

# Shakespeare's Medical Knowledge: How Did He Acquire It?

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VOLUMES have been written on the subject of Shakespeare's knowledge of legal language and issues, most of it by lawyers, all but a handful arguing strenuously that he had, as Lord Penzance stated, "a knowledge [of the law] so perfect and intimate that he was never incorrect and never at fault." (Greenwood 375). A number of scholars have felt the same way about his knowledge of medicine. As E.K. Chambers said, "on similar grounds [referring to the law] Shakespeare has been represented as an apothecary and a student of medicine" (1.23). Yet there have been only three comprehensive books written on the subject of Shakespeare's knowledge of medicine: J.C. Bucknill (1860); R.R. Simpson (1959); and Aubrey C. Kail (1986); along with a handful of less important works (see Selected Bibliography, page 58).

Let's examine what Shakespeare might have known about medicine in his day. First, it is important to note that there would be no comprehensive books on the history of medicine of the period until 1699, when Drs. Baden and Drake translated into English the *L'Histoire du Physique* of Le Clerc, and even this dealt primarily with the medicine of the Greeks and Arabs (Bucknill 10). Although there were at the time a number of essays or short works on narrow medical issues, true medical literature, like medicine itself, was still in its infancy, so that it would not have been possible for Shakespeare to have absorbed much from reading what was available to him in English. The vast majority of medical works were published in Latin or Greek. There were also political reasons that may have worked to inhibit physicians from publishing new methods or ideas, as will be shown.

Despite the relative scarcity of available books on medicine in England, this was a period of rapid growth and development in medicine on the Continent. A number of important teachers in Italy and France were experimenting with new methods and disseminating new ideas and techniques, men such as Fallopius, head of medicine and anatomy at the University of Padua (for whom the Fallopian tube was named); Eustacius, physician and anatomist (for whom the Eustacian tube was named); Fabricius, who succeeded Fallopius and gave us a modern technique of skull trephination and tube tracheotomy, among other things;

Columbus, who first described the relationship of the systole and diastole of the pulse to the beating heart; Caesalpini, who some think knew about blood circulation before William Harvey; Vesalius, upon whose anatomical dissections important anatomical atlases were based; Ambroise Paré, “the father of modern surgery”; and Montanus, the first to use clinical instruction for the teaching of medical students. Most of these great doctors and teachers were either based at the University of Padua, then the center for medical studies, or they studied there before returning home to practice.

**H**OWEVER, the advancements taking place in medical technology on the Continent were slow to reach England. As it was throughout the Middle Ages, English medicine was still solidly based on the fourth century B.C. works of Plato and Hippocrates and the second century A.D. theories of Galen. Fundamental to all medical thinking was still the ancient concept that all matter, including the human body, consisted of four basic elements: fire, water, earth and air. In the body this combination was seen in the “four humours”: black bile, yellow bile, blood and phlegm. Temperament, health and even complexion were dependent on these four humours remaining balanced. If one came to predominate over the others, some illness would result. Such ideas were basic to the common thinking of the period, so it's not surprising that Shakespeare expressed them in his writings.

Yet, as Chambers's statement suggests, Shakespeare's knowledge of medical matters was unusually broad and informed. R.R. Simpson claimed to have found 712 medical references in the plays; of these, 455 were major references and 257 minor, *an average of more than twelve major medical references per play (2-3)*. A “major medical reference” means that a disease or medical condition has been described or a medical reference used in an allusion or image, while “minor references” refer to a brief mention of something about anatomy or medicine without the use of description or imagery. Another commentator, Dr. Frank N. Miller of George Washington University, claims to have seen in Shakespeare “a dazzling array” of 1400 medical references (Ogburn 309).

Shakespeare's medical imagery could be powerful, as in *Henry VI Part 2* when Warwick describes the appearance of Gloucester's murdered body:

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*Dr. Davis did his undergraduate work at Emory University and took his M.D. at Tulane University in 1960, completing his residency in neurological surgery in 1968. He was co-founder of the Tallahassee Neurological Clinic where he practiced until retiring in 1993. He has been a member of the American Medical Assn., Southern Neurosurgical Society, American Association of Neurological Surgeons, Fellow of the American College of Surgeons, Diplomate of the American Board of Neurological Surgeons, and is past president of the Florida Neurosurgical Assn.. He has authored or co-authored a dozen medical publications. His interest in Shakespeare came from his father; his interest in the authorship question from meeting and becoming friends with Charlton Ogburn in 1994.*

See how the blood is settled in his face.  
 Oft I have seen a timely-parted ghost,  
 Of ashy semblence, meagre, pale and bloodless,  
 Who, in the conflict that it holds with death,  
 Attracts the same for aidance against the enemy,  
 Which with the heart there cools, and ne'er returneth  
 To blush the cheek again.  
 But see, his face is black and full of blood;  
 His eye-balls further out than when he lived,  
 Staring full ghastly like a strangled man;  
 His hair upreared, his nostrils stretched with struggling;  
 His hands abroad displayed, as on that grasped  
 And tugged for life and was by strength subdued.  
 Look, on the sheets his hair, you see, is sticking;  
 His well-proportioned beard made rough and rugged,  
 Like to the summer's corn by tempest lodged.  
 It cannot be but he was murdered here;  
 The least of all these signs were probable.

III.2.160-178

### Shakespeare's common medical knowledge

Many of Shakespeare's medical references are about things that anyone might learn just by living, yet even these far outnumber those of his fellow writers.<sup>1</sup> Medical imagery was an important component of the writing style of Shakespeare, and he used it more often than his contemporaries. A comparison of the medical references of Shakespeare with that of his contemporaries could, by itself, make up an entire book, but a representative selection is given on the following page.

A major key to the comparison of Shakespeare's works with any other writer is in his use of imagery of all kinds, wherein he stands above all others. As Carolyn Spurgeon attests in her book, *Shakespeare's Imagery*, his use of medical imagery is no different in this regard:

A study of Shakespeare's images of sickness and medicine shows that he had throughout his life a distinct interest in the treatment of disease and the action of medicine on the body . . . . [He] was greatly ahead of his time in such questions as the relation of temperate living to health, and his dislike of overeating and drunkenness. . . . His sensitive understanding of the influence of mind on body is what, however, puts him nearest modern expert opinion . . . ." (129-137)

THE RESULTS of a search for significant major medical references or imagery in fourteen plays by ten of Shakespeare's contemporaries:

Christopher Marlowe:

*Dr. Faustus*: three minor medical references (all to blood); no imagery.

*Tamburlaine I*: two significant medical references, one showing imagery:

Cosroe: (when wounded by Tamburlaine):  
 . . . and when death arrests the organ of my voice, who, entering at the breach thy sword hath made, sacks every vein and artery of my body. II.7.8-10

*Edward II*: ten major medical references. Two examples:

K. Edward: When sorrow at my elbow still attends; To company my heart with sad laments; That bleeds within me for this strange exchange. V.1.32-5

K. Edward: O, would my blood dropp'd out from every vein; As does this water from my tattered robes. V.5.65-6

Ben Jonson:

*Volpone or The Fox*: many minor medical references; no medical imagery.

*The Alchemist*: no medical references or imagery.

Thomas Sackville:

"Induction" to *The Mirror for Magistrates*: several minor references; no medical imagery.

Philip Sidney:

*Astrophil and Stella*: brief references to heart, blood, brain, but no medical aphorisms or imagery.

John Lyly:

*Endymion*: seven significant major medical references. Two examples:

Eumenides: That melancholy blood must be purged which draweth you to a dotage no less miserable than monstrous.

Endymion: My thoughts have no veins, and yet less they be let of blood, I shall perish. I.1.33-37

Thomas Dekker:

*The Shoemaker's Holiday* (1599): no major medical references or medical imagery.

John Webster:

*The Duchess of Malfi*: four major medical references, including one medical aphorism: "intemperate agues make physicians cruel." IV.1.137

Beaumont and Fletcher:

*The Knight of the Burning Pestle* (1613): two major medical allusions.

Philip Massinger:

*A New Way to Pay Old Debts*: two major medical references.

Although Simpson holds that there is as much medicine in Bacon, the lawyer, as there is law in Rabelais, the physician (9), neither Bacon's *Essays* nor his *Advancement of Learning* contain any significant major medical references.

Note that the two plays that do have significant numbers of major medical references have been under suspicion regarding their authorship: Marlowe's *Edward II* and Lyly's *Endymion*.

Many psychologists and members of the psychiatric profession, including, of course, Sigmund Freud himself, have noted the amazing modernity of Shakespeare's depiction of melancholy, the Elizabethan term for depression. Even today the descriptions of Hamlet's state of mind are often used as examples in psychiatric literature.

Like other of his contemporary writers, Shakespeare refers frequently to the main tool of medical diagnostics of the time, the "casting of waters," or the examination of urine specimens, and the favorite cure-all, purgation, via enemas ("clysters") or blood-letting.<sup>2</sup>

In *Richard II*, Shakespeare shows he knows Hippocrates's aphorism: "persons who are benefited by venesection or purging should be bled or purged in the spring":

Richard: Wrath-kindled gentlemen, be rul'd by me;  
let's purge this choler without letting blood.  
This we prescribe, though no physician;  
deep malice makes too deep incision.  
Forget, forgive, conclude, and be agreed.  
Our doctors say this is no month to bleed.

I.1.152-7

Shakespeare's portrayal of physicians is generally favorable. Of eight doctors portrayed in seven plays,<sup>3</sup> only one was portrayed as a buffoon, Dr. Caius in *Merry Wives of Windsor*. The low esteem in which surgeons were held at the time—still no more than barbers with a few additional tools—is reflected in Sir Toby's request for a surgeon in *Twelfth Night*.

Sir Toby: That's all one; he has hurt me and there's the end on't. Sot, didst see Dick surgeon, Sot?

Clown: O, he's drunk, Sir Toby, an hour ago; his eyes were set at eight i' the morning.

V.1.196-9

### Shakespeare's uncommon medical knowledge

Yet Shakespeare's knowledge seems to extend well beyond the folk medicine and common aphorisms he could have acquired simply through living at the time. Simpson agrees, saying, "Shakespeare was well acquainted with the medical knowledge of his day, and probably also with medical literature" (113). He notes the following from *Much Ado About Nothing*:

Don Pedro: What! Sigh for a toothache?

Leonato: Where is but a humour or a worm. II.2.23-4

Simpson tells us that the opinion that toothache was caused by a "humour or a worm" was expressed by John of Gatisden in the book, *De Corriosone Dentium*, published in Italy in 1595. Simpson also suggests that a reference to "a worm picked from a maid's finger" found in *Romeo and Juliet* (I.4.65-6) likely comes from the book, *A Compendious Chyrurgerie*, by John Bannister, published in 1585 (13).

During the Elizabethan period there was considerable disagreement among physicians over which to follow: Galen, in force since the second century A.D; or Paracelsus, a near contemporary Swiss alchemist and physician (1493-1541), who urged doctors to use empirical methods of observation and experimentation; in short, the process we now call "the scientific method." Paracelsus also promoted the use of distillates of herbs and other chemicals as medicines for treatment, earning him the title: "Father of Pharmacology." The conversation from *All's Well That Ends Well* regarding the King's medical condition shows that Shakespeare was aware of this conflict:

Lafeu: They say that miracles are past; and we have our philosophical persons to make modern and familiar things supernatural and cause less. Hence it is that we make trifles of terrors, ensconcing our selves into seeming knowledge when we should submit ourselves to an unknown fear.

Paroles: Why, 'tis the rarest argument of wonder, that hath shot out in our latter times.

Bertram: And tis so.

Lafeu: To be relinquished of the artists . . .

Paroles: So I say, both of Galen and Paracelsus.

Lafeu: Of all the learned and authentic fellows . . .

Paroles: Right, so I say. II.3.1-13

There is also evidence that Shakespeare had knowledge of an even more advanced nature. It is quite remarkable that in three plays he refers to the *pia mater*.<sup>4</sup> The *pia mater* is the inner lining of the covering of the brain and spinal cord. Knowledge of this relatively obscure part of anatomy could only mean that Shakespeare had either studied anatomy or

read medical literature.<sup>5</sup> He certainly did not get this knowledge from folk-medicine, Galen or Hippocrates.<sup>6</sup>

Even more striking to me as a neurosurgeon is his acquaintance with the relationship of the third ventricle with memory. In *Love's Labour's Lost* (IV.2.70-1), the pedant Holfernes states “. . . these are begot in the ventricle of memory, nourished in the womb of the *pia mater*.” A possible source might have been Vicary's *Anatomy of the Body of Man*, published in 1548, which refers to the third ventricle as the “ventricle of memory.” Today, we know that a paired structure, the fornices, that lies at the lateral wall of the third ventricle is, indeed, intimately involved with the function of recent memory.

### **The circulation of blood; who knew what and when?**

The discovery of the circulation of blood has been assigned to William Harvey by medical historians, dating it to 1616 when he gave a lecture on the subject in London for the College of Physicians. It was certainly Harvey who proved blood circulation by means of animal experimentation, but there are a number of indications that the concept was known for some time before his presentation of 1616. There are indications that Shakespeare, too, was aware of it long before Harvey's announcement.

J.C. Bucknill, writing in 1860, reports that Thomas Nimmo, while reading Brutus's lines to Portia in *Julius Caesar* (II.1.288-90): “You are my true and honourable wife, as dear to me as are those ruddy drops that visit my sad heart,” became convinced of “what I cannot view otherwise than a distinct reference to the circulation of blood, which was not announced to the world as generally supposed, until some years after the death of Shakespeare.” [Actually, Shakespeare of Stratford was alive at the time, though not for long.] From this, Nimmo argued that *Julius Caesar* could not have been written as early as thought (1603, by orthodox dating) and, therefore, Shakespeare must have been personally acquainted with William Harvey! Bucknill then quotes a Mr. T. J. Pettigrew: “it is quite clear that Shakespeare could not have met Harvey, and whatever may have been his reflections upon the discovery of the existence of valves in veins, there are no traces in any of his writings to show that he had then entertained any particular views upon the nature of circulation.”

Bucknill himself attempts to have it both ways: “Shakespeare believed in the flow of blood . . . but there is not a trace of any knowledge of the circulation of blood” (215). But what, after all, would be the difference in “circulation” vs. “flowing of blood”? Since the body is a closed space, if blood moves it must either circulate or move in a to-and-fro motion. In any case, despite Bucknill's assurances there are, in fact, at least nine significant references to the circulation or flowing of blood in Shakespeare's plays.<sup>7</sup> Writing in 1860, Pettigrew

acknowledges that Shakespeare must have known about the valves in veins, thus eliminating any to-and-fro motion; the valves that were discovered in 1574 by Fabricius (Gillispie 6.153). By 1600, Columbus had apparently recognized the connection between systole and diastole and the beating heart. It is thought that Caesalpini also knew about the circulation of blood prior to Harvey, and that Michael Servetus, too, knew something about circulation as he was the first to describe pulmonary circulation in 1546.

In his seventeenth century work, *Brief Lives*, John Aubrey stated that Walter Warner, one of the few true scientists of the Elizabethan period, had knowledge of the circulation of blood prior to Harvey's lecture of 1616 (Aubrey, Dick 315). According to Aubrey, Warner told a Dr. Pell that Harvey had come by the knowledge of circulation of blood from a Mr. Prothero to whom Warner had confided his idea that because of the "beates of the pulses" there must

*Give sorrow words. The grief that does not speak  
Whispers the o'er fraught heart and bids it break.*

*Macbeth: IV.3.209-10*

be a circulation of the blood. Warner was a mathematician and scientist, one of the three "magi" supported by Thomas Percy, Earl of Northumberland, often

referred to as "the wizard Earl," for his interest in science, magic and alchemy. It is unfortunate that, due to the fears of the ignorant that scientists with laboratories were atheists and sorcerers, the extreme secrecy required for scientific research and discourse during the Elizabethan period has caused Warner's knowledge and development of algebra and the logarithm tables to remain outside the mainstream of science history.

England is proud that it was an Englishman who has been credited with the discovery of the circulation of blood, but the establishment was initially dismissive of Harvey's work. His presentation of the proofs of the circulation of blood, given as the Lumleian Lecturer before the College of Physicians in April, 1616,<sup>8</sup> was very poorly received. Afterwards he said "I fell mightily in my practice and it was believed by the vulgar that I was crack-brained and all the physicians were against my opinion, and envied me." (Aubrey, Barber 138) He did not publish his book, *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus*, for another twelve years (1628) and then, published in Frankfurt, Germany. His book was not translated into English until 1653, thirty-seven years after his initial lecture. He did live long enough to see his theories accepted.

Harvey graduated in medicine from the University of Padua in 1602 after having studied under the famous Hieronymus Fabricius. Fabricius, one of the most famous doctors and teachers of medicine in the Renaissance, held the chair of Medicine and Anatomy at Padua for nearly fifty years (1562-1609). In 1574, Fabricius discovered the valves in veins respon-

sible for keeping the blood flowing in one direction toward the heart, the first to bring this important discovery to light (Gillispie 6.153).

It is evident that Harvey must have begun his work on blood circulation while studying with Fabricius in Padua. In fact, Fabricius himself may have known much more about the circulation of blood than he dared to publish, due to fear of reprisals from the Catholic Church. As the biographies of scientists and science theorists such as Galileo, Giordano Bruno and Michael Servetus show, the results of publishing science that the Church and the Inquisition didn't favor were harsh in the extreme.<sup>9</sup> (Sometimes scientists would find ways to publish without causing a disturbance, as when Realdus Columbus buried his concept of the relationship of diastole and systole with the beating heart in the text of a religious tract during the mid-sixteenth century.)

The briefest study of the subject will show that Shakespeare's interest in medicine was remarkable. Even more remarkable is the fact that the medical knowledge shown in his works is greater than what could be reasonably expected from the resources available to ordinary Englishmen at the time. It seems evident that Shakespeare must have had access to extraordinary sources for his knowledge of medical and dental theory, of the dispute over the ideas of Galen and Paracelsus and of the circulation of the blood. Since there is no evidence that William of Stratford had access to sources that might have afforded him such knowledge, what evidence is there that the Earl of Oxford might have been privy to such information?

**A**s Stephanie Hopkins Hughes shows in her forthcoming thesis, *Shakespeare's Tutors; the Education of Edward de Vere*, Oxford was "brought up" in the household of his tutor, Sir Thomas Smith.<sup>10</sup> It seems that Oxford was with Smith from age four (Dewar 74) to twelve, when he was transferred to Cecil House by Lord Burghley as a ward of the Crown (Ward 14). As Smith's biographer, Mary Dewar, emphasizes, Smith held the chair in Civil Law at Cambridge University from its creation by Henry VIII in 1540 until he left the university in 1547. Highly praised for his teaching and oratorical skills, he was also known for his dedication to "physic" (the Elizabethan word for *medicine*.) It is evident that Smith was particularly interested in the theories attributed to Paracelsus regarding the use of distillates of herbal waters (15, 214). Among the titles in a list of donors to the Queens' College library, sixty of Smith's books are listed, among them "Paracelsi: *Chirurgia*" (Hughes). In letters home to his wife and steward written during the years that he was England's ambassador to France, his concern for the "stills" in his private laboratory, and directions for maintaining them, are constant themes (Dewar 140).

Smith was an avid gardener who devoted much of his time and land to raising plants for the purpose of distilling into tonics and medicines (218). He frequently commented in his letters on the great value of his "waters" as treatments for his various ailments (as opposed to

what he considered the bumbling inefficacy of professional doctors) (139), and was fond of making up potions for his friends, as we see from several letters to the Cecils that accompanied potions he prepared for them (175; Strype 160).

According to John Strype, writing in 1820, among the 400 plus titles (some of them in multi-volumes) listed by Smith in the inventory of his library he made in 1566, there were twenty devoted to medical subjects, including four by Galen (279-280). In his will of 1576, Smith left his personal physician six books: three by Galen, one on pharmacology, one on healing plants, and the works of Fallopius.<sup>11</sup> Strype states that at the time of his death, Smith's library held over 1000 books (165).

That a boy, however bright, would choose to occupy his free time in reading abstruse medical tomes in Latin may seem unlikely, but Smith was always eager to instruct anyone who would listen (132). That he would strive to impart the medical concepts that so fascinated him to his intelligent young charge can hardly be doubted. Smith was also dedicated

*By medicine life may be prolong'd, yet death*

*Will seize the doctor too.*

*Cymbeline: V.5.29-30*

to the healthful effects of a simple, healthy diet (Dewar 133); a behavior promoted by Shakespeare, as noted earlier by Carolyn Spurgeon. If the youthful Oxford did

de-velop an interest in medicine, the library of his guardian, Lord Burghley, was available to him, not only during his teenage years at Cecil House, but, as his son-in-law, for many years after. This library, one of the best in the nation, consisted of over 1700 books at the time of its sale in 1687, including an estimated 170-200 on medical topics (Jolly, email).

In his youth, Smith spent a year at the University of Padua studying law (Dewar 21-2). In 1575, while Oxford was touring the cities of Europe, he, too, visited Padua, probably for a time in early May, then for certain in November (Ward 128). As we know, Oxford visited Strasbourg for the purpose of meeting Johann Sturm, the philosopher of education, so it is unlikely that in Padua, renowned as a center for the study of law, medicine, and the arts, he would have made no effort to meet some of the famous scholars in residence there. In the *Shakespeare Jahrbuch* of 1878, the prominent nineteenth-century Shakespearean scholar, Karl Elze, claims that the characteristics of old Bellario in *The Merchant of Venice* "fully and entirely correspond" to a prominent sixteenth-century law professor at the University of Padua, one Ottonello Discalzio. So convinced was he of this identification that Elze concluded that Shakespeare must have met the man (149).

With the background in pharmacology gained from his years with Sir Thomas Smith, it seems unlikely that Oxford would visit Padua without attempting to discover the latest devel-

opments in “physic.” Even if he didn’t actually meet with Fabricius in person it is easy to imagine that the great teacher’s 1574 discovery of the valves in the veins, along with other topics related to the circulation of the blood, would have been an ongoing staple of conversation among the students and faculty at the time of Oxford’s visit the following year. It is tempting to consider that Shakespeare’s reference to Paracelsus, along with many other medical references and themes (among them the important matter of the healing of the monarch’s fistula), occur in *Alls Well That Ends Well*, the Shakespeare play that appears to conform most closely to Oxford’s life during the period when he left England for his year abroad. It is as though medical ideas somehow suffused that entire adventure.

It is also of interest that in 1576, Oxford’s personal physician, George Baker, published an important book on alchemy, *The New Jewel of Health*, which he dedicated to Ann Cecil, Oxford’s wife. Scholars have long considered this a source for Shakespeare’s interest in alchemy (Brazil). Alchemy and medicine were, of course, closely allied at that time, alchemy being a sort of blanket term that included many studies we would now regard as chemistry. Oxford himself received dedications to three other medical books as well.<sup>12</sup>

A search of the known twenty-six poems by (or suspected to be by) Oxford in his youth reveals only one major medical reference along with a few minor references. There is, however, one striking incidence of medical imagery in the prefatory letter to Thomas Bedingfield’s translation of *Cardanus’ Comfort*, composed by Oxford in 1573:

Wherefore considering the small harm I do to you [and] the great good I do to others, I prefer mine own intention to discover your volume before your request to secret the same. Wherein I may seem to you to play the part of the cunning and expert mediciner or physician, who, although his patient in the extremity of his burning fever is desirous of cold liquor or drink to qualify his sore thirst, or rather kill his languishing body, yet for the danger he doth evidently know by his science to ensue, denieth him the same. So you being sick of too much doubt in your own proceedings, through which infirmity you are desirous to bury and ensevill [bury] your works in the grave of oblivion, yet I, knowing the discommodities that shall redound to yourself thereby (and which is more unto your countrymen), as one that is willing to salve so great an inconvenience, am nothing dainty to deny your request. (Ward 88-9)

Thus, although there is no proof that the Earl of Oxford did in fact acquire the particular knowledge of medicine and pharmacology displayed by Shakespeare, there are certainly indications of his interest. Furthermore, it should be obvious that he had sufficient access to these subjects did he care to learn, access that, without solid evidence, we must assume would have been completely out of reach of William of Stratford. \_\_\_\_\_ ©

## Notes

<sup>1</sup> The following illnesses and pathologies mentioned in Shakespeare's works far exceed in number what I have found thus far in the works of his contemporaries: melancholy, ague, rheumatism, plague, infections and contagions, mental illnesses, measles, leprosy, epilepsy, sciatica, palsy, hemiplegia, apoplexy, syphilis, hydrophobia, hysteria, colic, jaundice, heartburn, dropsy, gout, pox, smallpox, cholera (green sickness), senility, and venereal disease.

<sup>2</sup> Despite building evidence that neither were particularly efficacious, both treatments took a long time to disappear. Examinations of the urine and stool were just about all the doctors had to deal with the mental illness of George III in the late eighteenth century. George Washington died after being bled for treatment of pneumonia. In 1824, Lord Byron's physician was harshly accused of contributing to his death, weakening him by repeated blood-lettings.

<sup>3</sup> Other plays with medical characters are *King Henry VIII*, *King Lear*, *Macbeth* (two), *Cymbeline*, *Pericles*, and *All's Well That Ends Well*.

<sup>4</sup> *Twelfth Night*: I.5.123; *Troilus and Cressida*: II.1.77; and *Love's Labour's Lost*: IV.2.70-1.

<sup>5</sup> In 1888, a Dr. Richardson wrote in the English medical journal, *Lancet*, that he thought he had found how Shakespeare came upon the knowledge regarding the *pia mater*. Richardson had discovered an old anatomy book by Helkiah Crooke that was printed by Jaggard in 1615. He remembered that Jaggard had been involved in the printing of some of Shakespeare's works, and that his shop was not far from the Globe Theater. Richardson fails to note, however, that the book was printed less than a year before William of Stratford's death, and many years after *Love's Labour's Lost* was first written (Richardson 757). Furthermore, the Globe burned in 1613, two years before the book was published!

<sup>6</sup> Some Shakespearean scholars have suggested that Shakespeare acquired his medical knowledge from his son-in-law, Dr. John Hall. Simpson disproved this when he showed that the vast majority of medical references and imagery were written prior to 1600, when Dr. Hall first arrived in Stratford (115, 126).

<sup>7</sup> *Julius Caesar*: II.1.288-90; *Othello*: IV.2.57-60; *Hamlet*: I.5.65-8; *Measure for Measure*: II.4.20-3; *Romeo and Juliet*: IV.1.95-7; *King John*: III.3.44-6; *Coriolanus*: I.1.138-44; *Henry VI Part 1*: III.2.160-7; *Henry IV Part 2*: V.2.129-33.

<sup>8</sup> The Lumleian Lectureship was named after John, Lord Lumley (a friend and cousin of the Earl of Oxford). In 1582-3 Lumley and Dr. Richard Caldwell founded this surgery lectureship in the Royal College of Surgeons, endowing it with a yearly stipend of 40 pounds per annum. (DNB 12.273) Harvey was appointed Lumleian Lecturer in 1615, a post he held until 1656, a year before he died.

<sup>9</sup> Church reactions to scientific inquiry were equally harsh on both sides of the ideological fence. Michael Servetus was burned at the stake along with his books, by the order of John Calvin in 1553. Giordano Bruno was burned at the stake in Rome in 1600 for his heretical theories, including the Copernican concept that the sun (rather than Rome) was central to the solar system. Galileo was sentenced to life imprisonment by the Catholic Inquisition for the same theories in 1632, though subsequently commuted to house arrest for life.

<sup>11</sup> Smith to Burghley, 25 April, 1576. B.L. Harleian MS. 6992/21.

<sup>12</sup> The books Smith gave his doctor, Thomas Crow, include: by Galen: *de Compositione Medicamentorum*, *de Alimentorum Facultatibus* and *Methodus Medendi*; by Petrus Pena, *de Herbis* and *Anti-dotarium speciale*; Turner's *Herbal*; and the *Opera* of Fallopius and Rondeletius.

<sup>13</sup> Baker also dedicated to Oxford his first book, *Olenum Magistrale*, and later, *Practice of the New and Old Physic*. A third book dedicated to Oxford was John Hester's *Phioravanti's Discourse on Surgery* (Chiljan 27, 55, 98). Three out of the total of twenty-nine known books dedicated to Oxford were on medicine.



11,000 died of the plague in London in 1593. Here, a cart comes around to collect the dead while a gravedigger digs a mass grave; from *The Cry and Revenge of Blood*, 1620.

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