

Migraine in the Middle Ages: A study of two manuscripts

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Abstract

The Middle Ages underwent a period of transformation in medicine, not only in England, but across Europe. Early medieval medicine in England drew not only from Greek and Roman sources, and the medical theories of Hippocrates and Galen, but from native medicine, astrology, magic, and folkloric beliefs. Anglo-Saxon medical texts written in the vernacular were representative of the skills of the scribes in creating compilations from several classical sources and adapting them by integrating native constituents and traditional healing practices, to create medical manuscripts suitable for practical usage. The influence of Arab-Islamic medical texts with their more theoretical understanding of rational medicine, together with the significant contributions of the School of Salerno, brought about a transformation and expansion of medicine in England. To explain the transmission in medical knowledge, this dissertation will look at the treatment of migraine in an Anglo-Saxon manuscript and a Middle English one. The intention is to examine the sources of both, studying the secondary literature about the ingredients used, their pharmacological actions and efficacy. The aim is to explore whether and how much, medical treatment for migraine in the Middle Ages, benefitted from the introduction of Arab-Islamic medicine.

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INTRODUCTION

During the Middle Ages and up to the Renaissance the basis of all medicine in western Europe was rooted in the traditions of Classical Antiquity. Medical knowledge was drawn from ancient Greece and Rome, and later from the Middle East, also infused with Antique scholarship.

In England, as far back as the ninth century and perhaps earlier, Anglo-Saxon scribes were producing medical manuscripts in both Latin and the vernacular.¹ Whilst the Latin treatises were probably copies of a shared reservoir of recipes and remedies that circulated throughout Western Europe, they serve to demonstrate the extent of Anglo-Saxon ties with Mediterranean cultures, and provide evidence that Anglo-Saxon writers drew on the works of late antique writers.² Furthermore, medical texts such as the *Leechbook of Bald*, written in the vernacular around 950 AD, as a practical manual, containing a collection of remedies from the continent and Ireland, demonstrates both the breadth of knowledge held on medicinal herbs and the importance of medicine in England.³ These surviving Old English medical manuscripts are distinct from the Latin copies in that they demonstrate a blending of selected derivations from classical Greek and Latin sources with practical and popular native medicine.⁴

Medical recipes throughout the Middle Ages in England have generated much interest and considerable debate as to their curative properties, with scholarly opinion historically divided as to their effectiveness in treating diseases.⁵ Anglo-Saxon medicine as a representation of Early Medieval Europe's practical medicine, relied largely on herbal medicines, drawing on the authority of ancient works such as the *Herbarium* of Pseudo-Apuleius, the *De Materia medica* of Dioscoridis (40-90 AD), and Isadore of Seville's (560-636 AD) encyclopaedic *Etymologies* among others.⁶ Anglo-Saxon medicine, though founded on the theoretical

¹ C. H. Talbot, *Medicine in Medieval England* (London: Oldbourne Book Co. Ltd., 1967) p. 17.

² T. Tyers, 'New Medicine for Old? Recipes, remedies and treatments in vernacular manuscripts', University of Nottingham, (2009)

³ Vivian Nutton, 'Early Medieval Medicine and Natural Science' in *The Cambridge History of Science*, 2. ed. David Lindberg and Michael Shank (New York: Cambridge University Press, 2013), 323-340 (p. 336).

⁴ M. L. Cameron, *Anglo-Saxon Medicine* (Cambridge: Cambridge University Press, 1993), p. 2.

⁵ Peregrine Horden, 'What's wrong with Early Medieval Medicine'? *Social History of Medicine*, 24 1 (2011), 5-25 (p. 16).

⁶ C. H. Talbot, *Medicine in Medieval England*, p. 20.

underpinnings derived from the Graeco-Roman Classics, gave limited prominence to humoral theory, with the emphasis being on materia medica and the practical application of medicine, focusing on what worked rather than on theories of causation.⁷ Medical historians have scrutinized the usefulness of Anglo-Saxon medicine suggesting it was based on unscientific, folkloric remedies rather than learned treatises, and thereby ineffective against illness.⁸ Critics of its qualities propose it to have been no more than superstition and folly; others more sympathetic, argue that it was at the forefront of its time, and that it used the same Classical Greek and Latin sources that were the foundation of the Salernitan School.⁹

The introduction of previously unknown Arab-Islamic scientific texts into western Europe during the twelfth-century renaissance has long been credited with expanding the range of medical knowledge available to Western society.¹⁰ Whether this translated to an improvement in the diagnosis, prognosis and treatment of disease is the subject of much discussion and forms the basis of this study.

This dissertation will examine a Middle English manuscript, based on recipes from Salerno (itself influenced by Arab-Islamic medicine), and an Anglo-Saxon one. By looking at the sources for both, and by studying secondary literature about the ingredients used in the treatment of migraine, their pharmacological actions and their effectiveness, this dissertation will explore whether, and how much medicine in the Middle Ages benefitted from Arab-Islamic medicine. Using migraine as a complaint common to both manuscripts, the aim is to review and discuss the diagnosis and treatment pertaining to the disorder in both texts and consider the evolution of the remedies prescribed. Migraine as a disorder has been acknowledged from as far back as the second century, when Galen named it ‘hemicrania’, a pain affecting half the head.¹¹

⁷ Vivian Nutton, ‘Late Antiquity and the Early Middle Ages 3’, in *The Western Medical Tradition*, ed. Lawrence I. Conrad, Michael Neve, Vivian Nutton, Roy Potter, Andrew Wear (New York: Cambridge University Press, 1995), 71-87 (p.86).

⁸ Charles Singer, ‘A Review of the Medical Literature of the Dark Ages, with a New Text of about 1110’, *Proceedings of the Royal Society of Medicine*, 10 (1917), 107-160.

⁹ M. L. Cameron, ‘The sources of medical knowledge in Anglo-Saxon England’, *Anglo-Saxon England*, 11 (Cambridge University Press, 1983), 135-155 (p.135).

¹⁰ Charles Burnett, ‘Translation and Transmission of Greek and Islamic Science to Latin Christendom’, in *The Cambridge History of Science Volume II*, ed. David C. Lindberg and Michael H. Shank (New York: Cambridge University Press), 341-364 (p. 341).

¹¹ Katherine Foxhall, *Migraine a History* (Baltimore: John Hopkins University Press, 2019), p.3.

Methodology

The methodology is a comparative analysis of the remedies for migraine contained in two medieval medical texts written three hundred years apart. The manuscripts selected for this study are the *Laecebec, or Bald's Leechbook*, a tenth century manuscript, (London, British Library, Royal MS 12 D XVII), and, a fifteenth century Middle English, partial translation of the Latin thirteenth century *Compendium Medicinae*, the *Practica medicinae* in Middle English, by Gilbertus Anglicus, held in London, Wellcome Library, MS 537.¹²

The scholarship will use the transcript of *Bald's Leechbook* edited by Conan Doyle in his doctoral thesis, *Anglo-Saxon Medicine and Disease: A Semantic Approach*.¹³ Doyle's analysis is primarily focused on a linguistic study on the transmission of Latin vocabulary into the vernacular, and his comprehensive evaluation offers an opportunity to consider the evidence of parallel texts for the compilation of *Bald's Leechbook* from several late Antique and Byzantine sources, such as the *Physica Plinii*, *Liber tertius* and *Practica Alexandri Latine*.¹⁴ His detailed examination of the assimilation of medical texts from Latin and Greek authors not only serves to illustrate the complexity of content found in *Bald's Leechbook* but assists in the understanding of how Anglo-Saxon recipes evolved. The second manuscript Wellcome, MS. 537, has been comprehensively studied and interpreted in *Healing and Society in Middle England* by Faye Getz. Her analysis of Gilbertus Anglicus' *Practica Medicinae* in Middle English in Wellcome MS 537 demonstrates that the recipes from the Wellcome version 'derive almost exclusively' from a Latin exemplar. The *Compendium medicinae* from which the *Practica medicinae* is drawn, is preserved in several manuscripts including London, British Library, Sloane MS 272.¹⁵

The study will use a thematic approach to review the theoretical foundations for each manuscript looking at their origins, context, content, language, composition, and organisation that demonstrate the transmission of medical knowledge over three hundred

¹² *Bald's Leechbook*, London, British Library, Royal MS 12 D XVII. Gilbertus Anglicus', *Practica Medicinae* 1462, in Middle English, London, Wellcome Library, MS 537. Gilbertus Anglicus' *Compendium medicinae*, London, British Library, Sloane MS 272.

¹³ Conan Doyle, 'Anglo-Saxon Medicine and Disease: A Semantic Approach Vol II:' Appendix, *Bald's Leechbook*. Transcript of London, British Library MSS Royal 12D. XVII and Harley 55 (unpublished doctoral thesis, University of Cambridge, Cambridge, 2017).

¹⁴ Conan Doyle, 'Anglo-Saxon Medicine and Disease', p. 5.

¹⁵ Faye Marie Getz, *Healing and Society in Medieval England* (London: University of Wisconsin Press, 1991), p. iiv.

years. Medical historians have now accepted that both manuscripts drew from Classical sources, with the later text being influenced by Arab-Islamic medical literature emphasising a more theoretical perspective to disease, and a more complex formulary. Whether this translates to improved efficacy in comparison to the simpler recipes of the Anglo-Saxons, rooted in observation and empiricism will be explored using contemporary studies on medieval medicine and modern biochemistry.¹⁶ In comparing the manuscripts, the study attempts to determine whether there are any similarities in the use of ingredients to treat migraine, including substitutions, and where possible, evidence of rationale. The types of remedy and instructions, measurement of quantities and indication of replication from other sources will also be examined to establish any parallels.

To understand the transition in materia medica from the Anglo-Saxon herbal compendium to the more complex formularies of Arab-Islamic medicine it is important that the remedy in its entirety is appreciated. Remedies in both manuscripts may incorporate not just herbal ingredients but advice on both spiritual and physical healing.¹⁷ Arab-Islamic medicine paid great attention to the writings of Hippocrates and Galen, and the importance of natural science as part of a preventative strategy to ill health.¹⁸ As part of this study, features associated with treatments for migraine will be considered that evidence if the Middle English medical text reflected or indeed replicated Anglo-Saxon medical knowledge.

Chapter one offers an overview of English medieval medicine and its development over the Middle Ages, beginning with a presentation on Greek humoral theory. The quality of Anglo-Saxon medicine, medical practice and its practitioners will be considered, together with an introduction to Arab-Islamic medicine. The study will draw on the scholarship of several historians who have contributed to our understanding of Anglo-Saxon medicine and the transmission of medieval medicine into the West.¹⁹ The chapter will conclude with a

¹⁶ Jessica Furner-Pardoe, Blessing O. Anonye, Ricky Cain, John Moat, Catherine A. Ortori, Christina Lee, David A. Barrett, Christophe Corre, & Freya Harrison, 'Anti-biofilm efficacy of a medieval treatment for bacterial infection requires the combination of multiple ingredients', *Scientific Reports* (2020).

¹⁷ Benjamin Silverman, *Monastic Medicine: A Unique Dualism Between Natural Science and Spiritual Healing*, *HURJ*, 1 Spring 2002 10-15 p.11.

¹⁸ Edward J. Kealey, *Medieval Medicus: A Social History of Anglo-Norman Medicine* (Baltimore: John Hopkins University Press, 1981), p. 297. Danielle Jacquart, 'Anatomy, Physiology and Medical Theory', in *The Cambridge History of Science Volume II*, ed. David C. Lindberg and Michael H. Shank (New York: Cambridge University Press), 590-610 (p. 602).

¹⁹ M. L. Cameron, 'The sources of medical knowledge in Anglo-Saxon England' *Anglo-Saxon England*, 11 (Cambridge University Press, 1983) 135-155, Oswald Cockayne, *Leechdoms Wortcunning, and Starcraft of*

summary of migraine in the Middle Ages. Chapter two is a comparative analysis of the medical manuscripts, examining their approaches to the treatment of migraine. First, an overview of *Bald's Leechbook* will be undertaken: its origins, content, context, composition, organisation, authorship, and language. This will be compared with a similar exploration of the partial translation of the Middle English *Compendium Medicinæ* of Gilbertus Anglicus found in Wellcome MS 537. The study will consider each text and examine their remedies for migraine, comparing the differences between Old and Middle English medicine. Chapter three discusses the herbs found in the remedies of both manuscripts. Using modern herbal literature and current research, the ingredients, their origin, traditional uses, and pharmacological actions will be evaluated to determine any associations they may share, and the validity of their purpose in treating migraine. Chapter four reviews current scientific knowledge on the causation of migraine and assesses the actions of Anglo-Saxon and Arab-Islamic influenced herbs. The study will summarise the findings and determine whether Anglo-Saxon medicine based on 'non-scientific' medical knowledge was less effective and thus inferior to Salernitan based medicine.

Early England Volume 2 (HMSO: Eyre and Spottiswoode, Forgotten Books, 2018), C. H. Talbot 'Some Notes on Anglo-Saxon Medicine', *Medical History*, *Medical History*, 9 1 (1965), 56-69, A. L. Meaney, 'The Anglo-Saxon View of the Causes of Illness'. in: *Health Disease and Healing in Medieval Culture* ed. Campbell S., Hall B., Klausner D. (London: Palgrave Macmillan) 12-33, Peter Denton, 'Beyond the book: Charles Singer and Anglo-Saxon medicine revisited' *Canadian Bulletin of Medical History* 3 2 (1986), Winter, 263-268. Faye Marie Getz, *Healing and Society in Medieval England* (London: University of Wisconsin Press, 1991), P. E. Pormann and E. Savage-Smith, *Medieval Islamic Medicine* (Edinburgh: Edinburgh University Press, 2008), N. Siraisi, *Medieval and Early Renaissance Medicine* (Chicago, London: University of Chicago, 1990).

CHAPTER ONE Overview of Medieval medicine

Medieval Medicine and Medical Theory

As a system of health, the principles of rational medicine built on the premise that health, disease, and physiology were not dependent upon magical, theological, or mythological factors.²⁰ However, that is not to say that such influences were discounted. Throughout Antiquity and into the Middle Ages, there existed a passive enculturation and assimilation between Graeco-Roman medicine and the Church, that allowed for a mutual cohabitation of religion, magic, and secular medicine.²¹ Both a religious explanation and remedy for disease, as well as a non-divine therapeutic approach, have traditionally been accepted in the historiography of medicine.²²

Humoral theory governed both medical and pharmaceutical practice up to the nineteenth century, when its decline occurred due to advances in technology, combined with a deeper understanding of aetiology and the introduction of Germ Theory.²³ Up until then, medieval medicine was governed by this single comprehensive theory, proposed by the ancient Greeks, and refined by medieval Arab and Jewish scholars.²⁴

Hippocrates of Kos, a Greek physician (460-370 BC), was a firm believer in using rationalist approaches to investigate the human body to develop medical theories. A lot of the writings from this period cannot be accurately attributed to him but are known collectively as the Hippocratic Corpus.²⁵ Empedocles, (490 BC) an earlier Greek philosopher, theorised that the cosmos, was made up of four elements: air, fire, earth, and water. The elements were thought to combine in pairs with the four qualities of heat, cold, aridity, and moisture, making air hot

²⁰ N. Siraisi, *Medieval and Early Renaissance Medicine* (Chicago, London: University of Chicago, 1990), p.2.

²¹ David J. Collins, 'Magic in the Middle Ages: History and Historiography', *History Compass* 9 (2011) 410-422 (p. 411).

²² Vivian Nutton, 'Medicine in the Greek world, 800-50BC', in *The Western Medical Tradition 800-1800AD* eds. L.I. Conrad, M. Neve, V. Nutton, R. Porter, & A. Wear, (Cambridge: Cambridge University Press, 1995), 11-38 (p.16).

²³ Prof. R. Bhikha and Dr. J. Glynn, 'The Theory of Humours Revisited', *International Journal of Development Research*, 7. 9. (September 2017), 15029-15034 (p. 15034).

²⁴ Carole Rawcliffe, 'Sources for the History of Medicine in Late Medieval England' (Kalamazoo, Michigan: Medieval Institute Publications, 1995), p.13.

²⁵ Vivian Nutton, 'The Rise of Medicine', in *The Cambridge Illustrated History of Medicine* ed. Roy Porter (Cambridge: Cambridge University Press, 1996), p. 55.

and moist, water cold and moist, fire hot and dry, and earth cold and dry.²⁶ Polybus, (400 BC) credited with developing the doctrine of the four humours found in the fifth-century Hippocratic Corpus, *On the Nature of Man*, took this philosophy and adopted its principles in the construction of his humoral theory.²⁷ He proposed the four ‘humours’ of blood, phlegm, yellow bile and black bile, thought to be the fluids within the body, were essential to good health.²⁸ Each humour corresponds with a season that shares its qualities. For example, yellow bile, hot and dry, equates to summer.²⁹ An excess or deficiency of one or more humours would create an imbalance resulting in ill health.³⁰ To restore a humour and dispel the excess, a physician could bleed the vein or induce purging, and together with attention to diet and the use of medicine, health could be reinstated. Bloodletting as a cure originated in Egypt, and the practice was adopted by the Greeks and Romans before moving across the East and eventually into Western medicine.³¹

Galen, (129-216 AD) a Greek physician, studied Hippocratic theories and developed them further. Hippocrates, in his *Regimen for Health*, advocated moderation and diet as the means to maintain equilibrium and good health and Galen followed these principles.³² Central to his theory was hygiene and this served as the foundation of his medical theory. Hygiene was based upon the naturals, the non-naturals and the contra-naturals which equated to physiology, health, and pathology. He determined the causative factor of an imbalance lay predominantly in the external influences of the six non-naturals. These were made up from ‘air and environment, food (diet) and drink, sleep and wake, motion (exercise) and rest, retention and evacuation; and passions’.³³ These concepts became fundamental features of Galenic theory thereafter.³⁴ Galen determined humours to be essential components of the body’s ability to function by purifying the blood and nourishing the body, and were vital to

²⁶L. Ayoub, ‘Old English waeta and the Medical Theory of the Humours’, *The Journal of English and Germanic Philology*, July 94 3 (1995), 334-346 (p. 333).

²⁷ Jacques Jouanna, ‘The Legacy of the Hippocratic Treatise the Nature of Man: The Theory of the Four Humours’, in *Greek Medicine from Hippocrates to Galen* ed. Philip van der Eijk, 335-360 (p. 335).

²⁸ Jacques Jouanna, The Legacy of the Hippocratic Treatise the Nature of Man: The Theory of the Four Humours in: *Greek Medicine from Hippocrates to Galen* ed. Philip van der Eijk, p. 335.

²⁹ Jacques Jouanna, The Legacy of the Hippocratic Treatise the Nature of Man: p. 335.

³⁰ L. Ayoub, Old English waeta, 334-346 (p. 333).

³¹ G. Greenstone, ‘The history of bloodletting’, *BC Medical Journal* 52. 1. January/February (2010), 12-14.

³² Jack W. Berryman, ‘Motion and rest: Galen on exercise and health’, *The Lancet*, 380, July 21 (2012), 210-211 (p. 210).

³³ Jack Berryman, ‘Motion and rest: Galen on exercise and health’, 380 210-212 (p. 210).

³⁴ Pedro Gil Sotres, ‘The Regimens of Health’ in *Western Medical Thought from Antiquity to the Middle Ages*, ed. M. D. Grmek, (Massachusetts, London: Harvard University Press, 1998), 291-398 (p. 294).

the process of digestion.³⁵ Digested food (the first digestion) passed from the stomach as a liquid, (chyle) to the liver, where the individual humours were manufactured by the separation of its elements, known as the second digestion. The liver stored blood and transferred yellow bile to the gallbladder, and black bile to the spleen, whereas phlegm, which had no designated organ, accumulated mainly in the brain. The humours were transported through the veins as venous blood to provide nutrition to the organs and muscles of the body, with the third digestion occurring when the humours were absorbed as food.³⁶ Venous blood was made up of the four humours plus a watery constituent. The balance of this humoral blend was influenced by an individual's complexion or temperament, with any imbalance leading to illness. The temperaments of sanguine, phlegmatic, melancholic, and choleric each corresponded with one of the humours, and a person's characteristics were influenced by the dominance of one, which determined not just their personality, but their health. According to Galen, every person was born with a dominant temperament, although this could change with sickness, seasons, and age.³⁷ The temperament of a person was used in Greek medicine to determine the optimum therapy or health regimen for them.

Fire	Hot and Dry	Choler or Yellow Bile	Choleric
Water	Cold and Wet	Phlegm or Mucus	Phlegmatic
Earth	Cold and Dry	Black Bile	Melancholic
Air	Hot and Wet	Blood	Sanguine

Table 1: Humoral Theory and the Qualities and Corresponding Element³⁸

Any excess or toxic humour could be expelled naturally through sweat, tears, urine, and faeces, as well as sneezing. The humoral balance was disrupted, and the body's health was jeopardised if the waste removal system of the body failed.³⁹ Galen's theories rested on the philosophy of polarity and homeostasis. A cool cure must be used to treat a hot injury or

³⁵ Stanford education, 'A History of the Liver, Spleen, and Gallbladder',

³⁶ D. Luft, *Uroscopy and Urinary Ailments in Medieval Welsh Medical Texts* (Myddfai (UK): Physicians of Myddfai Society, 2018), 1-18 (p. 3).

³⁷ Pedro Gil Sotres, 'The Regimens of Health', in *Western Medical Thought from Antiquity to the Middle Ages* ed. M. D. Grmek, 291-398 (p.294).

³⁸ Carole Rawcliffe, *Sources for the History of Medicine*, p.14.

³⁹ Carole Rawcliffe, *Sources for the History of Medicine*, p.14.

disease and vice versa. This principle of balance was also equated to herbs. Poisonous mushrooms for example are cold, therefore a cure would be to eat something hot like toasted garlic.⁴⁰ To aid in the art of diagnosis, the physician employed a variety of techniques including observation, palpation, pulse feeling and urine investigation. Many practitioners used uroscopy as one of their main tools. The physician could tell which humoral balance was disrupted by looking at the ‘colour, opacity, sediments, smell, and relative viscosity’, and treat the patient mindful of which temperament or complexion he or she had.⁴¹ The practise of venesection became a primary therapy due to Galen’s belief of blood being the dominant humour and vulnerable to excess.⁴² Another accepted treatment was purging to achieve equilibrium. As such, purging may cause diarrhoea to deplete black bile or alternatively, emetics were used to eliminate excess yellow bile by vomiting.⁴³

Humoral principles viewed disease as a collection of symptoms, rather than the manifestation of one problem. Therefore, the focus was person centred and Galenic theory reflected both an empirical and rationalist approach.⁴⁴ In Greece, and later across the Continent, his commentaries became the standard texts to which physicians deferred.⁴⁵

With the fragmentation of the Roman Empire innovations in medical science ceased.⁴⁶ Even though Roman medicine was founded on Greek hypotheses, only a few Greek writings were translated into Latin, resulting in a deficit in medical knowledge. Medical texts in circulation were collections of mostly practical works with little originality. However, they did contribute the fundamental principles of Galenic theories, the relevance of prognosis, and the importance of diet and regimen.⁴⁷ Authors such as Pliny (23-79 AD) and Celsus, (First

⁴⁰ Denis O’Neil, ‘Humoral Pathology’, (2007)
https://www2.palomar.edu/anthro/medical/humoral_pathology.htm

⁴¹ Carole Rawcliffe, *Sources for the History of Medicine* p.15.

⁴² G. Greenstone, ‘The history of bloodletting’, 12-14.

⁴³ ‘Physick, Purge and Bleed,’ *Medical Antiques*, November 2011.

⁴⁴ N. Siraisi, *Medieval and Early Renaissance Medicine* p. 6.

⁴⁵ Vivian Nutton, ‘Early Medieval Medicine and Natural Science’, in *The Cambridge History of Science*, 2. ed. David Lindberg and Michael Shank (New York: Cambridge University Press, 2013), 323-364 (p. 328).

⁴⁶ Vivian Nutton, ‘Early Medieval Medicine and Natural Science’, in *The Cambridge History of Science* 323-364 (p. 327).

⁴⁷ N. Siraisi, *Medieval and Early Renaissance Medicine* p. 6.

century) contributed encyclopaedias of information on practical issues such as farming and medicine, but these added little to scientific knowledge.⁴⁸

Anglo-Saxon medicine

Medical manuscripts from the Latin West, found in monasteries between the fifth and tenth centuries, were an eclectic mix of mostly Greek theories mixed in with collections of prescriptions and summaries of ailments and remedies, all of which were of a practical nature.⁴⁹ Their existence illustrates the importance Christianity placed on medicine and healing.

Whilst the manuscripts contained collections of pharmacopeia and prescriptions from Classical Antiquity, such as Dioscorides' *De materia medica* (50-70 AD) and Pliny's *Historia Naturalis* (77-79 AD), they largely consisted of short treatises and missives on hygiene and bloodletting, with little evidence of a theoretical or defined medical model.⁵⁰ Riddle also saw medicine in the early Middle Ages as being practical. He regarded the rejection of the 'rational science of Antiquity' by the West, as a reaction to the division in Christianity between the East and the West.⁵¹ The monastic traditions of the West adopted the practical values of medicine, whilst the East maintained the Galenic traditions held by eastern Christianity.⁵²

In the absence of any new or advanced medical theories in Europe, the emphasis lay on treatment and preventive health regimens as developed by Hippocrates in his *A Regimen for Health*.⁵³ Adjustment of the six non-naturals, or elements outside the body over which a person has some control, could typically restore health. Non-natural referred to conditions

⁴⁸ Vivian Nutton, 'Roman medicine 250 BC to 200 AD,' in *The Western Medical Tradition 800BC to AD 1800* (Cambridge: Cambridge University Press, 1995), 39-70 (p. 40). Emily Kesling, *Medical Texts in Anglo-Saxon Literary Culture* (Cambridge: D. S. Brewer, 2020), p. 55.

⁴⁹ Danielle Jacquart, 'Medical Scholasticism' in *Western Medical Thought from Antiquity to the Middle Ages*, by M.D. Grmek, (Massachusetts, London: Harvard University Press, 1998), 197-240 (p. 200).

⁵⁰ Pedro Gil Sotres, 'The Regimens of Health', in *Western Medical Thought from Antiquity to the Middle Ages* ed. M. D. Grmek, 291-398 (p. 296).

⁵¹ J. M. Riddle, 'Theory and Practice in Medieval Medicine,' *Brepols Online* pp. 157-184, (p. 161).

⁵² Richard E. Sullivan, 'Early Medieval Missionary Activity: A Comparative Study of Eastern and Western Methods', *Church History*, 22. (1954), 17-35 in J. M. Riddle, (p. 161).

⁵³ Pedro Gil Sotres 'The Regimens of Health' in *Western Medical Thought from Antiquity to the Middle Ages* ed. M. D. Grmek, 291-398 (p. 293).

that a person could only control in part, whereas natural alluded to the system of humours, elements, qualities, and forces within the body itself.⁵⁴

Medical education during this period was not governed or licensed, and the study and compilation of rational medicine, including its practice in the Early Anglo-Saxon period, was largely confined to monasteries. The tenth century *Bald's Leechbook* is an example of a monastic medical manual created possibly at Winchester, and probably for practical use, and is perhaps an illustration of King Alfred's earlier drive to establish literacy in England. Although its construction draws on Greek and Latin sources, the book, written in the vernacular, clearly contains locally available constituents, shortening some of the Latin recipes and removing ingredients difficult to access in England.⁵⁵ Another example for practical application is Pseudo-Apuleius' *Old English Herbarium*, a translation from several Latin works, which illustrates amongst other subject matter, the great diversity of medicinal herbs available to the monks.⁵⁶ However, aside from clerics, there were many other sources of healing and a variety of practitioners, with treatment generally determined by wealth.⁵⁷ If a person was poor, treatment was tailored to simple remedies, easily sourced. Wealth allowed for the physician to prescribe more unusual treatments.⁵⁸ Educated physicians would generally adhere to observational traditions, with recourse to medical treatises to determine the diagnosis, prognosis and treatment.⁵⁹ Initial management would include an assessment of the clinical symptoms including waste products, palpation, pulses, inspection of the urine and the arrival at a diagnosis and prognosis.⁶⁰ Medicine was a melting pot of ancient customs, folkloric beliefs, astrology, magic, and learned or rational medicine.⁶¹ Leeches or physicians (the term is interchangeable), often learned their skills through a family tradition; the medical expertise was variable, and diagnosis dependent upon the level of knowledge of the practitioner.⁶² The medical practitioner gave a prognosis based on their previous

⁵⁴ P. E. Pormann and E. Savage-Smith, *Medieval Islamic Medicine* (Edinburgh: Edinburgh University Press, 2008), p. 44.

⁵⁵ Vivian Nutton, 'Early-Medieval Medicine and Natural Science', in *The Cambridge History of Science Vol 2, Medical Science*, ed. David Lindberg & Michael Shank, 323-363 (p. 337).

⁵⁶ N. Siraisi, *Medieval and Early Renaissance Medicine*, p. 10., M. Cameron, *Anglo-Saxon Medicine*, p. 32.

⁵⁷ P. E. Pormann and E. Savage-Smith, *Medieval Islamic Medicine*, p. 94.

⁵⁸ N. Siraisi, *Medieval and Early Renaissance Medicine*, p. 147.

⁵⁹ N. Siraisi, *Medieval and Early Renaissance Medicine* p. 124.

⁶⁰ N. Siraisi, *Medieval and Early Renaissance Medicine* p. 105.

⁶¹ D. J. Collins, 'Magic in the Middle Ages', 410-422 (p. 412).

⁶² J. M. Riddle, 'Theory and Practice in Medieval Medicine', *Brepols Online* 157-184 (p. 159).

experience as well as astrological and magical calculations.⁶³ Literate Anglo-Saxon physicians or leeches conceivably had access to various Latin and Greek medical texts combined with a comprehensive knowledge of herbs.⁶⁴ For example, pharmaceutical treatises such as Dioscorides' *De materia medica* (50-70 AD), had been in circulation from the sixth century.⁶⁵ Leeches familiar with Galenic theories would employ humoral theory and formulate more complex remedies. Other less knowledgeable leeches would at least have empirical knowledge on where to find or grow the herb, how to measure quantities, distil and create the recipes.⁶⁶ Diet, surgery or medicine would be treatment options. Diet was employed to cure a slight humoral imbalance, whereas surgery, including cauterization, was used to address varying degrees of impairment.⁶⁷ Bloodletting had a superstitious element to it, with some days being more auspicious than others, and astrological and lunar calendar dates were influential in outcomes.

Women, both as midwives and healers would have learned plant lore and healing as a craft and been in demand for their skills with herbs and amulets. As Sally Crawford notes, early medieval burial sites support this notion, with women buried with evidence of bags of herbs suggesting them to have been considered healers.⁶⁸ What can be established is that herbal medicine, although generally accepted as being a predominantly ecclesiastical pursuit, was in reality, not confined to the learned or rational medicine found in monasteries. Healers or leeches, wise women and secular physicians all had knowledge of plants and their properties and were active in both rural and urban communities across England.

Monastic influences

Unfortunately, evidence of England's medical tradition prior to the Anglo-Saxons, has proven elusive following the devastation created by the Danish invasions.⁶⁹ However, surviving examples of ecclesiastical writing support our understanding of the transmission of

⁶³ N. Siraisi, *Medieval and Early Renaissance Medicine* p. 149.

⁶⁴ Stanley Rubin, 'The medical practitioner in Anglo-Saxon England', *J. Roy. Coll. Gen. Practit.* 20 (1979), p. 63.

⁶⁵ J. M. Riddle, 'Theory and Practice', 157-184 (p. 162).

⁶⁶ Stanley Rubin, 'The medical practitioner in Anglo-Saxon England' p. 66.

⁶⁷ Antonio Fornaciari, Valentina Giuffra, Valeria Mongelli, Davide Caramella, Gino Fornaciari, 'Cautery in medieval surgery: a unique palaeopathological case', *The Lancet*, 392 September 29 (2018), p. 1111

⁶⁸ Sally Crawford, 'The Nadir of Western Medicine? Texts, Contexts and Practice in Anglo-Saxon England', 41-51, p.46, in *Bodies of Knowledge: Cultural Interpretations of Illness and Medicine in Medieval Europe*, eds. Sally Crawford and Christina Lee. *Studies in Early Medicine* 1 (Oxford: Bar International Series, 2010).

⁶⁹ C. H. Talbot, *Medicine in Medieval England* (London: Oldbourne Book Co. Ltd.) p. 10.

trade between monastic houses in England and Europe, in both knowledge and medicines. Latin medical literatures, such as Bede's, (673-735) Ch. 30 (*De aequinoctiis et solstitiis*) of his *De temporum ratione*, which discusses the 'physical and physiological fours, their correspondence with the four winds, four seasons and four elements of the physical world, the four ages and the four humours of man', informs our understanding of monastic interest in theories of health.⁷⁰ Furthermore, a surviving eyewitness account of Bede's last hours also alerts us to his having possessed pepper and incense, both of which are found in medical recipes, and are not indigenous to England.⁷¹ Confirmation of the spread of Anglo-Saxon trading activities is also found in correspondence between the Bishop of Winchester, to the Bishop of Mainz, enquiring about medical books and ingredients which he had difficulty locating.⁷²

Christianity traditionally combined ancient medical beliefs and superstitions with spiritual care.⁷³ Indeed, Rubin comments on the participation of clerics in medicine, with recipes signifying the use of Latin prayers, chants and incantations together with cautionary advice on the avoidance of bloodletting on Holy days.⁷⁴ The Church of late Antiquity and the early Middle Ages adopted a number of interpretations to enable the assimilation of what may be judged as natural, as opposed to manipulative magic.⁷⁵ The use of holy water and relics are an example of the Church's distinction between the agencies of miracles and magic.⁷⁶ An illustration of the co-existence between theology and magic is located in Pope Gregory the Great's *Dialogue*, The Life of St Benedict. This is littered with supernatural and miraculous wonders he performed which are characterised as miracles rather than activities designed to summon the forces of darkness.⁷⁷

⁷⁰ M. L. Cameron, *Anglo-Saxon Medicine* p. 28.

⁷¹ M. L. Cameron, *Anglo-Saxon Medicine* p. 147.

⁷² M. L. Cameron, 'The sources of medical knowledge', II, 135-155 (p. 137).

⁷³ N. Siraisi, *Medieval and Early Renaissance Medicine* p.7.

⁷⁴ Stanley Rubin, 'The medical practitioner', pp.66-68.

⁷⁵ D. J. Collins, 'Magic in the Middle Ages', 412-422 (p.411).

⁷⁶ Valerie Flint, *The Rise of Magic in Early Medieval Europe* (United States: Princeton University Press, 1991), p. 8.

⁷⁷ John B. Wickstrom, 'Gregory the Great's 'Life of St. Benedict' and the Illustrations of Abbot Desiderius II', *Studies in Iconography* 19. (1998) 31-73 (p. 42).

The Roman Catholic Church's doctrine opined that natural causes lead to illness and disease, with pain and sickness the punishments of sin.⁷⁸ Consequently, faith and prayer became inextricably associated with medical practice and healing.⁷⁹ Monasteries, such as the Benedictines, provided for the care and spiritual counsel of the sick by associating the health of the body with that of the soul, according to the *Rule of St. Benedict*.⁸⁰ St. Benedict initially regarded his *Rule* as being restricted to the care of monks rather than the lay population.⁸¹ However, this is not to say monk physicians did not treat people outside the cloister, but that they were selective, and tended to treat individuals who perhaps were critical to the monasteries' financial wellbeing.⁸² The central tenets of monastic compassion and charity gradually expanded to catering for a broader and changing spectrum of society. Whilst monasteries had the equivalent of sanatoriums for the monks, some founded hospitals separate to the monastery but built on the same architectural arrangement, whilst others established almonries at the gates of the monastery.⁸³ This ensured the monastery retained the control of both the spiritual and physical care of the invalid, whilst attending to the relief of their suffering.⁸⁴ Early houses were charitable institutions primarily for the traveller or returning crusader, but with the growth of pilgrimage the role of the hospital developed from guesthouse to infirmary.⁸⁵ Monastic hospitals followed the daily routine of the monastery of prayer, silence, fasting and uniform clothing.⁸⁶ The causation of illness was less important than the preservation of the soul, and treatment was based on prevention and cure in this life or the next, for which masses could be purchased to safeguard such events.⁸⁷

Because plants were believed to be of God's creation for the purpose of man's benefit, herbal therapy was an integral component of monastic life. The Bible emphasises this view by

⁷⁸ D. A. Furniss, 'The Monastic Contribution to Medieval Health Care', *J. Roy. Coll. Gen. Practit.*, 15 244-250 (p.244).

⁷⁹ Rachel Hajar, 'The Air of History (Part II) Medicine in the Middle Ages', *Heart views: the official journal of the Gulf Heart Association*, 13 4 (2012), 158-62 (p. 158).

⁸⁰ E. A. Hammond, 'Physicians in Medieval English Religious Houses', *Bulletin of the History of Medicine*, 32 2 March-April (1958), 105-120 (p. 105).

⁸¹ E. A. Hammond, 'Physicians in Medieval English Religious Houses', p 110.

⁸² Katherine Park, *Medicine and society: historical essays*. ed. Andrew Wear (Cambridge: Cambridge University Press, 1992), 59-90 (p.68).

⁸³ Gilchrist, R., 'Spirit, Mind and Body: The Archaeology of Monastic Healing', in: *Sacred Heritage: Monastic Archaeology, Identities, Beliefs* 71-109 p.72. (Cambridge: Cambridge University Press, 2020).

⁸⁴ D. A. Furniss, 'The Monastic Contribution', 244-250 (p. 244).

⁸⁵ R. M. Clay, *The Medieval Hospitals of England* (London: Methuen & Co., 1909), p. 5.

⁸⁶ Edward J. Kealey, *Medieval Medicus*, p.107.

⁸⁷ R. Williamson, *Med.hist.*, 1 51, in D. A. Furniss, *The Monastic Contribution to Medieval Health Care*, p. 245.

naming a variety of plant species as medicaments.⁸⁸ The scriptures support the belief of a connection between religion and medicine.⁸⁹ ‘Their fruit will be used for food and their leaves for medicine’.⁹⁰ The medicinal herb or physick garden provided the monk physician with all the pharmaceutical resources necessary. Monastic and secular physicians examined medical texts on the observable and theoretical foundation of herbs and implemented treatment regimens based on Galen’s theory of the four humours, as well as alternative theories that included magic and astrology.⁹¹

Monastic medicine saw a decline towards the end of the thirteenth century when the practice of medicine became associated less with spiritual rewards and more with profit led professionalism. The Church introduced rulings to restrict the opportunities for monks to practise ‘for the purposes of temporal gain’ with several statutes between 1130 and 1215.⁹² As medical education and practice gradual moved away from the monasteries, the study of medicine gravitated towards a secular model, employing a Latin-based curriculum including an accumulation of newly translated Arab-Islamic texts.

Arab-Islamic Influences

The Norman Conquest of 1066 established cultural and political ties between England and Normandy. The influx of Norman migrants, including physicians, resulted in a gradual blending of medical traditions from Anglo-Saxon to Anglo-Norman. Trade and travel expanded because of the alliance, and with it came the adoption of continental medical ideas into English medical traditions.⁹³

At the same time Western Europe including the Anglo-Saxons, was using a predominantly herbal dispensary based on known Latin translations from Classical Antiquity, and combined with charms, astrology and superstition; the physicians in the East were developing a system of medicine using not only Greek and Roman texts unavailable to the West, but

⁸⁸ K.Madra-Gackowska, E. Glowczewska and M. Gackowski, ‘Medications of medieval monastery medicine’ in *Journal of Education, Health and Sport*, September (2018), 1667-1674 (p.1668).

⁸⁹ K. Madra-Gackowska et al. p. 1668.

⁹⁰ Ezekiel 47:12 quoted in Madra-Gackowska et al. p.1668.

⁹¹ B. C. Silverman, ‘Monastic Medicine: A Unique Dualism Between Natural Science and Spiritual Healing’, *HURJ*, Spring 1 (2002), 10-15 (p. 11).

⁹² T. G. Benedek, ‘The Shift of Medical Education into the Universities’, in *University World: A Synoptic View of Higher Education in the Middle Ages and Renaissance*, ed. Douglas Radcliff-Umstead (University of Pittsburgh Medieval and Renaissance Studies Committee, 1973).

⁹³ Edward J. Kealey, *Medieval Medicus*, p. 2.

incorporating Syriac, Persian and Indian medical translations.⁹⁴ Whilst England was transitioning from Anglo-Saxon to Anglo-Norman rule, the influence of Salerno and the medical schools of the Continent was expanding.⁹⁵

Salerno

In any analysis of medieval medicine, the medical school of Salerno is pivotal in as much as Medieval medical historians delineate medicine into pre and post Salernitan medicine. Between approximately 1050 and 1225, as western medical practice became more theoretical in what medical historians describe as the ‘twelfth century renaissance’, medicine developed, into ‘a rich, and specialised, flourishing tradition of practice’.⁹⁶ This was evident no more so than in Salerno in southern Italy, where the school of medicine had gained distinction from the late tenth century as being a centre renowned for its practical rather than theoretical medical teachings. Medical knowledge at Salerno, whilst rooted in Greek antiquity, had relied on a practical approach to healing.⁹⁷ Around the eleventh century, the school experienced a change in its medical doctrine, adopting a more conjoined perspective of theoretical and observational education.⁹⁸ During this period a system of teaching was established using commentary that expounded the works of a number of classical writers including Hippocrates in his *Aphorismi and Prognostica*, Galen’s *Tegni*, The *Isagoge* of *Johannitius*, the writings of *Theophilus* and *Philaretus*, and the Hippocratic *De regimine acutorum morborum*, which collectively became known as the *Articella*.⁹⁹ A further known manuscript, the *Passionarius Galeni* compiled by Garioponto, a renowned teacher at Salerno, is thought to have been collated from various source materials and used as what may have been considered to be an early medical textbook.¹⁰⁰

This introduction of previously unknown Arabic translations, predominantly translated by Constantine the African, contributed to the change in focus of medical education, affording a more theoretical understanding of rational medicine to run alongside its practical application.

⁹⁴ Peter E. Portmann and Emilie Savage-Smith, *Medieval Islamic Medicine*, p. 36.

⁹⁵ Nancy G Siraisi, *Medieval and Early Renaissance Medicine*, p.13.

⁹⁶ Nancy G Siraisi, *Medieval and Early Renaissance Medicine*, p.1.

⁹⁷ Danielle Jacquart, ‘Anatomy, Physiology and Medical Theory’, in *The Cambridge History of Science* Volume II, ed. David C. Lindberg and Michael H. Shank, 590-610 (p. 590).

⁹⁸ Paul Oskar Kristeller, ‘The School of Salerno: Its Development and its Contribution to the History of Learning’, *Bulletin of the History of Medicine*, February 17 2 (1945), 138-194 (p. 148).

⁹⁹ Jon Arrizabalaga, ‘The Articella in the Early Press, c. 1476-1574’, *Cambridge Wellcome Unit for the History of Medicine*, 2 (1998), Barcelona. p. 5.

¹⁰⁰ Brian Lawn, *The Salernitan Question* (Oxford: The Clarendon Press: 1963), p. 17.

Constantine's translations also included seminal works such as Hunayn's *Introduction to Medicine* and al- Majusi's *Complete book of the Medical Art* otherwise known as the *Pantegni*.¹⁰¹ This association between the School of Salerno and the Abbey of Monte Cassino, the home of Constantine, facilitated medicine as an art being given increased prominence leading to its recognition as a natural science. Humoral pathology became more refined, building on mathematical principles such as the doctrine of the four degrees for compound medications.¹⁰² Strohmaier argues that the translations from Arabic into Latin were fundamentally Galenic theory and that in his opinion, Arabic medicine was not necessarily as innovative as first thought.¹⁰³ However, he reasons that the advances of Continental medicine with a greater focus on Arabic medicine did introduce a more effective system of healing. The translations from tomes such as Avicenna's *Canon of Medicine*, offered a more detailed understanding of Galenic theory and awareness of the natural sciences.¹⁰⁴ We can therefore assume that Constantine's translations gave fresh impetus to scientific and medical writings and opened the gateway to the spread of Arab-Islamic medicine into Europe. Indeed, by the twelfth and early thirteenth century Burnett notes the increase in translations from Arabic in major centres in England,¹⁰⁵ by scholars such as Adelard of Bath who, according to Lawn, was known more for his writings on traditional early medieval medicine, but whose *De eodem et diverso*, and the *Quaestiones naturales* for example, were thought to have been influenced by Constantine the African.¹⁰⁶

The upsurge in Latin translations stimulated the study of medicine, and around the mid thirteenth century it became part of the university curriculum in Europe. Initially limited to academic faculties in Paris and Montpellier, its popularity gradually spread through Italy, Germany, and England.¹⁰⁷ This increase can be credited in part to a developing professionalisation and secularisation that paralleled both an upsurge in population and the

¹⁰¹ Peter E. Portmann and Emilie Savage-Smith, *Medieval Islamic Medicine*, p. 164.

¹⁰² Gotthard Strohmaier, 'Reception and Tradition: Medicine in the Byzantine and Arab World', in *Western Medical Thought from Antiquity to the Middle Ages* ed. M. D. Grmek, 139-169 (p. 1584).

¹⁰³ Gotthard Strohmaier, 'Reception and Tradition: Medicine in the Byzantine and Arab World', in *Western Medical Thought from Antiquity to the Middle Ages* ed. M. D. Grmek, 139-169 (p. 163).

¹⁰⁴ Gotthard Strohmaier, 'Reception and Tradition: Medicine in the Byzantine and Arab World', ed. M. D. Grmek, ed. *Western Medical Thought from Antiquity to the Middle Ages* 139-163 (p. 163).

¹⁰⁵ Charles Burnett & Peter Murray, 'Scientific and Medical Writings,' in *The Book of Britain Vol 2. 1100-1400* (Cambridge: Cambridge University Press, 2014), 446-462 (p. 451).

¹⁰⁶ Brian Lawn, *The Salernitan Question*, p.20.

¹⁰⁷ Danielle Jacquart, 'Anatomy, Physiology and Medical Theory', in *The Cambridge History of Science Volume II*, ed. David C. Lindberg and Michael H. Shank 590-610 (p. 590).

expansion of scholasticism.¹⁰⁸ As a result, the early medieval traditions of medicine gave way to the principles of theory and education. Monastic healing was still practised, but universities became the centres of medical education.

Medical Manuscripts

Scholarly opinion agrees that the medical manuscripts prior to 1100 in England, apart from assorted remedies found in non-medical texts, and odd remnants of what may have once been complete manuscripts, are held primarily in four surviving collections, and as such, occupy an important role in facilitating our understanding of the vernacular literature of Anglo-Saxon culture.¹⁰⁹ In truth there is limited evidence surrounding actual medical practice and its practitioners in Anglo-Saxon England, and our knowledge is based largely on assumptions.¹¹⁰ That a large proportion of medical knowledge and practical care was provided by monasteries is derived from our access to the extant medical treatises that circulated between ecclesiastical communities, demonstrating the active business of study, translation, compilation and creation of texts, including medical ones. Their format was empirical, suggestive of basic explanations of medical theory, guidelines on prognosis and diagnosis, together with organised recipe lists, all of which were useful in practice.

The surviving Old English medical collection, extant in multiple manuscripts, consists of the *Old English Pharmacopeia*, a translation of several Latin works that were organised skilfully from several treatises to generate a vernacular pharmacopeia.¹¹¹ Assembled in two halves, and dating from the end of the Anglo-Saxon period it comprises of the *Old English Herbarium* and the *Medicina de Quadrupedibus*. Doyle found the *Pharmacopeia* to be collated from an amalgamation of associated texts, including writings from pseudo-Antonius Musa, Apuleius Platonicus and Pedanius Dioscorides of Anaxarbus.¹¹² Kesling suggests that *the Old English Herbarium* derives principally from the fourth century *Herbarium Apuleii*.¹¹³ Three further

¹⁰⁸ David C. Lindberg, *The Beginnings of Western Science: The European Scientific Tradition in Philosophical, Religious, and Institutional Context, 600 B.C. to A. D. 1450* (Chicago: The University of Chicago Press, 1992), p.329.

¹⁰⁹ Emily Kesling, *Medical Texts in Anglo-Saxon Literary Culture* (Cambridge: D. S. Brewer, 2020), p. 2.

¹¹⁰ Emily Kesling, *Medical Texts*, 155.

¹¹¹ Emily Kesling, *Medical Texts*, p. 4.

¹¹² Conan Doyle, 'Anglo-Saxon Medicine and Disease' p.51.

¹¹³ Emily Kesling, 'Translation style in the Old English Herbarium', *Notes and Queries*, March (2016)

medical treatises of significant importance that facilitate our knowledge of earlier Anglo-Saxon medicine are *Bald's Leechbook*, *Leechbook III* and the *Lacnunga* Manuscript.¹¹⁴

These texts are thought to represent compilations of popular or classical medicine. They appear to be revisions of older classical sources rather than direct translations, with the addition of native ingredients blended with 'liturgical, popular, and folkloric healing practices'.¹¹⁵ The texts themselves whilst limited in theoretical content, support an understanding of humoral theory as demonstrated in *Bald's Leechbook*. Kesling observes that whilst most medical care in Anglo-Saxon England would have been practised by leeches with little education and no access to medical texts, these manuscripts represent an 'elite facet of medical care', implying a type of educated medical class.¹¹⁶ She proposes these collections to be examples of the ecclesiastical accomplishments of the Anglo-Saxon period, demonstrating the skills of the compilers in transcribing, collating and organising extensive collections of remedies together with commentary drawn from Late Antique medical material.¹¹⁷

This brief introduction to the Old English medical collection does not characterise the entire accumulation of vernacular medical writing from the Anglo-Saxon period. It does, however, demonstrate the breadth of learning and expertise available during this period, and is testimony to the cross-cultural achievements, travel, and trade of the Anglo-Saxons.

As English medicine developed, Charles Burnett describes the twelfth and thirteenth centuries as being witness to a large increase in translations from Greek and Arabic scientific texts, creating one of the 'greatest shifts in Western science'.¹¹⁸

Evidence of this accelerated growth is found by comparing the numbers of surviving European medical manuscripts covering the 'presalernitan' period (c.800-c. 1100) to those

¹¹⁴ Stephen Pollington, *Leechcraft Early English Charms, Plantlore and Healing* (Ely, Cambridgeshire: Anglo-Saxon Books, 2011), 25-29.

¹¹⁵ R. A. Buck 'Woman's Milk in Anglo-Saxon and Later Medieval Medical Texts' *Neophilologus* 96, (2012), 467-485 (p. 476),

¹¹⁶ Emily Kesling, *Medical Texts*, p. 156.

¹¹⁷ Emily Kesling, *Medical Texts*, p. 3.

¹¹⁸ Charles Burnett 'Translation and Transmission of Greek and Islamic Science to Latin Christendom', in *The Cambridge History of Science* Vol 2, ed. David C. Lindberg and Michael H. Shank (Cambridge: Cambridge University Press, 2013), 341-364 (p.341).

between c.1075 and c.1200. The numbers quadrupled, representing a clear movement in medical scholarly activity.¹¹⁹

Progressively, with the adoption of Arabic medicine, medical writers endeavoured to synthesise Arabic theory and a new pharmacopeia into old knowledge and abandon that which was not grounded in rational theory. Examples of this are found in manuscripts such as the *Passionarius Galieni*, an early medieval manuscript initially uninfluenced by Islamic medicine, but, by the twelfth century, appears to have been annotated and amended, such as evidenced by research undertaken by Debbie Banham on Royal MS 12 C xxiv.¹²⁰ She observed that alterations to the manuscript were made much later to the original script including corrections and clarifications, suggesting medicine evolved by blending and amalgamating old and new ideas.¹²¹ The vocabulary of medical texts became Latin based, and contained sustained discussions on humoral theory. Banham claims that the Arab-Islamic influences introduced a more learned approach to medicine, broadening England's connections with the Continent and extending the transmission of knowledge.¹²²

Textual evidence suggests that although the vernacular languages of Old English and Anglo-Norman French continued to be read equally up to the middle of the fourteenth century, Middle English as a language (derived from a composite of the two) was established by the early thirteenth century, and gradually superseded them.¹²³ By the fourteenth century, Charles Burnett maintains the rise in literacy dictated an increase in manuscript production in both Latin and the vernacular of Middle English to meet the demands of the populace, with the medical book in England no longer created purely for the universities.¹²⁴ These Middle

¹¹⁹ M. H. Green 'Medical Books' in E. Kwakkel and R. Thomson, ed. *The European Book in the Twelfth Century* (Cambridge: Cambridge University Press, 2018), 277-292 (p. 278).

¹²⁰ D. Banham, 'Medicine at Bury' in *Bury St Edmunds and the Norman Conquest*, ed. T. Licence (Woodbridge: Boydell & Brewer, 2014), 226-247 (p. 246)

¹²¹ D. Banham, 'Medicine at Bury', p. 246.

¹²² D. Banham, 'Medicine at Bury', p. 245.

¹²³ Rodney M. Thomson and Nigel Morgan, 'Language and Literacy' in *The Cambridge History of the Book in Britain*, ed. Nigel J. Morgan and Rodney M. Thomson, (Cambridge: Cambridge University Press, 2014), 446-453 (p. 26).

¹²⁴ Peter Murray Jones, 'University books and the sciences,' in *The Cambridge History of the Book in Britain*, ed. Nigel J. Morgan and Rodney M. Thomson (Cambridge: Cambridge University Press, 2014), 453-462 (p. 461).

English manuscripts translated from Latin medical treatises became a popular source of information, albeit lacking in theoretical grounding, for general consumption.¹²⁵

Migraine

This dissertation is focused on migraine, a condition that has been documented throughout history. Chapter one will conclude with a general account of the disorder up to the Middle Ages as a background to chapter two, which analyses the manuscripts within which the recipes for the treatment of migraine are detailed. The characteristics of migraine today are a moderate or severe headache felt as a throbbing, usually unilateral pain, accompanied by nausea, vomiting, photophobia, and phonophobia.¹²⁶ It affects over twenty per cent of people at some point during their lives, accounting for substantial losses in terms of work absence and reduced productivity, not including the social impacts on family life.¹²⁷ The cause of migraine is unknown, but it is believed to be a neurovascular disorder with aura being a primary feature of classification. Triggers can include stress, tiredness or certain foods or drinks, however, there is also the possibility of genetic influences.¹²⁸

Symptoms of migraine are consistent across the centuries incorporating visual disturbances, a violent pain in the temple and digestive disturbances often involving vomiting. Because signs are often common to more than one illness, and because there are issues concerning the interpretations of an individual's experience, we must be careful in approaching historic cases of migraine. Indeed, Katherine Foxhall points out the neurological experience of migraine across history can only be defined by the sufferer as it leaves no bioarchaeological evidence.¹²⁹ However, treatment has been documented across the world including Mesopotamia, Egypt and Greece and the practice of trepanation, (to remedy the conditions by removing a piece of skull to release evil spirits) is evidence of attempts to cure chronic headaches including migraine.¹³⁰ Hippocrates of Kos (460-370 BC), described migraine in

¹²⁵ Charles Burnett, 'The Introduction of Scientific Texts into Britain, c. 1100-1250,' in *The Cambridge History of the Book in Britain*, ed. Nigel J. Morgan and Rodney M. Thomson, 446-453 (p. 461).

¹²⁶ Yulong Chen, Shengpeng Wang and Yitao Wang, Role of herbal medicine for prevention and treatment of migraine, *Phytotherapy Research*, 1. 2. (November 2021), 730-760 (p.730).

¹²⁷ M. D Ferrari, 'The Economic Burden of Migraine to Society', *Pharmacoeconomics* 13. (1998), 667-676 (p. 667).

¹²⁸ [www.nhs](https://www.nhs.uk/conditions/migraine/) Migraine overview

¹²⁹ Katherine Foxhall, 'Making Modern Migraine Medieval: Men of Science, Hildegard of Bingen and the Life of a Retrospective Diagnosis', *Medical History* 58 3 (2014), 354-374 (p. 357).

¹³⁰ A. Zargarani, Afshin Borhani-Haghighi, Pouya Faridi, Saeid Daneshamouz and Abdolali Mohagheghzadeh, 'A review on the management of migraine in the Avicenna's *Canon of Medicine*', *Neurological Science*, 37 (2016), 471-478 (p. 472).

terms of humoral theory with and without aura, describing it as a result of vapours ascending from the liver to the head, and advocating herbal remedies and bloodletting.¹³¹ Aretaeus of Cappadocia (30-90 AD) separated headaches into three categories:

1. *cephalalgia*, mild and short term,
2. *cephalea*, chronic and intense
3. *heterocrania*, a severe pain to one side of the head accompanied by vomiting, photophobia, and osmophobia.¹³²

Galen (129-210 AD), following in the footsteps of Hippocrates, described migraine also in terms of its humoral context, as being caused by the ‘ascent of vapours from the stomach that were excessive, either too hot, or too cold’.¹³³ Alexander of Tralles (525-605 AD) attributed migraine to an excess of yellow bile in his first book of the *Medici libri duodecim*.¹³⁴ Avicenna (980-1032) in his *Canon of Medicine* (the primary medical text until the seventeenth century), separated migraine into two categories of either Hot or Cold, also basing his definition on the principles of humoral theory, and prescribing treatments of herbal formularies, bloodletting and enema.¹³⁵ Hildegard of Bingen (1098-1179), in her *Liber Compositae Medicinae; Causae et Curae*, Book of Compound Medicine, Causes and Cures suggests migraine to affect only half the brain because ‘its strength is such that if it seized the whole head, a person would not be able to endure it’. Treatments have included poultices soaked in various herbal solutions to wrap around the head whilst others have prescribed herbal concoctions to purge the body and expel the noxious humours. This brief synopsis of migraine demonstrates the evolution of ideas on migraine through the early medieval period. The general premise appears to follow the notion that migraine was attributable to humoral traditions of digestive disturbances and the upward flow of bile.

¹³¹ Pricilla Throop, ‘*Hildegard of Bingen Causes and Cures*,’ the complete English translation of Hildegardis Causae et Curae Libri VI, 2nd edn. (Charlotte Vermont: Medieval MS, 2008), 74-5 (p.135), cited in Foxhall, Medical History, (2014).

¹³² P. J. Koehler and T. W. van de Wiel, ‘Aretaeus on migraine and headache’, *Journal of Hist Neuroscience* (2001) 253-261 (p. 255).

¹³³ Foxhall, ‘Making Modern Migraine Medieval’, p. 358.

¹³⁴ Angel Luis Guerrero-Peral, Virginia de Frutos Gonzalez and Maria Isabel Pedraza-Hueso, ‘Galeatea: chronic migraine independently considered in a medieval headache classification’, *Journal of Headache and Pain* 15 16 (2014), p.2.

¹³⁵ A. Zargaran, et al., ‘A review on the management of migraine in the Avicenna’s *Canon of Medicine*’, p. 478.

CHAPTER TWO Description and Comparison of Manuscripts

Bald's Leechbook

This is the oldest surviving example of a comprehensive medical work, dating from approximately 950 AD. It is believed to be a copy of an earlier work created during the period of vernacular book production generated during King Alfred's intellectual endeavours to improve literacy in England. The style of handwriting suggests it was most probably compiled in Winchester, possibly at the Abbey scriptorium.¹³⁶ Opinion as to the provenance of *Bald's Leechbook*, its professionalism, the quality and quantity of both its ingredients and prescriptions, and its attention to the patient, has led academics to consider the type of physician it was compiled for. Its characteristics are suggestive of its use by professional physicians and probably for wealthy if not Royal patrons.¹³⁷

From the portable size of the original book, we may take its purpose to be a working reference book. This does not seem to be the case with Royal MS 12 D. xvii, as its size would have made it unwieldy.¹³⁸

The manuscript is a parchment codex in three separate texts. *Bald's Leechbook* refers to the first two texts namely *Leechbook I* and *Leechbook II*.¹³⁹ The first two books covering both internal and external complaints, f.1r-109r are thought to follow each other, and whilst sharing similarities of medical material with Book III, (f.109r – 127v), are more structured and better organised.¹⁴⁰ Book III is considered as a separate and later inclusion, perhaps as the assorted remedies share a simpler but tangible association with the first two books.¹⁴¹ At the end of Book II, a break occurs with a colophon separating the first two books from *Leechbook III*. The colophon gives us the title *Bald's Leechbook* for the first two volumes, although whether Cild was instructed to either transcribe or compile the book, '*Bald habet*

¹³⁶ Stephen Pollington, *Leechcraft, Early English Charms Plantlore and Healing*, p.69. British Library, Royal MS 12 D XVII-Digitised Manuscripts, <http://www.bl.uk>.

¹³⁷ Stephanie Hollis, 'Scientific and Medial Writings,' in: Phillip Pulsiano and Elaine Trehanne, *Anglo-Saxon Literature* (Oxford: Blackwell Publishers Ltd., 2001), p.203.

¹³⁸ Richard S. Nokes, The several compilers of Bald's Leechbook, *Anglo-Saxon England*, 33 (2004) pp. 51-76 (p. 70).

¹³⁹ C. E. Wright, '*Bald's Leechbook*: British Museum Royal manuscript 12 D. xvii', f. 109r (Baltimore: John Hopkins Press, 1955), p. 14.

¹⁴⁰ Emily Kesling, *Translation style in the Old English Herbarium* (Cambridge: D. S. Brewer, 2020), p.57.

¹⁴¹ J. N. Adams and Marilyn Deegan, Bald's Leechbook and the Physica Plinii, *Anglo-Saxon England*, 21. (1992), 87-114 (p.88).

hunc librum Cild quem conscribere iussit’, remains unclear.¹⁴² Indeed, as Wright notes, our understanding as to Bald being the author or owner remains equally indistinct.¹⁴³

Nonetheless, historians acknowledge it to be perhaps the most comprehensive example surviving of Anglo-Saxon medical knowledge.¹⁴⁴

Classical sources

Bald’s Leechbook draws on both Roman and Byzantine medicine. Talbot suggested that the *Passionarius Galeni* (Garioponto) and the *Petrocellus* were sources,¹⁴⁵ but Doyle argues that the *Passionarius*, whilst displaying similarities with *Bald’s Leechbook*, was, in his opinion, unlikely to have been a source for the compiler of *Bald’s Leechbook*, proposing instead that both manuscripts seem to share mutual sources for their compilation both in Latin and the vernacular.¹⁴⁶ Further studies suggest an association between *Bald’s Leechbook* and the *Physica Plinii*, a fifth century medical collection thought to originate from the *Naturalis Historia* of Pliny the Elder, and believed to be from the fourth century. The compiler of *Leechbooks I* and *II* appears to have had access to a redacted version of this from the late ninth century.¹⁴⁷ Doyle’s research into the primary sources for *Book II* of *Bald’s Leechbook* contributes to the scholarly consensus that the compiler demonstrated skill in blending medical detail from both the pseudo-Galenic *Liber tertius* and the *Latin Practica Alexandri*.¹⁴⁸ Cameron proposes that the compiler of *Leechbook I* and *II* used *Oribasius’ Synopsis* and *Euporistes*, as well as the *Practica Alexandri* as direct translations, alongside works from the *Physica Plinii* and Marcellus’ *De Medicamentis*.¹⁴⁹ Banham also comments on the compiler’s knowledge of technical concepts in both Latin and Greek, demonstrated by his proficiency in translating Greek terms through the medium of Latin, into Old English.¹⁵⁰ Meaney agrees with the consensus of opinion regarding the interrelationship between multiple manuscripts illustrated by her review of over a hundred remedies across numerous

¹⁴² Emily Kesling, *Medical Texts in Anglo-Saxon England*, p. 24.

¹⁴³ C. E. Wright, *Bald’s Leechbook*, p. 13.

¹⁴⁴ M. L. Cameron, ‘*Bald’s Leechbook*: its sources and their use in its compilation’, *Anglo-Saxon England*, 12 December (1983), 153-182 (p. 153). Cambridge University Press.

¹⁴⁵ C. H. Talbot, ‘Some Notes on Anglo-Saxon Medicine’, *Medical History*, 9 (1965), 156-169 (p.157).

¹⁴⁶ Conan Doyle, ‘Anglo-Saxon Medicine and Disease’, p.72.

¹⁴⁷ J. N. Adams and Marilyn Deegan, ‘Bald’s Leechbook and the *Physica Plinii*’, 21 87-114 (p.89).

¹⁴⁸ Conan Doyle, ‘Anglo-Saxon Medicine and Disease’, p. 44.

¹⁴⁹ M. L. Cameron, ‘*Bald’s Leechbook*: its sources and their use in its compilation’, (p. 155).

¹⁵⁰ D. Banham, ‘Revealing the beginnings of English medicine at last! A new edition and translation of *Bald’s Leechbook* and *Leechbook III*’, *HerbalHistory.org*, 22 April (2019).

texts. She judges *Bald's Leechbook* to have drawn from both the *Herbarium of Pseudo-Apuleiu* and the *Medicina de Quadrupedibus* of Sextus Placitus.¹⁵¹

That remedies were circulated across many manuscripts is proven by this review of the textual relationships between extant manuscripts and supports our understanding of how Graeco-Roman translations influenced Anglo-Saxon medicine. Furthermore, we can see that Anglo-Saxon medicine was as much a product of classicism as Salernitan medicine, in which case it is unsurprising to see similar approaches and treatments.

In contrast, whilst the first two books of *Bald's Leechbook* offer a blend of local Anglo-Saxon and Mediterranean remedies, *Leechbook III* remains, according to Cameron, an example of northern medicine extant from the Anglo-Saxon period and not influenced by Mediterranean principles.¹⁵² *Leechbook III* remains virtually intact, comprising seventy-six chapters containing mainly native remedies using indigenous ingredients with English names, together with a significant number of magical treatments. Cameron speculates that the sources of the few Latin writings apparent in the chapters may have originated from texts similar to those found in *De medicamentis*, a compendium of pharmacological preparations by Marcellus Empiricus, together with material found in the *Herbarium*. Both these texts contain remedies thought to stem from Gaul, and Cameron contends that *Leechbook III* is an example of the Gallic past of English medicine.¹⁵³

The assembling of *Bald's Leechbook* was a process involving several stages. The compilation necessitated collating and organising the remedies, followed by the copying of the text into logical chapters. The roles of compiler and writer could be one and the same person, or a group working as a team. Nokes argues that stylistically the original two works were intended as a discrete two-volume unit and that through transmission they became separated. He proposes that during this period of separation redactions occurred.¹⁵⁴ This he argues, could have been because some remedies were ineffective, or alternatively the omissions may have been unintentional. He proposes that the main text of Royal MS 12 D.

¹⁵¹ A. L. Meaney, 'Variant versions of Old English medical remedies and the compilation of Bald's Leechbook', *Anglo-Saxon England*, 13 (1984), 235-268 (p.242).

¹⁵² M. L. Cameron, *Anglo-Saxon Medicine*, p. 65.

¹⁵³ M. L. Cameron, *Anglo-Saxon Medicine*, p. 36.

¹⁵⁴ Richard S. Nokes, 'The several compilers', 51-76 (p. 51).

xvii, was in one hand, but there were possibly three other hands at work, with additional marginalia added around the eleventh, late twelfth, and early thirteenth centuries. His opinion has generated debate questioning this analysis and suggesting his assessment has not accounted for linguistic variables between Latin and Old English sources.¹⁵⁵

Bald's Leechbook demonstrates a methodical and organised system of composition. The manuscript is comprised of the reunited Books I and II together with the addition of *Leechbook III*. The compilation of *Bald's Leechbook* follows the structure of the classical medical receipt or remedy, namely heading, symptoms, prescription, and method of administration.¹⁵⁶ Each book has a table of contents and is divided into chapters by Roman numerals. Each chapter is headed by the rubric *Laecedomas*, 'Remedies'. Meaney makes a distinction between the usage of the term remedies and recipe. She notes the author prefaced his content with the ailment or condition first and considers the expression 'recipe' as being representative of the preparation of ingredients, whilst the term remedy involves the inclusion of other factors essential for healing, making the term recipe improper.¹⁵⁷

The first volume covers ailments of the visible body from head to toe, while the second addresses internal and general issues. Each bodily component or ailment has its own chapter, with anywhere from one to twenty remedies. The majority of *materia medica* are herbal, with many of the remedies clearly drawn from classical models. *Whilst Bald's Leechbook* is an amalgamation of classical and native medicine, 'popular' aetiology, generally of a supernatural nature and containing characteristics of charms and liturgical practises, is more commonly found in other medical treatises, such as *Leechbook III*.¹⁵⁸

Remedies

The remedies for migraine are found mostly in Book I. Book II contains a reference to a 'great headache' mixed up near the end, alongside remedies for bowel issues and female complaints and recommends a salve and a liturgical prayer as treatment.

Bald's Leechbook remedies for migraine principally originate from the *Physica Plinii*.

¹⁵⁵ Emily Kesling, *Medical Texts* p.28., J. N. Adams and Marilyn Deegan, 'Bald's Leechbook and the *Physica Plinii*', 87-114 (p.88).

¹⁵⁶ Stephanie Hollis, 'Scientific and Medical Writings' in: Phillip Pulsiano and Elaine Treharne, *Anglo-Saxon Literature* (Oxford: Blackwell Publishers Ltd., 2001), p.200.

¹⁵⁷ A. L. Meaney, 'Variant versions' 235-268 (p.235).

¹⁵⁸ M. L. Cameron, *Anglo-Saxon Medicine*, p. 35.

The *Physica Plinii* survives in three main recensions: the *Bamberg* version, the ‘*Sangallensis*’ version and the ‘*Florentino-Pragensis*’ version.¹⁵⁹ The ingredients in the *Bamberg* recension are the same as in *Bald’s Leechbook*, being similarly listed.

- *Bamberg*. 8.17 ‘Item puluere bace lauri temperabis similiter sinapis termperabis aceto acro et linis’.¹⁶⁰
- ‘Likewise, you will temper the powder of laurel with berries; similarly, you will temper mustard, vinegar and flax’
- *Leechbook* 1.1.17 ‘Wiþ healfes heafdes ece. genim laures croppan dust 7 senep meng togædere geot eced on smire mid þa saran healfe mid þy’.
- ‘For *emicraneæ* take dust of bay sprigs and mustard, mix together, pour vinegar in, smear the sore half with that’.¹⁶¹

Cameron also identifies quotations from *De medicamentis* for migraine found in *Bald’s Leechbook*.

- *De medicamentis* 11.18 ‘Bacas lauri ex aceto tritas adiecto oleo impones aduersum eterogranii molestias.’¹⁶²
- ‘You should place the bay berries, rubbed together with the added oil of vinegar, to counteract the inconveniences of *eterogranium*.’
- *Leechbook* 1.1.15 ‘Wiþ healfes heafdes ece laures croppan getrifula on eced mid ele smyre mid þy þæt wenge’.
- ‘For *emicraneæ* sprigs of bay triturated in vinegar with oil, smear the forehead with that’.¹⁶³

Bald’s Leechbook gives six remedies for the ‘*healfes heafdes ece*,’ or half headache, together with an explanation for the causation of the condition. Remedies consist of herbal drinks and topical applications to be smeared or massaged. Measurements are subjective and left to the leech’s judgement. The ‘*healfes heafdes ece*’ was a consequence of the upward motion of harmful vapours or humours. This follows Galenic theory, which held the cause of hemicrania (the term classified by Galen to describe migraine), to

¹⁵⁹ J. N. Adams & M. Deegan, ‘Bald’s Leechbook and the *Physica Plinii*’, p. 91.

¹⁶⁰ J. N. Adams & M. Deegan, ‘Bald’s Leechbook and the *Physica Plinii*’, p. 103.

¹⁶¹ Conan Doyle, ‘Anglo-Saxon Medicine and Disease’, p.24.

¹⁶² M. L. Cameron, ‘*Bald’s Leechbook*: its sources and their use in its compilation’, 153-182 (p.158).

¹⁶³ Conan Doyle, ‘Anglo-Saxon Medicine and Disease’, p.23.

be the rising of harmful vapours from the stomach, so the similarity is evident. Treatment in *Bald's Leechbook* was to bleed from a vein, although it fails to provide a rationale, following which, herbal drinks should be given. This is unclear if it is in conjunction with an herbal concoction, or as an independent remedy. However, one can assume that the restorative effects were achieved by a combination of both. If the disease was from excessive heat, treatment with cold remedies was advocated and vice versa, again seemingly adhering to the Galenic principles of polarity and homeostasis.¹⁶⁴ The herbs used in the drinks, however, are not prescriptive, suggesting the practitioner be cognisant of which herbs provided the appropriate treatment.¹⁶⁵

The practice of phlebotomy to relieve the symptoms of hemicrania illustrates the significance of bloodletting in medieval society.¹⁶⁶ Indeed, its practice was the recommended custom to relieve excess harmful humours.¹⁶⁷ Macfarlane determined from a survey of Old English medical treatises that Anglo-Saxons used humoral theory more as an empirical tool of reasoning and observation to diagnose, rather than the more commonly held evaluation of it being an explanation for the causation of illness.¹⁶⁸ The Greek principals of bloodletting and humoral theory are explained by modern physiology. If blood is left to sit, it coagulates and forms layers. The bottom layer can be associated with black bile, whilst above this lie the red blood cells considered the blood humour. The third layer consists of white cells, the phlegmatic, and the top layer is a clear yellowish serum, the yellow bile.¹⁶⁹ We know that medical collections circulated in Anglo-Saxon monastic circles and that they contained translations of classical theory, so it is more than probable that humoral theory was known to male religious. A description of Anglo-Saxon classical humoral theory is evident in *Bald's Leechbook II* (2) 42, where the writer demonstrates his knowledge of haematology, drawing theory from the fourth-

¹⁶⁴ Katherine Foxhall, *Migraine A History*, p. 26. Denis O'Neil, *Humoral Pathology* (2007)

¹⁶⁵ Conan Doyle, 'Anglo-Saxon Medicine and Disease', p.24.

¹⁶⁶ Angel Luis Guerrero-Peral, Virginia de Frutos Gonzalez and Maria Isabel Pedraza-Hueso, 'Galeata: chronic migraine independently considered in a medieval headache classification', *The Journal of Headache and Pain*, 15. 16, (2014), p. 2.

¹⁶⁷ Katherine Foxhall, *Migraine A History*, p. 35.

¹⁶⁸ R. G. Macfarlane, "Reactions of the Blood to Injury, *Lectures on General Pathology*", ed. Howard Florey (London, 1954), cited in Sharpe, "Isadore", p.25. Shoner discusses this theory and its proponents among German historians of medicine (Shoner, 38-39). cited in L. Ayoub, Old English waeta and the Medical Theory of the Humours, *The Journal of English and Germanic Philology*, Jul. 1995 94. 3. 334-346 (p. 334).

¹⁶⁹ M. L. Cameron, *Anglo-Saxon Medicine*, p. 160.

century Greek physician Philagrius of Epirus. ‘And while the blood is flowing, one should watch the flow, whether it is too red or clear or livid. For, it is livid or reddish, more must be drawn off, if clear, less’. This advice can be found in the Latin sixth century *Practica Alexandri*.¹⁷⁰

Bald’s Leechbook describes the humour or vapour associated with migraine as harmful, although it fails to identify which humour or give any clear direction to correct internal imbalances, aside from the recommendation to bleed and give herbal drinks to establish health and strength. This seems to be the standard treatment in addition to the smearing of the head with herbs mixed in vinegar. The lack of clarity suggests the compiler was confident in his audience’s expertise. Taking the prescriptions for migraine at face value, the guidance suggests one should smear the head with the herbal remedy, bleed the vein, and offer an herbal drink tailoring the whole to suit the disposition of the patient.

Herbs were sympathetically matched to suit an individual’s condition, either hot or cold, which could also be interpreted as a method of balancing the humours. The remedies in *Bald’s Leechbook* contain nettles, laurel, rue, and mustard which were all considered hot and dry. Consequently, hemicrania may have been believed to be more commonly a cold and damp condition.¹⁷¹ *Bald’s Leechbook* mentions several standard solutions into which ingredients for headache or migraine could be mixed. These are, wine, honey, rose juice, butter, oil, vinegar, and water.¹⁷² Although Foxhall wrote that these were common staples and easily sourced,¹⁷³ Banham argued that butter, wine, and oil, were expensive and only available to the upper classes.¹⁷⁴ *Bald’s Leechbook* uses an assortment of solutions and carriers in the migraine remedies, with vinegar in three, egg white in one, oil in one, and wine in one. Vinegar was believed to open the pores thereby allowing the humours to be drawn out and rose vinegar with pounded rue was recommended by Dioscorides¹⁷⁵

¹⁷⁰ L. Ayoub, ‘Old English waeta’, 334-346 (p. 334).

¹⁷¹ Katherine Foxhall, *Migraine A History*, p. 26

¹⁷² Julie Bolotina, ‘Support for the Sick Poor in Anglo-Saxon England,’ *Selected Proceedings from ‘The Maladies, Miracles and Medicine of the Middle Ages’*, March 2014, The Reading Medievalist: A Postgraduate Journal, vol 2. Ed Salter, R. (The Graduate Centre for Medieval Studies, March 2015, 4-28.

¹⁷³ Sally Crawford, ‘The Nadir of Western Medicine? Texts, Contexts, and Practice in Anglo-Saxon England.’ 41-51 in *Bodies of Knowledge: Cultural Interpretations of Illness and Medicine in Medieval Europe*, ed. Sally Crawford and Christina Lee. p. 48. in Katherine Foxhall, p. 27.

¹⁷⁴ Debbie Banham, ‘Food and Drink in Anglo-Saxon England (Stroud: Tempus, 2004), p. 56.

¹⁷⁵ Steven M. Oberhelman, ‘Pharmacological and Non-Pharmacological Treatment of Headaches in Early Modern Cretan Healing Manuals’, *Athens Journal of Health & Medical Sciences* 6.1. 53-68 (p.55).

Cameron argued that the rationale for providing a variety of alternative remedies such as found in *Bald's Leechbook* allowed the physician flexibility, not only for seasonal considerations in native herbs, but to provide the leech with the option to select appropriate plants suitable for an individual's financial constraints.¹⁷⁶ Recurrently in the text the physician is commended to select the herbs most suited to the patient. This suggests the book was collated for the experienced physician. In relation to migraine, the herbs required were both Mediterranean and native to England. Bearing in mind the established links with trade and travel these would probably have been easily grown or sourced as represented below.

- *Leechbook* 1.1.14 'Wiþ healfes heafdes ece genim þa readan netlan anstelede getrifula meng wið eced 7 æges þæt hwite do eall togædere smire mid'. |
- 'For *emicrane*a take the red nettle having one stalk, triturate, mix with vinegar and egg white, add all together, smear with'.

Traced back to both the *Physica Plinii Florentino-Pragensis* and the *Physica Plinii Bambergensis* recensions.¹⁷⁷

- 1.1.15 'Wiþ healfes heafdes ece laures croppan getrifula on eced mid ele smyre mid þy þæt wenge'.
- 'For *emicrane*a sprigs of bay triturated in vinegar with oil, smear the forehead with that'.

Contained in both the *Physica Plinii Florentino-Pragensis* and the *Physica Plinii Bambergensis* recensions and, as commented on by Cameron, the *Marcelli de medicamentis liber*.¹⁷⁸

- *Leechbook* 1.1.16 'Wið þon ilcan genim rudan seaw wring on þæt næsþyrel þe on þa maran healfe bið'.
- 'For the same, take the juice of rue, wring into the nostril which is on the more (painful) side'.

¹⁷⁶ M. L. Cameron, *Anglo-Saxon Medicine*, p. 102.

¹⁷⁷ Conan Doyle, 'Anglo-Saxon Medicine and Disease', p.23.

¹⁷⁸ Conan Doyle, 'Anglo-Saxon Medicine and Disease', p.23.

Contained in both the *Physica Plinii Florentino-Pragensis* and the *Bambergensis recensions*.¹⁷⁹

A further remedy incorporated into the treatment with mustard, suggests mixing wine and bay sprigs, or rue seeds, with vinegar and kneading together in equal amounts, before massaging the neck. The limited remedies for migraine and lack of herbal constituents' contrast with the thirteen remedies for headache employing twenty different herbs. Although rue and red nettle were used in both migraine and headache, mustard and bay laurel were only applied in migraine. This is indicative of the belief that bay and mustard as warming herbs, were beneficial in drawing up harmful humours.

This brief review of *Bald's Leechbook* together with examples of remedies for migraine, has illustrated the professional and practical nature of the work. The study has demonstrated that Anglo-Saxon writers drew together classical Greek and Latin translations of medical theory for migraine, selected those they considered beneficial, and created a reference manual for physicians. The Anglo-Saxons took the principals of humoral theory and adapted them, though it is uncertain if the intention to disregard certain elements of humoral theory was deliberate. The construction of the remedies for migraine gave autonomy to the physician in determining the herbs or drink appropriate, and the quantities needed. Some of the herbs in the book originate from the Mediterranean, such as the bay laurel, which may have been brought to England by the Romans, and then subsequently grown here due to warmer climatic conditions.¹⁸⁰ Notwithstanding, the remedies for migraine appear simple to prepare and provide a choice of ingredients for the physician to use those which were easily sourced. The choice of solutions in which to mix the herbs appears limited to vinegar, egg white, wine and oil which are standard solvents in multiple remedies throughout book.

¹⁷⁹ Conan Doyle, 'Anglo-Saxon Medicine and Disease', p.23.

¹⁸⁰ Linda Voights, 'Anglo-Saxon Plant Remedies', 250-268 (p. 261).

Wellcome MS 537, edited from the Compendium Medicinae of Gilbertus Anglicus.

Wellcome MS 537, is a partial translation in Middle English, edited from the *Compendium Medicinae* of Gilbertus Anglicus. Gilbertus Anglicus, (Gilbert the Englishman, 1180-1230) physician, diplomat, and cleric is thought to have been born in England, a member of the de Aquila family of Essex. Educated initially in England he pursued a medical career, studying at Salerno in Italy and spending much of his life on the continent.¹⁸¹ Gilbertus is also recognised as having been physician to several eminent aristocrats, including King John. His reputation as an authority in medicine gained him mention in Chaucer's *Canterbury Tales* (c 1400) alongside distinguished physicians such as Galen and Avicenna.¹⁸² As a writer of numerous literary works, his *Compendium Medicinae* (Compendium of Medicine), an encyclopaedic volume of seven books, encompassing pharmacology, medicine and surgery is an important example of Anglo-Norman medicine.¹⁸³ Written in Latin somewhere between 1230 and 1250, it referenced the major works from both Greek and Arab-Islamic physicians including Galen and Avicenna together with writers such as Constantine the African.¹⁸⁴

The introduction of Arabic pharmaceutical translations at the beginning of the thirteenth century included well-documented and detailed explanations on the combining of pharmaceutical ingredients, and the qualities and degrees of substances.¹⁸⁵ Despite Gilbertus' undoubted awareness of such advancements, he chose to maintain the pharmaceutical traditions circulated by the School of Salerno by including a large pharmacological selection, whilst avoiding the complications of quantification in his *Compendium*.¹⁸⁶ He brought together a significant collection of medical recipes written by numerous authors, which is believed to be one of the most extensive medical treatises created in the West. His work illustrates the skilled physicians' understanding of

¹⁸¹ John Pearn, 'Two medieval doctors: Gilbertus Anglicus (c1180-c1230) and John of Gaddesden (1280-1361)', *Journal of Medical Biography*, (2013), 21 3-7.

¹⁸² Gonzales-Hernandez and Dominguez-Rodriguez, 'Migraine in Gilbertus Anglicus' *Compendium medicinae*, *Journal of the History of the Neurosciences* (2008), 17 2 147-159, (p.148).

¹⁸³ Gonzales-Hernandez and Dominguez-Rodriguez, p. 148.

¹⁸⁴ Henry E. Handerson, *Gilbertus Anglicus Medicine of the Thirteenth Century* (Cleveland, Ohio: The Cleveland Medical Library Association, 1918) p. 25.

¹⁸⁵ Faye Marie Getz, *Healing and Society* p. xxi.

¹⁸⁶ Paul Oskar Kristeller, *Studi sulla Scuola medica salernitana* (Naples: Istituto Italiano per gli Studi Filosofici, 1986) in Faye Marie Getz, *Healing & Society in Medieval England, A Middle English Translation of the Pharmaceutical Writings of Gilbertus Anglicus* (Madison, Wisconsin: The University of Wisconsin Press, 1991). p. xxi.

medieval pharmacology in the Middle Ages.¹⁸⁷ Gilbertus' knowledge of medicine was gained from the study of several authorities including Aristotle, Hippocrates, and Galen. He was acquainted with Arab-Islamic teachings from the writings of Rhazes, Joannitius and Avicenna, to name a few, and he would also have been familiar with Salernitan compendiums such as the *Articella* and the *Regimen Sanitatis Salernitanum*.¹⁸⁸

According to Tony Hunt he was a 'scholastic humoralist' and an 'enthusiastic polypharmacist', meaning he enjoyed delving into the minutiae of medical meanings and took pride in the complexity of his prescriptions.¹⁸⁹ Hunt also considers the *Compendium* to draw heavily on the *Antidotarium Nicolai*, a text commonly used in the teaching of materia medica of Salerno.¹⁹⁰ Written by Nicolaus of Salernus (1140-?), it is believed to have been composed of remedies collated from other sources, becoming as Hunt suggests, 'the essential pharmacopeia of the Middle Ages'.¹⁹¹ Listed alphabetically, its recipes follow a particular structure; the name of the remedy, an explanation, indications for the patient, ingredients, preparation, dosage and form of administration.¹⁹²

The Middle English partial edition of the *Compendium Medicinae*, (Wellcome MS 537), known as the *Practica medicinae* (1462 AD) is a late medieval translation of the Latin exemplar, offering the equivalent of a 'self-help manual' to a population eager for medical knowledge.¹⁹³ It is a manuscript of short medical and astronomical writings in Middle English and Latin, accompanying an extensive medical treatise in English.¹⁹⁴ Getz comments on the popularity of the Middle English medical manuscripts often commissioned by the less formally educated medical practitioner.¹⁹⁵ This text, in contrast to other Gilbertus translations, has several key differences that give valuable evidence, not only of its construction, but of its selective editing. The text summarises and shortens certain subjects whilst expanding others and provides interpretations of Latin terminology in

¹⁸⁷ Faye Marie Getz, 'The Pharmaceutical Writings of Gilbertus Anglicus' *Pharmacy in History*, (1992), 34 1 17-25 (p. 17).

¹⁸⁸ Henry E. Handerson, *Gilbertus Anglicus Medicine*, p. 25.

¹⁸⁹ Tony Hunt, *Popular Medicine in Thirteenth Century England* (Woodbridge, Suffolk: D. S. Brewer, 1990), p. 25.

¹⁹⁰ Paul Oskar Kristeller, 'The School of Salerno: Its Development and its Contribution to the History of Learning', *Bulletin of the History of Medicine*, (1945) February 17 2 138-194, (p. 155).

¹⁹¹ Tony Hunt, *Popular Medicine*, p. 14.

¹⁹² Marta Isabel Gonzalez Blanco, 'An edition of the Middle English translation of the *Antidotarium Nicolai*' (unpublished thesis, University of Glasgow, 2017), p. 9.

¹⁹³ Faye Marie Getz, *Healing and Society* xvi.

¹⁹⁴ Faye Marie Getz 'Gilbertus Anglicus Anglicized', *Medical History*, (1982), 26 436-442 (p. 438).

¹⁹⁵ Faye Marie Getz, 'Pharmacy in History', (1992), 34 1 17-25 (p. 18).

English. Wellcome MS 537 has also been revised to omit diseases of women and children and excludes prescriptions associated with animals and travel.¹⁹⁶ The decision to select the Wellcome edition of the Gilbertus translation for comparison was made because as a vernacular translation from Latin to Middle English, it too is believed to have a monastic origin which complements the comparison with the Anglo-Saxon *Bald's Leechbook*, also thought to be created within an ecclesiastical environment. The Middle English text, as a partial translation of the *Compendium* begins in the second book, and is, according to Getz, stylistically attributed in the late transitional English of the southeast Midlands.¹⁹⁷ Although its construction demonstrates a simplification of Latin medicine, it also includes some popular remedies and charms.¹⁹⁸

The book was constructed using alum tawed sheepskin or deerskin over oak boards and parchment and contains many illuminated initials. Alum-tawed skins were commonly used for book-bindings therefore give little information as to its source.¹⁹⁹ It is believed to be the work of one compiler; however, the author remains anonymous as does its provenance, with the first page having disappeared.

Many of the remedies were based on ancient Greek humoral or dietary medicine and aimed at enhancing the body's natural ability to heal itself.²⁰⁰ Gilbertus employed humoral medicine to explain disease, its aetiology, and corresponding cures in the way of all Latin medical translations. He classified diseases as hot, cold, dry, or moist and prescribed to restore humoral balance, based on Hippocratic and Galenic traditions, and the need to balance humours by purging and bloodletting. He cited several medical authorities including Avicenna and Averroes, although reference to authorities and Latin medical terminology in the Wellcome MS 537 translation was edited out.

Wellcome MS 537 primarily focuses on disease and the treatment of recognisable ailments. It is an example of the trend in Middle English medical manuals in which the language was adapted to avoid theoretical explanations, despite most of the remedies

¹⁹⁶ Faye Marie Getz, *Healing and Society* p.iii.

¹⁹⁷ Faye Marie Getz, *Healing and Society* p.Ixiv.

¹⁹⁸ Gonzales-Hernandez and Dominguez-Rodriguez, 'Migraine in Gilbertus Anglicus', p.149.

¹⁹⁹ Raymond Clemens & Timothy Graham, *Introduction to Manuscript Studies* (Ithaca & London: Cornell University Press, 2007), p.263.

²⁰⁰ Faye Marie Getz, 'Pharmacy in History', p.19.

being derived from Latin sources. The scribe classifies foods and medicine in relation to their actions, although he avoids technical descriptions of the actions of drugs to more explanatory terms, such as biting or sharp, perhaps to facilitate the less educated physician in understanding the effects of drugs.²⁰¹ For example, the ingestion of cumin or anise in those suffering a headache should be avoided ‘for they will send up smokes into the head that would increase the ache’.²⁰² His explanations of humoral theory regarding the qualities of foods were simplified and assisted in translating into practice an understanding of why, for example, cold wet food was to be avoided by people with phlegm.²⁰³ Wellcome MS 537 also classifies remedies into simple or compound, describing the differences and providing instructions on the preparation of powders, tinctures, pills, ointments, and many other medical formulations.

The format of the book covering diet, regimen, surgery, and pharmacy is arranged in a traditional head-to-toe configuration, and divided into nineteen chapters, each introduced by simple explanations for diagnosis.²⁰⁴ The scribe further reduces the eighteen head diseases in the original *Compendium* down to eight. In the Latin exemplar, Gilbertus covers *De emigrania* (migraine) in a discrete chapter over two pages, whereas the neurological aspects of migraine as discussed in Wellcome MS 537 are placed alongside the aetiology, semiology, and management of headaches. Seemingly, the compiler did not differentiate between types of headaches, regarding them to be responsive to the same humoral treatment.²⁰⁵ Headaches were either hot or cold and treated by using the contrasting opposite. Therefore, for example, a hot headache was treated with a cold remedy. Often there was also advice on limiting or moderating behaviour.

The aetiology of migraine in Wellcome MS 537 is characterised as ‘a pain in one side of the head’, and there is no discussion on the qualities of the strength, cyclicity, persistence or temporal impairment to distinguish it from other headaches.²⁰⁶ The translation considers both one sided and generalised pains in the head as being a consequence of an imbalance in the humours, although they fail to ascertain which humour is responsible or why it becomes excessive. The adherence to Hippocratic convention follows the Graeco-

²⁰¹ Faye Marie Getz, ‘Pharmacy in History’, p.20.

²⁰² Faye Marie Getz, *Healing and Society* p. xxxiv.

²⁰³ Faye Marie Getz, *Healing and Society* p. xxxvi.

²⁰⁴ Faye Marie Getz, *Healing and Society* p. Ivi.

²⁰⁵ Gonzales-Hernandez and Dominguez-Rodriguez, ‘Migraine in Gilbertus Anglicus’, p.151,

²⁰⁶ Gonzales-Hernandez and Dominguez-Rodriguez, ‘Migraine in Gilbertus Anglicus’, p. 151.

Roman theories on humoral medicine, whereby any imbalance causes disease. In Wellcome MS 537 migraine is associated with a collection of emotional and physical symptoms including sadness and listlessness together with temporary vision loss.²⁰⁷ There is also an implied connection with classical Greek medical theory drawn from the Hippocratic corpus, in which visual disturbances were believed to be associated with the aura phase of migraine rather than the headache. The translation further includes detailed humoral theory with its reference to temperaments such as melancholia and sadness and cautionary advice to avoid stimulating spices and extremes. These features are evident in the writings of Arab-Islamic teachers such as Ali Ebn-e-Isa (940-1010 AD) and Avicenna, who had access to more complex discussions on humoral theory than had previously been available.²⁰⁸

Remedies

The manuscript offers three remedies for migraine and includes advisory information. The first treatment is that of Arabic pills, and the scribe provides a detailed semiology together with instruction as to their preparation. These were recommended for all types of headaches rather than specifically for migraine. The arrangement displays the traditional format found in the therapeutic receipt of Anglo-Norman and Latin medical treatises: rubric, indication, composition, preparation, application, and efficacy.²⁰⁹ The use of apothecary weights and measures of drachms and ounces demonstrates the compilers effort to ensure accuracy for the reader.

Middle English recipe for the demegreyn (migraine) ²¹⁰

- ‘And if he haue a demegreyn, þat is, þe ache of oon side of þe hede, let him vse pillules Arabie, for þei ben gode for euery sikenes of þe hede, and for euery ache of þe hede, and prugen al noiful humours of þe brayn, and maken / a man glad. Þei doen away heuynes, and sharpen a mannes wittes and a mannes syzte, and saven his mynde. And þe suffren not a man to be hoor tofore his tyme. And also

²⁰⁷ Gonzales-Hernandez and Dominguez-Rodriguezp. ‘Migraine in Gilbertus Anglicus’, p.152.

²⁰⁸ Ali Gorji and Maryam Khaleghi Ghadiri, ‘History of headache in medieval Persian medicine’, *Neurology* 1. 2002. 510-515 (p. 512).

²⁰⁹ Tony Hunt, *Popular Medicine*, p. 17.

²¹⁰ Faye Marie Getz, *Healing and Society*, p. 5.

þei helpen a man þat haþ þe turning of his brayn and þe demegrayn. And þei ben good for men and women also.

- And þei ben made on þis wise: Take of alloes epatike, dr. iiij; of brome, of mastike, of baies of lorer, of scamonye, and of clowes, of eche of þes, oz. i. And, medle þes with þe iuse of cale eiþir of fenel. And do þerto a litil hony forto kepen it, for hony wol keke al maner medisyns þat it is put to from appearing. A man þat haþ þe hede-ache of ony humour in his hede shulde not eten comyn, ne anees, ne noon oþir aromatike þyngis, / for þey wolen heve vp smokis to þe hede þat shulde encrease þe ache. And if þer be ony emplastr leide to þe hede, it must be warme, þoughe it be made of hote herbis, to habate þe coolde of þe heed, it wole do harme to þe brayn’.

English translation

- And if he has a migraine, that is the ache of one side of the head, let him use pills of Arabic for be good for every sickness of the head and for every ache of the head and to purge the noxious humours of the brain, and make a man glad. That does away with heaviness and sharpens a man’s wits and a man’s sight and saves his mind. And be suffer not a man to be gray before his time. And also be help a man that chance be turning of his brain and be a migraine. And that be good for men and women.

And them to be made of this way. Take liver aloes, four drachms, and one ounce of broom, of mastic, of bays of laurel, of scammony and of cloves, and be mixed with the juice of a cabbage or fennel. And to put a little honey for to keep it, for honey will keep all manner of medicines that it is put to for preserving. A man that has the headache of any humour in his head should not eat cumin or anise or any aromatic spices for they will lift up smoke to the head which shall increase the ache. And if there is a plaster laid to the head it must be warm and it be made of hot herbs, to help the cold of the head for if it be laid too cool to the head it will do harm to the brain.

The recipe is both prescriptive and explanatory, referring to humoral theory for the aetiology of migraine. The recipe further advises a preventative treatment, presumably to facilitate relief and guard against an excess of bad humours to the head. By ensuring the

temperature of a medicinal plaster be neither too hot nor too cold, one could avoid the noxious humours from rising in the brain and increasing the pain.²¹¹

Wellcome MS 537 includes a further two recipes which are absent from Vincentis de Portonariis' Latin 1510 version of the *Compendium*.²¹² One recommends a medicinal plaster made from the blood tree and the white of an egg although quantities are missing. The recipe recommends placing it on the aching side, two or three times until cured, however, to be successful, it must cover the whole area. When the plaster is placed on the head and when it is smeared, the healer must recite an invocation to St. John the Baptist, '*Perpetuis nos domine Sancti Johannis Baptiste: tueri, praesidiis; et quanto fragiliores sumus, tanto magis necessariis attolle suffragiis*'. On occasion, prayers were recited to time the preparation of treatments, however, in this instance the invocation appears to be an intercessory prayer exemplifying the reciprocal relationship between the suffering of St. John and the patient. The inclusion of spiritual remedies with herbal medicaments to effect a cure, constitutes something of an antithesis, however, the compiler must have believed in the power of liturgy as being synergistic to the remedy.²¹³

The second recipe involves an herbal draught containing three drachms of aven, of milfoil and of rude (rue) with the addition of three crops of balm, crushed and drunk with ale. After drinking, the patient should lie on the sore side. There is no reference to identify the source of this recipe or to confirm its efficacy. The lack of an established provenance implies it may have originated from empirical medicine, and as such could have been a recipe familiar to the author.

There is evidence that the Latin Gilbertus shares substantial associations with several Middle English recipe books. This suggests that, as illustrated in Wellcome MS 537, the compilers of these books were able to select the most useful Latin medical material to include in their books and replicate without recourse to complex theoretical dialogue.²¹⁴

²¹¹ Gonzales-Hernandez and Dominguez-Rodriguez, 'Migraine in Gilbertus Anglicus', p. 154.

²¹² Gilbertus Anglicus, *Compendium medicine* (Lyon: Lugduni, Impressum per Jacobum Sacconum, expensis Vincentil de Portonariis, 1510), cited in, 'Migraine in Gilbertus Anglicus', p.149.

²¹³ Gonzales-Hernandez and Dominguez-Rodriguez, 'Migraine in Gilbertus Anglicus', p. 154.

²¹⁴ Faye Marie Getz 'Gilbertus Anglicus Anglicized', 26 436-442 (p. 441).

Comparison

Bald's Leechbook is an example of a collection of Anglo-Saxon and classical medical remedies, skilfully blended in the vernacular and offering six remedies for migraine. Wellcome MS 537 as an adapted and edited Middle English translation of the Latin *Compendium medicinae* of Gilbertus Anglicus, is one of several translations created over a period of fifty years and is primarily for the treatment of simple ailments. It contains three remedies for migraine.

Both manuscripts share similar characteristics in that the books are organised in a traditional head-to-foot configuration, with migraine classified in both texts as a sub-heading under the chapters dealing with ailments of the head. Despite the Latin *Compendium* having dedicated a short chapter to migraine, Wellcome MS 537 catalogues migraine as a type of headache that shares the same humoral characteristics as all headaches. *Bald's Leechbook* excludes humoral descriptions within its formularies for headaches, limiting the instructions to several simple herbal concoctions. It is only the remedies for migraine that have an associated humoral explanation, and this is restricted to commentary on harmful humours or vapours rising and an annotation to bleed a vein. There follows no theoretical explanation for bleeding, leading to the hypothesis that Anglo-Saxon scribes either did not fully appreciate the principles of humoral theory, or were making assumptions that its audience was aware of the rationale.

Each manuscript describes migraine as a 'pain on one side of the head'. Differences emerge in the detail. Wellcome MS 537 attributes the aetiology of the migraine developing because of an accumulation of humours leading to an imbalance. When they gather in the head, this increase intensifies the strength and occurrences of migraine episodes. It also associates migraine with psychological symptoms, manifesting as melancholy, together with mental and visual disturbances. *Bald's Leechbook* omits these characteristics placing the emphasis on the need to expel them. In contrast to *Bald's Leechbook*, the Wellcome manuscript does not recommend bleeding in its migraine remedies, though it does similarly advise the use of medicinal plasters. The remedies for migraine in *Bald's Leechbook* are all topical, herbal remedies, with additional vague advice regarding herbal drinks, apart from one which recommends pouring rue juice into the nostril. Wellcome MS 537 takes the remedy for Arabic pills from the *Compendium*

and provides an organised and prescriptive discussion, detailing the measurements and ingredients for making them and giving clear directions and rationale for use. It further includes two remedies which the compiler must have independently selected, possibly from a ‘popular’ source. Both Anglo-Saxon and Middle English texts stem from classical medicine and similarly contain a mix of remedies derived from empirical and rational origins. *Bald’s Leechbook* and the Middle English translation of the *Compendium* both contain remedies described as folk medicine, yet neither can be considered uninformed or unorganised.²¹⁵ Therefore, it is fair to say that both manuscripts exhibit features of the learned traditions of their culture, and the inclusion of the collect in Wellcome MS 537 does not diminish its credibility as a learned treaty of rational medicine.

The twelfth century renaissance brought a change in scholarship whereby Old English medical texts were superseded by medical texts influenced by the new Arab-Islamic theory containing mathematical quantifications, and a detailed focus on urology, diagnosis with the pulse, and prognostication. From a comparative perspective, Wellcome MS 537 refers in its text to the use of the pulse and urine to aid diagnosis and importantly prognosis (though not in relation to migraine). *Bald’s Leechbook* also mentions urine, both as a treatment and as a diagnostic tool in its text, albeit also not in the context of migraine. The term *cræft* in Old English, as found in the *Leechbook*, refers to both diagnosis and prognosis, further indicating a similarity of purpose between the Middle English translation and the material in *Bald’s Leechbook*. Each manuscript acknowledges diagnosis and prognosis as essential components of treatment, though in the *Leechbook* the reference is subtle.²¹⁶ They both demonstrate the traditional layout and provide a selection of remedies, although the Wellcome manuscript offers only three, and of those only one could be interpreted as rational medicine. It contains more herbs and a complex formulary, perhaps indicative of what Banham considers to be ‘new medicine’, influenced by the twelfth century renaissance, and demonstrated by the addition of a more detailed discussion on Galenic theory.²¹⁷

²¹⁵ Faye Getz, *Medicine in the English Middle Ages* (Princeton: Princeton University Press, 1998), p. 36.

²¹⁶ H. Stuart, ‘Some Old English Medical Terms’, *Parergon* 13. (1975), 21-35. In Conan Doyle, ‘*Anglo-Saxon Medicine and Disease: A Semantic Approach*’, p. 9.

²¹⁷ D. Banham, ‘Medicine at Bury’, p.228.

The differences between the two reveal the Wellcome manuscript not only to be more specific and extensive than *Bald's Leechbook* in its understanding of humoral theory but in the range of ingredients used for migraine. *Bald's Leechbook* relies on mostly simple remedies containing few ingredients whereas the Wellcome edition uses both simple and compound formularies and is clearly influenced by Arabic sources with exotic ingredients. The only herbs common to both are rue and bay laurel, though the remedies do not share any similarities. Interestingly enough, whilst prayers and charms were regularly found in medical treatises of the Middle Ages, *Bald's Leechbook* does not incorporate any reference to magic or religion in its remedies for migraine, whereas the Middle English translation has included a liturgical chant.²¹⁸ As noted by Getz, both Anglo-Saxon medical treatises such as the *Leechbook of Bald* and post Salernitan medical writings, including those found in the *Compendium Medicinae* of Gilbertus Anglicus, contain prayers and charms.²¹⁹ Each text lays witness to pagan and Christian source material, yet Anglo-Saxon medicine has historically been discredited as superstitious. This comparison of the textual evidence contained in both manuscripts demonstrates that the use of Christian prayers and charms was not discontinued with the introduction of Arab-Islamic influences but continued to be considered relevant and incorporated into some remedies.

The number of herbal ingredients in *Bald's Leechbook* for migraine is four, with three solutions, plus egg white, which is considerably fewer than those found in Wellcome MS 537, totalling eleven, plus three solutions and egg white, with honey to preserve. However, no explanation for the selection of ingredients in either is provided, and the texts appears to indicate all remedies to be equally effective. It is difficult to assess whether the writers had experience of the remedies in either book, as they both share characteristics with other texts and may be examples of automatic copying. In addition, because neither book provides a discussion on the choice of ingredients, any substitution would be difficult for the untrained.

²¹⁸ Gonzales-Hernandez and Dominguez-Rodriguez, 'Migraine in Gilbertus Anglicus', p. 154.

²¹⁹ Faye Getz, *Medicine in the English Middle Ages* p. 41-47.

Bald's Leechbook seems to have been written for a physician with knowledge. It overlooks measurements of herbs or solutions recommending guidelines of 'equal amount' or 'triturate in vinegar with oil', leaving it to the physician to measure accordingly. In contrast, the Wellcome manuscript, assumed to be monastic because of the selective omissions and editing of the original text, appears to be compiled for a wider audience of medical practitioners. The compilation of both books looks to have been the work of educated scribes who selected the remedies from multiple sources and adapted them to suit their requirements.

Each manuscript shows evidence of Galenic theory in their discussion on humours which is illustrated in the similarity of remedies cautioning on the temperature of plasters and by treatments being prepared to counteract either heat or cold.

The numerous translations of the *Compendium medicinae*, are an indication that it was a popular medical book adapted for general use by lay people as a household compendium. Its reputation as a standard medical treaty is proven by the numbers of surviving copies. As a self-help medical manual, it continued to be copied, amended, and translated in multiple reprints up to the seventeenth century.²²⁰ From the comparative analysis there is evidence that the two translations drew from the same sources, however the Wellcome text illustrates a deeper understanding of humoral theory. Whether this translates to a more effective treatment for migraine will be discussed in the following chapters.

²²⁰ Gonzales-Hernandez and Dominguez-Rodriguez, 'Migraine in Gilbertus Anglicus', p. 149.

CHAPTER THREE Qualities and Actions of herbs

Contemporary studies have examined the effectiveness of medieval medicine and established surprising results. Scientific research has discovered that the constituents of some Anglo-Saxon herbal remedies contain antibacterial properties which is a pertinent subject since modern antibiotics are becoming less effective.

As an example, recent studies have concluded that an Anglo-Saxon remedy for an eye salve found in *Bald's Leechbook* has been found to exhibit bactericidal activity against MRSA and is active against several strains of *Staphylococcus aureus* and *Pseudomonas aeruginosa*. The ingredients included garlic bulbs which the study determined released the bioactive compound allicin, and this was found to be the principal agent exhibiting antibacterial qualities. It works both as an antagonist and synergistically with other ingredients in combating gram-positive and gram-negative bacteria.²²¹

Table 2: Old English herbs in *Bald's Leechbook*

HERB	ST	AS	AB	PUR	AI	EM	DIA	EMM	HYD	STY	DI	AN	ANT	CAR
Rue	X				X		X	X				X		X
Red Nettle		X		X	X		X		X	X	X	X		
Mustard	X		X		X	X					X	X		
Wine	X										X	X	X	
Vinegar		X	X		X					X				
Oil					X					X				
Bay Laurel	X				X	X	X	X	X			X		X

Key: ST: Stimulant, AS: Astringent, AB: Antibiotic (Antifungal), PUR: Purgative, AI: Anti-inflammatory, EM: Emetic, DIA: Diaphoretic, EMM: Emmenagogue, HYD: Hydragogue, STY: Styptic, DI: Diuretic, AN: Analgesic, ANT: Antiseptic, CAR: Carminative

Rue: (*Ruta graveolens*) Rue is used twice in remedies in *Bald's Leechbook* for migraine, and once in Wellcome MS 537. According to Grieve, rue is a hardy evergreen, and native

²²¹ Amanda L. Fuch, Alan J. Weaver, Jr., Brian P. Tripet, Mary Cloud, B. Ammons, Martin Teintze, Valerie Copie, 'Characterization of the antibacterial activity of Bald's eyesalve against drug resistant *Staphylococcus aureus* and *Pseudomonas aeruginosa*', *PLoS ONE* 13 11 (2018).

to Southern Europe, being one of the oldest medicinal plants of England.²²² Probably introduced by the Romans, it is a plant with an unpleasant odour and a bitter taste. It was used by Hippocrates and considered an anti-magical herb as it soothed digestive problems brought on by supposed witchcraft. Its uses were manifold from the time of Dioscorides, and it has classical references to the *Physica Plinii*. Grieve states rue is a stimulant and antispasmodic, as well as an emmenagogue, a carminative and an analgesic. Culpepper also recommends it as a diaphoretic, presumably because as a hot herb it will draw the sweat and purge the humours thereby easing congestion.²²³ Recent scientific studies have concluded that rue can block pain from sensory neurons (antinociceptives) is anti-inflammatory and has anti-pyretic properties. Studies have found it to alleviate pain, inflammation, and fever.²²⁴ Grieve's herbal recommends amongst other suggestions, to use the expressed juice in small quantities and to apply fresh leaves to the temples to relieve a headache.

Red Dead Nettle: (*Lamium purpureum*) Grieve describes this as the Purple Archangel. It is a nonstinging member of the genus *Lamium*, so named by Pliny and known to Dioscorides²²⁵. A common weed with reddish-purple flowers it is found in England, but also in Africa, Asia, and Europe. Although not native to Britain it has been well established from before the fifteenth century.²²⁶ The plant is recognised as being astringent, diaphoretic, diuretic, and purgative.²²⁷ Being a styptic, it is useful in the management of haemorrhage by making a decoction, and for wounds by applying bruised leaves to the site. Grieve recommends it to be drunk to aid the kidneys and to promote perspiration, which corresponds with the Galenic principal of excretion to balance the humours.²²⁸ *Bald's Leechbook's* has one remedy including red nettle. It advises to triturate one stalk of red nettle with vinegar and egg white and apply although this does not seem to correlate with the medicinal use advocated by Grieve. However, scientific

²²² Mrs M. Grieve, *A Modern Herbal* ed. Mrs. C. F. Leyel (Bury St. Edmunds: St. Edmundsbury Press, 1985) p. 694.

²²³ Graeme Tobyn, *Culpepper's Medicine* (Shaftesbury, Dorset: Element Books Ltd., 1997), p. 212.

²²⁴ F. Loonat and G. J. Amabeoku, 'Antinociceptive, Anti-inflammatory and Anti-pyretic activities of the leaf methanol extract of *Ruta Graveolens* L. in mice and rats', *Afr. J. Tradit Complement Altern Med.* (2014), 11 3 173-181 (p.180).

²²⁵ Michael S. DeFelice, 'Henbit and the Deadnettles, *Lamium* spp.- Archangels or Demons', *Weed Technology*, 19.3. (2005), 768-774 (p. 768).

²²⁶ Botany in Scotland, Plant of the Week – February 7th, 2022- the Red Deadnettle (*Lamium purpureum*)

²²⁷ Theresa Green, 'Medicinal Uses of Red Deadnettle,' *Garden Wildlife*, (2012).

²²⁸ Mrs M. Grieve, *A Modern Herbal*, p. 580.

research has identified the *Lamium* genus to support a broad spectrum of properties, and studies indicate its use for both topical and ingestible remedies. It is considered to have both anti-inflammatory and antinociceptive properties.²²⁹

Mustard: (*Sinapsis alba* L. white mustard) White mustard was known to Hippocrates as a poultice and for internal use in digestive problems. (*Brassica sinapiodes*, Black mustard) Grieve considers black mustard to be a stimulant, irritant, diuretic, and emetic and useful in poultices for inflammation and for respiratory complaints. It is also considered beneficial for neuralgia and headaches. *Bald's Leechbook* uses mustard once but doesn't specify white or black mustard seeds, however, Culpepper describes black mustard as having the virtue of heat and purges the brain. He also it suggests it helpful in drawing down viscous humours.²³⁰ Modern science regards mustard as having anti-inflammatory, antioxidant, antidepressant, anti-mutative, and antibacterial properties, however the bioactive constituents vary between varieties.²³¹ It has been cultivated throughout Europe, possibly originating in Central Asia, and mentioned by both Dioscorides and Pliny.²³²

Bay laurel: (*Laurel nobilis*) This small tree was probably introduced by the Romans as its natural habitat was the Mediterranean. Known to the Greeks and Romans it has a symbolic history and is commonly used to flavour food. According to the *Alphabet* of Galen, it is a warming plant, known for its 'dispersive and loosening properties'.²³³ Acknowledged by Pliny the Elder, it was a recommended treatment for headaches amongst other ailments, and modern science considers it to have several properties including anticonvulsive, antiepileptic, anti-inflammatory, and antioxidant.²³⁴ Studies into its analgesic qualities confirm it to have antinociceptive activities.²³⁵ *Bald's Leechbook*

²²⁹ Esra Kupeli Akkol, Funda Nuray Yalcin, Duygu Kaya, Ihsan Calis, Erdem Yesilada, Tayfun Ersoz, 'In vivo anti-inflammatory and antinociceptive actions of some *Lamium* species', *J. Ethnopharmacol*, 19 118 (2008), 166-72 (p.169). C. M. Uritu, C. T. Mihai, G. D Stanciu, et al, 'Medicinal Plants of the Family Lamiaceae in Pain Therapy: A Review'. *Pain Res Manag*. May 2018 (2018) 1-45 (p.10).

²³⁰ Nicholas Culpeper, *Culpepper's Complete Herbal* (London: W. Foulsham & Co., Ltd., 1985), p. 345.

²³¹ Yan Tan and Fangming Deng, 'Phytochemistry and biological activity of mustard (*Brassica juncea*): a review', *Journal of Food*, 18 1 (2020), 704-718, (p.704).

²³² Nicholas Everett, *The Alphabet of Galen, Pharmacy from Antiquity to the Middle Ages* (Toronto: University of Toronto Press, 2012), p. 347.

²³³ Nicholas Everett, *The Alphabet of Galen*, p. 257.

²³⁴ Attilio Anzano, Bruna de Falco, Laura Grauso, Riccardo Motti, Virginia Lanzotti, 'Laurel, *Laurus nobilis* L.: a review of its botany, traditional uses, phytochemistry and pharmacology', *Phytochem Rev*

²³⁵ M. Sayyah, G. Saroukhani, A. Peirovi, and M. Kamalinejad, analgesic and anti-inflammatory activity of the leaf essential oil of *Laurus nobilis* Linn, *Phytother Res*. Aug. 17 7 (2003), 733-736 (p.733).

uses Bay in three remedies in a mixture with oil and/or vinegar. It is used in Wellcome MS 537 in the Arabic pills. Grieve suggests its leaves, berries and oil all have medicinal uses, and it is an excitant and narcotic. The leaves are diaphoretic, as well as an emetic in large doses, and the berries have properties as a carminative, and an emmenagogue.

Wine: Wine has long had a reputation as a medicine and winemaking was commonly practiced by monks in the Middle Ages. Greek physicians prescribed wine, and Hippocrates recommended wine ‘as a wound dressing and, as a nourishing dietary beverage, as a cooling agent for fevers, as a purgative and as a diuretic’.²³⁶ Galen recommended white wine as a diuretic and honey and wine to maintain the bowels.²³⁷ Rufus of Ephesus (first century) considered wine as warming and moistening and helped balance the humours.²³⁸

Vinegar: (*vin airgre*) Wine that has turned to vinegar is cooling and a styptic.²³⁹ Hippocrates was said to use vinegar medicinally, and it has been considered an antiseptic, anti-inflammatory, and antibacterial from the Middle Ages in wound healing.²⁴⁰ Thought to open the pores and draw out humours, *Bald’s Leechbook* uses vinegar in five remedies. Culpepper believed vinegar should be added to ‘hot’ prescriptions to aid penetration, due to its attenuating action in cutting through the humours.²⁴¹

Oil: The type of oil used in these remedies is unknown. However, olive oil, which may be assumed to have been introduced by the Romans, has long been considered beneficial not only in food, but as a soothing agent and in helping the bowels with its warming actions. Further, when stewed with bay laurel berries it has heating qualities which relieve the pain. *Bald’s Leechbook* uses oil in just one remedy in a mixture with vinegar presumably for its warming actions. According to the Alphabet of Galen, when mixed with rose oil, it becomes both a cooling agent and a styptic.²⁴² Modern scientific research has found olive oil active in reducing hypertension and it has been found to have anti-atherosclerotic

²³⁶ Philip Norrie, *The History of Wine as a Medicine: From its Beginnings in China to the Present Day* (Newcastle upon Tyne: Cambridge Scholars Publishing, 2019), p.12.

²³⁷ Nicholas Everett, *The Alphabet of Galen*, p. 373.

²³⁸ Emily Kate, A Historical Perspective on Health Benefits of Wine, May 21 (2014)

²³⁹ Nicholas Everett, *The Alphabet of Galen*, p. 373.

²⁴⁰ C. S. Johnson and C. A. Gaas, ‘Vinegar: Medicinal Uses and Antiglycemic Effect’, *MedGenMed*, 8 2 61 (2006).

²⁴¹ Graeme Todyn, *Culpepper’s Medicine*, p. 211.

²⁴² Nicholas Everett, *The Alphabet of Galen*, p. 301.

qualities. It is also believed to be anti-inflammatory and exhibit immunomodulatory actions.²⁴³

Egg: Possibly used as a binding agent in both *Bald's Leechbook*, and Wellcome MS 537. The egg had several uses. Raw egg drunk, helped when hoarse and the albumen, when applied warmed to the eyes healed inflammation. Egg yolk was considered a styptic and thought to relieve diarrhoea when smeared externally.²⁴⁴

Table 3: Middle English herbs in Wellcome MS 537

HERB	ST	AS	AB	PUR	AI	EM	DIA	VER	HYD	DI	AN	ANT	CAR	EMM
Aloe	X		X	X	X			X						
Broom				X		X				X				
Mastic	X		X		X					X				
Bay Laurel	X				X	X	X		X		X		X	X
Scammony				X				X	X		X			
Cloves	X	X	X								X	X	X	
Cabbage				X	X					X	X	X		
Fennel			X		X					X	X		X	X
Honey			X		X			X						
Sang dragon		X	X		X		X				X			
Avens			X		X						X	X		
Milfoil	X	X			X		X				X			
Balm			X		X		X				X		X	
Rue	X				X		X				X		X	X

Key: ST: Stimulant, AS: Astringent, AB: Antibiotic (Antifungal), PUR: Purgative AI: Anti-inflammatory, EM: Emetic, DIA: Diaphoretic, VER: Vermifuge, HYD: Hydragogue DI: Diuretic, AN: Analgesic, ANT: Antiseptic, CAR: Carminative, EMM: Emmenagogue

Wellcome MS 537 has a much more varied pharmacopeia containing exotic herbs, but also assimilates with Late Antiquity.

Aloe: (*Aloe Perryi*) Indigenous to Africa the plant was introduced to the West Indies and eventually grew on the borders of the Mediterranean.²⁴⁵ The active constituent of aloes is the bitter liquid or juice of the plant. It is mentioned by Dioscorides and Pliny who

²⁴³ Jose J. Garorio, F. Visioli, C. Alarcon-de-la-Lastro, O. Castaner et al, 'Virgin Olive Oil and Health: Summary of the III International Conference on Virgin Olive Oil and Health Consensus Report, JAEN (Spain)', *Nutrients* 11 2039 (2019), 1-35 (p. 21).

²⁴⁴ Nicholas Everett, *The Alphabet of Galen*, p. 303.

²⁴⁵ Mrs M. Grieve, *A Modern Herbal*, p. 26.

describe it as a Socotrine aloe, probably as it originates from the island of Socotra, and was known to have been imported from as early as the first century BC.²⁴⁶ It is described in the making of Arabic Pills as liver coloured, and its primary constituent is Barbaloin. Grieve suggests it is useful as a purgative and a vermifuge, and for those with a phlegmatic nature. It was also a common domestic medicine with a tradition as a basis in pill making.²⁴⁷ The Alphabet of Galen proposes aloes to have both a purgative effect when taken internally, and when mixed with oxymel (a mixture of honey, water and vinegar), to ease stomach and liver complaints.²⁴⁸ Culpepper proposed aloes to be lubricant laxatives, useful in clearing humours by their attenuating action.²⁴⁹ Modern science indicates aloes to have several pharmacological actions as an anti-inflammatory, antimicrobial, antioxidant, antiviral, and antihistamine, as well as being purgative.²⁵⁰

Broom: (*Genista Scoparium*) Broom was known to Anglo-Saxons from the early Middle Ages. Acknowledged by Pliny and Virgil, it was commonly found in Greece. Its active constituents are Sparteine and Scoparin. Grieve notes broom to be both a purgative and diuretic. She comments on its narcotic actions in reducing vascular tension but cautions its use due to risk of toxicity. Other types of broom were also used, such as Butcher's Broom (*Ruscus aculeatus* L.) which was known to Dioscorides as an aperient and diuretic and for use in oedema.²⁵¹ Recent research suggests Scotch Broom useful for cardiac problems and in fluid retention but can cause nausea and diarrhoea.²⁵²

Mastic: (*Thymus Mastichina*) Found around the Mediterranean it acts as a stimulant and a diuretic, Mild in taste and resinous it was used to sweeten the breath and for diarrhoea in children.²⁵³ Believed in ancient times to have dispersive properties when warmed.²⁵⁴ Culpepper recommended it for disorders of the head and nerves being a warm herb.²⁵⁵

²⁴⁶ Nicholas Everett, *The Alphabet of Galen*, p. 147.

²⁴⁷ Mrs M. Grieve, *A Modern Herbal*, p. 27.

²⁴⁸ Nicholas Everett, *The Alphabet of Galen*, p. 147.

²⁴⁹ Graeme Toby, *Culpepper's Medicine*, p.196.

²⁵⁰ D. K. Patel, K. Patel, and V. Tahilyani, Barbaloin: A concise report of its pharmacological and analytical aspects, *Asian Pac J. Trop Biomed*, 2 10 (2012), 835-838 (p. 836).

²⁵¹ Nicholas Everett, *The Alphabet of Galen*, p.357.

²⁵² WebMD, 'Scotch Broom-Uses, Side Effects, and More,' *Therapeutic Research Faculty*, (2020).

²⁵³ Mrs M. Grieve, *A Modern Herbal*, p.522.

²⁵⁴ Nicholas Everett, *The Alphabet of Galen*, p.285.

²⁵⁵ Graeme Toby, *Culpepper's Medicine*, p.229.

Modern research has confirmed its actions against *Helicobacter pylori*. It is also found to be an antimicrobial, antifungal, antioxidant, and an anti-inflammatory.²⁵⁶

Scammony: (*Convolvulus scammonia* L.) Otherwise known as Syrian bindweed, it can be grown in England, however it is also imported from the Mediterranean. Scammony was familiar to Dioscorides, Pliny amongst others and used as a purgative for the bowels.²⁵⁷ Grieve recommends it as a hydrogogue for oedema and is useful as a purgative in chronic disorders. A tincture of the flowers is advised for headaches.²⁵⁸ Modern science has found that scammony is a purgative and vermifuge. It is also found to have some anticancer properties.²⁵⁹

Cloves: (*Eugenia Aromatica*) Described as a small evergreen tree originating in the Southern Philippines, the spice was introduced to Europe from the fourth century. Cloves were considered a stimulant and a carminative, used for digestive purposes and to assist other herbs. It is an antiseptic and a weak topical anaesthetic.²⁶⁰ Contemporary science has found cloves to be an analgesic, antioxidant and antibiotic and its bioactive constituents indicate it has anti-cancer properties.²⁶¹

Cabbage: (*Brassica Capitata*, *Brassica Oleracea*) originating in Europe and possibly brought to England with the Romans. Culpepper describes cabbage as a windy medicine useful for several ailments, particularly as a diuretic. He considered it useful in healing sores and soothing for the throat when the juice is mixed with honey. Known to Greeks and Romans as a laxative and an analgesic for headaches, it has anti-inflammatory, anticarcinogenic and antioxidant behaviours.²⁶²

²⁵⁶ S. Paraschos, S. Mitakou, A. L. Skalsounis, 'Chios gum mastic: A review of its biological activities', *Curr Med Chem* 19. 14. (2012), 2292-2302 (p. 2292).

²⁵⁷ Nicholas Everett, *The Alphabet of Galen*, p.339.

²⁵⁸ Mrs M. Grieve, *A Modern Herbal*, p.103.

²⁵⁹ A. E. Al-Snafi, 'The chemical constituents and pharmacological effects of *Convolvulus arvensis* and *Convolvulus scammonia*-A review', ResearchGate 6 6 3 July (2016), 64-75 (p.70).

²⁶⁰ Mrs M. Grieve, *A Modern Herbal*, p.208.

²⁶¹ D. F. Cortes-Rojas, C. R. Fernandes de Souza, and W. P. Oliviera, 'Clove (*Syzygium aromaticum*): a precious spice', *Asian Pac J Trop Biomed* 4 2 (2014) 90-96 (p. 96).

²⁶² Iona M. A. Stefan and A. D. Ona, Cabbage (*Brassica oleracea* L.). Overview of the Health Benefits and Therapeutical Uses, Hop and Medicinal Plants XXVIII, 1 2 (2020), 150-169 (p.154).

Fennel: (*Foeniculum vulgare*) Grown throughout Europe and known to Pliny and the Anglo-Saxons for its protective qualities against evil spirits and as a vegetable and medicine pre-Norman Conquest. Used medicinally in drinks as a carminative to soothe pain, it also acts as a diuretic, an anti-emetic, and to cleanse the blood.²⁶³ Modern research has discovered fennel to exhibit several pharmacological activities acting as an anti-inflammatory, antimicrobial, diuretic, and emmenagogue amongst other actions.²⁶⁴

Honey: Honey is mentioned in the Alphabet of Galen and was known to Dioscorides and Pliny. Used both internally and externally it soothes and relaxes internal organs and cleans wounds. As an aid to thinning humours it prevents nausea.²⁶⁵ Modern science proposes honey to be an antioxidant and to contain anti-inflammatory and anti-bacterial properties.²⁶⁶

Dragon's Blood: Also known as Sangdragon (*Sanguis draconis*). Originating from Sumatra it was predominantly used as a colourant, emitting a red resin. It is soluble in alcohol and used as an astringent in diarrhoea. *Dracoena Draco* is another variety found in the Canary Island and the East Indies being used by the Egyptians in embalming, In China it was used as a diaphoretic.²⁶⁷ Science has explored the pharmacological actions of dragon's blood and found it to be an analgesic, anti-inflammatory and antioxidant. It also acts as an antibiotic and antihemorrhagic, and was used by the Greeks, the Romans, and the Arabs as an effective agent in wound healing.²⁶⁸

Avens: (*Geum urbanum L.*) A common plant found in hedges and woodlands throughout England. Also found in Europe Russia and Central Asia. Called a blessed herb for its qualities to ward off evil it symbolised the Holy Trinity in the Middle Ages. It had multiple uses as a styptic, febrifuge, antiseptic and aromatic amongst other medicinal

²⁶³ Mrs M. Grieve, *A Modern Herbal*, p.296.

²⁶⁴ R. Rahami, M. R. S. Ardekani, 'Medicina properties of *Foeniculum vulgare* Mill. In traditional Iranian medicine and modern phytotherapy', *Chin J Integr Med*, 19 1 (2013) 73-79 (p.73).

²⁶⁵ Nicholas Everett, *The Alphabet of Galen*, p.279.

²⁶⁶ S. A. Meo, S. A. Al-Asiri, A. L. Mahesar, M. J. Ansari, 'Role of honey in modern medicine', *Saudi Journal of Biological Sciences*, 24 5 (2017), 975-978 (p. 977).

²⁶⁷ Mrs M. Grieve, *A Modern Herbal*, p.262.

²⁶⁸ F. Namjoyan, F. Kiashi, Z. B. Moosavi, F. Saffari, B. S. Makhmalzadeh, 'Efficacy of Dragon's blood cream on wound healing: A Randomized, double-blind, placebo-controlled clinical trial', *Journal of Traditional and Complementary Medicine*, 6 (2016) 37-40 (p.39).

actions. Modern herbal medicine recommends it for diarrhoea. Another variety *Dryas octopetala* is useful for sore throats and fevers as well as headache. A third variety, *Geum rivale* has pharmacologic actions as a febrifuge and tonic.²⁶⁹ Culpepper recommended it to expel ‘crude and raw humours from the belly and stomach’ with its warming quality.²⁷⁰ Pharmacological research indicates avens to be anti-inflammatory, antimicrobial, antioxidant and neuroprotective.²⁷¹

Yarrow: (*Achillea millefolium*) also known as Milfoil. Originally thought to have been cultivated in Madeira, it is abundant in meadows and gardens throughout England. Yarrow was known in the Anglo-Saxon period as *gearwe* and is a diaphoretic, astringent, stimulant, and aromatic. History tells us it was used to heal wounds, (an old name was Soldier’s Wound Wort), and as a tea it was thought to dispel melancholy.²⁷² Current research agrees to its efficacy as an anti-inflammatory and is hepatoprotective. It is prescribed for headache and bruising amongst other conditions.²⁷³

Balm: (*Melissa officinalis*) The term balm is a short form of balsam and was favoured by Celsus who believed it helpful to the nervous system. Originating in the Mediterranean, it is now common in England. As a restorative it is said to relieve melancholy and was esteemed by both Pliny and Dioscorides as an anti-inflammatory, and an aid to wound healing. Grieve considers it a carminative, diaphoretic, and a febrifuge.²⁷⁴ Modern research suggests it has antibacterial, antiviral, and antispasmodic actions as well as performing as an anti-inflammatory and analgesic.²⁷⁵

This completes the study of herbs used in both manuscripts in the treatment of migraine. The only herbs common to both texts were bay laurel and rue. Research shows the herbs all have a range of pharmacological actions, however, a review of the tables itemising the

²⁶⁹ Mrs M. Grieve *A Modern Herbal*, p.75.

²⁷⁰ Graeme Todyn, *Culpepper’s Medicine*, p.36.

²⁷¹ Ali E. Al-Snafi, ‘Constituents and pharmacology of *Geum urbanum*-A review’, *IOSR Journal of Pharmacy*, 9 5 1 (May 2019), 28-33 (p.28).

²⁷² Mrs M. Grieve, *A Modern Herbal*, p.864.

²⁷³ Muhammad Akram, ‘Minireview on *Achillea millefolium* Linn’, *J Membrane Biol* 246 (2013), 661-663 (p.661).

²⁷⁴ Mrs M. Grieve, *A Modern Herbal*, p.76.

²⁷⁵ S. Miraj, R. Kopaei, S. Kiani, *Melissa officinalis* L.: ‘A Review Study With an Antioxidant Prospective’, *J Evid Based Complementary Altern Med* 22 3. (2017) 385-394 (p.386).

most significant actions illustrates the anti-inflammatory and analgesic activities to be the most meaningful.

CHAPTER FOUR Outcome of the analysis

Skin is the largest organ of the human body and plays a significant role in drug delivery.²⁷⁶ Molecules can penetrate the skin and reach the epidermis, dermis, and vascular network efficiently, therefore the application of poultices or medicinal plasters was clearly a useful method of treating migraine in the Middle Ages.²⁷⁷ Ensuring the temperature of the plaster was warm avoided aggravating the noxious humours. This correlates with modern science that confirms heat facilitates the permeation of medicine through the skin.²⁷⁸ In particular, follicular absorption has generated recent interest as a method of fast action drug delivery, using the sebum within the follicular duct to facilitate the transportation across the epidermis.²⁷⁹

Modern science has still not fully understood the causes of migraine, but it is acknowledged that vascular and neural structures are associated. Current research proposes that innervation of the trigeminovascular system and ensuing inflammation is responsible for the pathophysiology of migraine. The sensory neurons (nociceptors) in the trigeminal ganglion stimulate the cerebral vasculature including the Dural blood vessels. This triggers the release of vasoactive neuropeptides resulting in neurogenic inflammation, whilst also causing a reduction of neurotransmitters such as serotonin.²⁸⁰ Serotonin is a vasoconstrictor and known to play a key role in the pathogenesis of migraine with low levels increasing pain and affecting both speech and vision. Migraine is often accompanied by vomiting with subjects reporting relief following sickness. Vomiting stimulates intestinal activity, which in turn raises blood serotonin levels.²⁸¹ Mood disorders have also been associated with migraine and recent studies have

²⁷⁶ Yousef Javadzadeh, Leila Azharshekoufeh Bahari, 'Therapeutic Nanostructures for Dermal and Transdermal Drug Delivery', in *Nano-and Microscale Drug Delivery Systems*, (2017) 131-146, (p. 131).

²⁷⁷ Brad Galer, M.D. 'Topiceuticals', in *Pain Management Secrets*, ed. C. E. Argoff and G. McCleane, 3rd edn. (United States: Elsevier-Health Sciences Division, 2009), p.241.

²⁷⁸ F. Akomeah, T Nazir, G. P. Martin, M. B. Brown, 'Effect of heat on the percutaneous absorption and skin retention of three model penetrants', *European Journal of Pharmaceutical Sciences* 21 2/3 (2004) 337-345 (p.337).

²⁷⁹ F. Caserta, M. B. Brown, W. J. McAuley, 'The use of heat and chemical penetration enhancers to increase the follicular delivery of erythromycin to the skin', *European Journal of Pharmaceutical Sciences*, 132 April (2019), 55-62 (p.55).

²⁸⁰ B. N. Mason and A. F. Russo, 'Vascular Contributions to Migraine: Time to Revisit'? *Frontiers in Cellular Neuroscience* 12 233 (2018), 1-10 (p.2).

²⁸¹ M. Aggarwal, V. Puri and S. Puri, 'Serotonin and CGRP in Migraine', *Annals of Neurosciences* 19 2 (2012), April, 88-94, (p.89).

indicated that anxiety and depression are up to ten times more common in migraineurs than in the general population.²⁸² It may be observed from the Wellcome MS. 537 text that medieval physicians also acknowledged this as part of the pathophysiology of migraine.

The most useful functions from the review of herbs are in their activities as anti-inflammatories, analgesics, and purgatives. One can, therefore, assume that both the Anglo-Saxon and Middle English practice of prescribing herbs with anti-inflammatory, analgesic and purgative actions was a practical solution to a disorder that was, and continues to be, a complex condition. The herbs used in the preparation of the pills provided both a purgative, anti-inflammatory and analgesic effect and seem to be an attempt to combine purging the humours with treating the pain within the head. Migraine is renowned for its symptom of nausea so it would be rational to purge, which as modern science indicates, raises blood serotonin levels, and contributes to a reduction in pain. The two remedies in Wellcome MS 537 additionally added by the scribe, with no medical authority, nevertheless demonstrate anti-inflammatory and analgesic actions but are not purgatives.

The Arabic world, in developing the Greek and Roman translations of Hippocratic and Galenic theories, began to separate pharmacology and medicine from as early as the eighth century.²⁸³ However, at the time Gilbertus was writing his *Compendium Medicinae*, pharmacy in England was still within the domain of the physician. One must assume that Gilbertus, influenced by the pharmacological traditions of the School of Salerno brought together the remedies and formulas he believed most appropriate in the compiling of his text. This was translated into the vernacular, with the additional remedies deemed suitable for inclusion by the writer, that appear to have been acquired from commonplace religious and folkloric sources. The only mutually shared herbs amongst the two formularies were rue and bay laurel which have been confirmed by modern science to be both anti-inflammatories and analgesics.

²⁸² M. F. Prieto Peres, J. P. P. Mercante, P. R. Tobo, H. Kamei and M. E. Bigal, 'Anxiety and depression symptoms and migraine: a symptom-based approach research'. *The Journal of Headache and Pain*, 18 37 (2017).

²⁸³ H. Azaizeh, B. Saad, K. Khalil, O. Said, 'The state of the Art of Traditional Arab Herbal Medicine in the Eastern Region of the Mediterranean: A Review', *Evidence Based Complementary Altern Med.* 3 2 (2006), 229-235.

Conclusion

This dissertation has compared the remedies for migraine in an Anglo-Saxon and a Middle English medical text to determine if Anglo-Saxon medicine was less effective and thus inferior to Salernitan influenced medicine.

The study has established that both the Anglo-Saxon and Middle English texts drew from classical sources; however, the Anglo-Saxon manuscript demonstrated a closer affiliation with the earlier texts than was evident in the Middle English one. The *Leechbook of Bald* and the Gilbertus translation found in Wellcome MS 537 both used humoral theory to explain the symptoms of migraine, however the Middle English translation provided a more detailed explanation and an extended formulary.

The use of Arabic pills suggests a step forward in medical thinking, possibly in relation to the advances in pharmacology emanating from the East and filtering into the West through Salerno. Neither text incorporated magical remedies for migraine, although the Middle English text included two remedies not found in the 1510 edition, one of which involved a liturgical component. This was perhaps an independent inclusion by a cleric who was accustomed to the concept of blending traditional religious associations with local remedies to potentiate the cure. The Middle English translation, although lacking in theory, offered an implicit sense of advancing rationale medicine with its extended pharmacopeia. The study further illustrated how the various herbs demonstrated different actions within the remedies. From the analysis of the pharmacological activities of the ingredients, it is evident that the medieval physician combined the principals of humoral theory with the symptomatology of migraine. Some of the ingredients were clearly purgatives, others are now proven to be analgesics and anti-inflammatories.

In summarising the evidence garnered from the study, and using contemporary research, it has been possible to establish a distinct correlation between medieval medicine and modern science in the treatment of migraine. Whilst both manuscripts provided herbal remedies in the treatment of migraine, the Middle English text appears to have demonstrated a more effective approach to the treatment of migraine. Despite them both drawing from classical theories, the later medical text, although prescribing only three remedies in contrast to six, offered a more comprehensive pharmacopeia. The

introduction of Arabic pills may be considered to have delivered a more rationalist approach to the management of migraine, which supports the notion that Salernitan influenced medicine was superior to Anglo-Saxon medicine.

BIBLIOGRAPHY

Primary Sources

British Library, London, Royal MS 12D. XVII

<http://searcharchives.bl.uk/IAMS_VU2:LSCOP_BL:IAMS040-002106754> [accessed 28.07.22]

Sloane MS 272, British Library, London,

<<http://www.bl.uk/catalogues/illuminatedmanuscripts/ILLUMIN.ASP?Size=mid&IllID=6827>> [accessed 03.08.22]

Wellcome Library, London, Wellcome MS 537

<<https://wellcomecollection.org/works/jz6gu2rj>> [accessed 28.07.22]

Secondary Sources

Adams, J. N., and Marilyn, Deegan 'Bald's Leechbook and the Physica Plinii', *Anglo-Saxon England*, 21, (1992), 87-114, in *Cambridge University Press*

<<https://www.jstor.org/stable/44509937>> [accessed 11 February 2022]

Aggarwal, M., V. Puri and S. Puri, Serotonin and CGRP in Migraine, *Annals of Neurosciences* 19. 2. (2012) April, 88-94, p.89

<<https://doi.org/10.5214%2Fans.0972.7531.12190210>> [accessed 10.07.22]

Akkol, Kupeli Esra, and others, 'In vivo anti-inflammatory and antinociceptive actions of some Lamium species', *J. Ethnopharmacol*, 19.118. 166-72, (2008) DOI:

[10.1016/j.jep.2008.04.001](https://doi.org/10.1016/j.jep.2008.04.001)

Akomeah, F., T Nazir, G. P. Martin, M. B. Brown, 'Effect of heat on the percutaneous absorption and skin retention of three model penetrants', *European Journal of Pharmaceutical Sciences* 21. 2/3, (2004) 337-345, (p.337)

<<https://doi.org/10.1016/j.ejps.2003.10.025>> [accessed 08.07.22]

Akram, Muhammad, 'Minireview on *Achillea millefolium* Linn', *J Membrane Biol* (2013), 246:661-663, p.661. DOI: [10.1007/s00232-013-9588-x](https://doi.org/10.1007/s00232-013-9588-x) [accessed 14.08.21]

Al-Snafi, A. E., 'The chemical constituents and pharmacological effects of *Convolvulus arvensis* and *Consolvulus scammonia*-A review', ResearchGate 6.6.3. July (2016), 64-75 (p.70) < <https://www.researchgate.net/publication/313742953> > [accessed 06.07.22]

Arrizabalaga, Jon, 'The Articella in the Early Press, c. 1476-1574', *Cambridge Wellcome Unit for the History of Medicine*, 2 (1998), Barcelona. p. 5.
<<http://digital.csic.es/bitstream/10261/34330/1/Arrizabalaga-1998-The%20Articella%20in%20the%20Early%20Press.pdf>> [accessed 24.01.22]

Anzano, Attilio, and others, 'Laurel, *Laurus nobilis* L.: a review of its botany, traditional uses, phytochemistry and pharmacology, *Phytochem Rev*
<<https://doi.org/10.1007/s11101-021-09791-z> > [accessed 30.03.22]

Ayoub, L., 'Old English *waeta* and the Medical Theory of the Humours', *The Journal of English and Germanic Philology*, Jul. 1995 94. 3. 334-346, (p.343)

Azaizeh, H., B. Saad, K. Khalil, O. Said, The state of the Art of Traditional Arab Herbal Medicine in the Eastern Region of the Mediterranean: A Review, Evidence Based Complementary Altern Med. 3. 2. (2006), 229-235 DOI: [10.1093/ecam/nel034](https://doi.org/10.1093/ecam/nel034) [accessed 08.07.22]

Banham, D., Medicine at Bury in the Time of Abbot Baldwin, in *Bury St Edmunds and the Norman Conquest*, ed. T. Licence (Woodbridge: Boydell & Brewer, 2014), 226-247.
<www.jstor.org/stable/10.7722/j.ctt5vj7zd.19 > [accessed 21.11.22.]

Banham, D., *Food and Drink in Anglo-Saxon England* (Stroud: Tempus, 2004), p. 56

Banham, D., 'Revealing the beginnings of English medicine at last! A new edition and translation of Bald's *Leechbook and Leechbook III*', *HerbalHistory.org*, 22 April (2019). <<https://www.herbalhistory.org/home/revealing-the-beginnings-of-english-medicine> > [accessed 10.05.22]

Benedek, T. G., 'The Shift of Medical Education into the Universities', in: *University World: A Synoptic View of Higher Education in the Middle Ages and Renaissance*, ed. Douglas Radcliff-Umstead (University of Pittsburgh Medieval and Renaissance Studies Committee, 1973), < <https://www.medievalists.net/2008/10/the-shift-of-medical-education-into-the-universities/> > [accessed 14.04.22]

Berryman, Jack, W. 'Motion and rest: Galen on exercise and health' *The Lancet*, 380, July 21, (2012), 210-212 DOI: [10.1016/s0140-6736\(12\)61205-7](https://doi.org/10.1016/s0140-6736(12)61205-7) [accessed 04.01.22]

Bhikha, R. Prof., and Dr J. Glynn, 'The Theory of Humours Revisited', *International Journal of Development Research*, 7. 9. (September 2017), 15029-15034, (p. 15034) < <https://www.journalijdr.com> > [accessed 04.07.22]

Bolotina, Julie, 'Support for the Sick Poor in Anglo-Saxon England,' *Selected Proceedings from 'The Maladies, Miracles and Medicine of the Middle Ages'*, March 2014, *The Reading Medievalist: A Postgraduate Journal*, vol 2. Ed Salter, R. (The Graduate Centre for Medieval Studies, March 2015, 4-28

Botany in Scotland, Plant of the Week – February 7th, 2022- the Red Deadnettle (*Lamium purpureum*) < <https://botsocscot.wordpress.com/2022/02/06> > [accessed 30.06.22]

Brakelond, Jocelin of, *The Chronicle of Jocelin of Brakelond*, ed. by H. E. Butler, trans. by H. E. Butler (36 Park Street London: Thomas Nelson & Sons, 1962)

Buck, R. A., 'Woman's Milk in Anglo-Saxon and Later Medieval Medical Texts' *Neophilologus* 96, (2012), 467-485, (p. 468)

Burnett, Charles, and Peter, Murray, 'Scientific and Medical Writings,' in *The Book of Britain Vol 2. 1100-1400* (Cambridge: Cambridge University Press, 2014), 446-462. (p. 451)

Burnett, Charles, 'Translation and Transmission of Greek and Islamic Science to Latin Christendom', in *The Cambridge History of Science Vol 2*, eds., David C. Lindberg and Michael H. Shank (Cambridge: Cambridge University Press, 2013), 341-364 (p.341)

Cameron, M. L., *Anglo-Saxon Medicine* (Cambridge: Cambridge University Press, 1993)

Cameron, M. L., 'Bald's "Leechbook" and cultural interactions in Anglo-Saxon England', *Anglo-Saxon England* (Cambridge University Press, 1990), 19 5-12,

<<https://ezproxy.uwtsd.ac.uk/login?url=https://www.jstor.org/stable/44509948> >

[accessed 4 February 2021]

Cameron, M. L., 'Anglo-Saxon Medicine and Magic', *Anglo-Saxon England*, 17 (1988), 191-215, in *Cambridge University Press*

<<https://ezproxy.uwtsd.ac.uk/login?url=https://www.jstor.org/stable/44510843> >

[accessed 17 February 2022]

Cameron, M. L., 'The sources of medical knowledge in Anglo-Saxon England', *Anglo-Saxon England*, 11 (Cambridge University Press, 1983), pp. 135-155.

<<http://www.jstor.org/stable/44510764>. > [accessed 04/08/2022]

Caserta, F., M. B. Brown, W. J. McAuley, 'The use of heat and chemical penetration enhancers to increase the follicular delivery of erythromycin to the skin', *European Journal of Pharmaceutical Sciences*, 132, April (2019), 55-62. (p.55)

<<https://doi.org/10.1016/j.ejps.2019.02.030>> [accessed 08.07.22]

Chen, Yulong, Shengpeng Wang, and Yitao Wang, Role of herbal medicine for prevention and treatment of migraine, *Phytotherapy Research*, 1. 2. (November 2021), 730-760.

< <https://doi.org/10.1002/ptr.7339> > [accessed 04.07.22]

Clay, R. M., *The Medieval Hospitals of England* (36 Essex Street, WC, London: Methuen & Co., 1909)

Clemens, Raymond, and Timothy Graham, *Introduction to Manuscript Studies* (Ithaca & London: Cornell University Press, 2007), p.263

Cockayne, Oswald, *Leechdoms Wortcunning, and Starcraft of Early England* Volume 2 (HMSO: Eyre and Spottiswoode, Forgotten Books, 2018)

Collins, David, J., 'Magic in the Middle Ages: History and Historiography', *History Compass* 9/5 (2011) 410-422 < <https://doi.org/10.1111/j.1478-0542.2011.00776.x> > [accessed 25.04.22]

Conrad, Lawrence I., and others, *The Western Medical Tradition 800 BC to AD 1800* (The Edinburgh Building, Cambridge: Cambridge University Press, 1995)

Cortes-Rojas, D. F., C. R. Fernandes de Souza, and W. P. Oliviera, 'Clove (*Syzgium aromaticum*): a precious spice', *Asian Pac J Trop Biomed* 4.2.(2014) 90-96. (p 96)
DOI: [10.1016/S2221-1691\(14\)60215-X](https://doi.org/10.1016/S2221-1691(14)60215-X) [accessed 10.07.22]

Crawford, Sally. 'The Nadir of Western Medicine? Texts, Contexts and Practice in Anglo-Saxon England', 41-51, p.46, in *Bodies of Knowledge: Cultural Interpretations of Illness and Medicine in Medieval Europe*, ed. Sally Crawford and Christina Lee. *Studies in Early Medicine* 1 (Oxford: Bar International Series, 2010)

Cullum, P. H., *Cremetts and Corrodies: Care of the Poor and Sick at St Leornards's Hospital, York in the Middle Ages*, Borthwick Paper, No. 79 edn (York: Borthwick Papers, 1991)

Culpeper, Nicholas, *Culpepper's Complete Herbal* (London: W. Foulsham & Co., Ltd., 1985), p. 345

DeFelice, Michael S., 'Henbit and the Deadnettles, *Lamium* spp.- Archangels or Demons', *Weed Technology*, 19.3. (2005), 768-774 (p. 768)
doi:10.1614/WT-05-072.1 [accessed 30.05.22]

Denton, P., 'Beyond the book: Charles Singer and Anglo-Saxon medicine revisited' (*Canadian Bulletin of Medical History*), vol 3 2 (2016), p. 263-8, (p. 264)

Doyle, Conan, 'Anglo-Saxon Medicine and Disease: A Semantic Approach', (unpublished doctoral thesis, University of Cambridge, Cambridge, 2017),
< <https://doi.org/10.17863/CAM.14430> > [accessed 26.07.22]

Doyle, Conan, 'Anglo-Saxon Medicine and Disease: A Semantic Approach Vol II:' Appendix: Bald's Leechbook, Transcript of London, British Library MSS Royal 12D XVII and Harley 55, (unpublished doctoral thesis, University of Cambridge, Cambridge, 2017), < <https://doi.org/10.17863/CAM.14430> > [accessed 26.07.22]

Daunay, Marie-Christine, Jules Janick, and Harry S. Paris, 'Tacuinum Sanitatis: Horticulture and Health in the Late Middle Ages', *Chronica Horticulturae* 49. 3. (2009), 22-29 (p. 24)
<[https://www.researchgate.net/publication/11136679 Tacuinum Sanitatis Horticulture](https://www.researchgate.net/publication/11136679_Tacuinum_Sanitatis_Horticulture) > [accessed 23.05.22]

Everett, Nicholas, *The Alphabet of Galen, Pharmacy from Antiquity to the Middle Ages* (Toronto: University of Toronto Press, 2012), p347

Ezekiel 47:12, cited in Madra-Gackowska, K., E. Glowczewska, and M. Gackowski, 'Medications of medieval monastery medicine' in *Journal of Education, Health and Sport*, September (2018) 1667-1674 p.1668 <<http://dx.doi.org/10.5281/zenodo.1438770> > [accessed 10.04.22]

Ferrari, M. D, 'The Economic Burden of Migraine to Society', *Pharmaco Economics* 13. (1998), 667-676 (p. 667). < <https://doi.org/10.2165/00019053-199813060-00003> > [accessed 06.07.22]

Flint, Valerie, *'The Rise of Magic in Early Medieval Europe'* (United States: Princeton University Press, 1991), p. 8 < <https://www.jstor.org/stable/j.ctvx5wb8j.5> > [accessed 25.04.22]

Fornaciari, Antonio and others, Cautery in medieval surgery: a unique palaeopathological case, *The Lancet*, 392 September 29 (2018), p. 1111
>[https://www.thelancet.com/pdfs/journals/lancet/P11SO140-6736\(18\)31815-4.pdf](https://www.thelancet.com/pdfs/journals/lancet/P11SO140-6736(18)31815-4.pdf)>
[accessed 14.07.22]

Foxhall, Katherine, *Migraine: A History* (Baltimore, Maryland: John Hopkins University Press, 2019)

Foxhall, Katherine, 'Making Modern Migraine Medieval: Men of Science, Hildegard of Bingen and the Life of a Retrospective Diagnosis', *Medical History* 58. 3. (2014), 354-374. DOI: 10.1017/mdh.2014.28 [accessed 12.04.22]

Fuchs, A. L., and others (2018), *Characterization of the antibacterial activity of Bald's eyesalve against drug resistant Staphylococcus aureus and Pseudomonas aeruginosa*. PLoSONE13 (11): e0208108. <<https://doi.org/10.1371/journal.pone.0208108>>
[accessed 04.08.2022]

Furner-Pardoe, Jessica, and others, 'Anti-biofilm efficacy of a medieval treatment for bacterial infection requires the combination of multiple ingredients', *Scientific Reports* (2020), 10:12687 < <https://doi.org/10.1038/s41598-020-69273-8> > [accessed 02.01.22]

Furniss, D. A. 'The Monastic Contribution to Mediaeval Medical Care,' *Journal of the Royal College of General Practitioners*, 15 (1968), 244-250, (p.244)

Galer, Brad, M.D. 'Topiceuticals', in *Pain Management Secrets*, ed. C. E. Argoff and G. McCleane, 3rd edn. (United States: Elsevier-Health Sciences Division, 2009), p.241

Garorio, Jose J., and others, 'Virgin Olive Oil and Health: Summary of the III International Conference on Virgin Olive Oil and Health Consensus Report, JAEN (Spain)', *Nutrients* 11. (2019), p.2039 <www.mdpi.com/journal/nutrients> doi:10.3390/nu11092039

Getz, Faye Marie, *Medicine in the English Middle Ages* (Princeton: Princeton University Press, 1998), p. 36

Getz, Faye Marie, 'The Pharmaceutical Writings of Gilbertus Anglicus', *Pharmacy in History*, 34.1, (1992), 17-25
<<https://ezproxy.uwtsd.ac.uk/login?url=https://www.jstor.org/stable/41111419>>
[accessed 29 January 2022]

Getz, Faye Marie, *Healing & Society in Medieval England, A Middle English Translation of the Pharmaceutical Writings of Gilbertus Anglicus* (Madison, Wisconsin: The University of Wisconsin Press, 1991)

Getz, Faye Marie, Gilbertus Anglicus Anglicized, *Medical History*, (1982), 26. 436-442, (p. 438) < <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1139223/pdf/medhist00085-0077.pdf> >[accessed 25.06.22]

Gilchrist, R. (2020). Spirit, Mind and Body: The Archaeology of Monastic Healing. In *Sacred Heritage: Monastic Archaeology, Identities, Beliefs* (Cambridge: Cambridge University Press, 2019) 71-109 < DOI: <https://doi.org/10.1017/9781108678087.004>>
[accessed 23.03.22]

Gonzalez, Blanco, Marta Isabel, 'An edition of the Middle English translation of the *Antidotarium Nicolai*' (unpublished thesis, University of Glasgow, 2017), p. 9

Gonzalez-Hernandez, A., & M. V. Dominguez-Rodriguez, 'Migraine in Gilbertus Anglicus' *Compendium medicinae*. The cases of MS Sloane 3486 and Wellcome MS 537', *Journal of the History of the Neurosciences*, 17.2, (April 2008), 147-159,
<<http://dx.doi.org/10.1080/09647040601107598>> [accessed 5 February 2022]

Gorji, Ali, and Maryam Khaleghi Ghadiri, 'History of headache in medieval Persian medicine', *Neurology* 1. 2002. 510-515, p. 512.

DOI: [10.1016/s1474-4422\(02\)00226-0](https://doi.org/10.1016/s1474-4422(02)00226-0) [accessed 12.06.22]

Green, M. H., 'Medical Books' in E. Kwakkel and R. Thomson, ed. *The European Book in the Twelfth Century* (Cambridge: Cambridge University Press, 2018), 277-292

Green, Monica, "*Women's Healthcare in the Medieval West: Texts and Contexts*" (Aldershot: Ashgate, 2000)

Green, Theresa, Medicinal Uses of Red Deadnettle, Garden Wildlife (2012)

<<https://theresagreen.me/2012/04/15/love-your-weeds-red-deadnettle/>> [accessed 03.07.22]

Greenstone, G., 'The history of bloodletting', *BC Medical Journal* 52. 1.

January/February (2010), 12-14. < <https://bcmj.org/premise/history-bloodletting> > [accessed [27.04.22]

Gregory the Great. Dialogues, Book 2 (Collegeville: Order of Saint Benedict),

<<https://www.osb.org/gen/greg/>> [accessed 14.07.22]

Grieve, Mrs. M., *A Modern Herbal*, ed. by Mrs C. F. Leyel (32 Bedford Square, London, WC IB 3EL: Jonathan Cape Ltd., 1985)

Grmek, M., *Western Medical Thought from Antiquity to the Middle Ages* (Massachusetts, London: Harvard University Press, 1998), p. 129

Guerrero-Peral, Angel Luis, Virginia de Frutos Gonzalez, and Maria Isabel Pedraza-Hueso, 'Galeatea: chronic migraine independently considered in a medieval headache classification', *Journal of Headache and Pain* 15. 16. (2014) p.2.

<<https://doi.org/10.1186/1129-2377-15-16>>[accessed 24.05.22]

Hajar, Rachel, 'The Air of History (Part II) Medicine in the Middle Ages', *Heart views: the official journal of the Gulf Heart Association*, 13 4 (2012), 158-62
DOI: [10.4103/1995-705X.105744](https://doi.org/10.4103/1995-705X.105744) [accessed 03.04.22]

Hammond, E. A., 'Physicians in Medieval English Religious Houses', *Bulletin of the History of Medicine*, 32 2 (March-April 1958) 105-120.
<<https://www.jstor.org/stable/i40186782> > [accessed 23.07.22]

Handerson, Henry H., *Gilbertus Anglicus, Medicine of the Thirteenth Century* (Cleveland, Ohio: The Cleveland Medical Library Association, 1918)

Hollis, Stephanie, 'Scientific and Medial Writings,' in: Phillip Pulsiano and Elaine Treharne, *Anglo-Saxon Literature* (Oxford: Blackwell Publishers Ltd., 2001), p.203

Horden, Peregrine, 'What's wrong with Early Medieval Medicine'? *Social History of Medicine*, 24 1 (2011), 5-25. (p. 16) < <https://doi.org/10.1093/shm/hkp052> > [accessed 28.07.22]

Hunt, Tony, *Popular Medicine in Thirteenth Century England* (Woodbridge, Suffolk: Boydell & Brewer Inc., 1990)

Jacquart, Danielle, 'Anatomy, Physiology and Medical Theory', in *The Cambridge History of Science Volume II*, ed. by David C. Lindberg and Michael H. Shank (New York: Cambridge University Press, 2013), 590-610 (p. 602)

Jacquart, Danielle, 'Medical Scholasticism' in: *Western Medical Thought from Antiquity to the Middle Ages*, ed. by M. Grmek, (Massachusetts, London: Harvard University Press, 1998), 197-240 (p.200)

Javadzadeh, Yousef, and Leila Azharshekoufeh Bahari, 'Therapeutic Nanostructures for Dermal and Transdermal Drug Delivery', in *Nano-and Microscale Drug Delivery Systems*, (2017) 131-146, (p. 134). < <https://doi.org/10.1016/B978-0-323-52727-9.00008-X> > [accessed 03.07.22]

Johnson, C. S., and C. A. Gaas, 'Vinegar: Medicinal Uses and Antiglycemic Effect', *MedGenMed*, 8 2 61 (May 2006), *National Library of Medicine*, <PMCID: PMC1785201> [accessed 04.07.22]

Jones, Peter Murray, 'University books and the sciences,' in *The Cambridge History of the Book in Britain*, ed. Nigel J. Morgan and Rodney M. Thomson (Cambridge: Cambridge University Press, 2014), 453-462 (p. 461).

Jonsen, Albert R., *A Short History of Medical Ethics* (New York, Oxford: Oxford University Press, 2000)

Jouanna, Jacques, 'The Legacy of the Hippocratic Treatise the Nature of Man: The Theory of the Four Humours' in: *Greek Medicine from Hippocrates to Galen* ed. Philip van der Eijk, 335-360 (p. 335) < <https://www.jstor.org/stable/10.1163/j.ctt1w76vxx> > [accessed 30.01.21]

Kate, Emily, A Historical Perspective on Health Benefits of Wine, May 21 (2014) <www.academicwino.com/> [accessed 01.07.22]

Kealey, Edward, J., *Medieval Medicus: A Social History of Anglo-Norman Medicine* (Baltimore: John Hopkins University Press, 1981)

Kesling, Emily, *Medical Texts in Anglo-Saxon Literary Culture* (Cambridge: D. S. Brewer, 2020)

Kesling, Emily, 'Translation style in the Old English Herbarium', *Notes and Queries*, March (2016) < https://www.academia.edu/22363627/Translation_Style > [accessed 13.02.22]

Kinney, Shirley, 'Anglo-Saxon Medicine: Cures or Catastrophe?', *Primary Source*, II. (Spring 2012), 37-42

Knowles, D., and Hadcock Neville R., *Medieval Religious Houses England and Wales* (London: Longman Group Ltd, 1971)

Koehler, P. J., and T. W. van de Wiel, 'Aretaeus on migraine and headache', *Journal of Hist Neuroscience* (2001), 10 3 253-261 (p. 255).

<<https://www.tandfonline.com/loi/njhn20>> [accessed 13.04.22]

Kristeller, Paul Oskar, 'The School of Salerno: Its Development and its Contribution to the History of Learning', *Bulletin of the History of Medicine*, February 17 2 (1945), 138-194, (p. 148). < www.jstor.org/stable/44443265 > [accessed 25.01.22]

Kwakkel, E. and Thomson, R., ed. *The European Book in the Twelfth Century* (Cambridge: Cambridge University Press, 2018)

Lawn, B., *The Salernitan Questions* (Oxford: The Clarendon Press, 1963)

Licence, T., *Bury St Edmunds and the Norman Conquest*, (Woodbridge: Boydell & Brewer, 2014), p. 246

Lindberg, David C., and Shank Michael, Science and the Medieval Church, in *The Cambridge History of Science*, 2. ed. (New York: Cambridge University Press, 2013), p. 268-285

Lindberg, David C., *The Beginnings of Western Science: The European Scientific Tradition in Philosophical, Religious, and Institutional Context, 600 B.C. to A. D. 1450* (Chicago: The University of Chicago Press, 1992), p.329

Loonat, F. and G. J. Amabeoku, 'Antinociceptive, Anti-inflammatory and Anti-pyretic activities of the leaf methanol extract of *Ruta Graveolens* L. in mice and rats', *Afr. J. Tradit Complement Altern Med.* (2014) 11.3.173-181, (p.180)

Luft, D., ‘Uroscopy and Urinary Ailments in Medieval Welsh Medical Texts’. Myddfai (UK): Physicians of Myddfai Society; 2018)

<<https://www.ncbi.nlm.nih.gov/books/NBK540246/>> [accessed 14.07.22]

Macfarlane, R. G., “Reactions of the Blood to Injury, *Lectures on General Pathology*”, ed. Howard Florey (London, 1954), cited in Sharpe, “Isadore”, p.25. Schoner discusses this theory and its proponents among German historians of medicine (Schoner, pp.38-39n.). cited in L. Ayoub, ‘Old English *waeta* and the Medical Theory of the Humours’, *The Journal of English and Germanic Philology*, Jul. 1995 94. 3. p 334-346, (p. 334)

Madra-Gackowska, K., Glowczewska, E. and Gackowski, M., ‘Medications of medieval monastery medicine’ in *Journal of Education, Health and Sport*, September (2018) 1667-1674 (p.1668) <<http://dx.doi.org/10.5281/zenodo.1438770>> [accessed 10.04.22]

Mason, B. N., and A. F. Russo, Vascular Contributions to Migraine: Time to Revisit? *Frontiers in Cellular Neuroscience* (2018), 12. 233

<<https://doi.org/10.3389/fncel.2018.00233>> [accessed 12.07.22]

Meaney, A. L., The practice of medicine in England about the year 1000 in *Social history of medicine*, 13. (2000), 221-237

Meaney, A. L., ‘The Anglo-Saxon View of the Causes of Illness’. in: *Health Disease and Healing in Medieval Culture* ed. by Campbell S., Hall B., Klausner D. (London: Palgrave Macmillan, 1992) 12-33

Meaney, A. L., ‘Variant versions of Old English medical remedies and the compilation of Bald’s Leechbook’, *Anglo-Saxon England*, 13. (1984), 235-268 (p.242)

< <https://www.jstor.org/stable/44510797>> [accessed 24.03.21]

Meo, S. A., S. A. Al-Asiri, A. L. Mahesar, M. J. Ansari, ‘Role of honey in modern medicine’, *Saudi Journal of Biological Sciences*, 24. 5. (2017), 975-978, (p. 9777)

<<https://doi.org/10.1016/j.sjbs.2016.12.010>> [accessed 07.07.22]

Miraj, S., R. Kopaei, S. Kiani, Melissa officinalis L.: ‘A Review Study With an Antioxidant Prospective’, *J Evid Based Complementary Altern Med* 22 3. (2017) 385-394 p.386 DOI: [10.1177/2156587216663433](https://doi.org/10.1177/2156587216663433) [accessed 07.07.22]

Namjoyan, F., and others, ‘Efficacy of Dragon’s blood cream on wound healing: A Randomized, double-blind, placebo-controlled clinical trial’, *Journal of Traditional and Complementary Medicine*, 6. (2016) 37-40 (p.39) DOI: [10.1016/j.jtcme.2014.11.029](https://doi.org/10.1016/j.jtcme.2014.11.029) [accessed 07.07.22]

National Health Service, *Migraine Overview*, [www.nhs](http://www.nhs.uk/conditions/migraine/)
<https://www.nhs.uk/conditions/migraine/> [accessed 03.08.22]

Nokes, Richard S., The several compilers of Bald’s Leechbook, *Anglo-Saxon England*, 12 33 (2004) 51-76, (p. 70) DOI: 10.1017/s0263675104000031 [accessed 11.06.22]

Norrie, Philip, *The History of Wine as a Medicine: From its Beginnings in China to the Present Day* (Newcastle upon Tyne: Cambridge Scholars Publishing, 2019), p. 12

Nutton, Vivian, Medicine in the Greek world, 800-50BC, in: L.I. Conrad, and others, *The Western Medical Tradition 800-1800AD* (Cambridge: Cambridge University Press, 1995), 11-38. (p.16)

Nutton, Vivian, ‘Late Antiquity and the Early Middle Ages 3’, in *The Western Medical Tradition*, by Lawrence I. Conrad, and others, (New York: Cambridge University Press, 1995), 71-87 (p.86)

Nutton, Vivian, ‘Roman medicine 250 BC to 200 AD.’ in *The Western Medical Tradition 800BC to AD 1800* (Cambridge: Cambridge University Press, 1995), 39-70 (p. 39)

Nutton, Vivian, ‘The Rise of Medicine’, in *The Cambridge Illustrated History of Medicine* ed. Roy Porter (Cambridge: Cambridge University Press, 1996), p. 55

Nutton, Vivian, Early Medieval Medicine and Natural Science in *The Cambridge History of Science*, 2. eds. David Lindberg and Michael Shank (New York: Cambridge University Press, 2013), 323-340. p. 336

Nutton, Vivian, 'Early Medieval Medicine and Natural Science' in: *The Cambridge History of Science*, 2. ed. David Lindberg and Michael Shank (New York: Cambridge University Press, 2013), p. 327

Oberhelman, Steven M. 'Pharmacological and Non-Pharmacological Treatment of Headaches in Early Modern Cretan Healing Manuals', *Athens Journal of Health & Medical Sciences* 6.1. (2019), 53-68. (p.55).> <https://www.athensjournals.gr/health/2019-6-1-4-Oberhelman.pdf> [accessed 13.07.22]

O'Neil, Denis, 'Humoral Pathology' (2007)
<https://www2.palomar.edu/anthro/medical/humoral_pathology.htm > [accessed 03.05.22]

Park, Katherine, *Secrets of Women: Genders, Generation, and Origins of Human Dissection* (New York: Zone Books, 2006)

Park, Katherine, *Medicine and society: historical essays*. ed. Andrew Wear (Cambridge: Cambridge University Press, 1992), 59-90. (p.68)

Patel, D. K., K. Patel, and V. Tahilyani, Barbaloin: A concise report of its pharmacological and analytical aspects, *Asian Pac J. Trop Biomed*, 2. 10. (2012), 835-838, (p. 836) DOI: [10.1016/S2221-1691\(12\)60239-1](https://doi.org/10.1016/S2221-1691(12)60239-1) [accessed 29.07.22]

Pearn, John, 'Two medieval doctors: Gilbertus Anglicus (c1180-c1230) and John of Gaddesden (1280-1361)', *Journal of Medical Biography*, (2013), 21, 3-7
DOI: [10.1258/jmb.2011.011024](https://doi.org/10.1258/jmb.2011.011024) [accessed 26.05.22]

Physick, Purge and Bleed, *Medical Antiques*, November 2011,
<<https://phisick.com/article/humoral-theory/purge-and-bleed> > [accessed 23.06.22]

Pollington Stephen, *Leechcraft, Early English Charms Plantlore and Healing* (Ely, Cambridgeshire: Anglo-Saxon Books, 2011)

Pormann, E., and Savage-Smith, E., *Medieval Islamic Medicine* (Edinburgh: Edinburgh University Press, 2008)

Portonariis, Vincetii de, *Anglicus Gilbertus, Compendium Medicine Gilberti anglici tam morboru[m] vniversalium[m] quatuor[m] particularium nondum medicis sed & cyrurgicis vtilissimum* (Lugduni, impressum per Jacobum Sacconum, expensis (1510)
<<http://resource.nlm.nih.gov/2247008R>> [accessed 21.07.22]

Prieto Peres, M. F., and others, Anxiety and depression symptoms and migraine: a symptom-based approach research. *The Journal of Headache and Pain*, 18. 37 (2017) <<https://doi.org/10.1186/s10194-017-0742-1>> [accessed 12.07.22]

Rahami, R., M. R. S. Ardekani, 'Medicina properties of Foeniculum vulgare Mill. In traditional Iranian medicine and modern phytotherapy', *Chin J Integr Med*, 19. 1. (2013) 73-79, (p.73) DOI: [10.1007/s11655-013-1327-0](https://doi.org/10.1007/s11655-013-1327-0) [accessed 07.07.22]

Rawcliffe Carol, *Sources for the History of Medicine in Late Medieval England*, trans. by Carol Rawcliffe (Kalamazoo, Michigan: Medieval Institute Publications, 1995)

Rawcliffe C., *Medicine for the Soul* (Thrupp, Stroud, Gloucestershire: Sutton Publishing, 1999)

Riddle, J. M., 'Theory and Practice in Medieval Medicine,' *Brepols Online* pp. 157-184, (p. 161) <<https://doi.org/10.1484/J.VIATOR.2.301620>>[accessed 05.01.21]

Risse Guenter B., *Mending Bodies Saving Souls* (Madison Avenue New York: Oxford University Press, 1999)

Rubin Stanley, 'The medical practitioner in Anglo-Saxon England', *Journal of The Royal College of General Practitioners*, 20.97. 63-71, (1970)

<<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2237356/pdf/jroyalcgprac00349-0014.pdf>> [accessed 24.05.21]

Rubin Stanley, *Medieval English Medicine* (Newton Abbot, Devon: David & Charles (Holdings) Limited, 1974)

Sayyah, M., and others, analgesic and anti-inflammatory activity of the leaf essential oil of *Laurus nobilis* Linn, *Phytother Res.* Aug. 17, 7, (2003), 733-736 p. 733. DOI: 10.1002/ptr.1197

Silverman, Benjamin C., 'Monastic Medicine: A Unique Dualism Between Natural Science and Spiritual Healing', *HURJ*, 1 Spring (2002) 10-15.
<<https://www.semanticscholar.org/paper/Monastic-Medicine-%3A-A-Unique-Dualism-Between-and-Silverman/6bfd8b99f130b5cc1e4e4e1a37085646f4ed4b65>> [accessed 21/03/22]

Singer, Charles, 'A Review of the Medical Literature of the Dark Ages, with a New Text of about 1110', *Proceedings of the Royal Society of Medicine*, 10 (1917), 107-60

Siraisi Nancy G., *Medieval & Early Renaissance Medicine* (Chicago and London: The University of Chicago Press Ltd., London, 1990)

Sotres, Pedro, Gil, 'The Regimens of Health' in: *Western Medical Thought from Antiquity to the Middle Ages*, ed. by M. Grmek, (Massachusetts, London: Harvard University Press, 1998), 291-398. (p. 294)

Stanford education, 'A History of the Liver, Spleen, and Gallbladder', <https://web.stanford.edu/class/history13/earlysciencelab/body/liverpages/livergallbladder_spleen.html> [accessed 03.05.22]

Stannard Jerry, 'Medieval Herbalism and Post-Medieval Folk Medicine', *Pharmacy in History*, 55.2/3, (2013), 47-54, in *American Institute of the History of Pharmacy* <<https://www.jstor.org/stable/24631898>> [accessed 1 January 2022]

Stefan Iona M. A. and A. D. Ona, Cabbage (*Brassica oleracea* L.). Overview of the Health Benefits and Therapeutical Uses, *Hop and Medicinal Plants XXVIII*, 1-2. (2020), 150-169, p.154. < <https://www.researchgate.net/publication/353411136>> [accessed 07.07.22]

Strohmaier, Gotthard, 'Reception and Tradition: Medicine in the Byzantine and Arab World.' in *Western Medical Thought from Antiquity to the Middle Ages* ed. by M. Grmek, (Massachusetts, London: Harvard University Press, 1998), 139-169. (p. 158)

Stuart, H., 'Some Old English Medical Terms', *Parergon* 13. (1975), 21-35. In Conan Doyle,' *Anglo-Saxon Medicine and Disease: A Semantic Approach* ', p. 9

Sullivan, Richard, E., 'Early Medieval Missionary Activity: A Comparative Study of Eastern and Western Methods', *Church History*, 22. (1954), 17-35

Sweetingburgh Sheila, *The Role of the Hospital in Medieval England* (Dublin, Ireland: Four Courts Press Ltd, 2004)

Talbot, C. H., *Medicine in Medieval England* (2 Portmand Street, London W. 1: Oldbourne Book Co. Ltd., 1967)

Talbot C. H., 'Some Notes on Anglo-Saxon Medicine', *Medical History*, 9.1, (1965), 156-169. <<https://www.cambridge.org/core/journals/medical-history/volume/C45C30F2F782159CB41A08A6870350D9>?> [accessed 23.08.22]

Tan Yan and Fangming Deng, ' Phytochemistry and biological activity of mustard (*Brassica juncea*): a review', *Journal of Food*, (2020), 18. 1. 704-718, (p. 704) DOI: <[10.1080/19476337.2020.1833988](https://doi.org/10.1080/19476337.2020.1833988)> [accessed 30.06.22]

Thomson, Rodney, M., and Nigel Morgan, 'Language and Literacy' in *The Cambridge History of the Book in Britain*, (2008), eds., Nigel J. Morgan, and Rodney M. Thomson, 446-453, (p. 26)

Throop Pricilla, *Hildegard of Bingen Causes and Cures*, 2nd edn. (Charlotte Vermont:Medieval MS, 2008)

Tobyn, Graeme, *Culpepper's Medicine* (Shaftesbury, Dorset: Element Books Ltd., 1997), p. 212

Tyers, T., New Medicine for Old? Recipes, remedies and treatments in vernacular manuscripts, University of Nottingham, (2009) <
<https://www.nottingham.ac.uk/research/groups/medieval/documents/documents/pgconf2009proceedings/tyers.pdf>> [accessed 30.11.22]

Uritu, C. M., and others, 'Medicinal Plants of the Family Lamiaceae in Pain Therapy: A Review'. *Pain Res Manag*. 2018 May, 8. (2018), 1-45 (p.10)
<<https://doi.org/10.1155/2018/7801543>> [accessed 30.06.22]

Van Arsdall Anne, *Medieval Herbal Remedies the Old English Herbarium and Anglo-Saxon Medicine* (New York: Routledge,2002)

Vetten de Eveline, 'Dysentery in Old and Middle English Medical Texts' (unpublished MA thesis, University of Leiden, 2018) <https://hdl.handle.net/1887/63779> [accessed 23.05.21]

Voigts Linda E., 'Anglo-Saxon Plant Remedies and the Anglo-Saxons', *ISIS*, 70.2, (1979), 250-268, in <<https://www.jstor.org/stable/230791>> [accessed 4 January 2022]

Wallis Faith, *Medieval Medicine, A Reader*, ed. by Faith Wallis, series editor: Paul Edward Dutton ed. (Toronto, Ontario: University of Toronto Press, 2010)

WebMD, 'Scotch Broom-Uses, Side Effects, and More', *Therapeutic Research Faculty*, (2020). <<https://webmd.com/vitamins/ai/ingredientmono-375/scotch-broom>> [accessed 06.07.22]

Wickstrom, John B., Gregory the Great's 'Life of St. Benedict' and the Illustrations of Abbot Desiderius II, *Studies in Iconography* 19. (1998) 31-73 (p. 42) <https://www.jstor.org/stable/23923608> [accessed 01.08.22]

Williamson, R., *Med.hist.*, 1, 51 in: D. A. Furniss, *The Monastic Contribution to Medieval Health Care*, p.245

Winter J. M. van, *Regimina Sanitatis* by Month and by Season, in Patricia Lysaght (Ed.) *Food and Meals at Cultural Crossroads*. Proceedings of the 17th Conference of the International Commission for Ethnological Food Research, Oslo, Norway, September 15-19, 2008 (Novus Press, Oslo 2010) pp. 98-109
<https://www.academia.edu/4089997/Regimina_Sanitatis_by_Month_and_by_Season> [accessed 02.03.22]

Wood M., *The Practice of Traditional Western Herbalism* (Berkeley, California: North Atlantic Books, 1954), p. 31

Wright, C. E., 'Bald's Leechbook: British Museum Royal MS 12 D. xvii', f. 109r (Baltimore: John Hopkins Press, 1955), p. 14

Zargarán, A., and others, 'A review on the management of migraine in the Avicenna's Canon of Medicine', *Neurological Science* (2016) 37 471-478, (p. 472) DOI: [10.1007/s10072-016-2498-9](https://doi.org/10.1007/s10072-016-2498-9) [accessed 23.04.22]

Zargarán. A., and others, 'Avicenna' (980-1037 AD)', *Journal of neurology*, 25. 2 (2012), pp 389-390. DOI: [10.1007/s00415-011-6219-2](https://doi.org/10.1007/s00415-011-6219-2) [accessed 12.04.22]