ACTA UNIVERSITATIS CAROLINAE – HISTORIA UNIVERSITATIS CAROLINAE PRAGENSIS
2025 Tomus LXV. Fasc. 2 Pag. 17–27

WILLIS'S CIRCLE? EXPLORING THE CONFLICT BETWEEN GALENIC AND HARVEIAN PHYSICIANS THROUGH TREATISES ON RESPIRATION

CARTER PATTON

Thomas Willis was one of the most influential physicians of seventeenth-century England, yet his career has received less scholarly scrutiny than many of his contemporaries. Willis promoted the belief system of William Harvey, contrasting the Galenic traditions of the previous millennia. I argue that Willis and his circle's work on respiration and respiratory illnesses showcase the competitive and aggressive environment of mid-seventeenth-century English medical research.

Keywords: medical debate – England – seventeenth-century medicine – history of the lungs – respiratory illness

DOI: 10.14712/23365730.2025.17

Introduction

On March 3rd, 1637, Thomas Willis matriculated into the University of Oxford, starting his academic journey to becoming one of the most influential physicians of seventeenth-century England.[1] Known for his pioneering neurological breakthroughs, Willis published books and treatises on a wide range of medicinal topics, including respiration, fermentation, and diabetes. Willis remained busy experimenting throughout his rise to medical eminence, publishing his findings across 14 works. Nevertheless, despite his reputation, some of these works have undergone less scholarly scrutiny than others. In this paper, I argue that Willis and his circle's work on respiration and respiratory illnesses showcase the competitive and aggressive environment of mid-seventeenth-century English medical research leading to greater acceptance for the ideas of William Harvey. I start by briefly describing Willis and his training. Then, I shift to consider conceptions of the lungs and respiration in Willis's era, focusing on the written conflict between Willis, his collaborator Robert Lower, and his rival Edmund O'Meara. I conclude by looking at Willis's diagnosis and treatment of the respiratory ailments of 'peripneumony' and 'pleurisie' within *pharmaceutice rationalis* [rational pharmaceuticals] and compare his therapeutics with ideas from contemporary physicians.

Willis grew into a significant physician and experimentalist through rigorous training at Oxford, following the methodology of William Harvey, whose ideas I will explore shortly. He became one of the pre-eminent English physicians of the 1660s; at the peak of his

[1] Alastair Compston, *'All manner of ingenuity and industry': A bio-bibliography of Dr Thomas Willis 1621–1675*, Oxford 2021, p. 20.

© 2025 The Author. This is an open-access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0).

popularity, he was the highest-grossing physician in all of London.[2] Willis also had significant ties to respiratory diseases. Mary Willis, his first wife, died after a four-year battle with a respiratory illness in 1670. Willis's loss suggests why he started examining similar ailments in greater depth. Before he could publish his findings, in 1675 'peripneumony' and 'pleurisie' took Willis's life at the age of 53, and I will examine his thoughts on the two diseases.[3]

Notwithstanding his reputation, Willis and his works have not received the scholarship that other seventeenth-century experimentalists have accrued. A possible reason for the limited historical analysis of his oeuvre is its inaccessibility, as it was written and published in highly technical medical Latin. In the first monograph dedicated to the physician, Hansruedi Isler provided a generally positive outlook on Willis: "*Although Willis did not cause a single major breakthrough which might be compared with Harvey's great discovery, there is nothing comparable to the bulk of his accomplishments in seventeenth-century medicine, at least not in England.*"[4] It is important to note that Isler published his work during the mid-twentieth century, an era when historians frequently endorsed their subjects, and sometimes did not nuance their arguments with the faults of the individuals studied. Isler justified his book by illustrating Willis's contributions across multiple fields, and how he shaped medicine, with particular attention paid to neurology. Isler also concentrated on the Circle of Willis, an eponymous arterial structure delivering blood to different regions of the brain.[5] Since Isler's publication 55 years ago, surprisingly few dedicated studies have been conducted on Willis and his experiments. In 2011, Michael Hawkins supported the notion of Willis as a relatively understudied historical figure compared with some of his contemporaries, pointing out that some of Willis's treatises still lack a dedicated analysis.[6] In this paper, I examine part of Willis's infrequently-discussed *pharmaceutice rationalis*, which contains valuable insights into his understanding of respiration and the lungs.

A Cavalier and Piss Profiteer: Thomas Willis's Medical Training

Thomas Willis's humble beginning influenced his medical practice and relationship with other contemporary experimentalists. Born to a farming family in Wiltshire in 1621, Willis rose to become an Oxford-trained physician.[7] Willis's rise to fame stemmed from his geography, opportunities, and fortunate circumstances for developing a physician. He attended school in Oxfordshire, paying for his education by working as a servitor.[8] As

[2] Anthony Wood, *Athenae Oxonienses: An exact history of all the writers and bishops who have had their education in the University of Oxford. To which are added the fasti, or annals of the said University*, (ed.) Philip Bliss, II, London 1813, p. 1051.

[3] A. Compston, *'All Manner of ingenuity and industry,'* p. 72.

[4] Hansruedi Isler, *Thomas Willis 1621–1675: Doctor and Scientist*, New York 1968, p. 192.

[5] H. Isler, *Thomas Willis*, p. 186.

[6] Michael Hawkins, *Piss Profits: Thomas Willis, His Diatribae Duae and the Formation of His Professional Identity*, History of Science 49/1, 2011, pp. 1–2.

[7] Willis's upbringing is not fully known, but this is the most widely accepted version of the account. See Andrew Clark, *'Brief Lives,' chiefly of Contemporaries, set down by John Aubrey, between the Years 1669 & 1696*, II, Oxford 1898, pp. 302–304; A. Compston, *'All Manner of Ingenuity and Industry,'* p. 15.

[8] Charles Symonds, *Thomas Willis, F.R.S. (1621–1675)*, Notes and Records of the Royal Society of London 15, 1960, p. 91.

a servitor, he assisted a "knowing woman in physique and surgery," an early introduction to the medical field.[9] Willis continued his studies at the University of Oxford and received a Bachelor's and Master of Arts in Liberal Arts by 1642, the typical degree path for most students. Willis's early work crafting pharmaceuticals as a servitor propelled his interest to study chemistry outside his degree and start a medical degree as fighting broke out in the British Civil War period.[10] Willis stayed in Oxford and sided with the Royalists, or Cavaliers, solidifying his desire for a medical career. As he enlisted in the University Legions and Oxford endured a siege throughout the Civil War, Willis gained first-hand experience with battlefront ailments.[11]

While living in Oxford, Willis spent time practicing 6 miles away in Abingdon, where contemporary physicians denigrated him as a "piss-prophet", diagnosing people in the public market from their urine. While not a respected practice to diagnose publicly, Abingdon provided Willis the chance to work with a new patient population, and he started making notable observations there.[12] Willis formed connections in Abingdon with other physicians, including Ralph Bathurst.[13] Michael Hawkins has argued that Willis's devout Anglican faith influenced his propensity for charity medical care, which he started in Abingdon and maintained throughout his life. Willis took his faith seriously, dedicating most of his works to the Archbishop of Canterbury and maintaining his beliefs and daily prayers throughout his career. Luis Caron recently argued that Willis's neurological works directly connected with his faith and served the Anglican Church.[14]

Benefitting from his Royalist sympathies, Willis was elected the Sedleian professor of Natural Philosophy in 1660 after the restoration of the monarchy with Charles II. This significant University of Oxford appointment entailed Willis delivering lectures on Aristotelian theory.[15] Willis was the first in the position to depart from the medicinal theories of Aristotle, and used his platform to describe his anatomical experiments, with many lectures detailing his neurological work.[16]

Willis learned from physicians trained in the experimental method while at Oxford and likely from the influential anatomist William Harvey himself. Harvey, a Cambridge- and Padua-trained physician, had launched a departure from Galenic beliefs about the circulation

[9] A. Clark, *'Brief Lives,'* p. 302.

[10] Early modern students of chemistry often defined their framework in opposition to Galenic medicine, including drawing on the ideas of the physician Paracelsus. See Allen Debus, *Paracelsianism and the Diffusion of the Chemical Philosophy in Early Modern Europe*, in: Ole P. Grell (ed.), Paracelsus: The Man and his reputation, his Ideas and their Transformation, Leiden 1998, pp. 225–244.

[11] A. Compston, *'All Manner of Ingenuity and Industry,'* pp. 20–22.

[12] M. Hawkins, *Piss Profits*, p. 14. Willis was an early observer of the traits of diabetes mellitus, particularly the symptom of sweet-tasting urine.

[13] Robert Frank, *Harvey and the Oxford Physiologists*, Berkley 1980, pp. 107–112. Bathurst became a close friend of Willis and wrote considerably on respiration. Willis and Lower were known to have read transcriptions from his respiration lectures.

[14] Luis Caron, *Thomas Willis: the Restoration and the First Works of Neurology*, Medical History 59/4, 2015, p. 530.

[15] A. Compston, *'All Manner of Ingenuity and Industry,'* p. 37.

[16] A. Compston, *'All Manner of Ingenuity and Industry,'* p. 41. Additionally, Willis was early to argue that 'hysteria' originated in the nervous system. Traditionally, the disease was believed to originate in the uterus, but then the physician Nathaniel Highmore advocated its origin in the lungs. Willis directly responded and promoted his belief in his *Cerebri Anatome*; see Robert Martensen, *The Brain Takes Shape: An Early History*, Oxford 2004, pp. 153–174.

of blood and the function of the lungs in his 1628 publication of *de motu cordis* [of the movement of the heart].[17] While controversial when first published, Harvey's ideas had gained acceptance at Oxford by the time Willis started his medical degree. As Willis learned Harveian medicine, he became a staunch supporter of the methodology. Harvey's works set in motion many of the debates Willis engaged in with Galenic physicians. While not a monolithic group, physicians following Galenic principles occupied mainstream English medicine throughout the first half of the seventeenth century. Harvey's works gained popularity quickly amongst many contemporary scientists. Robert Frank Jr. outlined the relationship between Willis and his contemporaries in *Harvey and the Oxford Physiologists*. Frank calculated that during the time of Willis, Harvey's ideas influenced 110 Oxford scientists, who, between them, authored over 240 publications in "science, technology and medicine."[18] Harveian medicine emerged from English academic centres, propelling physicians to conduct more experiments and question their previous understandings, including their beliefs on the lungs and the origin of pulmonary ailments. Even with the rapid rise in popularity, plenty of English physicians refused to abandon key principles of Galenic medicine. As he developed into one of the most famous and successful of a new generation of Harveian physicians, Willis became a primary target for the Galenist critics.

Accusations and Vindications: Clashes Around the Process of Respiration

With the mid-seventeenth century bringing significant developments in methodology and technique across medicine, many physicians resisted immediately implementing new techniques. Incongruent beliefs caused tensions between physicians to boil over, surfacing as public attacks on one another's practices and overall schema. The aftermath of Thomas Willis's first published book, *diatribae duae medico-philosophicae* [A medical-philosophical discourse of fermentation], reveals fundamental disagreements amongst physicians. This opposition is shown particularly clearly in the case of respiration. With reluctant physicians opposing the adoption of Harvey's findings around the structure and function of the lungs, the respiratory system followed the trend and was a source of fierce debate.

Willis published the *diatribae duae* in 1659. The text primarily outlines Willis's beliefs about fermentation, fevers and urine.[19] Throughout his work, Willis promoted Harveian beliefs of blood circulation and aimed to re-evaluate fevers based on new understandings of the circulatory system.[20] Hawkins has argued that *diatribae duae* was also a way for Willis to announce his support for the ideology of Harveians and other experimentalists and legitimize his own medical practice and experiments.[21] This publication thrust Willis into the limelight, leaving him vulnerable to attacks from Galenists who disagreed with his analysis.

Robert Frank Jr. demonstrated that the period from 1659 to 1662 witnessed much discussion and focus on the mechanism of respiration for Willis, the renowned scientist Robert

[17] William Harvey, *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus*, trans. by Robert Willis, New York 1847, pp. 17–21.
[18] J. Trevor Hughes, *Thomas Willis 1621–1675: His Life and Work*, London 1991, p. 44.
[19] M. Hawkins, *Piss Profits*, p. 13.
[20] For analysis of the fermentation section, see R. Frank, *Harvey and the Oxford Physiologists*, pp. 164–169.
[21] M. Hawkins, *Piss Prophets*, p. 4.

Boyle, and their like-minded peers. However, Frank omits Willis's beliefs on respiration, only noting that he was in contact with Boyle and involved with anatomy experiments with other members of his circle of colleagues: Richard Lower, Walter Needham and Thomas Millington.[22]

While Willis received accolades from many admirers of *diatribae duae*, numerous contemporaries attacked his views after its publication. Some evaluations argued that Willis did not venture far enough *away* from traditional practices, such as the chemical physician George Thompson, who spurned him as a "Galeno-Chymist".[23] In reality, Thompson's critique had some truth and would have applied to most Harveians of the era. Throughout the work, Willis referenced the Galenic humours, most significantly departing from the humoral system in his *Fevers* section describing the nature of blood, where he drew extensive knowledge from Jan Baptist van Helmont.[24] While the sense of professional investment in humoral theory waned slowly for most physicians, Willis relied on many of its principles in his first work. Some continental European physicians launched broader attacks on Willis's work. In 1663, Martin Kerger accused Willis of "putting forward opinions without proof," and Martijn Schook believed "*Willis' book lacked logical formality or conceptional clarity.*"[25] While all of these were serious accusations, they paled in comparison to a bitter dispute initiated by Edmund O'Meara.

An Irish Galenist, O'Meara rejected Willis's perspective in his 178-page *examen diatribae Thomae Willisii* [examination of Thomas Willis's diatribe], published in 1665. O'Meara was a contemporary of Willis, as both men were members of the Royal College of Physicians who trained in Oxford immediately before the British Civil Wars.[26] O'Meara critiqued the entire school of Harveian medicine, putting into question Willis's ideas on fevers. He also attempted to use arguments based on Galenic logic against Willis's conceptual definitions, especially those relating to the humours.[27] O'Meara's largest departure from Willis was in his denial of the circulation of blood, which would negate Harvey's theories of lung function. He also critiqued Willis's use of animal models to understand human systems. O'Meara scorned Willis and the experimental method for "*Sweating away at his bellows, and monotonously tasting one substance after another…*"[28] In prodding Willis's *diatribae duae*, O'Meara attempted to denigrate the entire branch of Harveian medicine, funnelling his criticism through Willis's publication.

The significant academic attack against Willis upset Richard Lower, one of Willis's longtime assistants. Lower, a well-respected experimentalist himself, published a sharp and direct rebuttal to O'Meara, disparagingly describing his viewpoint:

[22] R. Frank, *Harvey and the Oxford Physiologists*, p. 157.

[23] Kenneth Dewhurst (ed.), *Richard Lower's Vindicatio: A defence of the experimental method*, Oxford 1983, p. xv. Thompson was a reliable critic of Galenic medicine and spent his life attempting to discredit many of its methods.

[24] For Willis and his circle's influence by van Helmont, see Antonio Clericuzio, *From van Helmont to Boyle. A study of the transmission of Helmontian chemical and medical theories in seventeenth-century England*, The British Journal for the History of Science 26/3, 1993.

[25] K. Dewhurst, *Richard Lower's Vindicatio*, pp. xv–xvi.

[26] Edward Chamberlayne, *The Second Part of the Present State of England Together with Divers Reflections upon the Antient* [sic] *State Thereof*, London 1671, p. 263.

[27] Edmund O'Meara, *Examen Diatribae Thomae Willisii*, in: K. Dewhurst, Richard Lower's Vindicatio, p. xxii; O'Meara is occasionally referenced as 'de Meara'.

[28] K. Dewhurst, *Richard Lower's Vindicatio*, p. xxvi.

Let us see what support that crude grimacing old man [O'Meara] relies on when he dons this insolent and swollen conceit … he is so remote from chemistry that one would think him in exile under sentence of banishment from water and fire…[29]

While Lower lengthily critiqued O'Meara's Galenic viewpoint, much of his criticism was aimed at O'Meara's character. Lower insulted O'Meara's heritage, calling him "*a little frog from the swamps of Ireland, engendered against the will of nature and croaking against that of decency.*"[30] Lower's criticisms descended into purely personal attacks beyond any scientific connection. Lower continued, lacing personal and professional criticisms addressed towards O'Meara's assessment of Harveian respiration:

Will not an inflation and immobility of the lungs, as is usual in attacks of asthma, be brought on by the blood stagnating in their ducts. Certainly nothing could be imagined anywhere in medicine not only more improbably, but also more ridiculous, than this circulation of the blood according to O'Meara.[31]

Lower's critique of O'Meara's Galenist perspective aptly showcases rhetorically the divide between physicians on theories as fundamental as respiration. O'Meara decried how Willis admitted he could not detect any of his five basic chemical particles in a pure state, thus making him unable to explain any system in the body.[32] Physiologically, O'Meara and other old-guard Galenists held firm in their belief of an open circulatory system for blood, while Willis and the Harveians advocated for the circulation of blood in a closed system, flowing through the heart and lungs. With their philosophical reputations at stake, O'Meara and Lower denigrated one another's opposing perspectives. Willis, Lower and other Harveians continued growing their advantage as more physicians learned their methodology and more experiments emerged to support their anatomical understandings.

Even when analysing written affronts, historians should exercise caution placing modern-day schema on 400-year-old subjects. Kenneth Dewhurst held Lower's vitriol was unnecessarily harsh and hypothesized that Lower suffered from a "*cyclothymic disposition, and wrote vindication during a hypomanic phase*," attributing a diagnosis for some "unacceptable errors of judgement." Alastair Compston respected this diagnosis due to Dewhurst's training as a psychiatrist.[33] Even with the nature of writing as erratic as Lower's, placing modern-day medical diagnoses on historical figures is challenging to justify, as diseases evolve in meaning and understanding over time. Lower was praised by contemporary Harveians for defending Willis, and scholars hypothesizing about the potential of mental illness does not advance analysis of the historical era.[34]

The rebuttals between Willis and O'Meara continued throughout the 1660s. Conlan Cashin, a fellow Irishman, published a defence of O'Meara with criticisms for Lower's beliefs. Lower published a response once again under the belief Cashin was a pseudonym for

[29] K. Dewhurst, *Richard Lower's Vindicatio*, p. 201. Dewhurst noted how the "banishment from water and fire" alluded to an Ancient Roman punishment of outlawing citizens.

[30] J. Hughes, *Thomas Willis*, p. 44.

[31] K. Dewhurst, *Richard Lower's Vindicatio*, p. 230.

[32] K. Dewhurst, *Richard Lower's Vindicatio*, p. xxii.

[33] K. Dewhurst, *Richard Lower's Vindicatio*, p. xxviii; A. Compston, *'All Manner of Ingenuity and Industry*,' p. 607, n. 166.

[34] Henry Oldenburg, *An Account of Mr. Richard Lower's newly published Vindication of Doctor Willis's Diatriba de Febribus*, Philosophical Transactions 1, 1665, pp. 77–78.

O'Meara.[35] As Dewhurst noted, "*In vindication, Lower launched the most vigorous seventeenth-century onslaught on humoral pathology and Galenic medicine.*"[36] As significant vitriol spewed from both Harveian and Galenist scholars throughout the middle of the seventeenth century, the circulation theory of Willis and Lower eventually became widely accepted as additional evidence developed to support the circulatory nature of blood. By looking at beliefs about the fundamental nature of respiration, it is possible to see the impact Willis and his contemporaries had on advancing medical knowledge and the challenges they faced from their critics.

Pulmonary Predators: 'Peripneumony' and 'Pleurisie'

If expansion and ventilation are prevented [in the lungs], the vital flame is extinguished and the body becomes congested as observed in conditions with obstruction of the airway causing suffocation.[37]

When exploring deadly respiratory illnesses later in his career, Thomas Willis still faced criticism for his beliefs, even from other prominent Harveian physicians. Willis received disapproval when publishing his analysis about the ailments 'peripneumony' and 'pleurisie'. However, he could not respond himself because of his untimely death due to suffering from a combination of both afflictions.[38] Willis's writings on the ailments, particularly in *pharmaceutice rationalis,* illustrate a blended form of understanding certain respiratory diseases, maintaining some Galenic aspects alongside applying newly understood experimental findings. As Harveian scholars developed experimental reasoning behind their beliefs, they did not entirely fall away from previous medical traditions in England. The two ailments of 'peripneumony' and 'pleurisie' strongly correlated in Willis's view. Willis's understanding of these diseases – and his overall beliefs on respiration – are illustrated through John Locke and Richard Lower's notes on Willis's lectures, given during his time as Sedleian Professor at Oxford. The diseases personally affected Willis before his death, as multiple family members, including his previously mentioned wife, succumbed to their symptoms. Willis's writings on 'peripneumony' and 'pleurisie' illustrate the continued defence of his ideas in a turbulent time for experimentalists.

Willis's theories on respiration, and specifically respiratory diseases, are illustrated throughout Locke's 416 pages of dictation transcripts. While not dedicating an entire lecture to the lungs or their ailments, Willis mentioned pulmonary anatomy along with various respiratory diseases. He named the "most renowned man Malpighi" as a significant influence on his study of the respiratory system.[39] Marcello Malpighi was an Italian physician who, in 1661, discovered capillaries in the lungs of frogs, and was a follower of the

[35] Conlan Cashin, *Willisius Male Vindicatus Sive Medicus Oxoniensis Mendacitatis et Inscitiaa Detectus*, Dublin 1671; see R. Lower, *Treatise on the Heart as well as on the Motion and Color of Blood and on the Transit of Chyle through it*, London 1669.

[36] K. Dewhurst, *Richard Lower's Vindicatio*, p. vii.

[37] John Locke, *Thomas Willis's Oxford Lectures*, trans. by Kenneth Dewhurst, Oxford 1980, pp. 53–54.

[38] A. Compston, *'All Manner of Ingenuity and Industry,'* p. 72.

[39] K. Dewhurst, *Thomas Willis's Oxford Lectures*, p. 24.

Harveian movement.[40] Locke noted that in his lectures, Willis mentioned 'pleurisie' six times, along with two mentions of 'peripneumonie'. Willis also highlighted a successful remedy for the respiratory disease 'asthma', a sudden freight.[41] J. Trevor Hughes highly praised Willis's pulmonary understandings during this era, and favourably declared them "the best anatomical description then available."[42] He also believed that regarding the pulmonary system, "*the reputation of Thomas Willis will continue to grow because of the diseases and syndromes recognized by him.*"[43] While 30 years have passed since Hughes boldly claimed Willis's superiority and predicted his rise in popularity, historians have yet to undertake a dedicated study of Willis's writings on respiration.

Richard Lower's notes of Willis's lecture survived by being sent to the experimentalist Robert Boyle.[44] Boyle studied respiratory diseases and wrote on their remedies in his *Medicinal experiments*, focusing on three treatments for 'pleurisie'. On 'pleurisie', Willis and Boyle had two of the same treatment methods, consuming horse-dung or the pizzle of a stag.[45] Richard Lower also discussed how to treat 'pleurisie'. He provided similar recommendations to Willis and Boyle, first bloodletting, then taking an herbal and animal-based remedy.[46] While unconventional treatments to the modern reader, Harveian physicians' agreement on treatments of ailments reinforces their experimental collaboration.

Willis elaborated on his perspective on the pulmonary system and its diseases in the second part of his *pharmaceutice rationalis* (published posthumously in 1675), which again faced significant blowback from critics. His book had a 93-page section dedicated to the thorax and its diseases. Willis dedicated 14 pages within the section to 'peripneumony' and 'pleurisie'. Willis detailed the similarities between 'peripneumony' and 'pleurisie' and linked their sections in *pharmaceutice rationalis*. He devoted significant space to describing their connection: "*How great affinity there is between a Pleurisie and Peripneumony* […] *they often happen together, or one while this, another while that, come one upon the other, or succeeds it.*"[47] Physicians historically linked the two diseases; Willis was not breaking new ground by making this connection.[48] When treating them, Willis noted that "*the same method of Cure* [sic] *is prescribed by most modern Physicians for either disease.*"[49] While

[40] John West, *Marcello Malpighi and the discovery of the pulmonary capillaries and alveoli*, American Journal of Physiology-Lung Cellular Molecular Physiology 304/6, 2013, pp. L383–L384.

[41] K. Dewhurst, *Thomas Willis's Oxford Lectures*, p. 25.

[42] J. Hughes, *Thomas Willis*, p. 83.

[43] J. Hughes, *Thomas Willis*, p. 85; citing WS Miller, *Thomas Willis and his De Phthisis Pulmonari*, American Review of Tuberculosis 5, 1922, pp. 934–949.

[44] K. Dewhurst, *Thomas Willis's Oxford Lectures*, p. 52.

[45] Robert Boyle, *Medicinal experiments*: *or, A collection of choice and safe remedies for the most part simple and easily prepared, useful in families, and very serviceable to country people*, London 1693, pp. 127–129.

[46] Richard Lower, *Dr. Lowers, and several other eminent physicians, receipts containing the best and safest method for curing most diseases in humane bodies: very useful for all sorts of people, especially those who live remore* [sic] *from physicians*, London 1700, p. 71.

[47] Thomas Willis, *Pharmaceutice rationalis: or, An exercitation of the operations of medicines in humane bodies. Shewing the signs, causes, and cures of most distempers incident thereunto: In two parts: As also a treatise of the scurvy and the several sorts thereof, with their symptoms, causes, and cure*, London 1678, p. 67.

[48] Georgios Stefanakis – Vasileia Nyktari – Alexandra Papaioannou – Helen Askitopoulou, *Hippocratic concepts of acute and urgent respiratory diseases still relevant to contemporary medical thinking and practice: a scoping review*, BMC Pulmonary Medicine 20/165, 2020, p. 3.

[49] T. Willis, *Pharmaceutice rationalis*, p. 67.

Willis prescribed very similar treatments for both ailments, the strategy of bloodletting for 'pleurisie' was not universally accepted. Detailing 'peripneumony', he wrote:

Wherefore the formal reason and conjunct cause of a Peripneumony consists in these two things, that the blood boils feaverishly, and sticking also within the narrower passages of the Lungs, engenders there an obstruction causing inflammation.[50]

Willis stuck with a traditional Galenic description of 'peripneumony', categorizing the disease as a fever and something blocking the flow of air. He also cited Hippocrates's mentioning of a classic symptom: pain with breathing. While mentioning the symptom of feeling heat in the lungs, Willis correlated 'peripneumony' with the Galenic belief that the lungs served to cool inspired air.[51] He primarily blamed blood slowing down within the lungs, with additional references to the humoral system.

For many pulmonary diseases, including 'peripneumony' and 'pleurisie', Willis's first line of treatment involved performing a phlebotomy, or bloodletting. He performed this procedure in hopes of balancing the blood levels within the body and reducing the pressure on the regions with inflammation.[52] The procedure had a lengthy historical precedent before Willis and many physicians viewed bloodletting as an initial remedy for inflammation, fever and other blood-related diseases. As Willis described herbal and animal-based remedies for 'peripneumony', he proposed a three-tiered treatment approach. This preceded a cautioning against other therapies, including opiates and purging early during the illness.[53] Working through a disease diagnosis from symptoms, prescribing treatment methods, and warning for contraindications, Willis demonstrated a methodical approach through multiple solutions to relieve the symptoms of specific respiratory diseases.

While agreeing on the structure of the lungs, Willis's contemporary Thomas Sydenham, a prominent Harveian physician, disagreed on the treatment of 'pleurisie' and 'peripneumony'. Compston noted Sydenham as a rival of Willis due to his replicating Willis's ideas on fermentation as his own into one of his own works. Sydenham supposedly called Willis "*an ingenious man but not a physitian* [sic]*, and that hee* [sic] *does not understand the way of practice.*"[54] Sydenham included his copied fermentation theories in an edition of O'Meara's *diatribae Thomae Willisii*, while not unusual due to the printing process at the time, was an act that could have soured their overall relationship.[55]

Sydenham provided a list of symptoms for 'peripneumony' similar Willis's, but differed from him on 'pleurisie'.[56] On 'pleurisie', both Willis and Sydenham noted that it could be diagnosed from a 'prickling pain' on one side of the body, along with recommending bloodletting as a first treatment.[57] They differ, however, on the question of which side of the body to take the blood from. Willis described the history of the decision behind which arm and

[50] T. Willis, *Pharmaceutice rationalis*, p. 60.
[51] T. Willis, *Pharmaceutice rationalis*, p. 60.
[52] T. Willis, *Pharmaceutice rationalis*, p. 63.
[53] T. Willis, *Pharmaceutice rationalis*, pp. 64–65.
[54] Geoffrey Guy Meynell, *Materials for a Biography of Dr Thomas Sydenham*, Folkestone 1988, p. 68.
[55] A. Compston, *'All Manner of Ingenuity and Industry,'* p. 581, n. 86. Edmund O'Meara did not have any specific writings on respiratory disease survive. Some of his beliefs survive through his contemporaries' writing. See Robert Pierce, *Bath Memoirs*, *Or, Observations in Three and Forty Years Practice*, Bristol 1697, p. 177, 272. See Adrian Johns, *The Nature of the Book: Print and Knowledge in the Making*, Chicago 2000.
[56] T. Sydenham, *The compleat* [sic] *method of curing almost all diseases to which is added an exact description of their several symptoms*, trans. by Randal Taylor, London 1694, p. 20.
[57] T. Sydenham, *The compleat* [sic] *method*, p. 18.

vein to use, referencing the perspective of Hippocrates, Galen and Harvey, among others.[58] With reference to this historical interlude, he determined that the arm opposite the pain was best suited. By contrast, Sydenham believed in letting blood from the arm on the affected side. Sydenham additionally highlighted the disease's seasonality and the precise points where patients could feel pain. Willis dove into greater depth on treatment options, with three pages full of medications physicians could administer.[59] Even with the same medical training, contemporaries frequently disagreed on treatment options for afflictions.

Throughout this section, Willis's viewpoints on 'peripneumony' and 'pleurisie' were endorsed by his circle but also provoked challenges from opposing physicians, both Harveians and Galenists. Willis, seen as influential by Hughes in his assessment of respiration works, wrote in great depth on the two diseases and laid out precise details of his treatment methods. The personal nature of 'peripneumony' and 'pleurisie', to which he himself eventually succumbed, increase the treatments of respiration importance when studying Willis's ideas compared to other contemporary physicians.

Conclusion

Thomas Willis lived during a time of significant cultural change in English medicine. Serving as a standard-bearer for the Harveian circle and methodology, he withstood steep criticism for the views of his burgeoning school of medicine. Despite his significant achievements and notability, Willis has received less scholarly attention than many of his contemporaries. Edmund O'Meara, George Thompson, Conlin Cashin and other physicians directly contrasted the methods and practices of Willis and his fellow Harveian experimentalists. Richard Lower's fierce rebuttal to O'Meara reiterates the high-stakes nature undertaken by physicians to defend their work. As dissenters against many longstanding Galenic methods of care, Harveians fought for their beliefs on respiration's importance towards the body's circulatory system.

Looking at Willis and his contemporaries' treatments for the respiratory ailments of 'peripneumony' and 'pleurisie' further illustrate the conflicts among physicians, even within the Harveians. Willis provided his beliefs on the two ailments, along with other respiratory illnesses, within his posthumously published *pharmaceutice rationalis*, which has yet to undergo a full scholarly analysis. Analysing the entirety of *pharmaceutice rationalis* could help elucidate Willis's understanding of thoracic versus lower abdominal diseases and continue to explore his relationships with his circle and adversaries.

William Harvey's publication of his experiments supporting the circulation of the blood in *de motu cordis* spurned a significant rift within the English medical community that would last for decades. Thomas Willis and his circle fought off criticism, through treatises across topics, throughout the mid-seventeenth century to further solidify the adoption of anatomical structure from the ideas of William Harvey. The fierce debates sparked by Willis's works on respiration illustrate the conflict and competitiveness that characterized relations among seventeenth-century English physicians.

[58] T. Willis, *Pharmaeutice rationalis*, pp. 71–72.
[59] T. Willis, *Pharmaeutice rationalis*, pp. 71–73.

CARTER PATTON

Willisův kruh? Zkoumání konfliktu mezi galénovskými a harveovskými lékaři prostřednictvím pojednání o dýchání

RESUMÉ

Thomas Willis byl jedním z nejvlivnějších lékařů sedmnáctého století v Anglii, přesto jeho kariéra nebyla předmětem takového vědeckého zájmu jako kariéra mnoha jeho současníků. Žil v době významných kulturních změn v anglické medicíně. Propagoval teorie Williama Harveyho, které byly v rozporu s galénovskými tradicemi předchozích tisíciletí. Bouřlivé debaty vyvolané pracemi Willise a jeho okruhu, věnované problematice dýchání a respiračních onemocnění, ilustrují konflikty a soutěživost, které charakterizovaly vztahy uvnitř konkurenčního výzkumného prostředí mezi anglickými lékaři v 17. století.

Carter Patton, MPhil
University of Cambridge, Department of History and Philosophy of Science, United Kingdom
Boonshoft School of Medicine, Wright State University, USA
patton.135@wright.edu