in England, 1800 - 1929* (Cambridge: Cambridge University Press, 1993).; *The art of Midwifery. Early Modern Midwives in Europe*, ed. by Hilary Marland (London: Routledge, 1993).; Borst, C. G. *Catching Babies. The professionalization of Childbirth 1870 - 1920* (Cambridge, Massachusetts: Harvard University Press, 1995).; Marland, H. & Rafferty, A. M. (Eds) *Midwives, Society & Chilbirth. Debates and controversies in the Modern Period*, (London: Routledge, 1997).

34 Oakley, A. (1980). *Women Confined: Toward a Sociology of Childbirth.* London: Martin Robertson. p. 11.

35 Donnison. *Midwives and Medical Men* (1988).

36 Pinchbeck, I. (1930) *Women Workers and the Industrial Revolution*. London.

37 *Ibid*. p. 304.

38 Donnison. *Midwives and Medical Men* (1988). p. 34.

39 Donnison. *Midwives and Medical Men* (1988). p. 41.

40 Blundell (1834) in named work cited by Jean Donnison. *Midwives and Medical Men* (1988). p. 201. Blundell, (1790-1878) was born in London, and was the nephew to the physiologist John Haighton. Blundell graduated MD from Edinburgh in 1813, and a year later assisted his uncle as lecturer in midwifery and physiology at Guy's hospital. He succeeded his uncle in 1818, and became a fellow of the Royal College of Physicians in 1838. He was author of 'Lectures on the principles and practice of midwifery' published in 1839.

41 Ute Kőnig (1982) cited by Donnison. *Midwives and Medical Men* (1988). p. 201.

42 Kőnig appears to be a German feminist philosopher, but Kőnig's original work has proved difficult to trace and review.

43 William Hunter, a leading man midwife, taught his pupils to be cautious in the application of instruments, saying 'we shall never use them [instruments] on any [woman], but where they are absolutely necessary'. See Anon. (1775). *Lectures Anatomical and Chirurgical by William Hunter*. Manuscript lecture notes MS2966, Wellcome Library. p.109.

44 Donnison. *Midwives and Medical Men* (1988). p. 44-5.

45 Donnison. *Midwives and Medical Men* (1988). Chapter 2: The decline of the Midwife.

46 Maubray was a follower of Hendrik van Deventer, a Dutch surgeon who was vociferously against the use of the forceps and instead advocated a manual technique to assist in obstructed labours who was influential at Court. Maubray was described as a man-midwife, and wrote not only *The Female Physician, containing all the diseases incident to that sex, in virgins, wives and widows* in 1724, but a second book *Midwifery Brought to Perfection by Manual Operation* in 1725. He also delivered lectures on midwifery. Although Maubray offered his pupils the opportunity to attend births, it is unclear how much practical he had since he allegedly delivered a demon baby known as a moodiwarp and was involved in the Mary Toft Case where a woman gave birth to rabbits. See Oxford Dictionary of National Biography entry on John Maubray, Adrian Wilson, *The Making of Man-midwifery: Childbirth in England 1660 – 1770.* (Cambridge: Harvard University Press, 1995)., Spencer, H (1929) The history of British Midwifery.

47 John Maubray. Female Physician. pp. 181-2. cited by Jean Donnison. *Midwives and Medical Men* (1988). p. 42.

48 Quoted in Spencer, H (1929) The history of British Midwifery. p. 73. cited by Donnison. *Midwives and Medical Men* (1988). p. 43.

49 Donnison. *Midwives and Medical Men* (1988). p. 43. Paraphrasing Sarah Stone. *Complete Practice of Midwifery* (1737). pp. xi-xii.

50 Wilson, A. *The Making of Man-midwifery: Childbirth in England 1660 – 1770.* (Cambridge: Harvard University Press, 1995).

51 *Ibid*. See discussion in Chapter Ten: John Bamber, the vectis, and the City of London. p. 135-144.

52 *Ibid*. p. 141.

53 Hibbard, B. (2000). *The Obstetrician's Armamentarium. Historical Obstetric Instruments and their Inventors.* San Anselmo: Norman Publishing.

54 *Ibid.* p. 199 – 212. The vectis is dicussed on pages 206-210.

55 Radcliffe, *The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989).

56 Jean Donnison. *Midwives and Medical Men* (1988).

57 Loudon argued that instead of a single factor to explain the phenomenon of the rise of man-midwifery, such as that suggested by Wilson of increased female literacy, there were likely to instead be several factors. Loudon postulated that these were likely to include the interdependent factors of an improved scientific understanding of childbirth, the changes in female culture identified by Wilson and an increased acceptability of attendance by a male practitioner. Loudon, I. (1996). Essay review: The Making of Man-Midwifery. *Bulletin of the History of Medicine*, 507-515.

58 See instrument catalogues such as those by S. Maw & Sons published in 1869, 1882, 1891, 1905 and 1913. Also, The Obstetrical Society of London. (1867). *Catalogue and Report of Obstetrical and other instruments exhibited at the conversazione of the Obstetrical Society of London, held by permission, at the Royal College of Physicians, March 28th 1866, with numerous illustrations.* London: Lingmans, Green, and Co.

59 Instrument manufacturers regularly reviewed and updated their catalogues and removed items from sale that were no longer ordered, while promoting new and innovative instruments. See Jones, C. L. (2012). Medical Trade Catalogs: The Uses of Professional Advertising in British Medical Practice

Bulletin of the History of Medicine, 86, 361-393.; Jones, C. L. (2013). *Email correspondence*. Retrieved March 11, 2013.; Jones, C. (2013). *The Medical Trade Catalogue in Britain*, 1870 - 1914. London: Pickering Chatto.

60 Bijker, W. E. *et al* (2012) *The social construction of technological systems: new directions in the sociology and history of technology*. MIT Press, Cambridge, Massachusetts. p. 4.

61 *Ibid*.

62 Bijker, W. E., Hughes, T. P., & Pinch, T. (Eds.). (2012). *The Social Construction of Technological Systems: New directions in the Sociology and History of Technology (Anniversary ed.).* London: The MIT Press.

63 Bijker, W. E., & Pinch, T. J. (1987). The social construction of facts and artifacts: or how the sociology of science and the sociology of technology might benefit each other. In Bijker. W. et al, *The Social Construction of Technological Systems.* MIT Press.

64 Oakley, A. (1980). *Women Confined: Toward a Sociology of Childbirth.* London: Martin Robertson.; Wajcman, J. (1991). *Feminism confronts Technology.* Oxford: Polity Press.; Faulkner, W. (2001). The technology question in feminism: A view from feminist technology studies. *Women's Studies International Forum*, 79-95.

65 Wajcman, J. (1991). *Feminism confronts Technology.* Oxford: Polity Press. p.17.

66 Harding, S. (1986) *The Science Question in Feminism*. New York, Cornell University Press. cited by Wajcman, J. (1991). *Feminism confronts Technology.* Oxford: Polity Press. p.11.

67 Wilson, A. (1995). *The Making of Man-midwifery*.

68 Basalla, G. (1998). *The Evolution of Technology.* Cambridge: Cambridge University Press.

69 *Ibid.*

70 Hibbard, B. (2000). *The Obstetrician's Armamentarium.* p. 210. Hibbard refers to the vectis as lever throughout his book.

71 RCOG. (2018, May 25). *RCOG Heritage: The Chamberlen Family.* Retrieved from Royal College of Obstetricians and Gyanecologists: https://www.rcog.org.uk/en/guidelines-research-services/library-services/archives-and-heritage/archives/rcog-heritage-the-chamberlen-family/

72 Pinch, T. J. & Bijker, W.E. (2012). The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other. In W. Bijker, D. Douglas, T. Hughes, & T. Pinch, The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology (pp. 11-97). London: MIT Press. p. 16.

73 Pinch, T. J. & Bijker, W.E. (2012). The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other. In W. Bijker, D. Douglas, T. Hughes, & T. Pinch, The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology (pp. 11-97). London: MIT Press. p. 16.

74 Examples of the vectis in print, include Denman, T. (1783). *Aphorisms on the application and use of the forceps, On preternatural labours and On labours attended with Haemorrhage.* London.; Denman, T. (1805). *Introduction to Midwifery* (4th Edition ed., Vol. 2). London.; Copeman, E. (1856). *Records of Obstetric Consultation Practice; and a translation of Busch & Moser on Uterine Haemorrhage.* London: John Churchill.; Galabin, A. L., & Blacker, G. (1910). *The Practice of Midwifery, being the Seventh Edition of Dr. Galabin's Manual of Midwifery, greatly enlarged and extended* (7th Edition ed.). London: J & A Churchill.

75 Bijker, W. E., Hughes, T. P., & Pinch, T. (Eds.). (2012). *The Social Construction of Technological Systems: New directions in the Sociology and History of Technology (Anniversary ed.).* London: The MIT Press.

76 Bijker, W. E., & Pinch, T. J. (1987). The social construction of facts and artifacts.

77 Bijker, W. E., Hughes, T. P., & Pinch, T. (Eds.). (2012). *The Social Construction of Technological Systems: New directions in the Sociology and History of Technology (Anniversary ed.).* London: The MIT Press.

78 Pinch, T, J., & Bijker, W E. (1984) The Social Construction of Facts and Artefacts.

79 *Ibid*.; Bijker, W. E., & Pinch, T. J. (1987). The social construction of facts and artifacts: or how the sociology of science and the sociology of technology might benefit each other. In B. W. al, *The Social Constrction of Technological Systems.* MIT Press.; Bijker, W. E., Hughes, T. P., & Pinch, T. (Eds.). (2012). *The Social Construction of Technological Systems: New directions in the Sociology and History of Technology* (Anniversary ed.). London: The MIT Press.

80 *Ibid*.

81 Prell, C. (2009). *Rethinking the Social Construction of Technology*.

82 Pinch, T, J., & Bijker, W E. (1984) The Social Construction of Facts and Artefacts. P. 428.

83 Adapted from Pinch, T, J., & Bijker, W E. (1984) The Social Construction of Facts and Artefacts.; Oudshoorn, N., & Pinch, T. (Eds). (2005). *How users matter*.; Prell, C. (2009). *Rethinking the Social Construction of Technology through 'Following the Actors': A Reappraisal of Technological Frames.* Retrieved from Sociological Research Online (Journal): http://www.socresonline.org.uk/14/2/4.html

84 Shields, M. A. (2012). Technology and Social Theory (review). *Technology and Culture*, pp. 918-20.

85 The dictionary gave several origins of the word *use*, including from the Latin *ūsus*, and from the French *eos.* See OED. (2017, June 12). *Use*. Retrieved from Oxford English Dictionary. The most relevant definitions of use that apply to this thesis include the manner of utilizing something, especially the skill of operating, or ability to use an instrument.

86 Oudshoorn, N., & Pinch, T. (Eds.). (2005). *How users matter: the co-construction of users and technology.* Cambridge, Massachusetts: The MIT Press.

87 Bijker, W. E., & Pinch, T. J. (1987). The social construction of facts and artifacts. In Bijker. W. et al, The Social Construction of Technological Systems. Also see Oudshoorn, N., & Pinch, T. (Eds.). (2005). *How users matter: the co-construction of users and technology.* Cambridge, Massachusetts: The MIT Press.

88 OED (2018, February 18) *User*. Retrieved from Oxford English Dictionary.

89 Russell, S. (1986). The Social Construction of Artefacts: A response to Pinch and Bijker. *Social Studies of Science*, 331-346.

90 Pinch, T, J., & Bijker, W E. (1984) The Social Construction of Facts and Artefacts. p. 406.

91 Pinch, T. J., & Bijker, W. E. (2012). The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other. In W. Bijker, D. Douglas, T. Hughes, & T. Pinch, *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (pp. 11-97). London: MIT Press.

92 Pinch, T. J., & Bijker, W. E. (1984). The Social Construction of Facts and Artefacts.; Oudshoorn, N., & Pinch, T. (Eds.). (2005). *How users matter*.

93 *Ibid*. See discussion on *Feminist Approaches: Diversity and Power*. pp. 4-7.

94 Winner, L (1993) Upon Opening the Black Box and Finding it Empty: Social Constructivism and the Philosophy of Technology. *Science, Technology & Human Values*. pp. 362-378.

95 Wyatt, S, Thomas, G, and Terranova, T. (2002). They came, they surfed, they went back to the beach: Conceptualising use and non-use of the Internet. In Woolgar, S (Ed) *Virtual Society*. Oxford University Press. Cited by Wyatt, S. (2005). Non-Users Also Matter: The Construction of users and Non-Users of the Internet. In N. Oudshoorn, & T. J. Pinch, *How Users Matter: The co-construction of Users and Technology* (pp. 67-79). Cambridge, Massachusetts: MIT Press.

96 Wyatt, S. (2005). Non-users also matter. p. 76.

97 Russell, S. (1986). The Social Construction of Artefacts: A response to Pinch and Bijker. *Social Studies of Science*, 331-346.

98 *Ibid*. p. 341.

99 Wilson, *The Making of Man-midwifery. (1995)*.

100 Text-book and treatise sources are listed in the bibliography. See appendix C.

101 Copeman, E. (Ed.). (1851). *Cases in Midwifery of the late J. G. Crosse Esq.arranged (With an introduction and remarks), by.* London: John Churchill.; Copeman, E. (1856). *Records of Obstetric Consultation Practice; and a translation of Busch & Moser on Uterine Haemorrhage.* London: John Churchill.

102 A biographical database of the lives of the Fellows of the Royal College of Physicians started by the Harveian Librarian William Munk. It was originally published in book form in 1861, and covered 1518 to 1825, although Munk's successors continued the project and continued to name it in his memory. It is now available on the internet at http://munksroll.rcplondon.ac.uk/Biography/Search

103 A biographical database of the lives of the Fellows of the Royal College of Surgeons was compiled by Victor Plarr, the College Librarian. It covers lives of the Fellows of the Surgeons from the time the role was created in 1843. It is available on the internet at http://livesonline.rcseng.ac.uk/

104 A biographical dictionary of notable Britons available was first published in 1900, and was re-born as the Oxford Dictionary of National Biography in 2004. It is available as hard copies or on the internet at http://www.oxforddnb.com/

105 A copy of the original source was sent by email by Librarian Dawn McInnis.

106 Jones documents that Trade Catalogues were updated regularly and the vectis was unlikely to be offered for sale if it were not being sold in sufficient numbers to justify its inclusion in the catalogue. Claire L Jones, 'Email correspondance', 2013; Claire L Jones, 'Medical Trade Catalogs: The Uses of Professional Advertising in British Medical Practice', *Bulletin of the History of Medicine*, 86 (2012), 361-93.

107 Leap, N., & Hunter, B. (1993). *The midwife's Tale.* London: Scarlett Press.

108 Allison, J. (1996). *Delivered at Home.* London: Chapman & Hall.

109 McIntosh, T. (2012). *A Social History of Maternity Care.* Abingdon: Routledge.

110 Intimate conversations such as those regarding birth stories are often shared between friends in person rather than recorded in letters. Furthermore, at the time, many 'ordinary' men and women were not literate and would not have committed their experiences to paper. Universal education did not become compulsory in England until the 1870 Education Act, when children had to attend school until they were 10 years old. The leaving age was raised to 12, and then 14 by the 1918 Education Act. See https://www.parliament.uk/about/living-heritage/transformingsociety/livinglearning/school/ [accessed 20/10/18]. Leap and Hunter discuss the limitations of traditional historiography on women's history in the methodology section of their book. See Leap, N., & Hunter, B. (1993). *The midwife's Tale*. London: Scarlett Press. p. 191.

111 See Snow, S. (2009). Blessed Days of Anaesthesia. Oxford: Oxford University Press.; Snow, S. J. (2009). Women, Sex and Suffering. In Blessed Days of Anaesthesia (pp. 75 - 96). Oxford: Oxford University Press.

112 Richard Croft (1762-1818) was the youngest of eleven children born to Herbert Croft, and his wife Elizabeth. The Croft family was wealthy, and Croft Castle in Herefordshire had been in the family since the reign of Edward IV. Croft studied medicine at St Bartholomew's Hospital, and was awarded a diploma from the Company of Surgeons in 1781. After befriending Thomas Denman's brother Joseph while he lived in Tutbury, Croft gained a letter of introduction to Denman in London. He gained an MD from Aberdeen in 1789, possibly on the advice of Denman, and married Denman's eldest daughter Margaret in the same year. He succeeded to the Baronetcy after the death of his elder brother in 1816 and was appointed as surgeon-in-ordinary to the Prince of Wales and Prince Leopold a year later. Croft is remembered for his involvement in the case of Princess Charlotte, wife

was married to Prince Leopold. Charlotte was the only child of the Prince of Wales, so the line of succession of the Royal Family was dependant on her. Charlotte's labour was prolonged, and Croft sent for John Sims, who had been appointed in the case of problems. Sims advised against the use of instruments to deliver the baby, a son, who was eventually stillborn after a fifty-two-hour labour. The Princess haemorrhaged after the birth and although the haemorrhage was arrested, she died five hours later, on the 6th November 1817. Croft was subjected to intense public criticism following the death of the Princess and became depressed. He committed suicide on 13th February 1818, just three months later. See Oxford Dictionary of National Biography entry, and Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy. *The Journal of Obstetrics and Gynaecology of the British Empire*, 905-919. He will be discussed in greater depth in chapter five.

Chapter 2

113 An example of this is the description on the RCOG website. See https://www.rcog.org.uk/en/about-us/history-of-the-college/og-pre-20th-century-foundation-college/

114 See J. H. Aveling, *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument* (London: J & A Churchil reprinted by AMS Press 1977, 1882).; Herbert R Spencer, *The History of British Midwifery from 1650 to 1800* (London: John Bale & Sons, 1927). Kedarnath Das, *Obstetric Forceps: its history and evolution (1929)* (Leeds: Medical Museum Publishing, 1993).; Walter Radcliffe, *Milestones in Midwifery (1967) and The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989).

115 Princess Alexandra Hospital in Harlow, Essex has a Chamberlen Ward in their Maternity department.

116 Donnison refers to the office of a midwife as a 'female mystery' in the first chapter of Jean Donnison, *Midwives and Medical Men*, 2nd edn (London: Historical Publications Ltd, 1988). p. 11.

117 Ornella Moscucci, *The Science of Woman: Gynaecology and gender in England, 1800 - 1929* (Cambridge: Cambridge University Press, 1993).

118 This is different from the management of breech births in the twenty-first century where they are more commonly managed by doctors. Most are delivered by Caesarean section and consequently both midwives and doctors have lost skills in delivering breech births. See RCOG Greentop Guideline no.20b Management of Breech Presentation (2017).

119 Wilson, A. *The Making of Man-midwifery: Childbirth in England 1660 – 1770.* (Cambridge: Harvard University Press, 1995)., p. 38.

120 Richards, L. 'Midwifery – The Second oldest profession.', *International Journal of Childbirth Education*, 10 (1995), 11-13.; Southern, 'On Trial: Women Healers', *Midwifery Today*, Spring (1998), 35-39.

121 Southern, 'On Trial: Women Healers', *Midwifery Today*, Spring (1998), 35-39.

122 Wilson, *The Making of Man-midwifery*. (1995).

123 Marland, (Ed) *The Art of Midwifery* (London: Routledge, 2005).

124 Donnison. *Midwives and Medical Men*, 2nd edn (London: Historical Publications Ltd, 1988). p. 11.

125 Wilson, A. *The Making of Man-midwifery*. (1995).

126 Evenden, D. 'Mothers and their midwives in seventeenth-century London', in *The art of Midwifery. Early Modern Midwives in Europe*, ed. by Hilary Marland (London: Routledge, 1993), pp. 9 - 26.

127 Hess, A. G. (2005). Midwifery practice among the Quakers in southern rural England in the late seventeenth century. In H. Marland (Ed.), *The art of midwifery. Early modern midwives in Europe* (pp. 49-76). London: Routledge.

128 See Forbes, T. R. (1964). The Regulation of English Midwives in the sixteenth and Seventeenth Centuries. *Medical History*, 235-244.; Wilson, A. (2016). *Ritual and Conflict: The Social Relations of Childbirth in Early Modern England.* Abingdon: Routledge. particularly p. 160.; Clark, G. *History of the Royal College of Physicians. Vol 1* (1964).; Donnison, J. (1988).; *Midwives and Medical Men*.

129 See Wilson, A. (2016). *Ritual and Conflict.*.

130 Clark, G. *History of the Royal College of Physicians. Vol 1* (1964). p. 55.

131 Forbes, T. R. (1964). The Regulation of English Midwives in the sixteenth and Seventeenth Centuries. *Medical History*, 235-244.

132 Wilson, A. (2016) *Ritual and Conflict*. p. 160.

133 Forbes, T. R. (1964). The Regulation of English Midwives in the sixteenth and Seventeenth Centuries. *Medical History*, 235-244. p. 242.

134 Donnison, J. *Midwives and Medical Men*. p. 19.

135 Wilson, A. (2016). *Ritual and Conflict*.

136 Ivan Waddington, *The Medical Profession in the Industrial Revolution* (Dublin: Gill and Macmillan Humanities Press, 1984)., particularly Chapter 2; The Changing Structure of Medical Practice in the Early Nineteenth Century; Ornella Moscucci, *The Science of Woman: Gynaecology and gender in England, 1800 - 1929* (Cambridge: Cambridge University Press, 1993). S W F Holloway, 'The Apothecaries' Act, 1815: A reinterpretation. Part 1: The origins of the Act', *Journal of Medical History*, 10 (1966), 107-29. p. 114.

137 Waddington, *The Medical Profession* (1984). p.6.

138 Clark, G. (1964). *A History of the Royal College of Physicians of London. Volume 1.* London: Clarendon Press.

139 Clark, G. (1964). *A History of the Royal College of Physicians of London.* Chapter IV: The foundation of the College of Physicians of London.

140 In 1663, the title of the College was amended in the Charter to 'The Kings Colledge of Physitians in the Cittie of London', which was viewed as an enhancement in their dignity. See Clark, G. History of the Royal College of Physicians. Vol 1 (1964). p. 304. There was some inconsistency with nomenclature after that point, with the College interchangeably referring to themselves as College of Physicians or Royal College of Physicians. The College was officially being granted 'Royal' status by Act of Parliament in 1960. See discussion by Payne, L. M. (1960). Title of the Royal College of Physicians of London. *British Medical Journal*, 123-4. For the purpose of this thesis, the title Royal College of Physicians will be used.

141 The incorporation of the Physicians covered English practice only. Scotland had its own Colleges: Glasgow had a Faculty of Physic and Surgery, and Edinburgh had both the Royal College of Physicians of Edinburgh and the Incorporation of Surgeons, which included both surgeons and apothecaries. The Incorporation of Surgeons became the Royal College of Surgeons, Edinburgh from 1778. See Ornella Moscucci, *The Science of Woman* (1993).

142 Waddington, (1984). *The Medical Profession.* p. 3-4.

143 Waddington, (1984). *The Medical Profession.* p. 4.

144 These irregularities were related to the Court of Examiners exceeding their authority and ordering the sale of the old building of the Company of Surgeons located by the Old Bailey, and ordering the purchase of a new property in Lincolns Inn Fields. The Court of Assistants approved the sale, but should have instigated it. The value of the new property exceeded the limits on assets under the terms of the 1745 Charter and this irregularity meant that the 1745 Charter was invalid. The Surgeons sought a new Charter, and to be re-born as a College rather than a Company. This meant that they moved away completely from City of London control. See discussion by Zachary Cope, *The Royal College of Surgeons of England: A History* (London: Anthony Blond, 1959). p. 15-18.

145 Cope, (1959). The Royal College of Surgeons. p. 22.; Lawrence, S. C. (1996). *Charitable knowledge: Hospital pupils and practitioners in eighteenth-century London.* Cambridge: Cambridge University Press. p. 90.

146 *Ibid*.

147 The charter used the title 'Worshipful Society of Apothecaries', but in everyday use they were referred to as the 'Company of Apothecaries'. See Copeman, W. S. (1967). *The Worshipful Society of Apothecaries of London: A History 1617-1967.* London: Worshipful Society of Apothecaries. p. 18, 20.

148 Copeman, W. S. (1967). *The Worshipful Society of Apothecaries of London.* p. 20.

149 Loudon, I. *Medical Care and the General Practitioner*.; Cook, H. J. The Rose Case Reconsidered: Physicians, Apothecaries, and the Law in Augustan England. *The Journal of the History of Medicine and Allied Sciences*, (1990). pp. 527-555.

150 Waddington, *The Medical Profession in the Industrial Revolution.* p. 4.

151 Loudon, *Medical Care and the General Practitioner 1750-1850* (Oxford: Oxford University Press, 1986).

152 Percivall Willughby (1596-1685), son of the MP for Nottinghamshire Sir Percivall, was a surgeon in Derby. He left a detailed record of over 200 births that he attended from 1630, which he later published as *Observations in Midwifery*. See ODNB entry. He wrote a collection of cases where he had been called to women in obstructed labour. These cases were edited by Henry Blenkinsop and published in 1863.

153 Wilson, (1995) *The Making of Man-midwifery.*

154 Willughby, P. (1863). *Observations in Midwifery*. (H. Blenkinsop, Ed.) Warwick: Cooke & Son. pp. 29-30.

155 S. Maw & Sons. (1869). *Book of Illustrations to S. Maw & Sons Quarterly Price-Current*. London: S. Maw & Sons. p. 75. Image taken by L. Jenkins at the Thackray Museum with permission.

156 *Ibid*.

157 See discussion in King, H. (2007). *Midwifery, Obstetrics and the Rise of Gynaecology: The uses of a sixteenth century Compendium.* Abingdon: Routledge. King identified that Avicenna used the fillet to deliver a woman from around the 10th century AD as described by John Burton in a letter to William Smellie written in 1753 (p. 141), and that the book entitled Aristotle's Complete and Experienced Midwife (London, 1749?), pp. 79-80 also described the use of a fillet (p. 137).

158 Wilson, *The Making of Man-midwifery*. (1995).

159 Frances Kingston, 'Notes abstracted from several courses of Lectures on Midwifery given by Dr Denman and Dr Osborn' (unpublished thesis, 1778). pp. 176/7. Wellcome library MS 2099. Manuscript transcribed by Louise Jenkins 05/04/2011.

160 S. Maw and Sons, *Book of Illustrations to S. Maw & Sons Quarterly Price-Current* (London: S. Maw & Sons, 1869).

161 *Ibid*. p. 75 Image taken by L. Jenkins at the Thackray Museum with permission.

162'One who has contracted spiritual affinity with another by acting as a sponsor at a baptism … esp. Applied to a woman's female friends invited to be present at a birth'. See OED entry for 'gossip'.

163 Wilson, *The Making of Man-midwifery* (1995). p. 20-1, and discussion of 'Male paths to Childbirth' in Chapter 4: Traditional Obstetric Surgery, of the same bookp. 47-53.; Wilson, A. (1993). The Perils of Early Modern Procreation: Childbirth with or without fear? *Journal for Eighteenth Century Studies*, 16, 1 - 19.

164 See discussion by Wilson, *The Making of Man-midwifery* (1995). p. 20-1, and discussion of 'Male paths to Childbirth' in Chapter 4: Traditional Obstetric Surgery, of the same book. p. 47-53.

165 Dunn, P. M. (1999). The Chamberlen family (1560 - 1728) and obstetric forceps. *Archives of Disease in Childhood - Fetal and Neonatal Edition, 81*, F232 - 235. Walter Radcliffe, *Milestones in Midwifery (1967) and The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989)

166 Walter Radcliffe, *Milestones in Midwifery* (1967) and *The Secret Instrument* (The Birth of the Midwifery Forceps) (1947), (San Fransisco: Norman Publishing, 1989).

167 *Ibid*. In other publications regarding the history of the family, Pierre was often referred to by the anglicized version of his name: Peter. See Walter Radcliffe, *Milestones in Midwifery (1967) and The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989). Since his youngest brother, born in England in 1572, was also called Peter, the anglicization of Pierre's name has meant that nomenclature of the Chamberlen family is often confusing. The result of this is that Pierre and Peter Chamberlen, are sometimes referred to as Peter I and II, or Peter the elder and younger in the historiography. For the purposes of this thesis, the elder brother will be referred to as Pierre, and the younger brother, Peter.

168 This is likely to be Pierre, with the sources using an anglicized version of his name, although it could also have been his brother Peter, as the source is unclear.

169 H Grimston, *The second part of the reports of Sir George Croke* (London: W. Rawlins, 1683), pp. 541-2. Cited by Thomas, R Forbes, 'A jury of matrons', *Medical History*, 32 (1988), 23-33. p. 27

170 J. H. Aveling, *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument* (London: J & A Churchil reprinted by AMS Press 1977, 1882).

171 The Queen paid Peter Chamberlen £40 in 1614. See Aveling, *The Chamberlens and the Midwifery Forceps*. p. 8.

172 Lindemann, M. *Professionals? Sisters? Rivals? Midwives in Braunschweig, 1750-1800* In H. Marland (Ed.), *The art of Midwifery. Early Modern Midwives in Europe* (pp. 176 - 191). London: Routledge.

173 Filippini, N. M. (2005). *The Church, the State and childbirth: the midwife in Italy during the eighteenth century*. In H. Marland (Ed.), The Art of Midwifery. Early Modern Midwives in Europe (pp. 153-175). London: Routledge

174 J. H. Aveling, *The Chamberlens and the Midwifery Forceps.* (1882) p. 31.

175 *Ibid*. Also see Kedarnath Das, *Obstetric Forceps: its history and evolution (1929)* (Leeds: Medical Museum Publishing, 1993).

176 J. H. Aveling, *The Chamberlens and the Midwifery Forceps.* (1882). p. 34.

177 Donnison, *Midwives and Medical Men*, 2nd edn (London: Historical Publications Ltd, 1988).

178 J. H. Aveling, *The Chamberlens and the Midwifery Forceps.* (1882). p. 34.

179 *Ibid*. pp. 36-37. My italics in the quotation for emphasis.

180 Known as Hugh I to distinguish him from his son, also named Hugh, who was known as Hugh II.

181 Radcliffe, W. *Milestones in Midwifery (1967) and The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989). Hugh Chamberlen is not listed as a Fellow or licentiate of the Royal College of Physicians in Munk's Roll, and a University education would have been necessary to become a member of the RCP.

182 Radcliffe, *The Secret Instrument (The Birth of the Midwifery Forceps) (1947,*. p. 22.

183 *Ibid*.

184 Radcliffe, *Milestones in Midwifery (1967).* p. 135. My use of bold text for emphasis.

185 Hugh Chamberlen had two brothers who also practiced midwifery, John and Paul. Little is known about John, but the life of Paul Chamberlen is better documented. Paul went on to practice midwifery in Great Suffolk Street, Haymarket in London, and although sometimes referred to as a doctor, there is no evidence to show which university he attended. Despite being a member of the renowned Chamberlen family and possessor of the family secret, Paul gained a reputation as a

quack and a charlatan and put his name to a 'celebrated anodyne necklace, recommended to the world by Dr Chamberlen for children's teeth, women in labour etc.' See J. H. Aveling, *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument* (London: J & A Churchil reprinted by AMS Press 1977, 1882). p.181.

186 J. H. Aveling, *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument* (London: J & A Churchil reprinted by AMS Press 1977, 1882).

187 J. H. Aveling, *The Chamberlens and the Midwifery Forceps.* (1882). p. 179.

188 See the Chapter *The Dutch Mystery* in Walter Radcliffe, *The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989). pp. 30-37. for further discussion of this issue.

189 Some nineteenth century authors would later use the terms vectis and lever interchangeably, although they were very different instruments. For this thesis, the term lever will be used to refer Roonhuysen's instrument, while the term vectis will refer to the fenestrated Chamberlen instrument used in England. The term lever may also be occasionally used in direct citations, when it is in fact referring to the Chamberlen vectis, but where this is the case it will be clarified.

190 Image from Murphy, E. W. (1845). Lectures on difficult and natural parturition (1st ed.). London: Taylor and Watson. p. 210. Murphy refers to Roonhuysen's lever as a vectis in the text.

191 Adrian Wilson, *The Making of Man-midwifery.* (1995). The case for the sale to Freke is supposition on Freke's later adaption of the forceps, but does not fit with the pattern of avoiding geographical competition.

192 Ibid.

193 Wilson, *The Making of Man-midwifery.* (1995).

194 King, H. The Chamberlen Family (per c. 1600 – c. 1730). Oxford Dictionary of National Biography.

195 Wilson, *The Making of Man-midwifery.* (1995).

196 Brock, H. (1974). James Douglas of the Pouch. *Medical History*, 162-72. p. 163.

197 Radcliffe, *Milestones in Midwifery (1967) and The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989)

198 Edmund Chapman, *Essay on Midwifery* cited by Walter Radcliffe, *The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989). p. 39.

199 Walter Radcliffe, *The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989).

200 Giffard, W. (1734). *Cases in Midwifery.* (E.Hody. Ed) London, Motte. pp. 178-9.

201 Wellcome Images images@wellcome.ac.uk http://wellcomeimages.org Mr Giffard's extractor forceps as improved by Mr Freke. Engraving Cases in midwifry Giffard, William Published: 1734. Image published under a Creative Commons Attribution only licence CC BY 4.0 http://creativecommons.org/licenses/by/4.0/

202 Wilson, *The Making of Man-midwifery.* (1995).

203 William Smellie (1697-1763) was born in Scotland, but moved to England where he practised as a man-midwife. Smellie built up a substantial and lucrative practice which he augmented with a formidable reputation as a teacher. See Peel, J. (2018, May 18). *Smellie, William (1697-1763).* Retrieved from Oxford Dictionary of National Biography: http://www.oxforddnb.com/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-25752; Johnstone, R. W. (1952). *William Smellie The Master of British Midwifery.* Edinburgh: E & S Livingstone.

204 Wilson, *The Making of Man-midwifery.* (1995).

205 See Wilson, *The Making of Man-midwifery.* (1995) for discussion of transmission of forceps to John Douglas and the vectis to Rogier van Roonhuysen in Holland, and John Giffard, John Drinkwater, Nally Woods, and Edmund Chapman amongst others in England.

206 Aitken, J. (1795). *Principles of Midwifery or Puerperal Medicine* (2nd ed.). Edinburgh. p. 75.

207 Burns, J. *The Principles of Midwifery; including the dieseases of women and children*, 9th edn (London: Longman, Orme, Brown, Green & Longmans, 1837).

208 Nisbet, W. *The Clinical Guide, or a concise view of the leading facts, on the history, nature, and treatment of the various diseases that form the subject of midwifery: or attend the pregnant, parturient, and puerperal states* (London: J. Johnson, 1800).

209 Burns, W. *The Principles of Midwifery, including the diseases of women and children*, 2nd edn (London: Longman, Hurst, Rees, Orme & Brown, 1811).; John Burns, *The Principles of Midwifery; including the diseases of women and children*, 9th edn (London: Longman, Orme, Brown, Green & Longmans, 1837).

210 'Copy of Chamberlen obstetric forceps, original dated 1600s' by Science Museum, London. Credit: Science Museum, London. CC BY

211 Denman, T. An Essay on Difficult Labours. Part Second. (1790). London: J. Johnson.

212 The instruments were donated to the Medico-Chirurgical Society. See Cansardine (Carwardine), H. H. (1818). Brief notice presented to the Medico-Chirurgical Society with the Original Obstetric Instruments of the Chamberlins. *Transactions of the Medico-Chirurgical Society*. The paper given by Carwardine was mis-attributed to Cansardine when an account was published in the Transactions of the Medico-Chirurgical Society. The Chamberlen instruments are presently on display at the Royal College of Obstetricians and Gynaecologists.

213 Lee, 1862. 'Observations on the discovery of the original obstetric instruments of the Chamberlens'.

214 *Ibid*.

215 Cansardine (Carwardine), H. H. (1818). Brief notice presented to the Medico-Chirurgical Society with the Original Obstetric Instruments of the Chamberlins. Transactions of the Medico-Chirurgical Society. pp. 182-3.

216 See J. H. Aveling, *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument* (London: J & A Churchil reprinted by AMS Press 1977, 1882). Herbert R Spencer, *The History of British Midwifery from 1650 to 1800* (London: John Bale & Sons, 1927). Kedarnath Das, *Obstetric Forceps: its history and evolution (1929)* (Leeds: Medical Museum Publishing, 1993). Walter Radcliffe, *Milestones in Midwifery (1967) and The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989).

217 See Wilson, *The Making of Man-midwifery.* (1995). p. 129/130

218 The Chamberlen instruments on display in the Royal College of Obstetrics and Gynaecology shows clear evolution in the mechanism for locking the two blades of the forceps together. Smellie invented the 'English lock' and added a pelvic curve to the Chamberlens instrument. See Hibbard, B. (n.d.). Milestones in the evolution of the obstetric forceps. Retrieved July 12, 2011, from LMI Liverpool Medical Institution: http://www.lmi.org.uk/Data/10/Docs/18/18Hibbard.pdf

219 Hibbard, B. (2000). *The Obstetrician's Armamentarium*. p. vii. Also see Aveling, J. H. (1882). *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument.* London: J & A Churchil reprinted by AMS Press 1977.; Das, K. (1993). *Obstetric Forceps: its history and evolution (1929).* Leeds: Medical Museum Publishing.; Radcliffe, W. (1989). *Milestones in Midwifery (1967) and The Secret Instrument (The Birth of the Midwifery Forceps) (1947),*. San Fransisco: Norman Publishing.; Hibbard, B. (n.d.). *Milestones in the evolution of the obstetric forceps.* Retrieved July 12, 2011, from LMI Liverpool Medical Institution: http://www.lmi.org.uk/Data/10/Docs/18/18Hibbard.pdf; Hibbard, B. (2000). *The Obstetrician's Armamentarium. Historical Obstetric Instruments and their Inventors.* San Anselmo: Norman Publishing.

220 Barnes, R. (1879). Opening Address ON THE USE OF FORCEPS AND ITS ALTERNATIVES IN LINGERING LABOUR. *The Lancet*, 113, 689-693. Most authors, for example Denman, T. (1790). *An Essay on Difficult Labours Part Second.* Denman recommended that instruments not be used until the cervix was fully dilated. Although this has been written nearly early a century earlier, many authors continued to echo Denman's advice. Indeed, modern recommendations on instrumental birth advise that instruments should not be applied until this time due to the risk of tearing the cervix, which would result in catastrophic blood loss.

221 Barnes, R. (1879). Opening Address.

222 S. Maw & Sons, Book of Illustrations to S. Maw & Sons Quarterly Price-Current. London: S. Maw & Sons., (1869). p. 77, Image taken at the Thackray Museum by L. Jenkins.

223 S. Maw & Sons. (1869). Book of Illustrations.; S. Maw, Son & Sons. (1905). Catalogue of Surgical Instruments & Appliances, Aseptic Hospital Furniture and Surgical Dressing etc. London: S. Maw, Son & Sons.; S. Maw, Son & Thompson's. (1882). Book of Illustrations, Quarterly Price-Current. London: S. Maw, Son & Thompson's.; S. Maw, Sons & Thompson. (1891). Book of Illustrations, Quarterly price-current. Surgeons Instruments etc. London: S. Maw, Son & Thompson.; S. Maw, Son & Sons. (1913). Catalogue of Surgical Instruments & Appliances, Aseptic Hospital Furniture and Surgical Dressing etc. London: S. Maw, Son & Sons.

224 S. Maw & Sons, Illustrations, (1882). p. 250, Image taken at the Thackray Museum by L. Jenkins

225 *Ibid*.

226 Das, K. (1993). *Obstetric Forceps: its history and evolution* (1929). Leeds: Medical Museum Publishing.

227 Obstetrical Society of London. (1866, April 6). Conversazione and Exhibition of Instruments. *The Lancet*, pp. 378-381. p. 378.; The Obstetrical Society of London. (1867). Catalogue and Report of Obstetrical and other instruments exhibited at the conversazione of the Obstetrical Society of London, held by permission, at the Royal College of Physicians, March 28th 1866, with numerous illustrations. London: Longmans, Green, and Co.

228 Hibbard, B. (2000). The Obstetrician's Armamentarium. Historical Obstetric Instruments and their Inventors. San Anselmo: Norman Publishing. Retrieved from Google Books. p. vii.

229 Denman, T. (1790). *An Essay on Difficult Labours Part Second.* London: J. Johnson. Also based on instruments surveyed at the Thackray Museum and the Royal College of Obstetricians and Gynaecologists Museum.

230 The Obstetrical Society of London. (1867). *Catalogue and Report*. p. 216.

231 Lowder, William (unknown-1801), was born in Southampton, and graduated MD from Aberdeen University in 1775. He gained his licence from the Royal College of Physicians in 1786. He worked as a man-midwife in Southwark, and is best known for his modification to the vectis, that was named after him. He lectured on midwifery at his home in Southwark. See Munk, W. *Lowder, William*. Retrieved from Munk's Roll.

232 See examples in Maw and Sons catalogues.

233 John Weiss & Son. (1863). A Catalogue of Surgical Instruments, Apparatus, Appliances etc. London: John Weiss & Son.

234 *Ibid*.

235 S. Maw, Son & Thompson's. (1882). Book of Illustrations, Quarterly Price-Current. London:

236 S. Maw & Sons. (1869). Book of Illustrations to S. Maw & Sons Quarterly Price-Current. London: S. Maw & Sons.; S. Maw, Son & Sons.

237 Jones, C. L. (2013). Email correspondence. Retrieved March 11, 2013

238 S. Maw, Sons & Thompson. (1891). *Book of Illustrations, Quarterly price-current. Surgeons Instruments etc.* London: S. Maw, Son & Thompson. p. 123.

239 *Ibid*. p. 123.

240 Acceptance of the transmission of infection by microbes, known as *germ theory*, gained widespread public acceptance during the 1880s**.** Joseph Lister's pioneering work on antisepsis resulted in recommendations to reduce the development of infection by using solutions of carbolic acid on surgical wounds, the surgeon's hands and on the instruments, that were used. See Nancy Tomes, 'The Private Side of Public Health: Sanitary Science, Domestic Hygiene and the Germ Theory', *Bulletin of the History of Medicine*, 64 (1990), 509-39.

241 Initially the metal was nickel or chrome plated, but after 1925 stainless steel was introduced. See J R Kirkup, 'The history and evolution of surgical instruments. Introduction', *Annals of the Royal College of Surgeons of England*, 63 (1981), 279-85.

242 Evans, J. (2013, June 19). Vectis: examples of and teaching thereon. Email correspondence.

243 Equivalent to around £40 today, based on a calculation using a calculator on http://www.thisismoney.co.uk/money/bills/article-1633409/Historic-inflation-calculator-value-money-changed-1900.html [25/03/2013]

244 Equivalent to around £33 today using the calculator above.

245 I have been unable to find any catalogues published by Maw and Sons between 1913 and 1925.

246 NHS Digital. (2017, November 09). *NHS Maternity Statistics 2016-7.* Retrieved from NHS Digital: https://files.digital.nhs.uk/pdf/l/1/hosp-epis-stat-mat-repo-2016-17.pdf

247 The ventouse machine was invented in the 1950's and is used to deliver babies for similar indications to those needing forceps delivery. The advantage in using the ventouse is that the incidence of maternal trauma is lower with a ventouse than with forceps since the presenting diameter that must pass through the vagina is not enlarged in any way. They can slip or detach if the fetal head is in a malposition, so there is still a place for the forceps in modern obstetrics.

Chapter three

248 Prell, C. (2009). *Rethinking the Social Construction of Technology*.

249 In 1807, Thomas Denman and the 'gentlemen who practised midwifery' outlined proposals for a separate college of obstetrics, but that idea would take over a century to materialise. General practitioners received political representation on the GMC with the passage of the 1886 Medical Act Amendment Act, but it was not until September 1929 that the British College of Obstetrics and Gynaecology was founded. The British College was granted the title 'Royal' in 1938 by George VI, but there was a delay in granting the Charter caused by the Second World War. The Royal College of Obstetricians and Gynaecologists finally received its Charter in 1947. See Royal College of Obstetricians and Gynaecologists. (2017). *History of the College*. Retrieved from Royal College of Obstetricians and Gynaecologists: https://www.rcog.org.uk/en/about-us/history-of-the-college/

250 The Charter of the Royal College of Physicians granted by Henry VIII in 1518, was affirmed by an Act of Parliament in 1523, which added a clause to the original Charter that stated that anyone wishing to practice physic, and so to use the title 'Physician' outside the City of London who did not hold a degree from Oxford or Cambridge would need to be examined by the President of the Physicians and three 'elects' of the College. Practitioners examined in this manner were 'extra-licentiates', and were not granted voting membership of the College. Although this had been specified in law, there was no mechanism for regulating this, and there were no sanctions for failing to comply, even if membership of the Colleges was highly prestigious. See Clark, G. History of the Royal College of Physicians. Vol 1 (1964).

251 Lane, J. 'The medical practitioners of provincial England in 1783', *Medical History*, 28 (1984), 353-71. Discussing Samuel Foart Simmons, *The Medical Register for the year 1783* (London: Joseph Johnson, 1783).; Irvine Loudon, *Medical Care and the General Practitioner*.

252 Irvine Loudon, *Medical Care and the General Practitioner*.

253 Wilson, *The Making of Man-midwifery.* (1995).

254 *Ibid.*

255 Waddington, *The Medical Profession*. (1984).

256 The situation regarding midwifery differed between Scotland and England; in Scotland midwifery was taught separately as a speciality in Universities long before it was recognised in England as being worthy of separate teaching. Indeed, Edinburgh was the first city in Great Britain to recognise midwifery at its University, with the first Professor of Midwifery, Dr Joseph Gibson, appointed as early as 1726. England did not follow suit until the appointment of Dr Daniel D. Davis over a century later in 1828 at University College London. See Ornella Moscucci, *The Science of Woman* (1993). p. 51; Loudon, I. *Death in Childbrith: An international study of maternal care and maternal mortality 1800 - 1950* (Oxford: Clarendon Press, 1992). p. 183.; Moore, N. rev. Baignet, E., 'Davis, David Daniel (1777 – 1841)' in *Oxford Dictionary of National Biography*.; Loudon, I. *Death in Childbrith: An international study of maternal care and maternal mortality 1800 - 1950* (Oxford: Clarendon Press, 1992).

257 H Grimston, *The second part of the reports of Sir George Croke* (London: W. Rawlins, 1683), pp. 541-2. Cited by Forbes, T. R. 'A jury of matrons', *Medical History*, 32 (1988), 23-33. p. 27

258 See Wilson, *The Making of Man-midwifery.* (1995).

259 *Ibid*. See discussion on p. 200.

260 See discussion in Chapter 2, section 2.1.1, and Forbes, T. R. (1964). The Regulation of English Midwives in the sixteenth and Seventeenth Centuries. *Medical History*, 235-244.; Wilson, A. (2016). *Ritual and Conflict.* particularly p. 160.; Clark, G. *History of the Royal College of Physicians. Vol 1* (1964). Clark, G. (1966). *A History of the Royal College of Physicians. Volume 2.* Oxford: Clarendon Press. Donnison, J. (1988).; *Midwives and Medical Men* (2nd Edition ed.). London: Historical Publications.

261 Female midwives in London organised their own informal system of regulation as recorded by Percival Willughby in *his Observations in Midwifery*. Young midwives in London were trained by their more experienced colleagues for seven years before being allowed to practice independently. Wilson, A. (2016). *Ritual and Conflict.* p. 162.

262 Thomas Denman was born in Bakewell, Derbyshire, on the 27th June 1733. He was the son of John Denman, an apothecary, and his wife, Elizabeth Buxton. Denman was the second son in a family of eight children, three of whom died in infancy. Denman moved to London in September 1754, when he was twenty-one, intending to attend St. George's Hospital. At the time, there was no medical school attached to the hospital, and pupils learned by observing the physicians and surgeons as they saw patients on the wards. An advantage for pupils attending St George's, was that William Hunter made his lectures on surgery free to pupils, so Denman would have been able to attend these. It was while he was at St George's that he met his friend, and later colleague, William Osborn. By early 1755, only six months after moving to London, Denman had spent all the money he had brought with him to subsidise his training. He avoided returning home in disgrace by applying to become a surgeon's mate in the Royal Navy, where he learned the role of a surgeon, treating battle wounds during wartime. In practice, the role was a combination of surgeon and apothecary, as the surgeons treated the general ailments of the crew during peacetime, as well as injuries during wartime. Denman earned promotion to the position of surgeon by early 1757. After leaving the Navy, Denman paid a brief visit back home to Bakewell, but then returned to London to attend lectures in anatomy and midwifery. When he struggled to do this, he briefly considered returning to sea but was unable to secure a commission. Denman reminisced (published on p. lxxiii of the 1832 edition of his Introduction to Midwifery) that 'being unable to get a warrant, I was obliged to go on, and about this time thinking my chance in midwifery the most promising, I published my essay on Puerperal fever, which I believe gained me some credit, and procured me some business'. Denman sought to capitalise further increase his reputation, and subsequently increase clinical practice, and thereby the income that was gained from it with an increasing record of publication. In 1769, Denman and his friend and colleague, William Osborn, purchased some midwifery teaching apparatus for £120, following the death of Dr Cooper, the man-midwife at the Middlesex Hospital, and began to provide lectures together. Denman also sought election as Dr Cooper's replacement at the Middlesex Hospital. Denman married Elizabeth Brodie in 1770 and they 'lived together with great affection and harmony till the Doctors death, a period of 45 years. Denman wrote of Elizabeth

'it is impossible to have chosen a wife more suitable to my disposition and circumstances; her manners are amiable, her disposition gentle, her understanding naturally good, improved by reading and the conversation of reasonable people, and she has that regard for truth and propriety, that I am firmly persuaded no human consideration could induce her to depart from them'. They went on to have three children together. Their twin daughters, Margaret, and Sophia were born in 1771 slightly prematurely, although both thrived. Thomas and Elizabeth's son, named after his father, was born in 1779, 'to the great joy of both his parents', and grew up to become a lawyer, and later Lord Chief Justice of England, before becoming Lord Denman of Dovedale in 1834. See Thomas Denman, *Introduction to Midwifery*, 7th edn (1832). McCall, C. *Naval Warfare to Natal Care: A brief look at the life and work of Thomas Denman (1733 - 1815) a founder contributor to male midwifery and modern medical practice* (Matlock: SOLCOL, 2010). Sophia Baillie, *Memoir in MSS of the life of Dr Thomas Denman in the handwriting of his daughter Sophia - the wife of Dr Matthew Bailiie* ([n.p]: [n.pub.], 1818). Munk, W. *The Roll of the Royal College of Physicians of London; comprising biographical sketches of all the eminent physicians, whose names are recorded in the annals from the foundation of the college in 1518 to its removal in 1825, from Warwick Ln to Pall Mall* , 2nd edn (London: The Royal College of Physicians, Pall Mall East, 1878), II 1701 TO 1800. Entry on Thomas Denman, pp. 333 – 335.

263 Osborn, William (1736-1808) was born in London in 1736, and gained his MD from St Andrews University on the 10th October 1777 when he was 41 years of age. Osborn was a former pupil of Hunter's. With his friend, and colleague, Osborn was the one of the first to be awarded a licence in midwifery from the Royal College of Physicians. He was appointed as physician to the General Lying-in Hospital in Store Street, London263. Denman and Osborn lectured together between 1770 and 1785. See Marland, H., Nisbet, William (1759 – 1822)' in *Oxford Dictionary of National Biography*.; Herbert R Spencer, *The History of British Midwifery from 1650 to 1800* (London: John Bale & Sons, 1927). p. 118; William Munk, *The Roll of the Royal College of Physicians*, William Osborn p.336.

264 Moscucci, *The Science of Woman* (1993). p. 56.

265 Royal College of Physicians. (1807-1811). *Annals Volume XVII (MS4159).* p. 35.

266 'The committee to whom the statute de Permissis ad artem obstetriciam was referred, went through the statute and made several amendments in it. He then reported the amendments which were agreed to by the College, excepting one, and it was resolved that instead of thirty two pounds, twenty pounds only be paid by each Licentiate to the College; and a motion being made and seconded that the statute de Permissis ad artem obstetriciam be finally enacted, and be inserted in the statute book, it passed in the affirmative' *Annals Volume XVII.* p. 37.

267 *Ibid.* p. 38. During the eighteenth century, both St. Andrews University, and Aberdeen University in Scotland, offered postal medical degrees which were granted on the written recommendation of fellow medical practitioner, and payment of a fee. See Ornella Moscucci, *The Science of Woman* (1993).

268 *RCP Annals Volume XVII*. p. 39.

269 *Ibid.* p. 40.

270 News. (1784, December 30 - 31). *Whitehall Evening Post (1770)*.

271 After Denman and Osborn received licences in 1783, Alexander Underwood and Charles Combe followed them on the 5th April 1784, Thomas Savage and John Cooper followed on the 26th June 1786, John Squire on the 30th September 1786, John Clarke on 2nd April 1787, Louis Poignand on 30th September 1788, and Robert Batty on the 30th September 1800. See Royal College of Physicians. (1807-1811). *Annals Volume XVII (MS4159).*; Herbert R Spencer, *The History of British Midwifery from 1650 to 1800* (London: John Bale & Sons, 1927). p. 176. Spencer's information came from Munk's Roll.

272 Clark, G. (1966). *A History of the Royal College of Physicians. Volume 2.* p. 589.

273 *Ibid*. Although it is outside the scope of this thesis, it would be a worthwhile topic of future research.

274 Holloway, S. W. F. 'The Apothecaries' Act, 1815: Part 1'. p. 107.

275 *Ibid*. p. 114.

276 *Ibid*. p. 114.

277 T Denman (Chairman),. (1807, October 27). Meeting of Gentlemen practicing Midwifery. RCP Env34/2.

278 See Clark, G. (1966). *A History of the Royal College of Physicians. Volume 2.* p. 589 and Munks Roll.

279 Spencer, H. R. (1927). *British Midwifery*. Supported by biographical information from Munks Roll.

280 Richard Dennison was born in Norfolk and worked as a surgeon at the Norfolk and Norwich Hospital before moving to Stafford to practice midwifery. See Munk's Roll.

281 T Denman (Chairman),. (1807, October 27). Meeting of Gentlemen practicing Midwifery. RCP Env34/2. And Munks Roll.

282 Denman, T. (1807, October 29). Letter from Dr Thomas Denman to Sir Lucas Pepys accompaying memorial to Royal College of Physicians.

283 Gentlemen practicing Midwifery. (1807, October). Memorial to the Royal College of Physicians by Licentitates, Licentiates in Midwifery, Members of the Royal College of Surgeons practicing Midwifery. RCP/Env34/1

284 *Ibid*.

285 Croft, R. (1807, October 29). *Letter from Richard Croft to Sir Lucas Pepys re: Memorial presented to College by Tho. Denman*. RCP/Env34/4

286 Plans repsecting the Obstetric Art. (n.d.). *Draft of Project for obtaining a Charter for the establishment of an obstetric College*. RCP/Env34/6

287 *Ibid*.

288 *Ibid*.

289 Royal College of Physicians. (1807-1811). *Annals Volume XVII (MS4159).* p. 26.

290 This was John Hunter (1754-1809), not his more famous namesake who was the brother of William Hunter. He was born in Perthshire, and undertook his medical education at the University of Edinburgh, where he took his degree on 12th September 1775. He was admitted as a Licentiate of the College of Physicians on the 24th March 1777, about the same time as he was appointed as a physician to the army. He was admitted a Fellow of the College, speciali gratiâ, on the 25th June 1793. He was elected as a Censor in 1793 and 1799, was the Gulstonian Lecturer in 1796, and Croonian Lecturer in 1797, 1799, 1800, 1801. He was a fellow of the Royal Society, and appointed as physician extraordinary to the prince of Wales. See entry in Munk's Roll.

291 Royal College of Physicians. (1807-1811). *Annals Volume XVII (MS4159).* p. 26.

292 Royal College of Physicians. (1807-1811). *Annals Volume XVII (MS4159).* p. 46-7.

293 *Ibid.* p. 47.

294 *Ibid*. p. 48.

295 Loudon, I *Medical Care and the General Practitioner 1750-1850* (Oxford: Oxford University Press, 1986).

296 Loudon, *Medical Care and the General Practitioner*. (1986); Waddington, *The Medical Profession* (1984). p. 17.

297 One of the Unfortunate, 'Medical Apprentices', *The Lancet*, 10 (1828), 814-5.

298 Loudon, I. (1986). *Medical Care and the General Practitioner*.

299 S W F Holloway, 'The Apothecaries' Act, 1815: A reinterpretation.

300 The Obstetric Society, 'The Obstetric Society', *The Lancet*, 17 March 1827, pp. 768-9. Donnison and Moscucci refer to the Obstetrical Society to mean this early nineteenth century society, although primary sources use the title Obstetric Society. There was a separate *Obstetrical Society* that was established in 1858. The term *Obstetric Society* will be used in this thesis to refer to the group set up in 1826, while the term *Obstetrical Society* will be used to refer to the group from 1858 onwards.

301 The Obstetric Society, 'The Obstetric Society', *The Lancet*, 17 March 1827, pp. 768-9. Clark described consulting Sir Astley Cooper on the case of a deaf woman regarding her hearing.

302 John Ramsbotham was a lecturer on obstetric medicine at the London Hospital and physician to the Royal Maternity Charity. His son Francis Henry Ramsbotham was also a member of the Society. See ODNB for F.H. Ramsbotham.

303 Donnison stated that the group was led by Dr Augustus Granville, but did not support this assertion with reference to a primary source, and it is not recorded in his biography. See Donnison, Midwives and Medical Men. (1988). p. 56. Granville was born Augustus Bozzi in Milan, Italy on 7th October 1783. He adopted the name of his maternal grandmother on his mother's deathbed wishes. He graduated with an MD from the University of Pavia in 1802. He served as a surgeon in the British Navy before settling in London in 1813. Although Granville initially practised as a general practitioner, he later specialised in obstetrics and the diseases of children. He took the LCRP and was elected as a Fellow of the Royal College of Surgeons and was appointed as Physician Accoucheur at the Westminster General Dispensary. See ODNB entry for Granville, Augustus Bozzi (1783-1872) by Moscucci.

304 The Lancet. (1837, September 30). Account of the London Hospitals and Schools of Medicine, open for the Reception of Students during the Medical Session, commencing October 2nd 1837. *The Lancet*, pp. 4-22.

305 Robert Masters Kerrison was a surgeon apothecary who graduated as a doctor of medicine from Edinburgh in 1820 and gained a LRCP the same year. See Munk's Roll entry.

306 Names recorded in The Obstetric Society, 'The Obstetric Society', *The Lancet*, 17 March 1827, pp. 768-9. p. 768. ODNB gives entries for Ramsbotham, Granville and Merriman as specialists, and The Lancet. (1837, September 30). Account of the London Hospitals and Schools of Medicine, open for the Reception of Students during the Medical Session, commencing October 2nd 1837. *The Lancet*, pp. 4-22. lists the names of the teachers, but the other names are not recorded.

307 F H Ramsbotham, 'Obstetric Society', *The Lancet*, 1830, pp. 745-8. p. 745.

308 The Obstetric Society, 'The Obstetric Society', *The Lancet*, 17 March 1827, pp. 768-9. p. 768

309 *Ibid*. p. 768

310 *Ibid*. p. 768

311 F H Ramsbotham, 'Obstetric Society', *The Lancet*, 1830, pp. 745-8. p. 747

312 John Watson, 'Apothecaries Hall: Regulations for the Examination of Apothecaries', *The Lancet*, 6 October 1827, pp. 10-11. p. 11.

313 Cope, *The Royal College of Surgeons of England*.

314 William Lawrence (1783 -1867) was born in 1783, in Cirencester. He was apprenticed to John Abernethy at St. Bartholomew's Hospital in London. In 1815, he was appointed Professor of Anatomy and Physiology at the Royal College of Surgeons, but joined Thomas Wakley as a leading critic of the College's Council. He chaired two meetings where the changes to education were roundly condemned, but was appointed to the Council himself in 1828 when his opposition more quietly. See Zachary Cope, *The Royal College of Surgeons of England*.

315 *Ibid*. p. 48.

316 University College London was formed in 1826, while Kings College London was formed between 1828-9 to provide a Church of England alternative. They formed the first two colleges in the University of London on its formation in 1836. See Kings College London. (2016, October 08).

Foundation of the College. Retrieved from Kings College London: http://www.kcl.ac.uk/aboutkings/history/foundation.aspx

317 William and John Hunter had taught in Great-Windmill street, and their nephew Matthew Baillie (Thomas Denman's Son-in-Law) had taken over after William Hunter's death.

318 Mazumdar, P. M. H. 'Anatomy, physiology and surgery:physiology teaching in early nineteenth-century London', *Canadian Bulletin of Medical History*, 4 (1987), 119-43.; Henry Warburton, 'Report from the Select Committee on Medical Education: with the minutes of evidence, and appendix.', in *House of Commons Parliamentary Papers* <http://0-parlipapers.chadwyck.co.uk.wam.leeds.ac.uk/fullrec/fullrec.do?id=1834-014948> [accessed 22 June 2012]

319 The Lancet , 'Provincial Medical Schools', *The Lancet*, 23 July 1831, pp. 542-3.

320 John Watson, 'Apothecaries Hall: Regulations for the Examination of Apothecaries', *The Lancet*, 6 October 1827, pp. 10-11. p. 11.; Zachary Cope, *The Royal College of Surgeons of England*.

321 Thomas Wakley was best known as the founder of the Lancet, but was also an MP and passionate advocate for medical reform.

322 See Cope, *The Royal College of Surgeons of England*. p. 49-51.

323 A Levee was a formal reception at the Palace where officials, diplomats and officers of the armed services were presented to the King.

324 Cope, Z. (1959). *The Royal College of Surgeons of England*. The Lancet. (1896, June 20). Thomas Wakley,: The Founder of "The Lancet". A Biography. Chapter XXIV. *The Lancet*, pp. 1738-1740.

325 UK Parliament. *Mr Henry Warburton 1785-1858.* Retrieved from Hansard. and Matthew, H. C. (2017, January 12). Warburton (1783-1858) had a commercial background and a keen interest in science, being elected a Fellow of the Royal Society in 1809. He developed an interest in medical reform in the late 1820s and chaired a select committee on anatomy in 1828 where he worked with Wakley. Warburton was MP for Bridport in Dorset between 1832 and 1841 and for Kendal in North West England between 1843 and 1847. He also worked again with Thomas Wakley to draft a medical reform bill in 1840. See entry in *Oxford Dictionary of National Biography*..

326 On 19th April Mr Abercrombie petitioned on behalf of Medical students of Edinburgh for an amendment to the Apothecaries Act; on 25th April, the Earl of Rosebery petitioned on behalf of the Medical Practitioners of Manchester against the Act; on 29th April Mr Ewart petitioned on behalf of the Medical Practitioners of Liverpool and Mr Bannerman of the University of Aberdeen petitioned for an alteration to the Act; on 29th April the Earl of Aberdeen on behalf of the Royal College of Physicians of Edinburgh for an alteration to the Act; on the 2nd May, Mr Ewing petitioned on behalf of the Faculty of Physicians and Surgeons (Glasgow) for an alteration to the Act; on the 8th May, Mr Marshall petitioned on behalf of the Medical Practitioners of Leeds for an alteration to the Act; on 9th May the Duke of Gordon for an alteration to the Act; on the 15th May, Mr Bannerman of Aberdeen petitioned for an alteration to the Act; on the 20th May Captain Gordon petitioned for an alteration to the Act; 23rd May the Duke of Gordon petitioned on behalf of the Medical Practitioners of Aberdeen for an alteration to the Apothecaries Act; on the 30th May, the Earl of Kinnoul petitioned on behalf of the Surgeons &c of Perth for an amendment; on the 31st May, Mr Bannerman petitioned on behalf of the Students of Medicine at Aberdeen for an alteration; on 4th June the Earl of Shaftesbury petitioned on behalf of the University of Glasgow for a repeal of the Apothecaries Act; on the 17th June a petition was presented by Sir Eardley Wilmot on behalf of the Birmingham School of Medicine against alteration of the Apothecaries Act. Information retrieved from Hansard.

327 UK Parliament. (2017, January 12). *11 February 1834 Commons Sitting: The Medical Profession Vol 21; cc233-6.* Retrieved from Hansard.

328 The Lancet. (1833, June 8). Apothecaries Act Amendment Bill. *The Lancet*, pp. 352-5.

329 *Ibid*.

330 The London Medical and Surgical Journal. (1833, June 22). Apothecaries' Company - House of Commons. *The London Medical and Surgical Journal*, pp. 665-7.

331 Anon. (1833, June 15). Medical Legislation. *London Medical and Surgical Journal*, pp. 628-9.

332 The London Medical and Surgical Journal. (1833, June 29). The Apothecaries Amendment Bill. *The London Medical and Surgical Journal*, pp. 692-4. p. 692.

333 *Ibid*.

334 The London Medical and Surgical Journal. (1833, July 7). The Apothecaries' Amendment Bill. *The London Medical and Surgical Journal*, p. 736.

335 The Lancet. (1833, July 6). Medical and Surgical Reform. Important News. *The Lancet*, p. 484.

336 *Ibid*.

337 UK Parliament. (1833, August 05). *Minutes.* Retrieved from Hansard.

338 UK Parliament. *11 February 1834 Commons Sitting: The Medical Profession Vol 21; cc233-6.* Retrieved from Hansard

339 *Ibid*.

340 *Ibid*.

341 *Ibid*.

342 *Ibid*.

343 *Ibid*.

344 See Warburton, H. (. (1834). *Report from the Select Committee on Medical Education. Part 1: The Royal College of Physicians*.

345 *Ibid*. p. ii.

346 The Physicians answered just 10 questions of 1,081 related to midwifery, while the Surgeons answered 105 questions of 2,285 related to midwifery, and the Apothecaries answered 19 of 1,081.

347 *Ibid*. Q184-6. pp.11.

347 *Ibid*. See Q5,725 and Q6,279-82

348 See discussion in Warburton, H. (. (1834). *Report from the Select Committee on Medical Education. Part 1: The Royal College of Physicians*; Warburton, H. (. (1834). *Report from the Select Committee on Medical Education: with the minutes of evidence, and appendix. Part 2: The Royal College of Surgeons, London.* London: The House of Commons.; Warburton, H. (. (1834). *Report from the Select Committee on Medical Education: with the minutes of evidence, and appendix. Part 3: The Worshipful Society of Apothecaries, London.* London: The House of Commons. The term 'general practitioner' is consistently used without the necessity for explanation therefore is must have been a term that was well known.

349 Warburton, H. (. (1834). *Report from the Select Committee on Medical Education. Part 2: The Royal College of Surgeons*. Evidence of Sir G. J. Guthrie Q4,801, p. 11.

350 Irvine Loudon, *Death in Childbrith: An international study of maternal care and maternal mortality 1800 - 1950* (Oxford: Clarendon Press, 1992). p. 191

351 Warburton, H. (. (1834). Report from the Select Committee on Medical Education. Part 2: The Royal College of Surgeons. Sir George Guthrie's evidence Q4,732, p. 3 & Q4,784, p. 10.

352 *Ibid*. Q4,762, 4,801-12, 4,883-5, 4,902, 6,265-5,287, 5,292-5.

353 *Ibid*. Sir Anthony Carlisle's evidence Q5,967.

354 *Ibid.* See evidence by Sir Benjamin Collins Brodie in Q5,725 and by James Wardrop Q6,279-83

355 *Ibid*. Sir George Guthrie's evidence Q4,902, p. 26.

356 *Ibid*. Sir George Guthrie's evidence Q4,902, p. 28.

357 *Ibid*. Sir George Guthrie's evidence Q4,902, p. 29.

358 *Ibid*. Sir Astley Cooper's evidence Q5,596, p. 104.

359 *Ibid*. Sir Brodie's evidence Q5,712, p. 112.

360 *Ibid*. Sir Brodie's evidence Q5,764, p. 121.

361 *Ibid*. Travers' evidence Q5,779, p. 123.

362 *Ibid*. Scott's evidence Q6,393-6,400, p. 177-8.

363 Warburton, H. (. (1834). *Report from the Select Committee on Medical Education. Part 1: The Royal College of Physicians*. p.iii.

364 UK Parliament. (2017, February 13). *Mr Thomas Wakley*. Retrieved from Hansard.

365 UK Parliament. *17 August 1835. Medical Regulations Vol 30, cc 602-3.* Retrieved from Hansard.

366 *Ibid*.

367 The University of London was founded with the amalgamation of two existing colleges. University College London had been founded in 1826, and Kings College founded in 1829. See University of London. (2017, February 26). *University of London: A brief history*. Retrieved from University of London: http://www.london.ac.uk/history.html; Also see The Lancet. (1836, December 31). Charter of the University of London. *The Lancet*, pp. 491-4.

368 *Ibid*. p. 493.

369 *Ibid*. p. 494.

370 The Lancet. (1837, September 30). Account of the London Hospitals and Schools of Medicine, open for the Reception of Students during the Medical Session, commencing October 2nd 1837. *The Lancet*, pp. 4-22. p. 12.

371 *Ibid*. p. 13.

372 *Ibid*.

373 *Ibid*.

374 UK Parliament. (2017, February 13). *Medical Education 10 June 1839 vol 48 c. 95.* Retrieved from Hansard.

375 Waddington, I. (1984). *The Medical Profession*. p. 75.

376 Sir James Graham (1792-1861) second baronet was Secretary of State of the Home Department between 1841 and 1846. See Parry, J. (2017, February 26). *Graham, Sir james Robert George.* Retrieved from Oxford Dictionary of National Biography.

377 Cope, Z. (1959). *The Royal College of Surgeons of England*.

378 See speech by Wakley. UK Parliament. *07 August 1844. The Medical Profession. vol 76, cc1896-911.* Retrieved from Hansard.

379 *Ibid*.

380 *Ibid*.

381 Newman, C. (1957). *The Evolution of Medical Education in the Nineteenth Century.* London: Oxford University Press. p. 170-171.

382 Newman, C. (1957). The Evolution of Medical Education. p. 171.

383 *Ibid*. p. 172.

384 UK Parliament. (2017, August 20). *The Medical Profession. 03 June 1853. cc1,091-2.* Retrieved from Hansard.

385 *Ibid. cc1,092.*

386 Newman, C. (1957). *The Evolution of Medical Education*. p. 179.

387 Physicians, Royal College of. (1856). *Resolution re Conduct of examinations in medicine, surgery and midwifery (MS4,091/2).*

388 See Medical Act (1858) at http://www.legislation.gov.uk/ukpga/Vict/21-22/90/enacted

389 Waddington, I. (1984). *The Medical Profession*.

390 *Ibid*.

391 This title was later shortened to become the General Medical Council.

392 Newman, C. (1957). *The Evolution of Medical Education*. See discussion in IX The Medical Act. pp. 186-193.

393 *Ibid*. p. 186.

394 Waddington, I. (1984). *The Medical Profession*. See discussion in Chapter 6: The 1858 Medical Act: A Triumph for the Reformers? pp. 96-132.

395 *Ibid*.

396 The Lancet. (1858, August 7). The Medical Practitioners Act. *The Lancet*, pp. 147-150.

397 *Ibid*. p. 642.

398 The Lancet. (1858, December 18). Obstetrical Society of London. *p.* 642. Robert Barnes, Samuel Berry, Lawson Cape, A. B. Granville, J. C. W. Lever, Edward Murphy, Henry Oldham, Thomas Radford, William Tyler Smith, and Charles Waller were listed as Vice Presidents. Charles Locock, Edward Rigby, Barnes, Radford, Smith and Waller were Obstetric Physicians, although Barnes and Radford had started as obstetric surgeons. Berry was Professor of Midwifery at Queen's College, Birmingham, Lawson Cape taught at St Thomas's, Granville specialised in obstetrics and children's diseases. The remaining nominees were teachers; Lever taught at Guy's, Murphy taught at UCL and Oldham taught at Guy's. See ODNB entries.

399 The Lancet. (1858, December 18). Obstetrical Society of London. *The Lancet*, p. 642.

400 The Lancet. (1858, December 25). Obstetrical Society of London. *The Lancet*, 655-7.

401 *Ibid*. *pp.* 655-7.

402 Search for "Obstetrical Society" in the Lancet 1858-1868 undertaken 14/05/2017 using Science Direct.

403 Cope, Z. (1959). *The Royal College of Surgeons of England*.

404 *Ibid*.

405 The Lancet. (1861). General Council of Medical Education and Registration. *The Lancet*, 71-2. p. 71.

406 *Ibid*. p. 72.

407 Cope, Z. (1959). *The Royal College of Surgeons of England*.

408 Moscucci, *The Science of Woman* (1993). p. 68. Membership consisted of Dr Robert Barnes of St. Thomas's Hospital, who led the review. He was joined by Dr Oldham of Guy's Hospital, Dr Hall Davis of the Middlesex Hospital, Dr Tyler Smith of St. Mary's Hospital, Dr Braxton Hicks of Guy's Hospital, Dr Priestley of King's College Hospital, Dr Graily Hewitt of University College Hospital, Dr John Clarke of St. George's Hospital, Dr Head of The Royal London Hospital, Dr Parson of Charing-Cross Hospital, Dr F. Bird of the Westminster Dispensary, and Dr Greenhalgh of St. Bartholomew's Hospital. See The Lancet , 'The Teaching of Midwifery and Mr. Symes Committee on Medical Education', *The Lancet*, 1868, 708-9.

409 James Syme (1799-1870) was born, and undertook his medical education, in Edinburgh, Scotland. He moved to London in February 1848 where he was appointed as a Surgeon at University College Hospital, before resigning only three months later and returning to Edinburgh. MRCS April 6th 1821; FRCS Dec 11th 1843, one of the original 300 Fellows; FRCS Edin 1823; Hon. FRCSI 1867; Hon MD Dublin 1867; Hon MD Bonn, 1868; Hon DCL Oxon 1868; FRS Edin 1830.

410 The Lancet , 'The Teaching of Midwifery and Mr. Symes Committee on Medical Education'. p. 708.

411 *Ibid*. pp. 708-9.

412 UK Parliament. 'No 69 Second Reading.' *Hansard.* 12 May 2017.

413 By 1869 the Obstetrical Society had over 600 members. See The Lancet. (1869, May 15). Representation of Obstetric Medicine in the General Council. *The Lancet*, 692.

414 *Ibid*.

415 *Ibid*.

416 *Ibid*.

417 UK Parliament. (2017, May 12). *No 69 Second Reading.* Retrieved from Hansard.

418 Cooke, A. M. (1972). *A History of The Royal College of Physicians of London* (Vol. III). Oxford: Clarendon Press for The Royal College of Physicians.

419 The Lancet. (1880). Meeting of the General Medical Council. *The Lancet*, 100-110. p. 100.

420 *Ibid*. p. 101.

421 Cope, Z. (1959). *The Royal College of Surgeons of England*.

422 *Ibid*.

423 *Ibid*.

424 Waddington, *The Medical Profession* (1984).

425 'A qualifying examination shall be an examination in medicine, surgery, and midwifery held, for the purpose of granting a diploma or diplomas conferring the right of registration under the Medical Acts'. *The Lancet*. (1886, July 3). A Bill to amend the Medical Acts. *The Lancet*, 33-5. p. 33.

426 Waddington, *The Medical Profession* (1984).

427 The Lancet. (1886, July 3). A Bill to amend the Medical Acts. *The Lancet*, 33-5.

428 But the result of this legislation was that it restricted the numbers of medical practitioners available to practice, when compared to the numbers of previously unregistered practitioners. See Cope, Z. (1959). *The Royal College of Surgeons of England*. The restriction in numbers of doctors and increased requirements for entry to the profession increased the income for medical practitioners, and that meant that their social position also increased. See discussion by Ivan Waddington, *The Medical Profession* (1984). Chapter 9: Professionalisation.

429 Prell, C. (2009). *Rethinking the Social Construction of Technology*.

430 OED entry for Obstetrician gives the earliest example of use of the word as 1826 and then again in 1828. The word was not cited again until 1879. Moscucci used the terms midwifery and obstetrics interchangeably when applied to male practice and did not explore the change in terms. See Moscucci, O. (1993). *The Science of Woman: Gynaecology and gender in England, 1800 - 1929*. Cambridge: Cambridge University Press.

431 This use of context also helps to address criticisms of the SCOT model by exploring the development of the relevant social group. Russell, S. (1986). The Social Construction of Artefacts.

Chapter 4

432 Sophia Baillie, *Memoir in MSS of the life of Dr Thomas Denman in the handwriting of his daughter Sophia - the wife of Dr Matthew Bailiie* ([n.p]: [n.pub.], 1818). pp.8-10.; Thomas Denman, *Introduction to Midwifery*, 7th edn (1832). p. lvii - lxxi; The Lancet, 'The bicentenary of Thomas Denman', p. 390. Colin McCall, *Naval Warfare to Natal Care: A brief look at the life and work of Thomas Denman (1733 - 1815) a founder contributor to male midwifery and modern medical practice* (Matlock: SOLCOL, 2010).

433 Blomfield, J. (1933). *St George's 1733 - 1933.* London: The Medici Society for St George's Hospital. p. 31.

434 Thomas Denman, *Introduction to Midwifery*, 7th edn (1832). p. lxx.

435 Thomas Denman, *Introduction to Midwifery*, 7th edn (1832). p. lxii

436 William Munk postulated that Denman attended lectures by Dr William Smellie, but this was unlikely since Smellie retired four years earlier in 1759. Smellie's former student, William Hunter, taught both anatomy and midwifery although he did not advertise his midwifery teaching in newspaper advertisements. It is likely that this omission was an indication that midwifery was simply included as part of his general teaching on anatomy. If indeed this was the case, others as well as Hunter, who lectured on anatomy may also have taught midwifery. See William Munk, *The Roll of the Royal College of Physicians of London; comprising biographical sketches of all the eminent physicians, whose names are recorded in the annals from the foundation of the college in 1518 to its removal in 1825, from Warwick Ln to Pall Mall* , 2nd edn (London: The Royal College of Physicians, Pall Mall East, 1878), II 1701 TO 1800. Entry on Thomas Denman, pp. 333 – 335; Adrian Wilson, *The Making of Man-midwifery*. (1995). *The Making of Man-Midwifery: Childbirth in England, 1660-1770* Cambridge, Harvard University Press. p. 179; Brock, H., 'William Hunter (1718 – 1783), physician, anatomist, and man-midwife' in Oxford Dictionary of National Biography. A search of London Newspapers from Gale Database British Newspapers 1600-1950, Search term 'Lectures' year limited to 1763-4 revealed that when Denman returned to London in 1763, there were twenty-two advertisements for medical lectures in newspapers during the whole year; sixteen for Anatomy and six for Midwifery. Dr Hunter, Mr Moffat, Mr Maclaurin, Dr Watson, and Dr Bayford advertised lectures in Anatomy in London, but Dr Mackenzie offered the only course that specifically advertised that it taught Midwifery.

437 Denman was an ambitious man, and Hunter was the leading man-midwife teaching in London at the time with a very prestigious clientele that included members of the aristocracy and royalty. In later lectures given by Denman he repeatedly made references such as 'Dr Hunter says ...' so it is likely that Denman had known Hunter, and it is most likely that their relationship was initially one of teacher/student. Denman had set out to build a substantial practice upon his return to London, and he regularly documented in his autobiography how his business had increased in terms of income, so it is likely that the ambitious Denman would have attended the most reputable lectures that were available to him. At the time, the 'best', as well as the most widely advertised anatomy lectures, were delivered by the eminent William Hunter. In 1769 Denman been engaged in a very public argument with his un-named former teacher that was played out in newspapers. In his autobiography, Denman never referred to the name of the person whose lectures he had attended when he had returned to London following his time in the Navy. It was common for practitioners to record who they were taught by, especially if they had been taught by a renowned teacher. A possible explanation for this omission was Denman had fallen out with his teacher and did not want to remind people of their association or public argument, most likely because he had come off badly in the disagreement. Nearly five years later, it was used as an example of his arrogance by an anonymous student of a rival, Dr Leake. He wrote 'for your part, Sir, had you been as grateful to the Gentleman from whom you received your Instructions in Midwifery, we should not have seen you engaged with him in a News-paper Billingsgate contest' A.D. 1769 A Late pupil of Dr. Leake's, *A vindication of the forceps described and recommended by Dr. Leake; in which, The injudicious and illiberal remarks on that subject, signed Thomas Denman, are examined and refuted.* (London: J. Hinton, 1774). p. 17. A search of newspapers of the time has so far not provided documentary evidence of this, unfortunately it is likely that it would have been undertaken anonymously, and consequently it is difficult to find supporting documentary evidence. The use of the term 'Billingsgate' to describe the altercation indicates how unpleasant the disagreement was. Billingsgate was a London fish market that was renowned for 'scurrilous vituperation, violent abuse' and the term was used to describe 'a clamouring foul-mouthed person, a vulgar abuser or scold' OED. (2017, May 31). *Billingsgate*. Retrieved from Oxford English Dictionary.See Brock, H., 'William Hunter' in ODNB.; Anon, 'Sketches of the Practice of Midwifery from the lectures of Drs Osborne and Denman' (unpublished lecture notes, 1776).; Thomas Denman, *Introduction to Midwifery*, 7th edn (1832).

438 Wilson, A. (1985). William Hunter and the varieties of man-midwifery. In W. F. Bynum, & R. Porter (Eds.), *William Hunter and the eighteenth-century medical world* (pp. 343-369). Cambridge: Cambridge University Press.

439 Thomas Denman, Introduction to Midwifery, 7th edn (1832). p. lxviii

440 Ornella Moscucci, *The Science of Woman* (1993). Many considered this system to discredit the medical profession since it was open to abuse and it resulted in a generalised hostility towards Scottish universities.

441 McCall, *Naval Warfare to Natal Care.* (2010). pp. 44; Sophia Baillie, *Memoir of Dr Thomas Denman*. 1818, p.6)

442 Brock, 'William Hunter', in Oxford Dictionary of National Biography

443 Thomas Denman, *Introduction to Midwifery*, 7th edn (1832).

444 Writing for publication became increasingly fashionable in the latter part of the eighteenth century, and practitioners such as Denman used it to boost their reputation. There had been an increase in the number of publishers, that combined with the falling cost of books, to make published work cheaper and more accessible.

445 Denman's strategy to increase his financial security continued, and in 1868, Denman was appointed as surgeon to the Royal William and Mary yacht, on recommendation to Admiral Keppell from Lord John Cavendish and Captain Drake, both whom he knew from his time in the Navy. Initially, this role was largely symbolic, and the annual salary of £75 augmented his income, whilst allowing him to develop his practice in London. He kept this post for eight years until the ship was ordered into active service and he was compelled to resign, as Denman admitted it would have interfered with his growing business as a man-midwife. See Thomas Denman, *Introduction to Midwifery*, 7th edn (1832). p. lxix

446 Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy. *The Journal of Obstetrics and Gynaecology of the British Empire*, 905-919.

447 See the multiple versions of the forceps as discussed in chapter two, and as outlined by Das, K. (1993). *Obstetric Forceps: its history and evolution* (1929). Leeds: Medical Museum Publishing.; Hibbard, B. (2000). The *Obstetrician's Armamentarium. Historical Obstetric Instruments and their Inventors*. San Anselmo: Norman Publishing. Retrieved from Google Books.

448 Sophia Baillie, *Memoir of Dr Thomas Denman*. 1818, pp.7/8; Herbert R Spencer, *The History of British Midwifery from 1650 to 1800* (London: John Bale & Sons, 1927). p. 132. Denman also sought election as Cooper's replacement at the Middlesex Hospital, although he reflected that he was elected after 'a very hard contest, some expense, and endless trouble'. There was some dispute around the circumstances of the original ballot a month earlier in which Denman appeared to have gained the most votes, but Krohn raised objections that caused the ballot to be repeated. Eventually a joint appointment proceeded, and Denman and a Dr Krohn were jointly elected to the post of physician accoucheur that November. See Thomas Denman, *Introduction to Midwifery*, 7th edn (1832). p. lxx.; H Krohn, 'Letters', *Public Advertiser*, 6 October 1769. and Thomas Denman, 'Classified Advertisements', *Gazetter & New Daily Advertiser*, 09 October 1769.The Lancet, 'The bicentenery of Thomas Denman', *The Lancet*, 12 August 1933, pp. 390-1. Thomas Denman, *Introduction to Midwifery*, 7th edn (1832). p. lxx, 'News', *Lloyd's Evening Post*, 1 November 1769.; 'News', *London Chronicle*, 2 November 1769.; 'News', *Public Advertiser*, 4 November 1769.

449 'Classified Advertisements', *Gazetteer and New Daily Advertiser*, 12 May 1770.; 'Classified Advertisements', *St. James's Chronicle or the British Evening Post*, 10-12 May 1770.

450 St George's Medical School was established in 1831. Blomfield, J. (1933). *St George's 1733 - 1933.* London: The Medici Society for St George's Hospital. p. 31.

451 In addition to offering lectures, Denman also occasionally offered studentships to a select number of 'house' pupils to supplement his income. Denman had a total of six pupils during his career. These included: Dr Caleb Parry of Bath who attended lectures by William and John Hunter, was a licentiate of the Royal College of Physicians and was married to Sarah Rigby, sister of the physician Edward Rigby; Mr Robert Chessher of Hinckley lived with Denman in 1868 and attended

the lectures of William Hunter and George Fordyce. He became the house surgeon at the Middlesex Hospital before returning to his hometown of Hinckley after the death of his stepfather. Philip Martineau Esq., of Norwich was a surgeon from 1777, then Senior or Principal Surgeon from 1793 at the Norfolk and Norwich Hospital until his resignation in 1828, where he would have worked with John Green Crosse and his apprentice Edward Copeman. Martineau was also a Member of the Royal Medical Society of Edinburgh. He published a Memoir of Lithotomy in the Transactions of the Medical and Chirurgical Society of London. See Sophia Baillie, *Memoir of Dr Thomas Denman*. 1818. p. 10. ODNB entries for Parry and Chessher. Also, Martineau See Transactions of the Medical and Chirurgical Society of London, 'A Professional Memoir of P.M. Martineau', *Transactions of the Medical and Chirurgical Society of London*, Second part of the Eleventh Volume (1831), 16-33.; Transactions of the Medical and Chirurgical Society of London, 'Biographical Notice. P.M. Martineau', *Transactions of the Medical and Chirurgical Society of London*, Second part of the Eleventh Volume (1831), 1-15. Philip Meadows Martineau Esq., 'Memoir of Lithotomy', *The Transaction of the Medical and Chirurgical Society of London*, Second part of the Eleventh Volume (1831), 34-44.

452 Denman did not refer to the vectis during his debate with Leake's pupil. See Denman, T. (1773). Remarks on Dr Leake's paper on the use of his forceps. London.; A Late Pupil of Dr Leakes's (1774). A vindication of the forceps described and recommended by Dr Leake; in which, the injudicious and illiberal remarks on that subject, signed Thomas Denman, are examined and refuted. London: J. Hinton.

453 Frances Kingston, 'Notes abstracted from several courses of Lectures on Midwifery given by Dr Denman and Dr Osborn' (unpublished lecture notes, 1778).

454 Anon. (1776). *Sketches of the Practice of Midwifery from the lectures of Drs Osborne and Denman*. Unpublished manuscript lecture notes MS 2098, Wellcome Library.

455 Frances Kingston, 'Notes abstracted from several courses of Lectures on Midwifery given by Dr Denman and Dr Osborn' (unpublished lecture notes, 1778). p. 197. No biographical information is available from Munk's Roll, Plarr's Lives, or the Oxford Dictionary of National Biography for Cowper, Lord, or for John Wathen. Cogan, Thomas (1736-1818) was born in Northamptonshire, and was the second son of John Cogan, a surgeon and apothecary. He worked for a time as a junior Minister at the English Church in The Hague. Whilst in the Netherlands, he married the daughter of a wealthy merchant, Johanna Maria Groen, and as a condition of their marriage began to study medicine. After graduating MD from the University of Leiden, he moved to London where he specialised in Midwifery. He briefly returned to the Netherlands with his wife in 1780, but the unstable political situation meant that they returned to England. Cogan concentrated on religious and philosophical writings after that time.

456 Thomas Denman, *An Essay on Difficult Labours Part Second* (London: J. Johnson, 1790). p. 39.

457 No biographical information is recorded for Francis Kingston on Munk's Roll, Plarr's Lives, or the Oxford Dictionary of National Biography.

458 Francis Kingston, 'Notes abstracted' (1778) p. 198.

459 *Ibid*. p. 197.

460 Francis Kingston, 'Notes abstracted' (1778).

461 *Ibid*. p. 175.

462 Thomas Denman, *Directions for the application of the forceps* (London: [n.pub.], 1780).

463 Denman, *Directions for the application of the forceps* (1780).

464 Denman advised that pupils should wait until the head of the baby was low down in the maternal pelvis, such as had been his recommendation for the use of forceps, so that they could feel the baby's ear and then pass the vectis over the ear, and down to its chin. Denman had used the ear as a landmark in his directions for the application of the forceps in his published work; Thomas Denman, *Directions for the application of the forceps*, 1780. See p. 5. The use of the forceps was not discussed in Greenhow's 1780 lecture notes, although he did say that adding the use of the forceps to the power of the contractions can prevent the child from becoming obstructed in the

case of shoulder dystocia, the perception being that the added force of the forceps would be beneficial.

465 Edward Greenhow, 'Dr Denman Lecture Notes' (unpublished lecture notes, 1780). pp. 49/50.

466 Thomas Denman, *Directions for the application of the forceps* (London: [n.pub.], 1780).

467 Anon, 'Dr Denman Lectures on Midwifery' (unpublished lecture notes, 1782).

468 *Ibid*. (1782). p. 126.

469 Denman's pamphlet was referred to as 'Dr Denman's excellent little pamphlet entitled Directions for the application of the forceps' in Anon, 'Sketches of the Practice of Midwifery from the lectures of Drs Osborne and Denman' (unpublished thesis, 1776). p.175. It would have been first published between the time when Denman started lecturing in 1770 and the date of the lecture notes in 1776. The British Library holds two copies, both estimated to date from 1780.

470 'Classified Advertisements', *Daily Advertiser*, 16 September 1773.

471 'News', *London Chronicle*, 20 -23 January 1781.

472 'Classified Advertisements', *Morning Herald and Daily Advertiser*, 19 July 1781.

473 'Classified Advertisements', *Morning Chronicle and London Advertiser*, 10 July 1783.

474 Moscucci, O, 'Denman, Thomas (1733 – 1815)' in *Oxford Dictionary of National Biography*.

475 Helen Brock 'William Hunter'. In *Oxford Dictionary of National Biography*.

476 *Ibid*. p. 5.

477 Foreman, H., 'Cavendish [nee Spencer], Georgiana' in *Oxford Dictionary of National Biography*

478 'News', *Public Advertiser*, 17 July 1783.

479 'News', *English Chronicle or Universal Evening Post*, 10 - 12 July 1783.; 'News', *Public Advertiser*, 14 July 1783. 'News', *Morning Herald and Daily Advertiser*, 14 July 1783.

480 'News', *Morning Post and Daily Advertiser*, 23 August 1785.

481 See Helen Foreman, 'Cavendish [nee Spencer], Georgiana'. ODNB entry.

482 Herbert R Spencer, *British Midwifery*. p. 181

483 McCall, C. (2010). *Naval Warfare to Natal Care: A brief look at the life and work of Thomas Denman (1733 - 1815) a founder contributor to male midwifery and modern medical practice.* Matlock: SOLCOL.

484 Clarke, John (1760 – 1815) had attended St George's Hospital, as had Denman and Osborn before him, where his teachers had also included John Hunter. Clarke originally gained a diploma from the College of Surgeons, but in 1787, gained one of only ten licentiates in Midwifery at the Royal College of Physicians, London that were awarded. Clarke started to lecture with Denman and Osborn in 1785 and continued to lecture with Osborn after Denman withdrew from the business. Clarke and Osborn advertised their courses of lectures jointly in May 1787, providing their lectures at St Bartholomew's Hospital, or at Clarke's house until 1804. After Osborn's death, Clarke continued his teaching practice, with his younger brother Sir Charles Mansfield Clarke. Sir Charles was also educated at St George's Hospital and the Hunterian School of Medicine in Great Windmill Street as his brother had been. Clarke obtained a Doctor of Medicine from the University of Frankfurt in Prussia on 20 October 1791, and was a long-standing friend of Matthew Baillie, Thomas Denman's son-in-law. See Hunter, K R., 'Clarke, John (bap. 1760, d. 1815), in Oxford Dictionary of National Biography.; 'Classified Advertisements', World and Fashionable Advertiser, 12 May 1787. – Lecture course commenced on Monday 14th May.; 'Classified Advertisement', General Evening Post, 05 - 07 January 1792.; 'Classified Advertisement', The Morning Post, 21 January 1804.; Bettany, G T. rev. Baignet, E., 'Clarke, Sir Charles Mansfield, first Baronet (1782 - 1857), accoucheur' in Oxford Dictionary of National Biography.

485 'Classified Advertisements', *Morning Chronicle and London Advertiser*, 23 April 1785.

486 'Classified Advertisements', *Morning Post and Daily Advertiser*, 13 March 1786.

487 *Ibid*.; Thomas Denman, *Introduction to Midwifery*. Seventh edition. (1832) p. lxxiv written by the Editor Charles Waller.; 'Classified Advertisements', *Morning Chronicle and London Advertiser*, 23 April 1785.'Classified Advertisements', *Morning Post and Daily Advertiser*, 22 June 1785. 'Classified Advertisements', *Morning Chronicle and London Advertiser*, 25 June 1785. 'Classified Advertisements', *Morning Post and Daily Advertiser*, 09 August 1785. 'Classified Advertisements', *Morning Chronicle and London Advertiser*, 15 August 1785.

488 Thomas Denman, *An Introduction to the Practice of Midwifery* (London: T. Bensley for J. Johnson, 1788), VOLUME THE FIRST.

489 Denman, T. *An Essay on Difficult Labours. Part Second.* (1790). London: J. Johnson.

490 *Ibid*.p. 39-40.

491 *Ibid*.p. 41.

492 *Ibid*. p. 42.

493 *Ibid*. pp. 47/8

494 William Osborn, *Essays on the Practice of Midwifery, in natural and difficult labours* (London: Cadell and Johnson, 1792).

495 Thomas Denman, *An Essay on Difficult Labours* (1790) pp. 50/51

496 William Osborn, *Essays on the Practice of Midwifery, in natural and difficult labours* (London: Cadell and Johnson, 1792).

497 *Ibid*. p. vii

498 *Ibid*. p. viii

499 *Ibid*. p. 119.

500 William Osborn, *Essays on the practice of midwifery, in natural and difficult labours* (London: J. Johnson, 1795).

501 Marland, H., 'Osborn, William (1736 – 1808)' in Oxford Dictionary of National Biography.; 'Obituary, with anecdotes, of remarkable persons', *Gentleman's magazine and Historical Chronicle* , 1808.

502 Denman had begun discussing the use of the vectis with students in 1780, and his teaching partnership with Osborn continued until 1786, while they were still speaking of each other with affection in 1788.

503 This was alluded to by A Late pupil of Dr Leake's, A vindication of the forceps. (1774). p. 17. however, no documentary evidence of this has illuminated this to date.

504 See Helen Brock 'William Hunter' in *Oxford Dictionary of National Biography* p. 5.

505 Denman and Osborn had delivered lectures in partnership from 1770. See 'Classified Advertisements', *Gazetteer and New Daily Advertiser*, 12 May 1770.; 'Classified Advertisements', *St. James's Chronicle or the British Evening Post*, 10-12 May 1770. Denman gradually handed over his lectures to his former pupil John Clark from 1785 before his partnership with Osborn was finally dissolved in March 1786, and Clark took his place in delivering lectures. See 'Classified Advertisements', *Morning Chronicle and London Advertiser*, 23 April 1785.; 'Classified Advertisements', *Morning Post and Daily Advertiser*, 13 March 1786.

506 Thomas Denman, *Introduction to Midwifery*. (1832) p. lxxiv.

507 Both of his twin daughters married eminent medical practitioners: Sophie married Matthew Baillie, and Margaret married Sir Richard Croft. While his son was a lawyer and Member of Parliament for many years, and later was given a peerage and became Baron Denman. Jones, G. H., & Jones, V. (2017, May 31). Denman, Thomas. First baron Denman (1779-1854). Retrieved from Oxford Dictionary of National Biography. Thomas Denman died suddenly at his house on Mount Street on the 26th November 1815, following an evening meal shared with his family. He was said to be 'in full possession of his mental powers, and with a constitution still vigorous and healthy, and at the advanced age of eighty-two, universally beloved and deeply lamented. Dr Denman was a [illegible]

strong original understanding, of great sagacity, and of the most persevering industry'. Sophia Baillie, *Memoir of Dr Thomas Denman*. 1818, p.12 Publication of his written work continued posthumously. His treatise 'Introduction to Midwifery' which had been published in five editions during his lifetime, continued with a further two editions published posthumously, the final one in 1832.

508 OED. (2017, June 17). *Traction*. Retrieved from Oxford English Dictionary.

509 Barnes, R. (1870). Chapter 3 - The Forceps — The Lever — Demonstration that the Lever is a Lever, not a Tractor ; also that the Forceps is a Lever. In R. Barnes, *Obstetric Operations, including the treatment of haemorrhage* (pp. 38-45). London: John Churchill and Sons. Denman instructed the practitioner to pass two fingers of the right hand to the ear of the baby, and to introduce the vectis between the fingers and the head, until the vectis reached the ear. Denman had learned to use the ear as a landmark for the introduction when he used the forceps. He then advised that the practitioner's hand be gradually withdrawn whilst the vectis is introduced, until the edge of the blade reached beyond the level of the baby's chin and rested in a straight line from the back of the baby's head (the vertex), over the ear, to the chin. Then, whilst grasping the handle in the right hand and during a contraction, the handle should be raised gently but firmly towards the pubis whilst 'at the same time, exerting a small degree of extracting force'. Denman, T. (1790). An Essay on Difficult Labours Part Second. London: J. Johnson. p. 50.

510 Denman, T. (1790). An Essay on Difficult Labours Part Second. London: J. Johnson. p. 50.

511 *Ibid*. pp. 48 – 52.

512 *Ibid*. p. 51.

513 *Ibid*.

514 Modern estimates give an incidence of 10% of fetuses in an occipito-posterior position at the start of labour, with 1.5 to 2% remaining in a persistent occipito-posterior position at delivery. See Fitzpatrick, McQuillan and O'Herlihy, 'Influence of Persistent Occiput Posterior Position on Delivery Outcome Obstetrics & Gynecology', 98 (2001), 1027 - 1031 <http://journals.lww.com/greenjournal/Fulltext/2001/12000/Influence_of_Persistent_Occiput_Posterior_Position.7.aspx>.

515 Denman, T. (1795). *An Introduction to the practice of Midwifery in two volumes.* London: J. Johnson. p. 168.

516 Denman's contemporary, John Burns agreed with Denman and recommended in his published works, printed in many editions between 1809 and 1843, that the vectis be used to provide traction. The description he gave of the woman meant that it was likely he used the vectis in an occipito-posterior or occipito-lateral position, although, like Denman, Burns did not explicitly state his advice in relation to the position of the baby. John Burns (1774-1850) was a prolific writer and published the first edition of his successful treatise The Principles of Midwifery in 1809. Burns was born in Glasgow and became the first private anatomy teacher in that city. He was appointed Professor of Anatomy and Theory of Surgery at Anderson's University in Glasgow.

517 Gaitskell, William (1763-1833) was a member of the Royal College of Surgeons, and President of the Society of General Practitioners. No biographical information is recorded for Gaitskell in the Oxford Dictionary of National Biography, Plarr's Lives, Munk's Roll, or as an obituary in *The Lancet,* or The British Medical Journal (including Provincial Medical and Surgical Journal). Gaitskell and his son, also named William, were in partnership as apothecaries and surgeons, with Charles Ventris Field until Field left the partnership on the 21st February 1831. Father and son continued the partnership together until that too was dissolved on 14th February 1832. See Gaitskell, W. (1823). A Case of Laceration of the Perineum, Urinary Bladder, and Rectum; with Observations on the Use and Abuse of the Vectis. Gaitskell, W. (1830). Society of General Practitioners. *The Lancet*, 451-2.; *The London Medical Repository*, 376 - 381.; The London Gazette. (1831, May 13). Notices. The London Gazette, p. 933.; The London Gazette. (1832, February 21). Notices. The London Gazette, p. 372.

518 Gaitskell, W. (1823). A Case of Laceration of the Perineum, Urinary Bladder, and Rectum; with Observations on the Use and Abuse of the Vectis. *The London Medical Repository*, 376 - 381.

519 The London Gazette. (1832, February 21). Notices. *The London Gazette*. p. 376.

520 *Ibid*.

521 *Ibid*. p. 378.

522 *Ibid*. p. 378.

523 *Ibid*. p. 379.

524 Conquest, J. T. (1837). *Outlines of Midwifery, developing its principles and practice; intended as a textbook for students and a book of reference for junior practitioners* (6th ed.). London: Longman, Brown, Orme & Green.

525 These practitioners were identified for discussion of their use of the vectis following a survey of all published works on midwifery in the nineteenth century that discussed the use of the vectis.

526 Gaitskell, W. (1823). A Case of Laceration of the Perineum, Urinary Bladder, and Rectum; with Observations on the Use and Abuse of the Vectis. p. 379.

527 Flexion is an important mechanism for the delivery of a baby. When the head of the baby is in a flexed position it means that the baby's chin is tucked onto its chest. The result of this is that the diameter of the head that presents, and moves through the pelvis, is around 9.5 centimetres, the smallest diameter possible for the head of a term baby. Flexion usually occurs as part of the mechanism of normal labour, when the head of the baby has descended through the pelvis and meets some resistance against the pelvic floor. If the baby's head is de-flexed, so the baby is looking straight and its chin is not on its chest, the diameter that presents is larger. This presents difficulty, since it means that labour is often slower, and it is more difficult for the baby to make the turns that are needed. The use of the vectis to encourage the head into a position of flexion would mean that a smaller diameter would be presenting, and it would be easier for the baby to navigate through the pelvis.

528 Conquest was born in 1789 in Kent and was the son of a doctor. He gained his MRCS in 1808, aged 18 years, an MD from Edinburgh in 1813 aged 24, and LRCP in 1819 aged 30. He succeeded Robert Gooch to lecture at St Bartholomew's Hospital in 1825 but was unpopular and resigned in 1834. He was physician to the City of London Lying-in hospital, the London Female Penitentiary, the London Orphan Asylum and Consulting Physician to the Stoke Newington and Stamford Hill dispensaries. See Marland, H, 'Conquest, John Tricker (bap.1789, d. 1866), in Oxford Dictionary of National Biography.

529 John Tricker Conquest, *Outlines of Midwifery, developing its principles and practice; intended as a textbook for students and a book of reference for junior practitioners*, (1837). Sixth Edition. London, Longman, Orme, Brown and Green. p. 99.

530 *Ibid*. p. 99.

531 *Ibid*.

532 *Ibid*. p.105.

533 *Ibid*.

534 Edward Copeman (1809 – 1880) was a practitioner from Norfolk who combined elements of Denman's education with those that Alfred Galabin would go on to experience. Copeman was apprenticed to study medicine to Mr Arthur Brown when he was fourteen or fifteen years old. When Brown died two years later, his apprenticeship was transferred to Mr. Crosse who was a surgeon at the Norfolk and Norwich Hospital. He moved to London and attended lectures at St. George's Hospital, as Denman had done. He was examined by the Worshipful Society of Apothecaries and returned to Norwich to practice as a general practitioner in 1835, before being elected to a post as a Consultant in Midwifery at the Norfolk and Norwich Hospital in 1851. See British Medical Journal, 'Obituary, Edward Copeman', p.382.; Royal College of Surgeons of England, 'Copeman, Edward (1809 - 1880)', in Royal College of Surgeons Plarr's Lives of the Fellows Online <http://livesonline.rcseng.ac.uk/biogs/E001271b.htm> [accessed 09 December 2011]; The Lancet, 'Obituary. Edward Copeman, M.D.', The Lancet, 6 March 1880, pp. 384-5. The Bury and Norwich Post, and Suffolk Herald (Bury Saint Edmunds, England), Wednesday, May 21, 1851; Issue 3595. 19th Century British Library Newspapers: Part II. 'News'. He will be used as a case study in Chapter five, and so will be introduced in greater detail there.

535 Copeman, E. (1841, October 09). Report on Midwifery in Private Practice. *Provincial Medical and Surgical Journal, Volume 3*, pp. 29 - 34.; Copeman, E. (Ed.). (1851). *Cases in Midwifery of the late J. G. Crosse Esq.arranged (With an introduction and remarks), by.* London: John Churchill.

536 The Bury and Norwich Post, and Suffolk Herald (Bury Saint Edmunds, England), Wednesday, May 21, 1851; Issue 3595. 19th Century British Library Newspapers: Part II. 'News'.

537 Edward Copeman, *Records of Obstetric Consultation Practice*, (1856). p. 56.

538 *Ibid*. p. 56.

539 *Ibid*. p. 56.

540 *Ibid*. p. 56.

541 *Ibid*. p. 59.

542 *Ibid*. p. 59. When the head of the baby is in an upright position, rather than having its chin on its chest, the head is said to be deflexed.

543 Edward Copeman, *Records of Obstetric Consultation Practice*, (1856). p. 58.

544 Swayne, Joseph Griffiths (1819-1903) was born in Bristol in 1819 and was the second son of John Champeny Swayne who was Senior Consulting Accoucheur to the Bristol Lying-in Institution and lecturer in midwifery in the Bristol Medical School. He was apprenticed to his father and commenced his studies at the Bristol Medical School and the Bristol Royal Infirmary in 1837, before moving to London to complete his education. Swayne completed his 'college and hall' exams by passing both his Membership of the Royal College of Surgeons, MRCS, and Licence of the Society of Apothecaries (LSA) in 1841. In addition to spending some time in Paris, Swayne completed his M.B. at the University of London in 1843, and his M.D. in 1845. Later that year he joined with, and then succeeded, his father in teaching midwifery in Bristol, until 1895, after which he became an emeritus professor. In addition to his role as a lecturer, Swayne worked at the Bristol General Hospital, being elected physician accoucheur in 1853, and consulting obstetric physician in 1875. Swayne was a fellow and vice president of the Obstetrical Society of London and was the honorary local secretary for Bristol as Copeman was for Norwich. In addition to the publication of journal articles, Swayne's highly popular and successful treatise Obstetric Aphorisms: for the Use of Students commencing Midwifery Practice was published in ten editions between 1856 and 1893, with a posthumous edition of the work being edited and published in 1913 by his nephew, and Professor of Obstetrics at the University of Bristol, Walter Carless Swayne. See Rolleston, H D. rev. Baignet, E., 'Joseph Griffiths Swayne' in *Oxford Dictionary of National Biography;* Royal College of Obstetrics and Gynaecology (Great Britain), 'Obituary. Joseph Griffiths Swayne', *The Journal of Obstetrics and Gynaecology of the British Empire*, 4 (1903), 412-15.; British Medical Journal, 'Obituary: Walter Carless Swayne, M.D., B.S.Lond., M.D., Ch.B.Bristol', *British Medical Journal*, 2 (1925), 363.

545 J. G. Swayne, 'Brow presentation as a cause of difficult labour', *Association Medical Journal*, 8 April 1853, pp. 299-300.; Joseph Grifiths Swyne, *Obsteric Aphorisms: for th use of students commencing midwifery practice*, 2nd edn (London: John Churchill, 1861).; Joseph Griffiths Swayne, *Obsteric Aphorisms: for the use of students commencing midwifery practice*, 4th edn (London: John Churchill & Sons, 1867). ; Joseph G. Swayne, 'On the use of obstetric instruments', BMJ, 1869, p. 497.; Joseph Griffiths Swayne, *Obsteric Aphorisms: for the use of students commencing midwifery practice*, 6th edn (London: J & A Churchill, 1876).; Joseph Griffiths Swayne, *Obsteric Aphorisms: for the use of students commencing midwifery practice*, 7th edn (London: J & A Churchill, 1880).

546 Marlborough College was founded in 1843 with the intention of providing subsidised education for sons of the clergy and dedicated approximately 1/3 of its places to this purpose. The headmaster from 1852-8 was George Cotton, and from 1858 – 70 George Bradley. See Marlborough College, 'First Fifty Years' <http://www.marlboroughcollege.org/about-us/college-history/first-fifty-years/> [accessed 09 May 2012]

547 Brown, G. (2017, April 21). *Alfred Lewis Galabin*. Retrieved from Munks Roll: http://munksroll.rcplondon.ac.uk/Biography/Details/1688

548 Under the terms of Schedule A of the 1858 Medical Act, a bachelor's degree in Medicine was needed to provide proof of a qualification in medicine to register with the General Medical Council. In England, the universities of Oxford, Cambridge, London, and Durham offered medical degrees, while in Scotland medical degrees were awarded by the universities of Edinburgh, Glasgow, Aberdeen, St. Andrews, and in Ireland by Trinity College in Dublin and Queens University of Ireland. See The Lancet, 'Regulations of Medical Examining Bodies in the United Kingdom.', *The Lancet*, 11 September 1869, pp. 367 -390.

549 The Lancet. (1861). General Council of Medical Education and Registration. *The Lancet*, 71-2.

550 The Lancet, 'Regulations of Medical Examining Bodies in the United Kingdom.', *The Lancet*, 11 September 1869, pp. 367 -390. pp. 367, 384. In today's terms, measuring this figure relative to the total output of the economy, using a share of Gross Domestic Product (GDP), in 1869, £100 was equivalent to £145,000 in 2012. Calculated using tool at www.measuringworth.com/ukcompare/relativevalue.php [accessed 11/07/2012]. Galabin paid his fees annually, paying £40 for each of the first and second years, and £10 for the third and fourth years. See *Guy's Hospital Pupil returns* 1869-1870. No.39, October 1869 Alfred Lewis Galabin held at KCL Archives.

551 The Lancet, 'Metropolitan Hospitals and Medical Schools', *The Lancet*, 1869, 391-94.

552 *Guy's Hospital Pupil returns* 1869-1870. No.39, October 1869 Alfred Lewis Galabin held at KCL Archives.

553 Contemporary readers will know Braxton Hicks' name due to the painless pre-labour contractions that he described, and that now bear his name. British Medical Journal, 'Obituary. John Braxton Hicks M.D.Lond., F.R.C.P., F.R.S.', *British Medical Journal*, 4 September 1897, p. 618.

554 *Guy's Hospital Medical and Surgical School (Prospectus)* ([n.p]: [n.pub.], 1869).

555 Neither Braxton Hicks, nor Phillips, have left any documentary evidence that they used the vectis. Braxton Hicks did author a book, but the focus was on using his hands to correct malpositions rather than instruments – See Braxton Hicks, J. (1864). *On Combined External and Internal Version.* London: Longman, Green, Longman, Roberts, and Green. On page 2, Braxton Hicks stated that 'the cultivation of the use of the hand was much neglected when the vectis, and more particularly the forceps, were introduced'.

556 *Guy's Hospital Medical and Surgical School (Prospectus)* ([n.p]: [n.pub.], 1869).p. 16.

557 *Guy's Hospital Pupil returns* 1869-1870 held at KCL Archives.

558 British Medical Journal, 'Obituary Alfred Lewis Galabin M.A., M. D., F.R.C.P., Consulting Physician to Guy's Hospital', *British Medical Journal*, 05 April 1913, pp. 748 - 750.

559 Cameron, H. C. (1954). *Mr Guy's Hospital 1726-1948.* London: Longmans, Green and Co.

560 British Medical Journal, 'Obituary Alfred Lewis Galabin M.A., M. D., F.R.C.P., Consulting Physician to Guy's Hospital', *British Medical Journal*, 05 April 1913, pp. 748 - 750.

561 A L Galabin and P Horrocks, 'Sixth Report of the Guy's Hospital Lying-in Charity, from October 1, 1875, to September 30, 1885. Collated from the records.', *Guy's Hospital Reports*, XLV (1888), 1 - 90.

562 At Guy's from 1863-1875 the forceps were used in 5.1 cases per 1,000, while at St. Thomas's in 1874 they were used in 54.2 cases per 1,000, and in 1875 they were used in 61.8 cases per 1,000 (statistics were given for those years only, with no consideration of extraneous factors). See Alfred Lewis Galabin, *A Manual of Midwifery*, (1893). p.439.

563 Galabin was a Council member from 1876-8, Honorary Librarian in 1879, Honorary Secretary from 1880 – 1883, Vice-President in 1884, Treasurer from 1885-8, and president in 1889-1990. See Herbert R Spencer and Robert Boxall (Eds), 'Transactions of the Obstetrical Society of London. Vol XLIX', in *Archive.org* <http://archive.org/stream/transactions49obst#page/n5/mode/2up> [accessed 10 May 2012]. It should be noted that the Obstetrical Society of the late nineteenth century was a distinct group from the Obstetric Society from earlier in that century.

564 For the report on the deputation see The Times, 'Deputations', *The Times*, 13 March 1876, p. 6.

565 The Obstetrical Journal of Great Britain and Ireland was published between 1873 and 1880. The first editor was James Hobson Aveling from 1873 – 1876. Galabin succeeded him and was followed by G. Ernest Herman in 1880.

566 This was the minimum amount of time that had to elapse before a member was eligible for election as a Fellow. British Medical Journal, 'Obituary Alfred Lewis Galabin M.A., M. D., F.R.C.P., Consulting Physician to Guy's Hospital', *British Medical Journal*, 05 April 1913, pp. 748 - 750.

567 The Times, 'News', *The Times*, 14 April 1880, p. 13.

568 The Hunterian Society was founded in 1819 by general practitioner Dr William Cooke, and surgeon Thomas Armiger who both practiced in the City of London and the Eastern district. The society was named to honour John Hunter and the principles of scientific discovery. See The Hunterian Society, 'Beginnings', in *The Hunterian Society* <http://www.hunteriansociety.org.uk/> [accessed 10 May 2012]

569 See The Times, 'Public Appointments', *The Times*, 5 March 1891, p. 14. In today's terms, measuring this income relative to the total output of the economy, using a share of Gross Domestic Product (GDP), £75 was equivalent to £75,800 in 2012. Calculated using tool at www.measuringworth.com/ukcompare/relativevalue.php [accessed 09/05/2012]

570 See The Times, 'Public Appointments', *The Times*, 2 March 1892, p. 14. Using the same calculation as above £105 was worth £109,000 in 2012. Calculated using tool at www.measuringworth.com/ukcompare/relativevalue.php [accessed 09/05/2012]

571 The Times, 'Court Circular', *The Times*, 27 May 1897, p. 8.

572 Princess Christian of Schleswig-Holstein was formerly known as Princess Helena Augusta Victoria, and was the third daughter and fifth child of Queen Victoria and Prince Albert. The presentation was reported in The Times, 'The Drawing Room', *The Times*, 14 May 1898, p. 9.

573 British Medical Journal, 'Obituary Alfred Lewis Galabin M.A., M. D., F.R.C.P., Consulting Physician to Guy's Hospital', *British Medical Journal*, 05 April 1913, pp. 748 - 750. p. 749.

574 Galabin, A. L., & Horrocks, P. (1888). Sixth Report of the Guy's Hospital Lying-in Charity.

575 Galabin, A. L. (1893). *A Manual of Midwifery* (3rd Edition ed.). London: J & A Churchill, 11 New Burlington Street. p. 595

576 *Ibid*.

577 *Ibid*. p.595

578 *Ibid*.

579 Galabin, A. L. (1893). *A Manual of Midwifery* (3rd Edition ed.). London: J & A Churchill, 11 New Burlington Street.

[580] Edward Copeman was an advocate for the vectis, and favoured the instrument over the forceps. He was recognised by his peers as possessing a high degree of skill in its use. In the Transactions of the Obstetrical Society's report of a meeting where Copeman had discussed the effectiveness of the vectis, Dr Wiltshire replied that the vectis was probably a more effective instrument in Copeman's hands than it would be for others. Edward Copeman, 'Statistical and practical remarks', *Transactions, XVI* (1875), p. 109-110.

581 *Guy's Hospital Pupil returns* 1869-1870. No.39, October 1869 Alfred Lewis Galabin held at KCL Archives.

Chapter 5

582 Radcliffe, W. (1989). *Milestones in Midwifery* (1967) and *The Secret Instrument (The Birth of the Midwifery Forceps)* (1947). San Francisco: Norman Publishing.

583 Donnison, J. (1988). *Midwives and Medical Men* (2nd Edition ed.). London: Historical Publications Ltd.

584 William Smellie (1697-1763) was born in Lanarkshire, Scotland, and educated at the Grammar School in Lanark. Smellie was apprenticed to the apothecary William Inglis, but also received instruction in surgery from the Glasgow Surgeon John Gordon. After serving in the Navy, he began to practice in Lanark where he gained experience in midwifery after being called to attend complex labours by local midwives. From 1737 onwards, Smellie concentrated on his midwifery practice, and was aware of the newly published forceps. After a brief stay in France to study with Gregoire, Smellie moved to London to establish his midwifery and teaching practice. He published his best-selling book *A treatise on the Theory and Practice of Midwifery* in 1752 which was translated into German, French and Dutch. In it he detailed the adaptations he had made to the forceps, and his method of applying them. See ODNB entry.

585 William Hunter (1718-1783) was also born in Lanarkshire, Scotland and was the elder brother of John Hunter (1728-1793). He attended university in Glasgow, but left without graduating and commenced an apprenticeship with William Cullen in Hamilton. Hunter attended lectures by Alexander Monro in Edinburgh, before moving to London and attending lectures by fellow Scot, William Smellie. Hunter began to provide his own lectures in October 1746, became a member of the Company of Surgeons a year later, and man-midwife to the Middlesex Hospital for a short while in 1748, before the same appointment to the British Lying-in hospital a year later. In 1756, Hunter left the Company of Surgeons and gained his Licence from the Royal College of Physicians, possibly since the latter was more prestigious and better supported his increasingly fashionable business. Hunter was disappointed to discover that his practice as a man-midwife precluded him from being appointed as a Fellow of the RCP, and joined the rival organisation, the Society of Collegiate Physicians, to campaign against the RCP. See ODNB entry.

586 See Wilson, A. (1995). *The Making of Man-midwifery.* Chapter 9 – A New Synthesis: William Smellie and Chapter 13 – William Hunter: the man as midwife; Wilson, A. (1985). *William Hunter and the varieties of man-midwifery.* In W. F. Bynum, & R. Porter (Eds.), William Hunter and the eighteenth-century medical world (pp. 343-369). Cambridge: Cambridge University Press.

587 Spencer, H. R. (1927). *The History of British Midwifery from 1650 to 1800*. London: John Bale & Sons. p. 53. Figures taken from Smellie's treatise 1746, vol. iii, p. 288 and given as 10:1000.

588 Anon. (1775). *Lectures Anatomical and Chirurgical by William Hunter*. Manuscript lecture notes MS2966, Wellcome Library. p.109. A similar quote 'it was a thousand pities it was ever invented … where they save one they murder twenty' is cited by Spencer, H. R. (1927). History of British Midwifery. p. 73. taken from a Manuscript of Hunter's lectures held at the Royal Society of Medicine's Library. The word in brackets indicate conjecture on an unclear word in my transcription of the original manuscript.

589 Thomas Denman, *Aphorisms on the application and use of the forceps,* (1783). p. 8.

590 *Ibid*.

591 Royal College of Obstetricians and Gynaecologists. (2011). *Operative Vaginal Delivery: Green-top Guideline No.26.* Retrieved March 10, 2019, from Royal College of Obstetricians and Gynaecologists: https://www.rcog.org.uk/globalassets/documents/guidelines/gtg_26.pdf

592 This subject was discussed at a 'Risks of Childbirth' workshop in London on 3rd November 2016.

593 Thomas Denman, Introduction to Midwifery. 4th edn, 2 vols (London: [n.pub.], 1805), II.

594 Thomas Denman, *Introduction to Midwifery*. On difficult labours, section IV – General observations.

595 Thomas Denman, *Aphorisms on the application and use of the forceps,* (1783). Thomas Denman, *Aphorisms on the application and use of the forceps and vectis,* (1793).

596 Thomas Denman, *Introduction to Midwifery*, 4th edn, 2 vols (London: [n.pub.], 1805), II.

597 Thomas Denman, *An introduction to the practice of midwifery with a biographical sketch of the author, with additional modern information on the various subjects treated of in the work and a dissertation on the transfusion of blood by Charles Waller* (London: E.Cox, 1832).

598 Thomas Denman, *Introduction to Midwifery,* (1805). p. 102. My italics.

599 Rhodes, P., 'John Leake', in *Oxford Dictionary of National Biography*.

600 Denman criticised Leake in his paper. See Denman, T. (1773). *Remarks on Dr. Leakes paper on the use of his forceps.* London.

601 A Late Pupil of Dr/ Leakes's. (1774). *A vindication of the forceps described and recommended by Dr. Leake; in which, The injudicious and illiberal remarks on that subject, signed Thomas Denman, are examined and refuted.* London: J. Hinton.

602 Osborn, W. (1792). *Essays on the Practice of Midwifery, in natural and difficult labours*. London: Cadell and Johnson. p. 70.

603 Also see cautionary discussion in Haighton, J. (1799). *A Syllabus of the lectures on Midwifery, delivered at Guy's Hospital and at Dr Lowders and Dr Haightons Theatre* (2nd Edition ed.). London: T. Bensley.

604 Nisbet, William (1759-1822) was both a physician and writer. He gained an M.D. from Aberdeen in 1785, and became a Member of the Royal College of Surgeons (MRCS) in Edinburgh in 1786, although he practised in London from 1801. Few details exist about Nisbet's life, although his treatise The Clinical Guide was popular with young hospital-based practitioners, and the book was designed to fit in a coat pocket. See ODNB entry.

605 Nisbet, W. (1800). *The Clinical Guide, or a concise view of the leading facts, on the history, nature, and treatment of the various diseases that form the subject of midwifery: or attend the pregnant, parturient, and puerperal states.* London: J. Johnson. p. 164.

606 *Ibid*. pp. 163-4.

607 *Ibid*. p. 165.

608 John Burns, *The Principles of Midwifery*, (1811). pp. 328/9.

609 Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy. *The Journal of Obstetrics and Gynaecology of the British Empire*, 905-919.

610 *Ibid*.

611 For reasons that are unclear, the accoucheur, Croft left the placenta in the vagina after it had been separated, and further haemorrhage was evident when it finally delivered. See Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy. p. 914.

612 This is common is childbearing women who are usually young and fit. Their bodies physiologically compensate for blood loss for a long time, but when it becomes unable to do so any longer, they appear to become seriously unwell very quickly.

613 See Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy. p. 915. An hourglass constriction is more commonly known in modern obstetrics as a Bandl's ring. It is a sign of an obstructed labour, and is often a pre-cursor to uterine rupture.

614 See ODNB entry for Croft, Sir Richard, sixth baronet (1762-1818).

615 See Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy. p. 908.; ODNB entries for Home, Sir Everard, first baronet (1756-1832); Baillie, Matthew (1761-1823).; Hunter, John (1728-1793).

616 See ODNB entry. Thomas Cogan (1736-1818) was born in Northamptonshire, and was the second son of John Cogan, a surgeon and apothecary. He worked for a time as a junior Minister at the English Church in The Hague. Whilst in the Netherlands, he married the daughter of a wealthy merchant, Johanna Maria Groen, and as a condition of their marriage began to study medicine. After graduating MD from the University of Leiden, he moved to London where he specialised in Midwifery. He briefly returned to the Netherlands with his wife in 1780, but the unstable political situation meant that they returned to England. Cogan concentrated on religious and philosophical writings after that time.

617 Frances Kingston, 'Notes abstracted from several courses of Lectures on Midwifery given by Dr Denman and Dr Osborn' (unpublished lecture notes, 1778). p. 197. No biographical information is available from Munk's Roll, Plarr's Lives, or the Oxford Dictionary of National Biography for Cowper, Lord, or for John Wathen.

618 Holland did not have evidence of a link between Sims and the others, and wrote 'The mystery man of the confinement was Dr. Sims. … One wonders how much time Sims had left for midwifery or if he really was a ''celebrated accoucheur". It seems astonishing that he was chosen as the consultant …'. See Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy. p. 908.

619 See Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy.

620 The Morning Chronicle. (1817, November 7). The Demise of Princess Charlotte. *The Morning Chronicle.*

621 The Morning Chronicle. (1817, November 8). The demise of Her Royal Highness, The Princess Charlotte. *The Morning Chronicle*.

622 Princess Charlotte was the only legitimate grandchild of George III, despite having numerous aunts and uncles. Following Charlotte's death, her uncle Prince Edward married, and fathered the future Queen Victoria.

623 Price, R. (1817). *A critical inquiry into the nature and treatment of the case of Her Royal Highness the Princess Charlotte of Wales and her infant son, with the probable causes of their deaths and the subsequent appearances*. London: Rees Price.

624 Ireland, W. M. (1818). An Inquiry into the most proper means to be adopted in the management of lying-in women with critical remarks on the medical report, and the death of Princess Charlotte of Wales. New York: James Eastburn & Co.

625 See Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy.; ODNB entry.

626 Denman, T. (1832). *An introduction to the practice of midwifery with a biographical sketch of the author, with additional modern information on the various subjects treated of in the work and a dissertation on the transfusion of blood by Charles Waller*. London: E. Cox.

627 Burns, J. (1843). *The Principles of Midwifery: including the diseases of women and children* (10th ed.). London: Longman, Brown, Green & Longmans.

628 John Tricker Conquest (bap. 1789-1866) was baptized in Kent, the son of Dr Conquest of Chatham. He gained his MRCS aged eighteen, graduated as an MD from Edinburgh in 1813, and became a licentiate of the Royal College of Physicians in 1819. Conquest was a man-midwife who practiced in London. He succeeded Robert Gooch to the post of lecturer in Midwifery at St Bartholomew's Hospital, was Physician to the City of London Lying-in hospital. Conquest was a lecturer in Midwifery at St Bartholomew's Hospital, and wrote a book entitled Outlines of Midwifery, for students and junior practitioners. It was published in six editions between 1820 and 1837, and translated into French and German in addition to the English. See ODNB entry.

629 Conquest, J. T. (1821). Outlines of Midwifery. London: John Anderson. pp. 76-77.

630 *Ibid*. p. 77.

631 David Daniel Davis (1777-1841) was born in Carmarthenshire in 1777 and undertook his medical education at the University of Glasgow, graduating with an MD in 1801. Davis' son died soon after birth in 1807 following the use of an undocumented instrument. He initially worked in Sheffield before moving to London in 1813. He gained his LRCP the same year and practiced midwifery. He was appointed as physician to Queen Charlottes Lying-in hospital and Professor of Midwifery and diseases of Women and Children at University College London from 1828 to 1841, and obstetric physician to University College Hospital from 1834 until the year he died in 1841. He was a friend to Lancet founder, Thomas Wakley. Davis published a syllabus of lectures in 1831 and editions of his treatise Elements of Operative Midwifery in 1825 and 1841. Davis had lost his son following a difficult forceps delivery and this experience had a strong influence on his behaviour, and cautious approach to the use of instruments.

632 Davis, D. D. (1825). *Elements of Operative Midwifery: A description of certain new and improved powers for assisting difficult and dangerous labours: illustrated by plates; with cautionary strictures on the improper use of instruments*. London: Hurst, Robinson, and Co.

633 James Blundell (1790-1878) was born in London, and was the nephew to the physiologist John Haighton. Blundell graduated MD from Edinburgh in 1813, and a year later assisted his uncle as lecturer in midwifery and physiology at Guy's hospital. He succeeded his uncle in 1818. He became a fellow of the Royal College of Physicians in 1838.

634 Blundell, J. (1828). Lectures on the Theory and Practice of Midwifery delivered at Guy's Hospital by Dr Blundell. Lecture XXXIV. *The Lancet*, II (258), 577-583. p. 579.

635 Conquest, J. T. (1837). *Outlines of Midwifery, developing its principles and practice; intended as a textbook for students and a book of reference for junior practitioners* (6th ed.). London: Longman, Brown, Orme & Green. p. 88.

636 John Ramsbotham (no dates available) was a lecturer in obstetric medicine at the London Hospital. He was also physician to the Royal Maternity Charity, and had a large obstetric practice in East London. He does not feature in Munk's Roll, Plarr's Lives or ODNB, except as part of the entry for his son.

637 Francis Henry Ramsbotham (1801-1868) was born in 1801 in Richmond, the son of John Ramsbotham. Ramsbotham served his apprenticeship to a druggist in Cheapside in London, prior to attending lectures at the Royal London Hospital in 1818. A year later he started attending the University of Edinburgh and graduated, as well as passing his licence of the Royal College of Physicians (LRCP), in 1822. Ramsbotham was instrumental in establishing the Obstetrical Society of London in 1826, which campaigned for improvements in midwifery education and regulation. He was appointed as Physician to the Tower Hamlets and Eastern Dispensaries of the Royal Maternity Charity in 1825, and assisted, then succeeded his father being appointed as lecturer at the Royal London Hospital from 1854. See Goodwin, G., & Baigent, E. Francis Henry Ramsbotham. In *Oxford Dictionary of National Biography.*

638 Ramsbotham, F. R. (1834, May 31). Lectures on the theory and practice of Midwifery. *The London Medical Gazette, being a weekly journal of Medicine and the Collateral Sciences*, pp. 305-312.

639 Ramsbotham, F. H. (1845). *The Principles and Practice of Obstetric Medicine and Surgery, in reference to the Process of Parturition*. Philadelphia: Lea & Blanchard p. 190-191.

640 Ramsbotham, F. H. (1867). *The Principles and Practice of Obstetric medicine and surgery, in reference to the process of parturition*. London: John Churchill and Sons.

641 Robert Barnes (1817-1907) was born in Norwich, the second of six children. Barnes commenced an apprenticeship with Richard Griffin in Norwich in 1832, before moving to London with his family and continuing his studies at University College, London. He gained his membership of the Royal College of Surgeons (MRCS) in 1842, graduated with an MD in 1848, and became a Licentiate of the Royal College of Physicians in 1853, and a fellow of the Physicians in 1859. Barnes held posts as obstetric surgeon at the Western General Dispensary, as lecturer on midwifery at Great Windmill Street. In 1859, he was elected assistant obstetric physician, and four years later as obstetric physician to the London Hospital. In 1862, he moved to St Thomas's Hospital as a lecturer on midwifery, and in 1865 he was elected obstetric physician there. He became dean of St Thomas's medical school before taking a post as obstetric physician to St George's Hospital in 1875. Ten years later he was elected consulting obstetric physician there. Barnes was one of the founders of the Obstetrical Society of London, but following a disagreement with others in the Society in 1884, he left to set up the British Gynaecological Society.

642 Barnes, R. (1876). *Lectures on Obstetric Operations* (3rd ed.). London: J & A Churchill. p. 9.

643 Leishman, W. (1888). *A System of Midwifery including the diseases of pregnancy and the puerperal state* (Vol. 1). Glasgow: James Maclehose & Sons. William Leishman (1834-1894) was the Regius Professor of Midwifery at the University of Glasgow from 1868 to 1894. He practised at the Glasgow Western Infirmary and the Glasgow Maternity Hospital. His treatise *a System of Midwifery* was first published in 1873 and a further three editions were published over the next fifteen years.

See University of Glasgow, 'Biography of William Leishman', in University of Glasgow Story <http://www.universitystory.gla.ac.uk/biography/?id=WH2091&type=P> [accessed 06 December 2010]

644 Meadows, A. (1876). *A Manual of Midwifery* (3rd ed.). London: Henry Renshaw. Alfred Meadows (1833-1887) was born in Ipswich in 1833, and apprenticed to Mr William Elliston of Ipswich. He went to London as was common practice, and entered Kings College Medical School. He gained his membership of the Royal College of Surgeons (MRCS) and Licence from the Royal College of Physicians (LRCP), his initial medical qualifications, in 1856. Upon qualification, Meadows was appointed as house physician and resident midwifery assistant at Kings College Hospital. He was secretary of the Obstetrical Society of London, but failed to get elected as president in 1884, after which he left to set up the British Gynaecological Society of which he was the first president. Meadows was a fellow of King's College, London, Physician accoucheur to St. Marys Hospital and Lecturer in Midwifery at St. Mary's Hospital Medical School. He was also consulting physician accoucheur to the St. Johns Wood and Portland Town Provident Dispensary and the Westbourne Provident Dispensary. Meadows' treatise *A Manual of Midwifery* was first published in 1862, and a further two editions were published in 1871 and 1878. The final edition of his treatise was co-authored with Albert Venn in 1882. See Power, D A, rev. Moscucci, O., 'Meadows, Alfred (1833 – 1887) Obstetric Physician' in Oxford Dictionary of National Biography.

645 Joseph Griffiths Swayne (1819-1903) was born in Bristol, and was the second son of John Champeny Swayne who was Senior Consulting Accoucheur to the Bristol Lying-in Institution and lecturer in midwifery in the Bristol Medical School. He was apprenticed to his father and commenced his studies at the Bristol Medical School and the Bristol Royal Infirmary in 1837, before moving to London to complete his education. Swayne completed his 'college and hall' exams by passing both his Membership of the Royal College of Surgeons, MRCS, and Licence of the Society of Apothecaries (LSA) in 1841. In addition to spending some time in Paris, Swayne completed his M.B. at the University of London in 1843, and his M.D. in 1845. Later that year he joined with, and then succeeded, his father in teaching midwifery in Bristol, until 1895, after which he became an emeritus professor. In addition to his role as a lecturer, Swayne worked at the Bristol General Hospital, being elected physician accoucheur in 1853, and consulting obstetric physician in 1875. Swayne was a fellow and vice president of the Obstetrical Society of London, and was the honorary local secretary for Bristol as Copeman was for Norwich. In addition to the publication of journal articles, Swayne's highly popular and successful treatise *Obstetric Aphorisms: for the Use of Students commencing Midwifery Practice* was published in ten editions between 1856 and 1893, with a posthumous edition of the work being edited and published in 1913 by his nephew, and Professor of Obstetrics at the University of Bristol, Walter Carless Swayne. See Rolleston, H D. rev. Baignet, E., 'Joseph Griffiths Swayne' in *Oxford Dictionary of National Biography.*; Royal College of Obstetrics and Gynaecology (Great Britain), 'Obituary. Joseph Griffiths Swayne', *The Journal of Obstetrics and Gynaecology of the British Empire*, 4 (1903), 412-15.

646 Swayne, J. G. (1878). Remarks on the effects of Forceps delivery on the Infant. *British Medical Journal*, 459-460.

647 Meadows, A. (1862). *Manual of Midwifery*. London: Henry Renshaw. p.137.

648 Aveling, J. H. (1882). *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument*. London: J & A Churchill reprinted by AMS Press 1977.

649 *Ibid*.

650 Denman, T. (1780). *Directions for the application of the forceps*. London.

651 Denman, T. (1783). *Aphorisms on the application and use of the forceps, On preternatural labours and On labours attended with Haemorrhage*. London.

652 *Ibid*. p.8. Italics used as they appear in Denman's original text.

653 Denman, T. (1805). *Introduction to Midwifery* (4th Edition ed., Vol. 2). London.

654 Denman, T. (1807). *An Introduction to the Practice of Midwifery*. Brattleborough: Fessenden, William. p. 230.

655 S. Maw & Sons. (1869). *Book of Illustrations to S. Maw & Sons Quarterly Price-Current*. London: S. Maw & Sons. p. 76.

656 Denman, T. (1783). *Aphorisms on the application and use of the forceps, On preternatural labours and On labours attended with Haemorrhage*. London. p. 12.

657 *Ibid*. p. 15.

658 *Ibid*. p. 20.

659 Denman, T. (1793). *Aphorisms on the application and use of the forceps and vectis; on preternatural labours, on labours attended with haemorrhage, and with convulsions* (Fourth ed.). J. Johnson, St Pauls Churchyard.

660 Davis, D. D. (1825). *Elements of Operative Midwifery: A description of certain new and improved powers for assisting difficult and dangerous labours: illustrated by plates; with cautionary strictures on the improper use of instruments*. London: Hurst, Robinson, and Co.

661 Ramsbotham, F. H. (1844). *The Principles and Practice of Obstetric Medicine and Surgery* (2nd Edition, enlarged ed.). London: John Churchill. Plate XXXIII, figure 98 adjacent to p. 190.

662 Ramsbotham, F. H. (1844). *The Principles and Practice of Obstetric Medicine and Surgery*.;

663 Meadows, A. (1862). *Manual of Midwifery*. London: Henry Renshaw.

664 Barnes, R. (1876). *Lectures on Obstetric Operations* (3rd ed.). London: J & A Churchill.

665 Galabin, A. L. (1893). *A Manual of Midwifery* (3rd Edition ed.). London: J & A Churchill, 11 New Burlington Street.

666 *Ibid*.

667 Ramsbotham, F. H. (1844). *The Principles and Practice of Obstetric Medicine and Surgery*. p. 209.

668 Ramsbotham, F. H. (1844). *The Principles and Practice of Obstetric Medicine and Surgery*. Plate XXXV, figure 103.

669 *Ibid*; Burns, J. (1843). *The Principles of Midwifery: including the diseases of women and children* (10th ed.). London: Longman, Brown, Green & Longmans.

670 Denman, T. (1793). *Aphorisms on the application and use of the forceps and vectis; on preternatural labours, on labours attended with haemorrhage, and with convulsions* (Fourth ed.). J. Johnson, St Pauls Churchyard.; Denman, T. (1805*). Introduction to Midwifery* (4th Edition ed., Vol. 2). London.

671 Burns, J. (1843). *The Principles of Midwifery.*

672 *Ibid.*

673 Ramsbotham, F. H. (1844). *The Principles and Practice of Obstetric Medicine and Surgery*.

674 *Ibid*. Plate XXXV, figure 104.

675 *Ibid*.

676 Barnes, R. (1876). *Lectures on Obstetric Operations* (3rd ed.). London: J & A Churchill.

677 Galabin, A. L. (1893). *A Manual of Midwifery.* See discussion on p. 600.

678 *Ibid*. p. 209.

679 John Weiss & Son. (1863). *A Catalogue of Surgical Instruments, Apparatus, Appliances etc.* London: John Weiss & Son. Plate XXXIII contains illustrations (top to bottom) of Simpson's, Oldham's, Lever's, Roberton's, Ramsbotham's and Assalini's forceps. Plate XXXIV contains illustrations (top to bottom, left to right) of Brünninghausen's curved forceps introduced by Rigby, Clarke's, Haighton's, Denman's, Greenhalgh's, and Davies' forceps, Brünninghausen's short forceps, and a pair of generic short forceps. Photographs taken at the Thackray Museum by L. Jenkins with permission.

680 Leishman, W. (1888). *A System of Midwifery including the diseases of pregnancy and the puerperal state (Vol. 2).* Glasgow: James Maclehose & Sons. p. 569

681 See discussion in Chapter 3, section 3.3.2 The Obstetrical Society.

682 The Times. (1851, May 1). The Great Exhibition. *The Times*, p. 8.

683 A search of *The Lancet* for the term *Conversazione* between 1850 and 1900 revealed 806 articles that fulfilled this criterion.

684 The Obstetrical Society of London. (1867). Catalogue and Report of Obstetrical and other instruments exhibited at the conversazione of the Obstetrical Society of London, held by permission, at the Royal College of Physicians, March 28th 1866, with numerous illustrations. London: Longmans, Green, and Co.

685 Obstetrical Society of London. (1866, April 6). Conversazione and Exhibition of Instruments. *The Lancet*, pp. 378-381. p. 378.

686 The Obstetrical Society of London. (1867). *Catalogue and Report of Obstetrical and other instruments exhibited at the conversazione of the Obstetrical Society of London*. p. iii.

687 Obstetrical Society of London. (1866, April 6). Conversazione and Exhibition of Instruments.

688 *Ibid*.

689 *Ibid*. p. 379.

690 *Ibid*.

691 *Ibid*.

692 The Obstetrical Society of London. (1867). *Catalogue and Report of Obstetrical and other instruments exhibited at the conversazione of the Obstetrical Society of London*.

693 Ibid. p. 214-6.

694 Obstetrical Society of London. (1866, April 6). Conversazione and Exhibition of Instruments.

695 The British Medical Journal. (1902). The Midwives Act. The British Medical Journal, 481-483. p. 481.

696 The Lancet, 'The registration of Midwives: The Midwives Board', *The Lancet*, 160 (1902), 1411.

697 *Ibid*.

698 Central Midwives Board. (1907). *Rules framed by the Central midwives Board*. London: Central Midwives Board. p. 22.

699 The Rules defined Normal as ‘Natural, usual, healthy’ on page 42, as opposed to abnormal on page 41, which it defined as ‘Unnatural, unusual, unhealthy’. See Central Midwives Board. (1907). *Rules*.

700 *Ibid*. p. 23.

701 Leap, N., & Hunter, B. (1993). *The Midwife's Tale*. London: Scarlett Press.

702 Wilson described the practice of midwife Sarah Stone in the early eighteenth century, before the publication of the forceps, as reflecting ‘the midwife’s customary aversion to the use of instruments’, although she did occasionally use a craniotomy knife. See Wilson, A. (1995). The Making of Man-midwifery. p. 57-59. Donnison also described that midwife Mrs Stephen taught pupils to use the forceps towards the end of the eighteenth century. See Chapter 2: The Decline of the Midwife in Donnison, J. (1988). Midwives and Medical Men. As has already been established, non-use is difficult to establish, but instrument use by midwives was not discussed later historiographies such as those by Leap, N., & Hunter, B. (1993). *The Midwife's Tale*. London: Scarlett Press.; Allison, J. (1996). *Delivered at Home*. London: Chapman & Hall.; and McIntosh, T. (2012). *A Social History of Maternity Care*. Abingdon: Routledge.

703 Russell, S. (1986). The Social Construction of Artefacts: A response to Pinch and Bijker. *Social Studies of Science*, 331-346.

704 Oudshoorn, N., & Pinch, T. (Eds.). (2005). *How users' matter: the co-construction of users and technology*. Cambridge, Massachusetts: The MIT Press.

Chapter 6: Conclusions

705 The secondary literature on the use of the forceps has been divided into two key narratives. Firstly, that the forceps were worthy of study as the better instrument, and secondly that there was a patriarchal conspiracy to remove childbirth from the control of women, and the use of the forceps exemplified this. See Aveling, J. H. (1882). *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument*. London: J & A Churchill reprinted by AMS Press 1977.; Donnison, J. (1988). *Midwives and Medical Men* (2nd Edition ed.). London: Historical Publications Ltd.

706 Clark, G. (1966). *A History of the Royal College of Physicians. Volume 2.*

707 See discussion in Chapter 4, section 4.3.3.

708 Although these gendered divisions are not true at the beginning of the twenty-first century where many obstetricians are also female, the divisions were true during the nineteenth century.

709 Adrian Wilson, *The Making of Man-midwifery: Childbirth in England 1660 – 1770.* (Cambridge: Harvard University Press, 1995).

710 Pinch, T, J., & Bijker, W E. (1984) The Social Construction of Facts and Artefacts.; Prell, C. (2009). *Rethinking the Social Construction of Technology*.

711 Denman's network of practice included Dr Cowper, Dr Lord, Dr Jonathan (John) Wathen, and Dr Thomas Cogan, all of whom he watched use the vectis, between 1774 and 1778. The use of the vectis by Wathen et al can be traced directly from the Chamberlens. See discussion by Wilson (1995) in Making of Man-Midwifery. It would be a worthwhile area of future research to explore whether they had any other 'professional heirs' that used the instrument in the same way as they did. Denman was not converted wholesale to the use of the vectis at this point, and continued to experiment with it.

712 Authors such as Denman, Nisbet and Burns expressed such concerns. See table for summary of use of the vectis in publications between 1783 and 1914 in Appendix C.

713 See the graphic account by Gaitskell, W. (1823). A Case of Laceration of the Perineum, Urinary Bladder, and Rectum; with Observations on the Use and Abuse of the Vectis. *The London Medical Repository*, 376 - 381.

714 The Obstetrical Society of London. (1867). *Catalogue and Report of Obstetrical and other instruments exhibited at the conversazione of the Obstetrical Society of London, held by permission, at the Royal College of Physicians, March 28th 1866, with numerous illustrations*. London: Longmans, Green, and Co.

715 S. Maw & Sons. (1869). *Book of Illustrations to S. Maw & Sons Quarterly Price-Current.* London: S. Maw & Sons.

716 S. Maw, Sons & Thompson. (1891). *Book of Illustrations, Quarterly price-current. Surgeons Instruments etc.* London: S. Maw, Son & Thompson.

717 Denman, T. *An Essay on Difficult Labours. Part First.* (1787). London: J. Johnson. p. 41.

718 Pinch, T, J., & Bijker, W E. (1984) The Social Construction of Facts and Artefacts.; Prell, C. (2009). *Rethinking the Social Construction of Technology*.

719 Alfred Lewis Galabin, *A Manual of Midwifery*, (1893). p. 594.

720 Herman, G. E. (1912). *Difficult labour. A guide to its management for students and practitioners* (New & Enlarged 5th Edition ed.). London: Cassell and Company Limited.

721 Russell, S. (1986). The Social Construction of Artefacts: A response to Pinch and Bijker. *Social Studies of Science*, 331-346.

722 Brown, G. (2017, April 21). *Alfred Lewis Galabin*. Retrieved from Munks Roll: http://munksroll.rcplondon.ac.uk/Biography/Details/1688

723 *Guy's Hospital Pupil returns* 1869-1870. No.39, October 1869 Alfred Lewis Galabin held at KCL Archives.

724 Wenger, E. (2018, December 19). *Communities of Practice: A brief introduction.* Retrieved from University of Oregon Libraries: https://scholarsbank.uoregon.edu/xmlui/handle/1794/11736; Hildreth, P., & Kimble, C. (2004). *Knowledge Networks: Innovation through Communities of Practice.* London: Idea Group Publishing.; Lundkvist, A. (2004). User Networks as Sources of Innovation. In P. Hildreth, & C. Kimble, *Knowledge Networks: Innovation through Communities of Practice* (pp. 96-105). London: Idea Group Publishing.

725 *Guy's Hospital Pupil returns* 1869-1870. No.39, October 1869 Alfred Lewis Galabin held at KCL Archives.

726 John Biggs, *Teaching and Learning* (London: Jones, 2003).

727 Cantillon, P. (2003). Teaching Large Groups. *British Medical Journal*, 437.

728 Douglas manuscript notes cited by Brock, H. (1974). James Douglas of the Pouch. *Medical History*, 162-72.

729 Ramsbotham, F. H. (1845). *The Principles and Practice of Obstetric Medicine and Surgery, in reference to the Process of Parturition*. Philadelphia: Lea & Blanchard. p. 198

730 In manual rotation, the practitioner inserts their hand into the vagina and manipulates the position of the baby's head using his hand. See Herman, G. E. (1912). *Difficult labour. A guide to its management for students and practitioners* (New & Enlarged 5th Edition ed.). London: Cassell and Company Limited.

731 See by Ivan Waddington, *The Medical Profession* (1984). Chapter 9: Professionalisation.

732 See Denman, T. (1807). *An Introduction to the Practice of Midwifery.* Brattleborough: Fessenden, William., Burns, J. (1810). *The principles of midwifery: including the diseases of women and children.* (N. Chapman, Ed.) Philadelphia: Hopkins and Earle. Ramsbotham, F. H. (1845). The Principles and Practice of Obstetric Medicine and Surgery, in reference to the Process of Parturition. Philadelphia: Lea & Blanchard.; Churchill, F. (1853). *On the theory and practice of midwifery.* (D. F. Condie, Ed.) Philadelphia: Blanchard & Lea.; Ramsbotham, F. H. (1865). The Principles and Practice of Obstetric Medicine and Surgery, in reference to the process of parturition with sixty-four and numerous woodcuts. A new American Edition, revisesd by the author with notes and additions by William V. Keating. Philadelphia: Henry C. Lea.; Galabin, A. L., & Blacker, G. (1910). *The practice of midwifery* (7th, greatly enlarged and extended ed.). New York: Macmillan.

733 Walter Radcliffe, *The Secret Instrument (The Birth of the Midwifery Forceps) (1947),* (San Fransisco: Norman Publishing, 1989). pp. 65-66.

734 Walter Radcliffe, *Milestones in Midwifery (1967),* (San Fransisco: Norman Publishing, 1989). See Chapter 3: The key to the lying-in room.

735 Loudon, I. (1986). *Medical Care and the General Practitioner 1750-1850.* Oxford: Oxford University Press. ; Loudon, I. (1996). Essay review: The Making of Man-Midwifery. *Bulletin of the History of Medicine*, 507-515.

736 Wilson, A. (1995). *The Making of Man-midwifery*.

737 *Ibid*.

738 Essay review: The Making of Man-Midwifery. *Bulletin of the History of Medicine*, 507-515. p. 515.

739 There were a few notable early exceptions to this, such as the use of forceps by Sarah Stone. Wilson, A. (1995). *The Making of Man-midwifery*. See The female/male division transcended: Sarah Stone on p. 57.

740 The 1902 Midwives Act refers exclusively to midwives as female. Although women had been admitted to study medicine towards the end of the nineteenth century, most doctors were still male at the beginning of the twentieth century.

741 Oudshoorn, N., & Pinch, T. (Eds.). (2005). How users' matter: the co-construction of users and technology. Cambridge, Massachusetts: The MIT Press.

742 Royal College of Obstetricians and Gynaecologists. (2011). *Operative Vaginal Delivery: Green-top Guideline No.26*. Retrieved March 10, 2019, from Royal College of Obstetricians and Gynaecologists: https://www.rcog.org.uk/globalassets/documents/guidelines/gtg_26.pdf

743 Search of http://collectionsonline.nmsi.ac.uk/ undertaken on 09/07/2017

744 Science Museum website, search term vectis at http://www.sciencemuseum.org.uk/GSearch?terms=vectis [Consulted 09/07/2017]

745 Cansardine (Carwardine), H. H. (1818). Brief notice presented to the Medico-Chirurgical Society.

746 Royal College of Obstetrics and Gynaecology. (2017, July 09). *RCOG museum*. Retrieved from RCOG: https://www.rcog.org.uk/en/guidelines-research-services/library-services/archives-and-heritage/rcog-museum/

Bibliography

Academy of Medicine in Ireland. (1883). Obstetrical Section. *The Lancet*(Jan 27), pp. 147 - 148.

Aitken, J. (1795). *Principles of Midwifery or Puerperal Medicine* (2nd ed.). Edinburgh.

Allison, J. (1996). *Delivered at Home.* London: Chapman & Hall.

Anning, S. T., & Walls, W. K. (1982). *A History of the Leeds School of Medicine: One and a Half Centuries 1831-1981.* Leeds: Leeds University Press.

Anon. (1775). *Lectures Anatomical and Chirurgical by William Hunter.* Manuscript lecture notes MS2966, Wellcome Library .

Anon. (1776). *Sketches of the Practice of Midwifery from the lectures of Drs Osborne and Denman.* Unpublished manuscript lecture notes MS 2098, Wellcome Library.

Anon. (1782). *Dr Denman Lectures on Midwifery.* Unpublished Manuscript Lecture Notes Ref TH/PP DENMAN, Kings College Archives.

Anon. (1803). *The Edinburgh Practice of Physic, Surgery & Midwifery* (Vols. Volume 5 - Midwifery). London: G. Kearsley.

Anon. (1856). Reviews and Notices of Books. Records of Obstetric Consultation Practice; and a translation of Busch and Moser on Uterine Haemorrhage. *The Lancet*(September 6), p. 284.

Anon. (1990). Overview of history of midwifery. *Australian College of Midwives Incorporated Journal, 2*(4), 15-20.

Archibald, D. (1905). *An Introduction to Midwifery: A handbook for Medical Students and Midwives with numerous illustrations* (6th Edition ed.). London: Charles Griffin and Company Limited.

Arthure, H. G. (1969). The London Obstetrical Society. *Proceeding of the Royal Society of Medicine, 62*, 363-5.

Associated Apothecaries and Surgeon-Apothecaries of England and Wales. (1823). *Transactions of the Associated Apothecaries and Surgeon-Apothecaries of England and Wales* (Vol. I). London: Burgess ad Hill.

Aveling, J. H. (1870, November 12). On the advantages to be derived from curving the handles of the midwifery forceps. *The British Medical Journal*, p. 528.

Aveling, J. H. (1873). On the instruction, examination and registration of Midwives. *The British Medical Journal*, 308 - 310.

Aveling, J. H. (1878, September 28). Correspondance. Axis-traction Forceps. *British Medical Journal*, p. 459.

Aveling, J. H. (1882). *The Chamberlens and the Midwifery Forceps. Memorials of the family and an essay on the invention of the instrument.* London: J & A Churchill reprinted by AMS Press 1977.

Babington, B. G. (1861, November 30). On the discovery of the original obstetric instruments of the Chamberlens. *The British Medical Journal*, pp. 589 - 590.

Baillie, S. (1818). *Memoir in MSS of the life of Dr Thomas Denman in the handwriting of his daughter Sophia - the wife of Dr Matthew Bailiie.* Unpublished Manuscript MS5620, Wellcome Library.

Baines, M. (1865, December 16). Reports of Societies: Western Medical & Surgical Society. *British Medical Journal*, p. 644.

Balfour, E. (1824, April 24). Royal College of Surgeons in London. *The Lancet*, pp. 116-7.

Bard, S. (1819). *Compendium of the Theory and Practice of Midwifery, containing instructions for the management of women, during pregnancy, in labour, and in child-bed. Illustrated by many cases and particularly adapted to the use of students.* (5th ed.). New York: Collins and Co.

Barlow, J. (1822). *Essays on Surgery and Midwifery; with practical observations, and select cases with plates.* London: Baldwin, Craddon & Joy.

Barnes, F. (1883). *A Manual of Midwifery for Midwives* (Second Edition ed.). London: Smith, Elder & Co.

Barnes, R. (1862). The Obstetric Bag: A description of the Instruments used in Operative Midwifery. *The Lancet*(July 12), pp. 30 - 32.

Barnes, R. (1868). An address on obstetric medicine and its position in medical education. *The Lancet*, 289-99.

Barnes, R. (1870). Chapter 3 - The Forceps — The Lever — Demonstration that the Lever is a Lever, not a Tractor ; also that the Forceps is a Lever. In R. Barnes, *Obstetric Operations, including the treatment of haemorrhage* (pp. 38-45). London: John Churchill and Sons.

Barnes, R. (1876). *Lectures on Obstetric Operations* (3rd ed.). London: J & A Churchill.

Barnes, R. (1879). Opening Address ON THE USE OF FORCEPS AND ITS ALTERNATIVES IN LINGERING LABOUR. *The Lancet, 113*, 689-693.

Barnes, R., & Barnes, F. (1885). *A System of Obstetric Medicine and Surgery Theoretical and Clinical* (Vol. II). London: Smith, Elder & Co.

Basalla, G. (1998). *The Evolution of Technology.* Cambridge: Cambridge University Press.

Beard, M. (2017). *Women and Power: A Manifesto.* London: Profile Books.

Belfour, E. (1841, October 2). The Provincial Schools of Medicine. Session 1841-2. *Provincial Medical & Surgical Journal*, pp. 1-5.

Beverley, M. (1890, July 19). Extracts from An address on Norwich Medical Worthies. *The British Medical Journal*, pp. 129- 134.

Biggs, J. (2003). *Teaching and Learning.* London: Jones.

Bijker, W. E., & Pinch, T. J. (1987). The social construction of facts and artifacts: or how the sociology of science and the sociology of technology might benefit each other. In B. W. al, *The Social Constrction of Technological Systems.* MIT Press.

Bijker, W. E., Hughes, T. P., & Pinch, T. (Eds.). (2012). *The Social Construction of Technological Systems: New directions in the Sociology and History of Technology* (Anniversary ed.). London: The MIT Press.

Bird, J., & Ancell, H. (1845, June 28). National Association of General Practitoners in Medicine, Surgery, and Midwifery. *The Lancet*, p. 744.

Birth, Death & Marriage Notices. (1877, December 11). *The Bury and Norwich Post, and Suffolk Herald*, p. 7.

Births, Deaths & Marriage notices. (1862, July 08). *The Bury and Norwich Post, and Suffolk Herald*, p. 8.

Births, Deaths, Marriages & Obituaries. (1837, February 1837). *The Bury & Norwich Post*.

Births, Deaths, Marriages & Obituaries. (1837, January 27). *Liverpool Mercury*.

Births, Deaths, Marriages & Obituaries. (1844, January 10). *The Bury and Norwich Post, and East Anglian*.

Bland, R. (1790). Some account of the invention and use of the Lever of Roonhuysen. In *Medical Communications.* (pp. 397-462). London: Joseph Johnson.

Bland, R. (1794). *Observations on Human and on Comparative Parturition.* London: J. Johnson.

Blomfield, J. (1933). *St George's 1733 - 1933.* London: The Medici Society for St George's Hospital.

Blundell, J. (1828). Lectures on the Theory and Practice of Midwifery delivered at Guy's Hospital by Dr Blundell. Lecture XXXIV. *The Lancet, II*(258), 577-583.

Blundell, J. (1839). *Lectures on the Principles and Practice of Midwifery.* (C. Severn, Ed.) London: J.Masters.

Bonner, T. N. (2000). *Becoming a Physician; Medical Education in Britain, France, Germany and the United States, 1750-1945.* Baltimore: John Hopkins University Press.

Borrett, J. (1841). Use of the vectis in difficult labours. *The London Medical Gazette*, pp. 648-653.

Borst, C. G. (1995). *Catching Babies. The professionalization of Childbirth 1870 - 1920.* Cambridge, Massachusetts: Harvard University Press.

Braithwaite, J. (1869, December 25). Remarks on a mode of applying the short midwifery-forceps. *The British Medical Journal*, pp. 673-4.

Braxton Hicks, J. (1864). *On Combined External and Internal Version.* London: Longman, Green, Longman, Roberts, and Green.

Breen, J. (1835). Observations on the Obstetric Extractor, the Instrument usually called the Midwifery Lever. *The Dublin Journal of Medical and Chemical Science containing a comprehensive view of the latest discoveries in Medicine, Surgery, Chemistry, and the Collateral Sciences, VII*, 350-372.

Briggs, A. (2003). *Victorian Things.* Stroud: Sutton Publishing.

British Medical Association. (n.d.). *An outline history of the British Medical Association*. Retrieved December 09, 2011, from British Medical Association: http://www.bma.org.uk/about_bma/BMAOutlineHistory.jsp

British Medical Journal. (1874, May 30). Reports of Societies; . *British Medical Journal*, p. 712.

British Medical Journal. (1876, December 2). The International Medical Congress in Philadelphia: Section of Obstetrics. *British Medical Journal*, p. 729.

British Medical Journal. (1880, March 06). Obituary Edward Copeman M.D., F.R.C.P., Vice-President of the British Medical Association. *British Medical Journal*, p. 382.

British Medical Journal. (1897, September 4). Obituary. John Braxton Hicks M.D.Lond., F.R.C.P., F.R.S. *British Medical Journal*, p. 618.

British Medical Journal. (1913, April 05). Obituary Alfred Lewis Galabin M.A., M. D., F.R.C.P., Consulting Physician to Guy's Hospital. *British Medical Journal*, pp. 748 - 750.

British Medical Journal. (1925). Obituary: Walter Carless Swayne, M.D., B.S.Lond., M.D., Ch.B.Bristol. *British Medical Journal, 2*, 363.

British Medical Journal. (1948, June 26). Obituary Henry Jellett, M.D., F.R.C.P.I. *British Medical Journal, 26 June*, pp. 1262 - 3. Retrieved from British Medical Journal.

Brock, H. (1974). James Douglas of the Pouch. *Medical History*, 162-72.

Brodsky, P. L. (2008). *The Control of Childbirth: Women Versus Medicine Through the Ages.* London: McFarland & Company.

Brown, A. M. (n.d.). *Foucauldian Perspectives on Midwifery Practice and Education.* Retrieved May 18, 2012, from The Internet Journal of Advanced Nursing Practice: http://www.ispub.com/journal/the-internet-journal-of-advanced-nursing-practice/volume-6-number-1/foucauldian-perspectives-on-midwifery-practices-and-education.html

Brown, G. H. (1955). *Lives of the Fellows of the Royal College of Physicians of London 1826 - 1925.* London: The Royal College of Physicians.

Brundage, A. (2013). *Going to the Sources: A Guide to Historical Research and Writing* (5th ed.). Chichester: John Wiley & Sons.

Buchanan, R. R. (1888). *An Epitome of the Practice of Medicine and Surgery & Midwifery, or the Key notes of Practice* (2nd Edition ed.). New York: R. R. Russell.

Burnett, C., & Anderson, r. b. (1992). *The anatomy and Physiology of Obstetrics: A short textbook for Students and Midwives* (2nd Edition ed.). London: Wolfe Publishing Ltd.

Burns, J. (1810). *The principles of midwifery: including the diseases of women and children.* (N. Chapman, Ed.) Philadelphia: Hopkins and Earle.

Burns, J. (1811). *The Principles of Midwifery, including the diseases of women and children* (2nd Edition, much enl. ed.). London: Longman, Hurst, Rees, Orme & Brown.

Burns, J. (1837). *The Principles of Midwifery; including the diseases of women and children* (9th Edition, greatly enlarged ed.). London: Longman, Orme, Brown, Green & Longmans.

Burns, J. (1843). *The Principles of Midwifery: including the diseases of women and children* (10th ed.). London: Longman, Brown, Green & Longmans.

Butterton, J. R. (1986). The education, naval service and early career of William Smellie. *Bulletin of the History of Medicine*, 1-18.

Cahill, H. (2001). Male appropriation and medicalization of childbirth: an historical analysis. *Journal of Advanced Nursing*, 334 - 342.

Cameron, H. C. (1954). *Mr Guy's Hospital 1726-1948.* London: Longmans, Green and Co.

Camper, M. (1774). Remarques sur les Accouchemens laborieux par l'enclavement de la tete, & sur l'usage du levier de Roonhuysen dans ce cas. *Memoires Academie Royale de Chirurgie*, 729-746.

Cansardine (Carwardine), H. H. (1818). Brief notice presented to the Medico-Chirurgical Society with the Original Obstetric Instruments of the Chamberlins. *Transactions of the Medico-Chirurgical Society*.

Cantillon, P. (2003). Teaching Large Groups. *British Medical Journal*, 437.

Carlisle, A. (1827, 05 01). To His Majesties Judges, Coroners, and Justices of the Peace. *The Times*.

Carlisle, A. (1827, February 26). To the Right Honourable Robert Peel &c &c. *The Times*.

Carroll, J., Howard, S., Vetere, F., Peck, J., & Murphy, J. (2001). Identity, Power And Fragmentation in Cyberspace: Technology Appropriation by Young People. *ACIS Proceedings.* AIS Electronic Library (AISeL). Retrieved from ACIS Proceedings.

Cassidy, T. (2007). *Birth: A History.* London: Chatto & Windus.

Central Midwives Board. (1907). *Rules framed by the Central midwives Board.* London: Central Midwives Board.

Champion, A. (2012, June 06). The vectis. *Email correspondance*. Retrieved June 06, 2012

Chazaro, L., & Kersey, (. b. (2005). Mexican women's pelves and obstetrical procedures: interventions with forceps in late 19th-century medicine. *Feminist Review, 79*, 100 - 115.

Churchill, F. (1835). Researches on Instrumental Delivery. *The Dublin Journal of Medical and Chemical Science; exhibiting a comprehensive view of the latest discoveries in medicine, surery, chemistry, andthe collateral sciences, II*, 7-23.

Churchill, F. (1840). Researches on Operative Midwifery. *Dublin Journal of Medical Science, 16*, 432 - 464.

Churchill, F. (1853). *On the theory and practice of midwifery.* (D. F. Condie, Ed.) Philadelphia: Blanchard & Lea.

Churchill, F. (1860). *On the Theory and Practice of Midwifery* (A new American from the 4th corrected and enlarged English Edition ed.). Philadephia: Blanchard & Lea. Retrieved July 27, 2010, from Google Books.

Churchill, F. (1866). *On the Theory and Practice of Midwifery* (5th Edition, Corrected and Enlarged ed.). London: Henry Renshaw.

Clark, G. (1964). *A History of the Royal College of Physicians of London. Volume 1.* London: Clarendon Press.

Clark, G. (1966). *A History of the Royal College of Physicians. Volume 2.* Oxford: Clarendon Press.

Clarke, J. (1793). *Practical Essays on the management of Pregnancy and Labour; and on the inflammatory and febrile diseases of Lying-in women.* London: J. Johnson.

Classified Advertisements. (1769, December 2). *Gazetteer and New Daily Advertiser*.

Classified Advertisements. (1770, May 10-12). *St. James's Chronicle or the British Evening Post*.

Classified Advertisements. (1770, May 12). *Gazetteer and New Daily Advertiser*.

Classified Advertisements. (1773, September 16). *Daily Advertiser*.

Classified Advertisements. (1781, July 19). *Morning Herald and Daily Advertiser*.

Classified Advertisements. (1783, July 10). *Morning Chronicle and London Advertiser*.

Classified Advertisements. (1784, March 30). *London Chronicle*.

Classified Advertisements. (1785, August 15). *Morning Chronicle and London Advertiser*.

Classified Advertisements. (1785, August 09). *Morning Post and Daily Advertiser*.

Classified Advertisements. (1785, June 25). *Morning Chronicle and London Advertiser*.

Classified Advertisements. (1785, June 22). *Morning Post and Daily Advertiser*.

Classified Advertisements. (1785, April 23). *Morning Chronicle and London Advertiser*.

Classified Advertisements. (1785, April 23). *Morning Chronicle and London Advertiser*.

Classified Advertisements. (1786, January 23). *St James's Chronicle or the British Evening Post*.

Classified Advertisements. (1786, March 13). *Morning Post and Daily Advertiser*.

Classified Advertisements. (1787, May 12). *World and Fashionable Advertiser*.

Classified Advertisements. (1792, January 05 - 07). *General Evening Post*.

Classified Advertisements. (1804, January 21). *The Morning Post*.

Classified Advertisements. (1835, March 11). *The Bury & Norwich Post* , p. 1.

Coates, T. (1998). Impressions of the midwife in literature. *RCM Midwives Journal, 1*(1), 21-22.

College of Physicians. (June 25th 1781 - April 1st 1789). *Register Book of the Royal College of Physicians London.*

Collins, A., Holum, A., & Seely Brown, J. (n.d.). *Cognitive Apprenticeship: Making thinking visible.* Retrieved February 10, 2014, from The 21st Century Learning Initiative: http://www.21learn.org/archive/cognitive-apprenticeship-making-thinking-visible/

Collins, R. (1836). *A Practical Treatise on Midwifery, containing the result of sixteen thousand, six hundred and fifty-four births, occuring in the Dublin Lying-in hospital, during a period of seven years, commencing in November 1826.* London: Longman, Rees, Orme, Brown, Green & Longman.

Conquest, J. T. (1821). *Outlines of Midwifery.* London: John Anderson.

Conquest, J. T. (1837). *Outlines of Midwifery, developing its principles and practice; intended as a textbook for students and a book of reference for junior practitioners* (6th ed.). London: Longman, Brown, Orme & Green.

Cook, H. J. (1990). The Rose Case Reconsidered: Physicians, Apothecaries, and the Law in Augustan England. *The Journal of the History of Medicine and Allied Sciences*, 527-555.

Cooke, A. M. (1972). *A History of The Royal College of Physicians of London* (Vol. III). Oxford: Clarendon Press for The Royal College of Physicians.

Cope, Z. (1959). *The Royal College of Surgeons of England: A History.* London: Anthony Blond.

Copeman, E. (1841, October 09). Report on Midwifery in Private Practice. *Provincial Medical and Surgical Journal, Volume 3*, pp. 29 - 34.

Copeman, E. (Ed.). (1851). *Cases in Midwifery of the late J. G. Crosse Esq.arranged (With an introduction and remarks), by.* London: John Churchill.

Copeman, E. (1856). *Records of Obstetric Consultation Practice; and a translation of Busch & Moser on Uterine Haemorrhage.* London: John Churchill.

Copeman, E. (1861, November 9). Rare cases in midwifery. *The British Medical Journal*, pp. 495-6.

Copeman, E. (1862, August 30). Correspondence. Remarks on Chloroform. *Britsh Medical Journal*, pp. 237 - 238.

Copeman, E. (1862, June 21). Rare Cases in Midwifery. *British Medical Journal*, pp. 649 - 650.

Copeman, E. (1862, September 20). Rare Cases in Midwifery. *British Medical Journal*, pp. 297 - 299.

Copeman, E. (1862, November 15). Rare Cases in Midwifery. *British Medical Journal*, pp. 506 - 507.

Copeman, E. (1862, December 27). Rare Cases in Midwifery. *British Medical Journal*, pp. 663 - 664.

Copeman, E. (1862, November 29). Rare Cases in Midwifery. *British Medical Journal*, pp. 556 - 558.

Copeman, E. (1862, April 19). Rare Cases in Midwifery. *British Medical Journal*, pp. 404 - 407.

Copeman, E. (1862, February 22). Rare Cases in Midwifery. *British Medical Journal*, pp. 198-9.

Copeman, E. (1862, May 10). Rare Cases in Midwifery. *British Medical Journal*, pp. 489 - 491.

Copeman, E. (1863, January 10). Rare cases in midwifery. *British Medical Journal*, pp. 35-36.

Copeman, E. (1863, July 18). Transactions of Branches. East Anglian Branch. President's address. *British Medical Journal*, pp. 56-57.

Copeman, E. (1874, August 15). Presidents Address, delivered at the Forty-Second Annual Meeting of the British Medical Association, Held in Norwich, August 11th, 12th, 13th, and 14th, 1874., by Edward Copeman, M.D., Senior Physician to the Norfolk and Norwich Hospital. *The British Medical Journal*, pp. 195 - 199.

Copeman, E. (1875). Statistical and practical remarks on consultation midwifery in private practice. *Transactions of the Obstetrical Society of London, XVI*, 103-110.

Copeman, W. S. (1967). *The Worshipful Society of Apothecaries of London: A History 1617-1967.* London: Worshipful Society of Apothecaries.

Crawford, M. D. (1932, June 11). The obstetrical forceps and its use. *The Lancet*, pp. 1239 - 1243.

Croft, R. (1807, October 29). *Letter from Richard Croft to Sir Lucas Pepys re: Memorial presented to College by Tho. Denman.* Unpublished Letter RCP/Env34/4, Royal College of Physicians.

Crosse, J. G. (1819 - 1825). *Case notes 1819-1825.* Wellcome Library MS1916.

Crosse, J. G. (1833-1841). *Case notes 1833-1841.* Wellcome Library MS1917.

Crosse, V. (1968). *A Surgeon in the early nineteenth century: The life and times of John Green Crosse M.D., F.R.C.S., F.R.S. 1790 - 1850.* Edinburgh: E & S Livingstone Ltd.

Cullingworth, C. J. (1907). The Obstetrical Society of London and its Examinations for Midwives. *The Lancet*, 528 - 535.

Dale, P., & Fisher, K. (2009). Implementing the 1902 Midwives Act: assessing problems, developing services and creating a new role for a variety of female practitoners. *Women's History Review*, 427 - 452.

Das, K. (1993). *Obstetric Forceps: its history and evolution (1929).* Leeds: Medical Museum Publishing.

Davis, D. D. (1825). *Elements of Operative Midwifery: A description of certain new and improved powers for assisting difficult and dangerous labours: illustrated by plates; with cautionary strictures on the improper use of instruments.* London: Hurst, Robinson, and Co.

Davis, D. D. (1836). *The principles and practice of obstetric medicine: in a series of systematic disseertations on midwifery, and on the diseases of women.* London: Taylor and Walton.

Davis, J. H. (1865). *Parturition and its difficulties: with clinical illustrations and statistics of 13,783 deliveries* (2nd Edition, Revised and Enlarged ed.). London: Robert Hardwicke.

De Brouwere, V. (2007). The Comparative Study of Maternal Mortality over Time: The role of Professisonalisation of Childbirth. *Social History of Medicine, 20*, 541 - 652.

Dease, W. (1783). *Observations in Midwifery particularly on the different methods of assisting women in tedious and difficult labours: to which are added observations on the principal disorders incident to women and children.* Dublin: J. Williams, L. White, W. Wilson, P. Byrne & J. Cash.

Denman (Chairman), T. (1807, October 27). Meeting of Gentlemen practicing Midwifery. RCP Env34/2.

Denman, T. (1768). *Essays on the puerperal fever and on puerperal convulsions.* London: J. Walter.

Denman, T. (1769, October 09). Classified Advertisements. *Gazetter & New Daily Advertiser*.

Denman, T. (1773). *Essay on the puerperal fever* (2nd ed.). London: J. Walter.

Denman, T. (1773). *Remarks on Dr. Leake's paper on the use of his forceps.* London.

Denman, T. (1780). *Directions for the application of the forceps.* London.

Denman, T. (1783). *Aphorisms on the application and use of the forceps, On preternatural labours and On labours attended with Haemorrhage.* London.

Denman, T. (1784). Observations to prove, that in cases of arm presentation, delivery may be effected by spontaneous evolution of the child. *London Medical Journal, Quarter 1*.

Denman, T. (1787). *An Essay on Difficult Labours. Part First.* London: J. Johnson.

Denman, T. (1788). *An Introduction to the Practice of Midwifery* (Vol. Volume the first). London: T. Bensley for J. Johnson.

Denman, T. (1790). *An Essay on Difficult Labours Part Second.* London: J. Johnson.

Denman, T. (1791). *An Essay on Difficult Labours Part Third.* London: J.Johnson.

Denman, T. (1793). *Aphorisms on the application and use of the forceps and vectis; on preternatural labours, on labours attended with haemorrhage, and with convulsions* (Fourth ed.). J. Johnson, St Pauls Churchyard.

Denman, T. (1795). *An Introduction to the practice of Midwifery in two volumes.* London: J. Johnson.

Denman, T. (1805). *Introduction to Midwifery* (4th Edition ed., Vol. 2). London.

Denman, T. (1807). *An Introduction to the Practice of Midwifery.* Brattleborough: Fessenden, William.

Denman, T. (1807, October 29). *Letter from Dr Thomas Denman to Sir Lucas Pepys accompanying memorial to Royal College of Physicians.* Unpublished Letter RCP/Env34/3, Royal College of Physicians.

Denman, T. (1832). *An introduction to the practice of midwifery with a biographical sketch of the author, with additional modern information on the various subjects treated of in the work and a dissertation on the transfusion of blood by Charles Waller.* London: E.Cox.

Denman, T., & Practitioner, A. A. (1816). *The London Practice of Midwifery: to which are added, instructions for the treatment of lying-in women, and the principle diseases of children, chiefly designed for the use of students and early practitioners* (4th Edition ed.). London: Longman, Hurst, Rees, Orme & Co.

Denman, T., Cogan, T., & Hey F.R.S, W. (1784). Farther observations on the Spontaneous Evolution of the foetus in cases of arm presentation. *London Medical Journal, Quarter 3*.

Donnison, J. (1988). *Midwives and Medical Men* (2nd Edition ed.). London: Historical Publications Ltd.

Downe, S. (2008). *Normal Childbirth; evidence and debate* (2nd ed.). Edinburgh: Churchill Livingstone.

Drage, L. (1891). Midwives Registration Bill. *The Lancet*, 514.

Drage, L. (1893). The report of the select committee on midwives' registration. *The Lancet*, 774.

Dunn, P. M. (1995). Dr Francis Ramsbotham (1801 - 1868) and Obstetric Practice in London. *Archives of Disease in London, 73*, F118 - F120.

Dunn, P. M. (1999). John Braxton Hicks (1823-1897) and painless uterine contractions. *Archives of Diseases in Childhood Fetal Neonatal Edition*, F157-8.

Dunn, P. M. (1999). The Chamberlen family (1560 - 1728) and obstetric forceps. *Archives of Disease in Childhood - Fetal and Neonatal Edition, 81*, F232 - 235.

Dunn, P. M. (2006). Adolphe Pinard (1844 - 1934) of Paris and intrauterine paediatric care. *Archives of Disease in Childhood Fetal and Neonatal Edition, 91*, F321-2.

Earle, C. (1846). Report of obstetric cases occuring in private practice. *Provincial Medical and Surgical Journal, 23*, 261-3.

Ebling Library for the Health Sciences. (n.d.). *With Wisconsin Women: Midwives in the Badger State - Instruments*. Retrieved December 07, 2010, from Ebling Library for the Health Sciences: http://ebling.library.wisc.edu/historical/wi-women/index.cfm

Edgerton, D. (2008). *The shock of the old: technology and global history since 1900.* London: Profile Books Ltd.

Evans, E. J. (1997). *The Birth of Modern Britain 1780 - 1914.* Harlow: Longmans.

Evans, E. J. (2001). *The Forging of the Modern State: Early industrial Britain 1783 1870* (3rd ed.). Harlow: Longman.

Evans, J. (2013, June 19). Vectis: examples of and teaching thereon. *Email correspondence*.

Evenden, D. (2005). Mothers and their midwives in seventeenth-century London. In H. Marland (Ed.), *The art of Midwifery. Early Modern Midwives in Europe* (pp. 9 - 26). London: Routledge.

Faulkner, W. (2001). The technology question in feminism: A view from feminist technology studies. *Women's Studies International Forum*, 79-95.

Field, C. (1839, 23 March). Use of the vectis in cases of protracted labour. *The Lancet, 32*(812), pp. 11-13.

Filippini, N. M. (2005). The Church, the State and childbirth: the midwife in Italy during the eighteenth century. In H. Marland (Ed.), *The Art of Midwifery. Early Modern Midwives in Europe* (pp. 153-175). London: Routledge.

Fitzpatrick, McQuillan, & O'Herlihy. (2001). Influence of Persistent Occiput Posterior Position on Delivery Outcome Obstetrics & Gynecology. *98*(6), 1027 - 1031. Retrieved from http://journals.lww.com/greenjournal/Fulltext/2001/12000/Influence_of_Persistent_Occiput_Posterior_Position.7.aspx

Forbes, T. R. (1964). The Regulation of English Midwives in the sixteenth and Seventeenth Centuries. *Medical History*, 235-244.

Forbes, T. R. (1971). The regulation of English Midwives in the 18th and 19th Centuries. *Medical History*, 352 - 362.

Forbes, T. R. (1988). A jury of matrons. *Medical History, 32*, 23-33.

Fothergill, W. E. (1900). *Manual of Midwifery for the use of students & practitioners* (2nd Edition ed.). Edinburgh: William F. Clay.

Foucault, M. (1992). *The Use of Pleasure: The History of Sexuality Volume 2.* London: Penguin Books.

Foucault, M. (1998). *The Will to Knowledge: The History of Sexuality Volume 1.* London: Penguin Books.

Freidson, E. (1988). *Profession of Medicine. A Study of the Sociology of Applied Knowledge.* Chicago: The University of Chicago Press.

Friedman, A., Kohorn, E., & Nuland, S. (1988). Did Princess Charlotte die of pulmonary embolism? *British Journal of Obstetrics and Gynaecology*, 683-8.

Gaitskell, W. (1823). A Case of Laceration of the Perineum, Urinary Bladder, and Rectum; with Observations on the Use and Abuse of the Vectis. . *The London Medical Repository*, 376 - 381.

Gaitskell, W. (1830). Society of General Practitioners. *The Lancet*, 451-2.

Galabin, A. L. (1873). The Causes of the Secondary Waves in the Pulse. *Journal of Anatomy and Physiology*, 1 - 22.

Galabin, A. L. (1875). On the Causation of Puerperal Convulsions. *British Medical Journal, 1*, 667-9.

Galabin, A. L. (1875). On the construction and use of a new form of Cardiograph. *Medical and Chirurgical Transactions*, 353-368.

Galabin, A. L. (1876). On the Causation of the Water-Hammer Pulse, and its Transformation in Different Arteries as illustrated by the Graphic Method. *Medical Chirurgical Transactions, 59*, 361-88.

Galabin, A. L. (1876). The Transformations of the Pulse-Wave in the different Arteries of the Body. *Journal of Anatomy and Physiology*, 296-319.

Galabin, A. L. (1877). The Mechanical and Operative Treatment of Prolapse of the Uterus. *British Medical Journal*, 408-10.

Galabin, A. L. (1879). The Physiological effect of Pilocarpine in conjunction with the administration of Chloroform. *British Medical Journal*, 729-30.

Galabin, A. L. (1880). A case of Ovariotomy performed during the sixth month of pregnancy without interuption to gestation. *British Medical Journal*, 397-8.

Galabin, A. L. (1886). *A Manual of Midwifery.* London: J & A Churchill.

Galabin, A. L. (1887). Hunterian Oration on the etiology of puerperal fever. *British Medical Journal*, 919-25.

Galabin, A. L. (1889). Inaugural address on modern progress in Obstetrics and Gynaecology. *British Medical Journal*, 577-80.

Galabin, A. L. (1891). *A Manual of Midwifery* (2nd Edition ed.). London: J & A Churchill.

Galabin, A. L. (1892). Introductory Address Delivered at the Opening of the Section of Obstetric Medicine: At the Annual Meeting of the British Medical Association Held at Nottingham, July, 1892. *British Medical Journal*, 291-2.

Galabin, A. L. (1893). *A Manual of Midwifery* (3rd Edition ed.). London: J & A Churchill, 11 New Burlington Street.

Galabin, A. L. (1897). *A Manual of Midwifery* (4th Edition ed.). London : J & A Churchill.

Galabin, A. L. (1900). *A Manual of Midwifery* (5th Edition ed.). London: J & A Churchill.

Galabin, A. L. (1904). *A Manual of Midwifery* (6th Edition ed.). London: J & A Churchill.

Galabin, A. L., & Blacker, G. (1910). *The practice of midwifery* (7th, greatly enlarged and extended ed.). New York: Macmillan.

Galabin, A. L., & Blacker, G. (1910). *The Practice of Midwifery, being the Seventh Edition of Dr. Galabin's Manual of Midwifery, greatly enlarged and extended* (7th Edition ed.). London: J & A Churchill.

Galabin, A. L., & Horrocks, P. (1888). Sixth Report of the Guy's Hospital Lying-in Charity, from October 1, 1875, to September 30, 1885. Collated from the records. *Guy's Hospital Reports, XLV*, 1 - 90.

Gentlemen practicing Midwifery. (1807, October). *Memorial to the Royal College of Physicians by Licentitates, Licentiates in Midwifery, Members of the Royal College of Surgeons practicing Midwifery.* Unpublished Memorial RCP/Env34/1, Royal College of Physicians.

Giffard, W. (1734). *Cases in Midwifery.* (E. Hody, Ed.) London: Motte.

Gosden, C., & Marshall, Y. (1999). The Cultural Biography of Objects. *World Archaeology, 31*, 169 - 178.

Gould, T., & Uttley, D. (1997). *A short history of St. Georges Hospital and the origins of its ward names.* London: Atlantic Highland.

Graduate, A. I. (1898, September 10). The use and abuse of midwifery forceps. *The British Medical Journal*, p. 749.

Greenhow, E. (1780). *Dr Denman Lecture Notes.* Unpublished Manuscript Lecture Notes, Clendening History of Medicine Library, Kansas, USA.

Grimston, H. (1683). *The second part of the reports of Sir George Croke.* London: W. Rawlins.

Guy's Hospital. (1869-1870). *Pupils returns*. Unpublished.

Guy's Hospital Medical and Surgical School. (1869). Prospectus.

Haighton, J. (1799). *A Syllabus of the lectures on Midwifery, delivered at Guy's Hospital and at Dr Lowders and Dr Haightons Theatre* (2nd Edition ed.). London: T.Bensley.

Haighton, J. (1811). *A Syllabus of the lectures on Midwifery, delivered at Guy's Hospital and at Dr Lowders and Dr Haightons Theatre.* London: Cox.

Hall Davis, J. (1843). Cases in midwifery. *The Lancet, 41*, 299.

Hall Davis, J. (1846). Contributions to the practice of midwifery. *The Lancet, 47*, 578-580.

Hall Davis, J. (1848). Contributions from obstetric practice. *The Lancet*, 423-4.

Hamilton, A. (1791). *Outlines of the Theory and Practice of Midwifery* (3rd Edition ed.). London: T. Kay.

Hamilton, A. (1791). *Outlines on the Theory and Practice of Midwifery* (3rd ed.). London: T.Kay.

Hand, A. O. (1860, March 10). How to protect the perineum. *British Medical Journal*, p. 195.

Hankins, T. L., & Silverman, R. J. (1995). *Instruments and the Imagination.* Princeton, New Jersey: Princeton University Press.

Hannam, J. (1997). Rosalind Paget: The midwife, the women's movement and reform before 1914. In H. Marland, & A. M. Rafferty (Eds.), *Midwives, Society & Childbirth. Debates and controversies in the Modern Period* (pp. 81 - 101). London: Routledge.

Harley, D. (1990). Historians as Demonologists: The Myth of the Midwife-Witch. *The Society for the Social History of Medicine*, 1 - 26.

Harte, N. (1986). *The University of London 1836-1986.* Continuum International Publishing Group.

Herbiniaux, M. G. (1791). Histoire raisonée du Levier de Roonhuysen, et de ses Usages. In M. G. Herbiniaux, *Traite sur divers accouchemens laborieux et sur les polypes de la matrice.* Bruxelles: Lemaire.

Herman, G. E. (1898). *Difficult Labour. A guide to its management for students and practitioners.* London: Cassell and Company Limited.

Herman, G. E. (1900, December 29). Midwifery and Gynaecology in 1900. *The British Medical Journal*, pp. 1854 - 56.

Herman, G. E. (1902). *Difficult Labour. A guide to its management for students and practitioners* (New and Revised Edition ed.). London: Cassell and Company Limited.

Herman, G. E. (1912). *Difficult labour. A guide to its management for students and practitioners* (New & Enlarged 5th Edition ed.). London: Cassell and Company Limited.

Herrle-Fanning, J. (2004). *Of Forceps and Folios: Eighteenth Century British Midwifery Publications and the construction of professional identity.* Unpublished PhD Thesis, City University of New York, Graduate Faculty in History.

Hess, A. G. (2005). Midwifery practice among the Quakers in southern rural England in the late seventeenth century. In H. Marland (Ed.), *The art of midwifery. Early modern midwives in Europe* (pp. 49-76). London: Routledge.

Hewitt, G. (1868). Clinical Lecture on the application of the forceps. *The Lancet, 91*, 401-3.

Hey, W. (n.d.). *Case histories in midwifery in the Leeds area 1759 - 1807.*

Hibbard, B. (2000). *The Obstetrician's Armamentarium. Historical Obstetric Instruments and their Inventors.* San Anselmo: Norman Publishing. Retrieved from Google Books.

Hibbard, B. (n.d.). *Milestones in the evolution of the obstetric forceps.* Retrieved July 12, 2011, from LMI Liverpool Medical Institution: http://www.lmi.org.uk/Data/10/Docs/18/18Hibbard.pdf

Hicks, J., & Allen, G. (1999). *A Century of Change: Trends in UK Statistics since 1900.* Retrieved April 10, 2012, from Documents: http://www.parliament.uk/documents/commons/lib/research/rp99/rp99-111.pdf

Hildreth, P., & Kimble, C. (2004). *Knowledge Networks: Innovation through Communities of Practice.* London: Idea Group Publishing.

Hingston Fox, R. (1894, August 18). The Late Lord Denman. *Lancet*, pp. 538-9.

Hoar, W. (1861, July 13). Use of Instruments in Midwifery without assistance. *British Medical Journal*, pp. 47 - 8.

Hogben, J. (1813). *Plates Illustrative of a Treatise on Midwifery.* London.

Holland, E. (1951). The Princess Charlotte of Wales: A Triple Obstetric Tragedy. *The Journal of Obstetrics and Gynaecology of the British Empire*, 905-919.

Holloway, S. W. (1966). The Apothecaries' Act, 1815: A reinterpretation. Part 1: The origins of the Act. *Journal of Medical History, 10*, 107-129.

Holloway, S. W. (1966). The Apothecaries Act, 1815: A reinterpretation. Part 2: The consequences of the Act. *Medical History, 10*, 221-236.

Holman, C., Desmond, L. E., & Aveling, J. H. (1874). The Registration of Midwives. *The British Medical Journal*, 186 - 7.

Holmes, J. P. (1831). *Popular observations on diseases incident to females: with an appendix on the use of the Author's obstetrical instruments.* London: The Author.

Houghton, C. (2014). *Looking for Pleasure or Knowledge? Dissecting the Narcissistic gaze of William Hunter (1718-1783).* Unpublished MA dissertation, California State University Dominguez Hills, Humanities.

Howard, S. (2003). Imagining the Pain and Peril of Seventeenth-century Childbirth: Travail and Deliverance in the Making of an Early Modern World. *The Society for the Social History of Medicine, 16*, 367 - 382.

Innes, J. (2016, September 12). *Legislating for the Three Kingdoms in the early ninteenth century: the case of medical profession regulation.* Retrieved from Fournationshistory: https://fournationshistory.wordpress.com/2015/11/16/legislating-for-three-kingdoms-in-the-early-nineteenth-century-the-case-of-medical-professional-regulation/

Ireland, W. M. (1818). *An Inquiry into the most proper means to be adopted in the management of lying-in womenwith critical remarks on the medical report, and the death of Princess Charlotte of Wales.* New York: James Eastburn & Co.

James, J. B. (1879, March 29). Letters, notes, and Answers to Correspondants. *British Medical Journal*, p. 497.

Jardine, R. (1898, September 10). The Teaching of Midwifery. *The British Medical Journal* , pp. 748 - 9.

Jardine, R. (1899). *Practical text-book of Midwifery for nurses and students.* Edinburgh: William F Clay.

Jellett, H. (1899). *A short practice of Midwifery, embodying the treatment adopted in the Rotunda Hospital, Dublin* (2nd Edition ed.). London: J & A Churchill.

Johanson, R., Newburn, M., & Macfarlane, A. (2002). Has the medicalisation of childbirth gone too far? *BMJ, 324*, 892 - 895.

John Weiss & Son. (1863). *A Catalogue of Surgical Instruments, Apparatus, Appliances etc.* London: John Weiss & Son.

Johnstone, R. W. (1952). *William Smellie The Master of British Midwifery.* Edinburgh: E & S Livingstone.

Jones, C. (2013). *The Medical Trade Catalogue in Britain, 1870 - 1914.* London: Pickering Chatto.

Jones, C. L. (2012). Medical Trade Catalogs: The Uses of Professional Advertising in British Medical Practice. *Bulletin of the History of Medicine, 86*, 361-393.

Jones, C. L. (2013). Email correspondence. Retrieved March 11, 2013

Jordanova, L. (1995). The social construction of knowledge. *The Society for the Social History of Medicine*, 361 - 381.

Joy, J. (2009). Reinvigorating object biography: reproducing the drama of object lives. *World Archaeology, 41*, 540 - 556.

King, H. (2005). The politick midwife: models of midwifery in the work of Elizabeth Cellier. In H. Marland (Ed.), *The art of Midwifery. Early Modern Midwives in Europe* (pp. 115 - 130). London: Routledge.

King, H. (2007). *Midwifery, Obstetrics and the Rise of Gynaecology: The uses of a sixteenth century Compendium.* Abingdon: Routledge.

Kings College London. (2016, October 08). *Foundation of the College*. Retrieved from Kings College London: http://www.kcl.ac.uk/aboutkings/history/foundation.aspx

Kingston, F. (1778). *Notes abstracted from several courses of Lectures on Midwifery given by Dr Denman and Dr Osborn.* Unpublished Manuscript Lecture Notes MS2099, Wellcome Library.

Kirkup, J. R. (1981). The history and evolution of surgical instruments. Introduction. *Annals of the Royal College of Surgeons of England, 63*, 279-285.

Kohorn, E. (2018). The death of the Princess Charlotte of Wales in 1817 was more likely due to pulmonary embolism than to postpartum haemorrhage. *British Journal of Obstetrics and Gynaecology*, 1356.

Kornelsen, J. (1998). *Focusing on Birth: A philosophy of Technology and Childbirth .* Unpublished PhD Thesis, Simon Fraser University, School of Communication.

Krohn, H. (1769, October 6). Letters. *Public Advertiser*.

Lane, J. (1984). The medical practitioners of provincial England in 1783. *Medical History, 28*, 353-371.

Laufe, L. E. (1968). *Obstetric Forceps.* New York: Hoeber Medical Division, Harper & Row Publishers.

Lave, J., & Wenger, E. (1991). *Situated Learning. Legitimate peripheral participation.* Cambridge: University of Cambridge Press.

Lawrence, S. (1988). Entrepreneurs and private enterprise: the development of medical lecturing in London 1775 - 1820. *Bulletin of the History of Medicine, 62*, 171 - 192.

Lawrence, S. C. (1996). *Charitable knowledge: Hospital pupils and practitioners in eighteenth-century London.* Cambridge: Cambridge University Press.

Leakes's, A. L. (1774). *A vindication of the forceps described and recommended by Dr. Leake; in which, The injudicious and illiberal remarks on that subject, signed Thomas Denman, are examined and refuted.* London: J. Hinton.

Leap, N., & Hunter, B. (1993). *The midwife's Tale.* London: Scarlett Press.

Lee, J. (1844). Report on the practice of midwifery. *Provincial Medical and Surgical Journal, 8*, 414-5.

Lee, R. (1844). *Lectures on the Theory and Practice of Midwifery.* London: Longman, Brown, Green & Longmans.

Lee, R. (1854). Observations on the discovery of the original obstetric instruments of the Chamberlens. *Medico-Chirurgical Transactions, 45*, 1 - 24.

Lee, R. (1862 (Read 12th November 1861)). Observations on the discovery of the original obstetric instruments of the Chamberlens. *Medico-Chirurgical Transactions, 45*, 1 - 24.

Legge, W. (1897, September 11). Correspondance. The use of the forceps in Midwifery. *British Medical Journals*, p. 682.

Leishman, W. (1873). *A System of Midwifery including the diseases of pregnancy and the pueperal state.* Glasgow: James MacLehose.

Leishman, W. (1877). *A System of Midwifery, including the diseases of pregnancy and the puerperal state* (2nd Edition ed.). Glasgow: James Maclehose.

Leishman, W. (1888). *A System of Midwifery including the diseases of pregnancy and the puerperal state* (Vol. 1). Glasgow: James Maclehose & Sons.

Leishman, W. (1888). *A System of Midwifery including the diseases of Pregnancy and the Puerperal state* (Vol. 2). Glasgow: James Maclehose & Sons.

Lindemann, M. (2005). Professionals? Sisters? Rivals? Midwives in Braunschweig, 1750 - 1800. In H. Marland (Ed.), *The art of Midwifery. Early Modern Midwives in Europe* (pp. 177 - 192). London: Routledge.

Lloyd, J. (2005). *The casebooks of William Hey F.R.S. (1736-1819) : an analysis of a provincial surgical and midwifery practice* . Leeds: University of Leeds PhD Thesis.

London Medical and Surgical Journal. (1833, June 15). Medical Legislation. *London Medical and Surgical Journal*, pp. 628-9.

London Quarterly Review. (1840). Report from the Select Committee on Medical Education, with the Minutes of Evidence and Appendix . *London Quarterly Review Vol LXVII*, 53-79.

Loudon, I. (1986). *Medical Care and the General Practitioner 1750-1850.* Oxford: Oxford University Press.

Loudon, I. (1986). Obstetric care, social class, and maternal mortality. *British Medical Journal, 293*, 606 - 608.

Loudon, I. (1988). Maternal Mortality: 1880 - 1950. Some Regional and International Comparisons. *The Society for the Social History of Medicine*, 183 - 228.

Loudon, I. (1990). Obstetrics and the General Practitioner. *British Medical Journal, 301*, 703 - 7.

Loudon, I. (1992). *Death in Childbrith: An international study of maternal care and maternal mortality 1800 - 1950.* Oxford: Clarendon Press.

Loudon, I. (1992). The transformation of maternal mortality. *BMJ, 305*, 1557 - 60.

Loudon, I. (1996). Essay review: The Making of Man-Midwifery. *Bulletin of the History of Medicine*, 507-515.

Lundkvist, A. (2004). User Networks as Sources of Innovation. In P. Hildreth, & C. Kimble, *Knowledge Networks: Innovation through Communities of Practice* (pp. 96-105). London: Idea Group Publishing.

Lusk, W. T. (1882). *The Science and Art of Midwifery.* London: H K Lewis.

Lyon, J. G. (1881, March 19). Removable axis-traction rods for midwifery forceps. *The British Medical Journal*, pp. 425 - 426.

Macaulay, T. B. (1847). *Report from the Select Committee on Medical Regulation; together with the minutes of evidence, appendix and index.* London: The House of Commons.

Mander, R., & Fleming, V. (Eds.). (2002). *Failure to Progress: The contraction of the midwifery profession.* London: Routledge.

Mantell, G. (1828). On the Secale Cornutum. *The London Medical Gazette; being a weekly journal of medicine and the collateral sciences, II*, 781-782.

Marland, H. (2005). Introduction. In H. Marland (Ed.), *The Art of Midwifery. Early Modern Midwives in Europe* (pp. 1 - 8). London: Routledge.

Marland, H. (Ed.). (2005). *The art of Midwifery. Early Modern Midwives in Europe.* London: Routledge.

Marland, H., & Rafferty, A. M. (Eds.). (1997). *Midwives, Society & Chilbirth. Debates and controversies in the Modern Period.* London: Routledge.

Marlborough College. (n.d.). *First Fifty Years*. Retrieved May 09, 2012, from http://www.marlboroughcollege.org/about-us/college-history/first-fifty-years/

Martineau Esq., P. M. (1831). Memoir of Lithotomy. *The Transaction of the Medical and Chirurgical Society of London, Second part of the Eleventh Volume*, 34-44.

Mazumdar, P. M. (1987). Anatomy, physiology and surgery:physiology teaching in early nineteenth-century London. *Canadian Bulletin of Medical History, 4*, 119-43.

McAfee, N. (2016). *Feminist Political Philosophy.* (E. N. Zalta, Ed.) Retrieved 01 2018, 01, from The Stanford Encyclopedia of Philosophy (Winter 2016 Edition): https://plato.stanford.edu/archives/win2016/entries/feminism-political/

McCall, C. (2010). *Naval Warfare to Natal Care: A brief look at the life and work of Thomas Denman (1733 - 1815) a founder contributor to male midwifery and modern medical practice.* Matlock: SOLCOL.

McCarthy, G. (1867). On the use of the Vectis in assisting Parturition. *The British Medical Journal*(Dec 14), p. 542.

McCarthy, G. D. (1874, October 24). On the use of instruments in obstetrical practice. *British Medical Journal*, pp. 523-4.

McIntosh, T. (1998). Profession, Skill or Domestic Duty? Midwifery in Sheffield, 1881 - 1936? *The Society for the Social History of Medicine, 11*, 403 - 420.

McIntosh, T. (2012). *A Social History of Maternity Care.* Abingdon: Routledge.

McTavish, L. (2001). On Display: Portraits of Seventeenth-century French Men-midwives. *The Society for the Social History of Medicine, 14*, 389 - 415.

Meadows, A. (1862). *Manual of Midwifery.* London: Henry Renshaw.

Meadows, A. (1871). *A Manual of Midwifery* (1st American Edition, from the 2nd London ed.). Philadelphia: Lindsay & Blakiston.

Meadows, A. (1871). *A Manual of Midwifery* (2nd ed.). London: Henry Renshaw.

Meadows, A. (1876). *A Manual of Midwifery* (3rd ed.). London: Henry Renshaw.

Meadows, A., & Venn, A. J. (1882). *A Manual of Midwifery* (4th Edition, Revised & Enlarged ed.). London: Henry Renshaw.

More Madden, T. (1875). On the History and Use of the Short Straight Forceps as a Tractor, and of the Long Double Curved Forceps as a Compressor and Lever. *The Dublin Journal of Medical Science*, 332 - 361.

Moscucci, O. (1993). *The Science of Woman: Gynaecology and gender in England, 1800 - 1929.* Cambridge: Cambridge University Press.

Mulder, J. (1794). *Historia litteraria et critica forcipium et vectium obstetriciorum.* Leyden.

Munk, W. (1878). *The Roll of the Royal College of Physicians of London; comprising biographical sketches of all the eminent physicians, whose names are recorded in the annals from the foundation of the college in 1518 to its removal in 1825, from Warwick Ln to Pall Mall* (2nd ed., Vol. II 1701 to 1800). London: The Royal College of Physicians, Pall Mall East.

Munro-Kerr, J., Johnstone, R., & Phillips, M. H. (1954). *Historical Review of British Obstetrics and Gynaecology 1800 - 1950.* Edinburgh: E & S Livingstone Ltd. .

Murphy, D. J., Leibling, R. E., Patel, R., Verity, L., & Swingler, R. (2003). Cohort study of operative delivery in the second stage of labour and standard of obstetric care. *BJOG: an International Journal of Obstetrics and Gynaecology, 110*, 610 - 615.

Murphy, D. J., Leibling, R. E., Verity, L., Swingler, R., & Patel, R. (2001). Early maternal and neonatal morbidity associated with operative delivery in second stage of labour: a cohort study. *Lancet, 358*, 1203 - 07.

Murphy, E. (1845, 16 August). Lectures on the Mechanism and Management of Natural and difficult labours. Lecture XI Induction of premature labour - Obstetric Instruments. *The Lancet, 46*(1146), pp. 171 - 174.

Murphy, E. (1845, 26 July). Lectures on the mechanism and management of natural and difficult labours. Lecture IX Obstetric Operations - The Forceps. *The Lancet, 46*(1143), pp. 85 - 88.

Murphy, E. W. (1845). *Lectures on difficult and natural parturition* (1st ed.). London: Taylor and Watson.

Murphy, E. W. (1862). *Lectures on the principles and practice of midwifery* (2nd ed.). London: Walton and Maberly.

Murphy, E. W. (1864, May 14). Introductory Lecture on the History of Midwifery. *British Medical Journal*, pp. 523-528.

Murphy-Lawless, J. (1998). *Reading Birth and Death A History of Obstetric Thinking.* Bloomington: Indiana University Press.

Myles, M. (1968). *A Textbook for Midwives* (Sixth Edition ed.). Edinburgh: E & S Livingstone Ltd.

Nall, S., & Nepean Longridge, C. J. (1909). *Aids to Obstetrics* (7th Edition ed.). London: Balliere, Tindall & Cox.

Nemo. (1840, 12 September). The Erlagen Vectis. *The Lancet, 34*(888), p. 865.

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

News. (1769, November 1). *Lloyd's Evening Post*.

News. (1769, November 2). *London Chronicle*.

News. (1769, November 4). *Public Advertiser*.

News. (1781, January 20 -23). *London Chronicle*.

News. (1783, July 17). *Public Advertiser*.

News. (1783, July 14). *Morning Herald and Daily Advertiser*.

News. (1783, July 14). *Public Advertiser*.

News. (1783, July 10 - 12). *English Chronicle or Universal Evening Post*.

News. (1784, December 30 - 31). *Whitehall Evening Post (1770)*.

News. (1785, August 23). *Morning Post and Daily Advertiser*.

News. (1790, May 22 - 25). *English Chronicle or Universal Evening Post*.

News. (1790, February 16). *World (1787)*.

News. (1831, June 08). *The Bury & Norwich Post*.

News. (1851, May 21). *The Bury & Norwich Post*.

News. (1853, December 21). *The Bury & Norwich Post*.

News. (1859, November 22). *The Bury & Norwich Post*.

News. (1860, May 08). *The Bury & Norwich Post*.

NHS Digital. (2017, November 09). *NHS Maternity Statistics 2016-7.* Retrieved from NHS Digital: https://files.digital.nhs.uk/pdf/l/1/hosp-epis-stat-mat-repo-2016-17.pdf

Nichols, M. (2010). *The Man-Midwife's Tale: Re-reading Male-authored Midwifery Guides in Britain and America, 1750 - 1820.* Unpublished PhD Thesis, University of South Carolina, College of Arts and Sciences.

Nisbet, W. (1800). *The Clinical Guide, or a concise view of the leading facts, on the history, nature, and treatment of the various diseases that form the subject of midwifery: or attend the pregnant, parturient, and puerperal states.* London: J. Johnson.

Norris, R. C., & Dickinson, R. C. (Eds.). (1897). *An American Textbook of Obstetrics for practitioners and students.* London: The Rebman Publishing Company.

Nuttall, A. (2006). Passive Trust or Active Application: Changes in the Management of Difficult Childbirth and the Edinburgh Royal Maternity Hospital, 1850 - 1890. *Medical History, 50*, 351 - 372.

Nyulasy, F. A. (1898, December 3). The use and abuse of midwifery forceps. *The British Medical Journal*, p. 1724.

Oakley, A. (1980). *Women Confined: Toward a Sociology of Childbirth.* London: Martin Robertson.

Obituary, with anecdotes, of remarkable persons. (1808). *Gentleman's magazine and Historical Chronicle* .

Obstetrical Society of London. (1866, April 6). Conversazione and Exhibition of Instruments. *The Lancet*, pp. 378-381.

Obstetrical Society of London. (1870). *Transactions of the Obstetrical Society of London. For the Year 1869. with a list of fellows etc.* London: Longmans, Green & Co.

Obstetrical Society of London. (1874). *Transactions of the Obstetrical Society of London. For the year 1873. With a list of Fellows etc.* (Vol. XV). London: Longmans, Green, and Co.

Obstetrical Society of London. (1875). *Transactions of the Obstetrical Society of London* (Vol. XVI). London: Longmans, Greene and Co.

Ogden, J. (1857). New Vectis: Claim of priority. *British Medical Journal*, p. 205.

Oke, W. S. (1831). *Practical examinations on the immediate treatment of the principle emergencies that occur in surgery and midwifery, systematically arranged, intended to serve as an exercise for the student, and a brief work of reference for the general practitioner.* London: Longman, Rees, Orme, Brown & Green.

One of the Unfortunate. (1828). Medical Apprentices. *The Lancet, 10*, 814-5.

Osborn, W. (1792). *Essays on the Practice of Midwifery, in natural and difficult labours.* London: Cadell and Johnson.

Osborn, W. (1795). *Essays on the practice of midwifery, in natural and difficult labours.* London: J. Johnson.

Oudshoorn, N., & Pinch, T. (Eds.). (2005). *How users matter: the co-construction of users and technology.* Cambridge, Massachusetts: The MIT Press.

Payne, L. M. (1960). Title of the Royal College of Physicians of London. *British Medical Journal*, 123-4.

Pelling, M. (1995). The Women of the Family? Speculations around Early Modern British Physicians. *The Society for the Social History of Medicine*, 383 - 401.

Perkin, H. (2002). *The Origins of Modern English Society* (2nd Edition ed.). Abingdon: Routledge.

Peterson, J. (1978). *The medical profession in mid-Victorian London.* London: University of California Press.

Physicians, Royal College of. (1856). *Resolution re Conduct of examinations in medicine, surgery and midwifery (MS4091/2).*

Pinch, T. J., & Bijker, W. E. (1984). The Social Construction of Facts and Artefacts: or How the Sociology of Science and the Sociology of Technology might Benefit Each Other. *Social Studies of Science*, 399-431.

Pinch, T. J., & Bijker, W. E. (2012). The Social Construction of Facts and Artifacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other. In W. Bijker, D. Douglas, T. Hughes, & T. Pinch, *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology* (pp. 11-97). London: MIT Press.

Pinchbeck, I. (1930). *Women Workers and the Industrial Revolution.* London.

Pitt, S. (1997). Midwifery and Medicine. In H. Marland, & A. M. Rafferty (Eds.), *Midwives, Society & Childbirth. Debates and controversies in the Modern Period* (pp. 218 - 231). London: Routledge.

Playfair, W. S. (1886). *A Treatise on the Science and Practice of Midwifery* (6th Edition ed.). London: Smith, Elder & Co.

Porter, D. (1995). The Mission of Social History of Medicine: An Historical View. *The Society for the Social History of Medicine*, 345 - 359.

Porter, R. (1999). *The Greatest Benefit to Mankind. A medical History of Humanity from Antiquity to the Present.* London: Fontana Press.

Postgraduate Medical Journal. (1929, November). Herman's Difficult Labour: 7th Edition. *Postgraduate Medical Journal*, p. 38.

Poynter, F. N. (1961). *The Evolution of Medical Practice in Britain.* London: Pittman Medical Publishing.

Prell, C. (2009). *Rethinking the Social Construction of Technology through 'Following the Actors': A Reappraisal of Technological Frames.* Retrieved from Sociological Research Online (Journal): http://www.socresonline.org.uk/14/2/4.html

Prerogative Court of Canterbury. June 19. (1844). In T. Thornton (Ed.), *Notes of Cases in the Ecclesiastical & Maritime Courts: Easter* (p. 384). London: Thomas Blenkarn.

Price, R. (1817). *A critical inquiry into the nature and treatment of the case of Her Royal Highness the Princess Charlotte of Wales and her infant son, with the probable causes of their deaths and the subsequent appearances.* London: Rees Price.

Priest, A. (1853). Record of Midwifery Practice. *The Lancet*, pp. 184 - 5.

Provincial Medical and Surgical Journal. (1841). Conference on Medical Reform. *Provincial Medical and Surgical Journal*, pp. 77-80.

Provincial Medical and Surgical Journal. (1841, October 2). The Provincial Schools of Medicine. *Provincial Medical and Surgical Journal*, pp. 1-4.

Radcliffe, W. (1989). *Milestones in Midwifery (1967) and The Secret Instrument (The Birth of the Midwifery Forceps) (1947),.* San Francisco: Norman Publishing.

Radford, T. (1838). *Essays on various subjects connected with midwifery.* Manchester: James Leech.

Ramsbotham, F. H. (1830). Obstetric Society. *The Lancet*, pp. 745-8.

Ramsbotham, F. H. (1844). Eastern Disctrict of the Royal Maternity Charity. Tabular view of the cases admitted from Jan. 1, 1831 to Dec. 31, 1843. *The London Medical Gazette; being a weekly journal of medicine and the collateral sciences, II*, 619-623.

Ramsbotham, F. H. (1844). *The Principles and Practice of Obstetric Medicine and Surgery* (2nd Edition, enlarged ed.). London: John Churchill.

Ramsbotham, F. H. (1845). *The Principles and Practice of Obstetric Medicine and Surgery, in reference to the Process of Parturition.* Philadelphia: Lea & Blanchard.

Ramsbotham, F. H. (1865). *The Principles and Practice of Obstetric Medicine and Surgery, in reference to the process of parturition with sixty-four and numerous woodcuts. A new American Edition, revisesd by the author with notes and additions by William V. Keating.* Philadelphia: Henry C. Lea.

Ramsbotham, F. H. (1867). *The Principles and Practice of Obstetric medicine and surgery, in reference to the process of parturition.* London: John Churchill and Sons.

Ramsbotham, F. R. (1834, May 31). Lectures on the theory and practice of Midwifery. *The London Medical Gazette, being a weekly journal of Medicine and the Collateral Sciences*, pp. 305-312.

Rawlings, R. (1793). *A dissertation on the structure of the obstetric forceps.* London: The Author.

RCOG. (2018, May 25). *RCOG Heritage: The Chamberlen Family.* Retrieved from Royal College of Obstetricians and Gyanecologists: https://www.rcog.org.uk/en/guidelines-research-services/library-services/archives-and-heritage/archives/rcog-heritage-the-chamberlen-family/

Reformer, A. R. (1827, January 26). To the Editor of the Lancet. *The Lancet*, pp. 455-6.

Reid, A. (n.d.). *Birth Attendants and Midwifery Practice in Early Twentieth-century Derbyshire.* Retrieved May 18, 2012, from Social History of Medicine Advance Access: http://shm.oxfordjournals.org/

Rentoul, R. R. (1890). The Midwives' Registration Bill. *The Lancet*, 1149 - 50.

Rentoul, R. R. (1891). Midwives' Registration Bill. *THe Lancet*, 514 - 5.

Rentoul, R. R. (1891). The training of the medical student in midwifery. *The Lancet*, 875 - 6.

Rentoul, R. R. (1893). Proposed new Midwifery Practitioners. *The Lancet*, 1215 - 6.

Rentoul, R. R. (1897). Dr RR Rentoul and the Midwives Bill. *The Lancet*, 408 - 9.

Rentoul, R. R. (1897). Is it in the best interests of public health and of public safety that the proposed plan of supplying poorer women only with midwives should be opposed; and, if so, how are midwives to be done without? *The Lancet*, 153 - 159.

Rentoul, R. R. (1900). The Midwives Bill. *The Lancet*, 805 - 6.

Richards, L. (1995). Midwifery – The Second oldest profession. *International Journal of Childbirth Education, 10*(2), 11-13.

Rigby, E. (1837). Dr Rigby's Midwifery Reports. *London Medical Gazette, 20*, 782-784.

Rigby, E. (1841). *A System of Midwifery.* London: Whittaker & Co.

Rigby, E. (1844). *A System of Midwifery.* London: Whittaker & Co.

Roberts, M. J. (2009). The politics of Professionalisation: MPs, Medical Men, and the 1858 Medical Act. *Medical History, 53*, 37 - 56.

Robinson, L. (1884, August 2). A new lever with a tractor blade. *The Lancet, 124*(3179), p. 196.

Romlid, C. (1997). Swedish Midwives and their Instruments in the eigtheenth and nineteenth centuries. In H. Marland, & A. M. Rafferty (Eds.), *Midwives, Society & Childbirth. Debates and controversies in the Modern Period* (pp. 38 - 60). London: Routledge.

Rooks, J. P. (1999). The midwifery model of care. *Journal of Nurse-Midwifery, 44*, 370 - 374.

Royal College of Obstetricians and Gynaecologists. (2011). *Operative Vaginal Delivery: Green-top Guideline No.26.* Retrieved March 10, 2019, from Royal College of Obstetricians and Gynaecologists: https://www.rcog.org.uk/globalassets/documents/guidelines/gtg_26.pdf

Royal College of Obstetricians and Gynaecologists. (2017). *History of the College*. Retrieved from Royal College of Obstetricians and Gynaecologists: https://www.rcog.org.uk/en/about-us/history-of-the-college/

Royal College of Obstetrics and Gynaecology (Great Britain). (1903). Obituary. Joseph Griffiths Swayne. *The Journal of Obstetrics and Gynaecology of the British Empire, 4*, 412-415.

Royal College of Obstetrics and Gynaecology. (2017, July 09). *RCOG museum*. Retrieved from RCOG: https://www.rcog.org.uk/en/guidelines-research-services/library-services/archives-and-heritage/rcog-museum/

Royal College of Physicians. (1807-1811). *Annals Volume XVII (MS4159).*

Royal College of Physicians. (n.d.). *Development of exams - Past - Early days: 1518-1859*. Retrieved June 30, 2016, from Membership of the Royal College of Physicians: https://www.mrcpuk.org/about-us/development-exams/past

Royal College of Surgeons England. (n.d.). *History of the College*. Retrieved June 30, 2016, from Royal College of Surgeons: https://www.rcseng.ac.uk/about/college-history

Russell, S. (1986). The Social Construction of Artefacts: A response to Pinch and Bijker. *Social Studies of Science*, 331-346.

S. Maw & Sons. (1869). *Book of Illustrations to S. Maw & Sons Quarterly Price-Current.* London: S. Maw & Sons.

S. Maw, Son & Sons. (1905). *Catalogue of Surgical Instruments & Appliances, Aseptic Hospital Furniture and Surgical Dressing etc.* London: S. Maw, Son & Sons.

S. Maw, Son & Sons. (1913). *Catalogue of Surgical Instruments & Appliances, Aseptic Hospital Furniture and Surgical Dressing etc.* London: S. Maw, Son & Sons.

S. Maw, Son & Thompson's. (1882). *Book of Illustrations, Quarterly Price-Current.* London: S. Maw, Son & Thompson's.

S. Maw, Sons & Thompson. (1891). *Book of Illustrations, Quarterly price-current. Surgeons Instruments etc.* London: S. Maw, Son & Thompson.

Saltmarshe, M. A. (1893). To the Editors of the Lancet. *The Lancet*, 776.

Savage, W. (2007). *Birth and Power: A Savage Enquiry revisited.* London: Middlesex University Press.

Schlumbohm, J. (2001). 'The pregnant women are here for the sake of the teaching institution': The Lying-In Hospital of Gottingen University, 1751 to c.1830. *The Society for the Social History of Medicine*, 59 - 78.

Scott, G. W. (1923, December 15). Correspondance. The use and abuse of obstetric forceps. *British Medical Journal*, p. 1182.

Sheikh, S., Ganesaratnam, I., & Haider, J. (2013). The birth of the forceps. *Journal of the Royal Society of Medicine Short Reports*, 1-4.

Shields, M. A. (2012). Technology and Social Theory (review). *Technology and Culture*, pp. 918-20.

Shortt, S. E. (1983). Physicians, Science, and Status: Issues in the professionalisation of Anglo-American Medicine in the Nineteenth Century. *Medical History, 27*, 51 - 68.

Simmons, S. F. (1783). *The Medical Register for the year 1783.* London: Joseph Johnson.

Snow, S. (2009). *Blessed Days of Anaesthesia.* Oxford: Oxford University Press.

Snow, S. J. (2009). Women, Sex and Suffering. In *Blessed Days of Anaesthesia* (pp. 75 - 96). Oxford: Oxford University Press.

Snowden & Brother. (1860). *Illustrated Wholesale Catalogue fo Surgical and Dental Instruments, Elastic Trusses, Medical Saddle Bags, Abdominal Supporters, Shoulder Braces and Druggists Supplies.* Philadelphia: Snowden & Brother.

Society of Apothecaries. (1841). Society of Apothecaries April 23, 1835. *Provincial Medical and Surgical Journal, 1*, 5.

Southern. (1998). On Trial: Women Healers. *Midwifery Today, Spring*, 35-39.

Spencer, H. R. (1927). *The History of British Midwifery from 1650 to 1800.* London: John Bale & Sons.

Spencer, H. R., & Boxall (Eds), R. (n.d.). *Transactions of the Obstetrical Society of London. Vol XLIX.* Retrieved May 10, 2012, from Archive.org: http://archive.org/stream/transactions49obst#page/n5/mode/2up

Squire, C. (Ed.). (2009). *The Social Context of Birth* (2nd ed.). Oxford: Radcliffe Publishing.

Stephenson, W. (1886, August 28). On the principle of traction-rods, with a simple suggestion applicable to any forceps. *The British Medical Journal*, pp. 411 - 412.

Stephenson, W. (1888, March 31). A criticism of the midwifery forceps in general use. *The British Medical Journal*, pp. 684 - 5.

Stevens, R. (2002, November). *The Midwives Act 1902: An historical landmark.* Retrieved April 10, 2012, from Royal College of Midwives.

Stevenson, L. G. (1953). A note on the relation of Military Service to licencing in the history of British Surgery. *Bulletin of the History of Medicine*, 420-7.

Stewart, C. (1849). On the employment of the forceps in midwifery. *The Lancet, 54*, 309-311.

Swayne, J. G. (1853, April 8). Brow presentation as a cause of difficult labour. *Association Medical Journal*, pp. 299-300.

Swayne, J. G. (1861). *Obsteric Aphorisms: for the use of students commencing midwifery practice* (2nd ed.). London: John Churchill.

Swayne, J. G. (1867). *Obsteric Aphorisms: for the use of students commencing midwifery practice* (4th ed.). London: John Churchill & Sons.

Swayne, J. G. (1869, May 29). On the use of obstetric instruments. *The British Medical Journal*, pp. 487 - 8.

Swayne, J. G. (1876). *Obsteric Aphorisms: for the use of students commencing midwifery practice* (6th ed.). London: J & A Churchill.

Swayne, J. G. (1878). Remarks on the effects of Forceps delivery on the Infant. *British Medical Journal*, 459-460.

Swayne, J. G. (1880). *Obsteric Aphorisms: for the use of students commencing midwifery practice* (7th ed.). London: J & A Churchill.

Swayne, J. G. (1888). *Obsteric Aphorisms: for the use of students commencing midwifery practice* (9th ed.). London: J & A Churchill.

Swayne, J. G. (1893). *Obsteric Aphorisms: for the use of students commencing midwifery practice* (10th ed.). London: J & A Churchill.

Swayne, J. G. (1913). *Obsteric Aphorisms: for the use of students commencing midwifery practice* (11th ed.). (W. C. Swayne, Ed.) London: J & A Churchill.

Symon, A. (2006). *Risk and Choice in Maternity Care: An International Perspective.* Edinburgh: Churchill Livingstone.

Taylor, W., & Fountain, E. (1831). *A Memoir of the late Philip Meadows Martineau, Surgeon.* Norwich: Bacon and Kinnebrook, Mercury Office.

Tew, M. (1978). Intended Place of Delivery and Perinatal outcome. *British Medical Journal, 1*, 1139-40.

Tew, M. (1979). The Safest Place of Birth. *Lancet, i*, 1388-90.

The Annual Register. (1840). *The Annual Register, Or, A View of the History and Politics of the year 1839.* London: Longman and Co.

The British Medical Journal. (1877, May 26). The new forceps of M. Tarnier. *The British Medical Journal*, pp. 665 - 6.

The British Medical Journal. (1902). The Midwives Act. *The British Medical Journal*, 481-483.

The British Medical Journal. (1902). The Midwives Bill. Committee stage in the House of Lords. *The British Medical Journal, 2*, 151 - 2.

The British Medical Journal. (1908, May 23). Charles James Cullingworth. *The British Medical Journal*, pp. 1269-1272.

The British Medical Journal. (1925, October 3). Dr Robert Reid Rentoul. *The British Medical Journal*, p. 630.

The Hunterian Society. (n.d.). *Beginnings*. Retrieved May 10, 2012, from The Hunterian Society: http://www.hunteriansociety.org.uk/

The Lancet . (1831, July 23). Provincial Medical Schools. *The Lancet*, pp. 542-3.

The Lancet . (1868). The Teaching of Midwifery and Mr. Symes Committee on Medical Education. *The Lancet*, 708-9.

The Lancet. (1823). Preface. *The Lancet, i*, 1-2.

The Lancet. (1827-8). Advertisement. *The Lancet, 1*, 1-3.

The Lancet. (1830, September 25). Account of the Medical and Surgical Schools of London for the session 1830-1. *The Lancet*, pp. 5-19.

The Lancet. (1833, June 8). Apothecaries Act Amendment Bill. *The Lancet*, pp. 352-5.

The Lancet. (1833, July 6). Medical and Surgical Reform. Important News. *The Lancet*, p. 484.

The Lancet. (1836, December 31). Charter of the University of London. *The Lancet*, pp. 491-4.

The Lancet. (1837, September 30). Account of the London Hospitals and Schools of Medicine, open for the Reception of Students during the Medical Session, commencing October 2nd 1837. *The Lancet*, pp. 4-22.

The Lancet. (1838, September 22). Account of the Hospitals and Schools of Medicine in London; for the session commencing October 1, 1838-9. *The Lancet*, pp. 6-22.

The Lancet. (1844, December 21). News of the Week. *The Lancet*, p. 388.

The Lancet. (1844, September 28). The Medical Session, 1844-5. *The Lancet*, pp. 1-7.

The Lancet. (1844, December 28). The National Association of General Practitioners. *The Lancet*, pp. 407-11.

The Lancet. (1845, November 15). Medical Reform. *The Lancet*, pp. 544-6.

The Lancet. (1845, February 1). The National Association of General Practitioners. *The Lancet*, pp. 127-136.

The Lancet. (1846, December 12). The "Institute", or Ghost of the National Association. *The Lancet*, p. 653.

The Lancet. (1847, October 2). The Medical Session, 1847-8. *The Lancet*, pp. 345-355.

The Lancet. (1851, September 27). Medical Session, 1851-2. *The Lancet*, pp. 287-306.

The Lancet. (1858, December 18). Obstetrical Society of London. *The Lancet*, 642.

The Lancet. (1858, December 25). Obstetrical Society of London. *The Lancet*, 655-7.

The Lancet. (1858, August 7). The Medical Practitioners Act. *The Lancet*, pp. 147-150.

The Lancet. (1861). General Council of Medical Education and Registration. *The Lancet*, 71-2.

The Lancet. (1869). Metropolitan Hospitals and Medical Schools. *The Lancet*, 391-394.

The Lancet. (1869, September 11). Regulations of Medical Examining Bodies in the United Kingdom. *The Lancet*, pp. 367 -390.

The Lancet. (1869, May 15). Representation of Obstetric Medicine in the General Council. *The Lancet*, 692.

The Lancet. (1880). Meeting of the General Medical Council. *The Lancet*, 100-110.

The Lancet. (1880, March 6). Obituary. Edward Copeman, M.D. *The Lancet*, pp. 384-5.

The Lancet. (1886, July 3). A Bill to amend the Medical Acts. *The Lancet*, 33-5.

The Lancet. (1896, June 20). Thomas Wakley,: The Founder of "The Lancet". A Biography. Chapter XXIV. *The Lancet*, pp. 1738-1740.

The Lancet. (1902). Midwives Bill. Debate in the House of Lords. *The Lancet, 160*, 120 - 122.

The Lancet. (1902). Parliamentary Intelligence. *The Lancet, 160*, 254.

The Lancet. (1902). Parliamentary Intelligence. *The Lancet, 160*, 413.

The Lancet. (1902). The debate on the midwives bill: A full report of the speeches. *The Lancet, 160*, 688 -682.

The Lancet. (1902). The registration of Midwives: The Midwives Board. *The Lancet, 160*, 1411.

The Lancet. (1917). Premiums of old-time medical apprentices. *The Lancet*, 434-5.

The Lancet. (1933, August 12). The bicentenery of Thomas Denman. *The Lancet*, pp. 390-1.

The London Gazette. (1831, May 13). Notices. *The London Gazette*, p. 933.

The London Gazette. (1832, February 21). Notices. *The London Gazette*, p. 372.

The London Medical and Surgical Journal. (1833, June 22). Apothecaries' Company - House of Commons. *The London Medical and Surgical Journal*, pp. 665-7.

The London Medical and Surgical Journal. (1833, June 29). The Apothecaries Amendment Bill. *The London Medical and Surgical Journal*, pp. 692-4.

The London Medical and Surgical Journal. (1833, July 7). The Apothecaries' Amendment Bill. *The London Medical and Surgical Journal*, p. 736.

The London Medical Repository. (1817, December 1). The case of the Late Princess Charlotte of Wales. *The London Medical Repository*.

The Morning Chronicle. (1817, November 8). The demise of Her Royal Highness, The Princess Charlotte. *The Morning Chronicle*.

The Morning Chronicle. (1817, November 7). The Demise of Princess Charlotte. *The Morning Chronicle*.

The National Association of General Practitioners. (1845, March 29). The Government Medical Bill. *The Lancet*, pp. 361-2.

The Obstetric Society. (1827, March 17). The Obstetric Society. *The Lancet*, pp. 768-9.

The Obstetrical Society of London. (1867). *Catalogue and Report of Obstetrical and other instruments exhibited at the conversazione of the Obstetrical Society of London, held by permission, at the Royal College of Physicians, March 28th 1866, with numerous illustrations.* London: Longmans, Green, and Co.

The Times. (1851, May 1). The Great Exhibition. *The Times*, p. 8.

The Times. (1876, March 13). Deputations. *The Times*, p. 6.

The Times. (1880, April 14). News. *The Times*, p. 13.

The Times. (1891, March 5). Public Appointments. *The Times*, p. 14.

The Times. (1892, March 2). Public Appointments. *The Times*, p. 14.

The Times. (1897, May 27). Court Circular. *The Times*, p. 8.

The Times. (1898, May 14). The Drawing Room. *The Times*, p. 9.

The Times. (1907, September 27). The Midwives Act. *The Times*, p. 11.

The Worshipful Society of Apothecaries. (13 February 2012). Email Correspondence from the record books.

The Worshipful Society of Apothecaries of London. (n.d.). *Family History*. Retrieved February 09, 2012, from The Worshipful Society of Apothecaries of London: http://www.apothecaries.org/index.php?page=101

Thicknesse. (1764). *Man-Midwifery Analysed: and the Tendency of that Practice detected and exposed.* London: R. Davis.

Thomas, K. (1973). *Religion and the Decline of Magic; studies in popular beliefs in sixteenth- and seventeenth-century England.* London: Penguin books.

Thurlow, E. (2016, October 14). Archive help please: email response.

Tiemann, G & Co. (1876). *Index and Price List to Part One of Illustrated Catalogue of Sugical Instruments.* New York: G. Tiemann & Co.

Tiemann, G; Co. (1889, reprinted 1989). *American Armamentarium Chirurgicum.* San Francisco: Norman Publishing & The Printers Devil.

Tilt, E. J. (1874). Obstetrical Society of London. *The Lancet*(May 30), pp. 767 - 768.

Tilt, E. J. (1874, May 30). A paper by Dr E Copeman Statistical and practical remarks on consultation midwifery in private practice (as part of Obstetrical Society of London (Report)). *The Lancet, 103*(2648), pp. 767-8.

Tomes, N. (1990). The Private Side of Public Health: Sanitary Science, Domestic Hygiene and the Germ Theory. *Bulletin of the History of Medicine, 64*, 509-539.

Toogood, J. (1844). On the practice of Midwifery, with remarks. *Provincial Medical & Surgical Journal*, 103 - 108.

Towler, J., & Bramall, J. (1986). *Midwives in History & Society.* London: Croon Helm.

Transactions of the Medical and Chirurgical Society of London. (1831). A Professional Memoir of P.M. Martineau. *Transactions of the Medical and Chirurgical Society of London, Second part of the Eleventh Volume*, 16-33.

Transactions of the Medical and Chirurgical Society of London. (1831). Biographical Notice. P.M. Martineau. *Transactions of the Medical and Chirurgical Society of London, Second part of the Eleventh Volume*, 1-15.

Traux, C. (1899). *The Mechanics of Surgery.* Chicago.

UK Parliament. (1833, August 05). *Minutes, vol 20, c325.* Retrieved February 13, 2017, from Hansard: http://hansard.millbanksystems.com/commons/1833/aug/05/minutes#S3V0020P0_18330805_HOC_2

UK Parliament. (1834, February 11). *Commons Sitting: The Medical Profession, vol 21; cc233-236.* Retrieved January 12, 2017, from Hansard: http://hansard.millbanksystems.com/commons/1834/feb/11/the-medical-profession#column_233

UK Parliament. (1835, August 17). *Medical Regulations, Vol 30, cc 602-3.* Retrieved February 13, 2017, from Hansard: http://hansard.millbanksystems.com/commons/1835/aug/17/medical-regulations#S3V0030P0_18350817_HOC_3

UK Parliament. (1839, June 10). *Medical Education, vol 48 c. 95.* Retrieved February 13, 2017, from Hansard: http://hansard.millbanksystems.com/commons/1839/jun/10/medical-education#S3V0048P0_18390610_HOC_7

UK Parliament. (1844, August 7). *The Medical Profession, vol 76, cc1896-911.* Retrieved February 13, 2017, from Hansard: http://hansard.millbanksystems.com/commons/1844/aug/07/the-medical-profession

UK Parliament. (1845, May 15). *Medical Reform, vol 8, cc416-30.* Retrieved February 13, 2017, from Hansard: http://hansard.millbanksystems.com/commons/1845/may/15/medical-reform#S3V0080P0_18450515_HOC_14

UK Parliament. (1853, June 3). *The Medical Profession, HC Debate, vol 127 cc1091-2.* Retrieved August 20, 2017, from Hansard: http://hansard.millbanksystems.com/commons/1853/jun/03/the-medical-profession

UK Parliament. (1870, May 5). *No 69 Second Reading, vol 201, cc253-65.* Retrieved May 12, 2017, from Hansard: http://hansard.millbanksystems.com/lords/1870/may/05/no-69-second-reading#S3V0201P0_18700505_HOL_14

UK Parliament. (1902, July 04). *Midwives Bill HL Deb, vol 110, cc791-811.* Retrieved November 29, 2018, from Hansard 1803-2005: https://api.parliament.uk/historic-hansard/lords/1902/jul/04/midwives-bill

UK Parliament. (2017, January 12). *Mr Henry Warburton 1785-1858.* Retrieved from Hansard: http://hansard.millbanksystems.com/people/mr-henry-warburton/

UK Parliament. (2017, May 31). *Mr Thomas Denman*. Retrieved from Hansard: http://hansard.millbanksystems.com/people/mr-thomas-denman/

UK Parliament. (2017, February 13). *Mr Thomas Wakley*. Retrieved from Hansard: http://hansard.millbanksystems.com/people/mr-thomas-wakley/

University of Glasgow. (n.d.). *Biography of William Leishman*. Retrieved 12 06, 2010, from University of Glasgow Story: http://www.universitystory.gla.ac.uk/biography/?id=WH2091&type=P

University of London. (2017, February 26). *University of London: A brief history*. Retrieved from University of London: http://www.london.ac.uk/history.html

Uvedale West, R. (1859, November 12). A Statistical study of the causes and relative proportion of still-births in private country practice. *The Lancet*, pp. 478 - 481.

Waddington, I. (1984). *The Medical Profession in the Industrial Revolution.* Dublin: Gill and Macmillan Humanities Press.

Waddington, J. (1849). On employing instruments in midwifery. *The Lancet, 53*, 40-1.

Wajcman, J. (1991). *Feminism confronts Technology.* Oxford: Polity Press.

Warburton, H. (. (1834). *Report from the Select Committee on Medical Education: with the minutes of evidence, and appendix. Part 1: The Royal College of Physicians, London.* London: The House of Commons. Retrieved from House of Commons Parliamentary Papers.

Warburton, H. (. (1834). *Report from the Select Committee on Medical Education: with the minutes of evidence, and appendix. Part 2: The Royal College of Surgeons, London.* London: The House of Commons.

Warburton, H. (. (1834). *Report from the Select Committee on Medical Education: with the minutes of evidence, and appendix. Part 3: The Worshipful Society of Apothecaries, London.* London: The House of Commons.

Wardleworth, T. H. (1840, 22 August). New form of Vectis. *The Lancet, 43*(886), pp. 782 - 783.

Watson, J. (1827, October 6). Apothecaries Hall: Regulations for the Examination of Apothecaries. *The Lancet*, pp. 10-11.

Watson, K. (1844). Report of midwifery cases occuring in private practice. *The Provincial Medical and Surgical Journal, 8*, 558-9.

Wenger, E. (2018, December 19). *Communities of Practice: A brief introduction.* Retrieved from University of Oregon Libraries: https://scholarsbank.uoregon.edu/xmlui/handle/1794/11736

Williams, J. (1997). The controlling power of childbirth in Britain. In H. Marland, & A. M. Rafferty (Eds.), *Midwives, Society & Childbirth. Debates and controversies in the Modern Period* (pp. 232 - 247). London: Routledge.

Willughby, P. (1863). *Observations in Midwifery.* (H. Blenkinsop, Ed.) Warwick: Cooke & Son.

Wilson, A. (1985). William Hunter and the varieties of man-midwifery. In W. F. Bynum, & R. Porter (Eds.), *William Hunter and the eighteenth-century medical world* (pp. 343-369). Cambridge: Cambridge University Press.

Wilson, A. (1993). The Perils of Early Modern Procreation: Childbirth with or without fear? *Journal for Eighteenth Century Studies, 16*, 1 - 19.

Wilson, A. (1995). *The Making of Man-midwifery: Childbirth in England 1660 – 1770.* Cambridge: Harvard University Press.

Wilson, A. (2016). *Ritual and Conflict: The Social Relations of Childbirth in Early Modern England.* Abingdon: Routledge.

Wiltshire, A. (1877, July 28). Correspondance. Dr.Tarnier's Midwifery Forceps. *British Medical Journal*, p. 123.

Winner, L. (1993). Upon Opening the Black Box and Finding it Empty: Social Constructivism and the Philosophy of Technology. *Science, Technology & Human Values*, 362-378.

Witz, A. (1990). Patriarchy and Professions: The gendered politics of occupational closure. *Sociology*, 675 - 690.

Woods, R. (2007). Lying-in and Laying-out: Fetal Health and the Contribution of Midwifery. *Bulletin of the History of Medicine, 81*, 730 - 759.

Wootton, D. (2016). *The Invention of Science: A New History of the Scientific Revolution.* London: Penguin.

Wyatt, S. (2005). Non-Users Also Matter: The Construction of users and Non-Users of the Internet. In N. Oudshoorn, & T. J. Pinch, *How Users Matter: The co-construction of Users and Technology* (pp. 67-79). Cambridge, Massachusetts: MIT Press.

Zavala, M. G. (1898). In the present state of Obstetrical Knowlegde are we justified in Casting aside the Vectis? *Transactions of Second Pan-American Medical Congress held in the City of Mexico, Republic of Mexico. KOYKMRKK 16, 17, 18 and 19. 1 806. MEXICO HOECK Y OOMPAFFLA IMPRESOREFT Y EDITORES. Primern de San Francisco No. 12. .*

Appendices

Contents

Appendix A: Summary of amendments

Specific recommendation from examiners		Place addressed in revised thesis
Abstract	Requires revision following completion of revisions	Revised
Chapter 1	Must contain critical consideration of relevant secondary literature	Section 1.1 (p. 2-10) contains a review of the secondary literature on the vectis. Includes emergence of the vectis in print, dominance of the forceps in the historiography, emergence of feminist critiques, modern views on instruments.
	Detailed critique of models of technological development and adoption	Section 1.2 (p.10-17) contains a critique of sociological theories of technology.
	Critical engagement with relevant feminist and sociological literature	1.1.3 Introduces feminist concepts – developed further in chapter 4 and 5 1.2 (p.10-17) discusses sociological literature
	Rationales for research decisions made • Literature critiqued • Theoretical models • Archive selection and use • Time frames and geographical boundaries	Section 1.2 gives a critique of sociological theories of technologies and give a critical discussion of the SCOT model, and its choice as a theoretical framework. Section 1.3 (p.17-21) outlines research methodology and rationale, and covers why the vectis is a topic for investigation, selection of archival and secondary sources, chronological and geographical boundaries.
Chapter 2	Section from original introduction on instruments and Chamberlen family needs to be expanded to a standalone chapter. Needs to include critical engagement with the literature and historiography around forceps, and situate this in relation to vectis.	Chapter 2 now contains an overview of male involvement in childbirth, including the clinical practice of the Chamberlen family, followed by description of the Chamberlen instruments (forceps and vectis) and the variety of these, before situating this in the historiography to look at the legacy of the Chamberlen family.
Chapter 3	Original material in Part 1 must be condensed into one chapter. Select elements of these chapters that add to the argument regarding the vectis.	Completed in chapter 3.
	Ensure that the narrative is contextualised through reference to ideas and	One criticism of the SCOT model is that users are identified and described without being situated in their historical context.

	reading from secondary reading, particularly in relation to the SCOT model.	Chapter 3 seeks to address this limitation by describing the social context of the male practice of midwifery. While this chapter discusses the development of this group, the introduction to the chapter on the first page, and the final section 3.2.6 on the impact of medical education and reform on male practice of midwifery discuss the relevance of this in developing the SCOT model.
Chapter 4/5	Material originally in Part 2 should be condensed into two chapters.	Original thesis part 2 has been divided into two chapters with supporting new material. Chapter 4 explores the clinical use of the vectis, while Chapter 5 looks at the clinical use of the forceps and the co-construction of professional identity.
	Consider how each chapter develops the argument surrounding the vectis.	Each chapter now has a clear place in the overall argument of the thesis. • The introductory chapter reviews the context of the research and secondary literature on the use of the vectis • The second chapter summarises existing scholarship on male involvement in childbirth, and explore how the expanded legacy of the Chamberlen family changed that. • Chapter three locates the practice of medical men in their historical context during the long nineteenth century. • The fourth chapter explores the flexibility in use and design of the vectis by male practitioners, and summarises the way that use stabilised towards the end of the nineteenth century. • Chapter five explores the acceptance of instrument use in general, and the forceps as the sole instrument for use in obstructed labour in particular. • The final chapter summarises the key findings and implications of the research.
	Link back to chapter on medical education.	Use of Case studies links to chapter on medical education in chapter 4 and 5.

	Relate source material to wider literature and SCOT model.	Each chapter now relates to the SCOT model and secondary literature.
Chapter 6	Be clear about the thesis put forward in the work, how it has been developed and justified.	The thesis sought to answer the question 'Why did the vectis disappear from use in nineteenth century clinical practice?'. This thesis now argues that the regulation of medical practice reduced opportunities for informal networks of practice, meanwhile larger groups of students changed what could be taught. Regulation of practice meant that midwives were confined by law to normal childbirth while doctors were responsible for more complicated cases that they resolved using instruments. The use of obstetric instruments is therefore intertwined with the development of male obstetric practice and co-constructs the professional identity of practitioners, as practitioners constructed the meaning ascribed to obstetric instruments.
	Consider the findings of the study on the wider historiography, particularly the use of the SCOT model.	The role of users in influencing the design and use of technology has been explored by the SCOT model, but this this argues that this technology has co-constructed the identity of users.
Figures and tables	Presented separately in the contents page and number separately	Tables removed and limited relevant information converted into bar charts. Included in contents page.
Appendices	Original appendix B not required/Original appendix C – information only required where it is referred to in the text	Incorporated into footnotes of chapters 2-5 where relevant.
General presentation	General attention to presentation and proof reading required	Thesis was proof-read twice prior to resubmission.

Appendix B: Papers from PhD thesis

The following papers have been given during the course of the research for this thesis.

Louise Jenkins, ‘An overview of midwifery regulation in the UK and the role of the midwife’ (Seminar Presentation, Chelmsford, Masters Seminar Series, 2018).

Louise Jenkins, ‘Midwifery Education for medical practitioners as part of medical regulation in the nineteenth century’ (Seminar Presentation, York, De Partu Workshop, 2017).

Louise Jenkins, ‘Edward Copeman; an interesting case’ (Birth Stories, Risks of Childbirth Project, 2017). Available at https://www.youtube.com/watch?v=mL0kOY21sXs

Louise Jenkins, ‘Attitudes to Instrumental Delivery rates; Lessons from history’ (Seminar Presentation, London, Risks of Childbirth Workshop, 2016).

Louise Jenkins and Adrian Wilson, 'Forceps: the known and unknown history' (Public Lecture Series, University of Leeds, History and Philosohy of Science in 20 objects, 2016). Available at https://www.youtube.com/watch?v=lmmgxeMvlKM&t=8s

Louise Jenkins, 'Historical Research Methods: uncovering the use of the vectis' (Seminar Presentation, Anglia Ruskin University, Sharing Practice and Research Knowledge (SPaRK) Seminar series, 2015).

Louise Jenkins, 'The use of the Wellcome Archive to elucidate the use of the vectis' (Seminar presentation, Wellcome Library, De Partu, 2015).

Louise Jenkins, 'An overview of midwifery regulation' (Seminar Presentation, Anglia Ruskin Unversity, Sharing Practice and Research Knowledge (SPaRK) Seminar, 2014).

Louise Jenkins, 'The vectis made public: Thomas Denman 1733 - 1815' (Seminar Presentation, The University of Manchester, Centre for the History of Science, Technology and Medicine (CHSTM), 2011).

Louise Jenkins, 'The vectis and the ways in which it was used' (Seminar Presentation, De Partu, Manchester, History of Childbirth Research Colloquium, 2010).

Appendix C: Clinical Use of the vectis

Author	No of Editions	Date first published	Date last published	Type of Publication	Instrument preferred	Preferred action of the vectis	Notes
Denman, Thomas	7	1783	1832	Treatise / Aphorisms	Vectis	Traction	Preferred vectis to forceps in all cases
Burns, John	10	1809	1843	Treatise	Forceps	Traction	Described the use of the vectis (lever) for malpositions
Conquest, John Tricker	6	1820	1837	Treatise	Forceps	Traction	Preferred vectis to forceps for malpositions
Gaitskell, William	1	1823	1823	Journal article	Vectis	Flexion and Traction	Placed vectis over occiput and depress to reduce presenting diameter and then alternate over occiput and face.
Radford, Thomas	1	1838		Treatise	Forceps	Not discussed	N/A

Author	No of Editions	Date first published	Date last published	Type of Publication	Instrument preferred	Preferred action of the vectis	Notes
Davis, David Daniel	2	1836	1841	Treatise	Forceps	Flexion	Davis advise the insertion of a toothed vertex over the occiput to increase flexion in a face presentation. The vectis could also be substituted for the fingers where rotation was required.
Blundell, James	1	1839	1839	Treatise	Forceps and vectis	Traction	an instrument excellent, and of great effect in dexterous hands. If skills and judgement are wanting, … may inflict dreadful injuries'. (p. 260) 'The cases in which the lever may be employed are various' (p. 260). Based advice on William Gaitskell (1823).
Field, Charles Ventris	n/a	1839	1839	Letter published in a journal	Vectis	Traction	Used the vectis for correction of malpositions. Former partner of Gaitskell.
Ramsbotham, Francis Henry	5	1841	1865	Treatise	Forceps	Traction	Preferred vectis to forceps for malpositions
Rigby, Edward	2	1841	1844	Treatise	Forceps	Not discussed	Briefly mentions Roonhuysen's lever
Lee, Robert	2	1842	1848	Treatise	Forceps	Not discussed	N/A

Author	No of Editions	Date first published	Date last published	Type of Publication	Instrument preferred	Preferred action of the vectis	Notes
Churchill, Fleetwood	6	1842	1872	Treatise	Forceps	Traction	Recognised that the vectis could be used to correct malpositions, as a lever or as a tractor, but advocated use as a tractor
Murphy, Edward	2	1845	1862	Treatise	Forceps	Traction / Rotation	Vectis is intended to act as an extractor, to assist the feeble action of the uterus, to correct malpositions of the head, or to overcome any unusual resistance of the perineum
Davies, John Hall	2	1848	1865	Case histories	Forceps	Rotation	Use the vectis for occipito-posterior positions
Crosse (Ed. Copeman)	1	1851	1851	Case Studies	Vectis	Traction	Later came to prefer the forceps to vectis.
Barnes, Robert	4	1852	1886	Treatise	Forceps	Leverage/Traction	Vectis not useful in providing traction, but can be used if limited leverage / traction required
Swayne, Joseph Griffiths	11	1853	1913	Treatise / Journal article	Forceps	Flexion / Rotation	Preferred vectis to forceps for malpositions
Copeman, Edward	1	1856	1856	Case histories	Vectis	Traction / Rotation / Flexion	Particularly useful for occipito-posterior position or a de-flexed head

Author	No of Editions	Date first published	Date last published	Type of Publication	Instrument preferred	Preferred action of the vectis	Notes
Meadows, Alfred	4	1862	1882	Treatise	Turning (manual rotation)	Rotation	Considered vectis a poor substitute for the short forceps where traction was needed. Vectis was useful for face, brow presentations and other malpositions to correct flexion aid rotation. Preferred manual rotation.
McCarthy, G D R	n/a	1867	1867	Journal article	Vectis	Flexion / Rotation	Case history describing use in an occipito-posterior position
Leishman, William	4	1873	1888	Treatise	Forceps	Flexion	Vectis of limited use in occipito-anterior positions to provide leverage/traction. Useful in occipito-posterior positions where flexion would aid rotation
Playfair, William Smoult	9	1876	1898	Treatise	Forceps	Rotation	Preferred forceps where traction was needed. Vectis useful for correcting malpositions.
Galabin, Alfred Lewis	7	1886	1910	Treatise	Forceps	To correct malpositions	Discussed vectis for correcting OP