

## GCSE Medicine through Time

### Robert Boyle and medical reform in the 17<sup>th</sup> century

#### FOR TEACHERS

**Context:** These teaching materials are relevant to the Core, c. 1350-c.1750 period, and the nominated topics for 2005, 'The Scientific Revolution: new ideas and technology', and 'The role of the Royal Society and William Harvey'.

**Aims:** The aim of these materials is to introduce pupils to Robert Boyle (1627-91) and his place in the history of science and medicine. In particular, they deal with Boyle's relationship to chemical medicine, his conviction that the human body was best understood according to the mechanical philosophy, and his dissatisfaction with the prevailing Galenic orthodoxy of the day. Although Boyle wrote a book expressing his views on medical practice, he decided not to publish it and it is now lost except for an outline: the reasons why this should have been the case therefore invite exploration.

**Vocabulary:** abstract ideas; advocates; ague (fever); ailments; amanuensis; apothecaries; black bile; blood; chemical physicians; chemical remedies; choleric; contemporary; corpuscles; corpuscularian; deductive; diagnosis; diaphoretics; diffidence; dogmatic; emetics; Ens Veneris; establishment; experimental; expulsion; forms and qualities; Galenic; Galenism; herbal; humours, the four (sanguine, phlegmatic, choleric and melancholic); induction; laxatives; matter; mechanical hypothesis; mechanical philosophy; manuscript; medications; melancholic; mercury; orthodox; Paracelsians; patron; phenomena; phlegm/phlegmatic; receptive; remedy/remedies; Restoration; sanguine; stroke; subversive; synthesis; therapy; transcended; vomiting; yellow bile

**Historical figures mentioned (other than Boyle):** Aristotle (384-322 BC); Bacon, Francis (1561-1626); Democritus (c. 460-c. 370 BC); Epicurus (341-270 BC); Galen, Claudius (c. 130-201 AD); Harvey, Gideon (c. 1640-c.1700); Harvey, William (1578-1657); Paracelsus (1493-1541); Pepys, Samuel (1633-1703); Thompson, George (fl. 1660s-1670s); Vesalius, Andreas (1514-64); Willis, Thomas (1621-75); Wren, Christopher (1632-1723)

**Time frame:** If used in full, the material presented here could provide the basis for two, hour-long classes, if not three. However, there is an element of flexibility about this, depending on whether pupils have already been introduced to Boyle at Key stage 3, and whether they are already familiar with the rudiments of Galenism through their work for 'Medicine through Time'.

**Resources:** Worksheet given below.

**Pupil tasks:** The worksheet should be read aloud, with pauses for explanation and questioning. At intervals throughout it, pupils are set various tasks, based either on the content of the worksheet, the extracts from sources included in it, or (in the case of Boyle's abortive reformist book), examination of a photograph of the manuscript of its list of contents.

## Robert Boyle and Medical Reform

### Section A. Who was Robert Boyle and What was his Place in Natural Philosophy and Science?

{This section is optional and can be omitted by those who have studied Boyle at Key stage 3}

Robert Boyle (1627-1691) played a central role in the emergence of modern science. He was curious about a wide range of natural **phenomena** and how they were to be explained. Before Boyle's birth, many scientists tried to explain phenomena using the theories of **Aristotle**, a Greek philosopher who lived in 384-322 BC. The Aristotelian explanation was based on the idea of '**forms and qualities**' and used **deductive** methods of reasoning, based on **abstract ideas**.

In contrast to the Aristotelians Boyle, and a few other scientists of the late sixteenth and seventeenth centuries such as **Francis Bacon** (1561-1626), preferred discovery by doing experiments, recording data and drawing conclusions from it. This **experimental, inductive** method of reasoning contrasted with the **deductive** method used by Aristotle and his followers.

Boyle used these new experimental methods to prove his theories concerning the understanding of nature – what he termed his '**mechanical hypothesis**'. He believed that all **matter** was made of units called '**corpuscles**' and Boyle called himself a '**corpuscularian**'. This idea was not totally new because it had been used by ancient Greeks such as **Epicurus** (341-270 BC) and **Democritus** (c. 460-c. 370 BC). However, in the early period most people had preferred to follow the ideas of Aristotle.

### Section A Task.

1. After having read the text above, complete the table below using the words in this list. *Inductive, deductive, mechanical hypothesis + corpuscularian; philosophy of 'forms and qualities'; experimentation, reasoning from abstract ideas.*

Scientist	Method of reasoning	Name of philosophy	Method of proof
Robert Boyle (1627-1691 AD)			
Aristotle (384-322 BC)			<i>Reasoning from abstract ideas</i>



Brass cast by C.R.Berch of an ivory medallion of Boyle produced by Jean Cavalier in 1690. This shows his distinguished but rather infirm appearance in his later years.

## **Section B. What kind of character was Robert Boyle?**

Throughout his life, Robert Boyle was troubled in body and soul. From the 1640s he suffered from ‘**ague**’ (fever) and some years later his eyesight deteriorated after a serious illness. This meant that, for much of his life, he had to make use of an **amanuensis** (a kind of secretary). For the rest of his life, he often suffered from bad health and he had a **stroke** in 1670.

As a result, Boyle made use of a wide range of **medications**. He collected these and exchanged them with his friends and colleagues. He claimed to have a remedy called ‘**Ens Veneris**’, a copper compound which had amazing curative powers; his development of this grew out of his experimental work. In addition, Boyle’s curiosity about the workings of nature made him fascinated by the human body, and he made many observations of people both when ill and when healthy. This experience made him well-placed to take an independent line on medical matters.

In addition to his physical illnesses, Boyle also had a complicated personality. For example, he agonised over every decision he took and worried about causing offence to people. He also worried greatly about his relationship with God, and spent much time examining his conscience. Historians have records of interviews with him just before his death, in which he outlined the spiritual dilemmas that faced him. Similarly in his writings he frequently put forward alternative points of view in an attempt to be as balanced as possible.

## **Section B Tasks**

1. Read Source One. What does it reveal about Boyle’s diffident personality?
2. Read Source Two. What can historians learn from this source about the state of Boyle’s personal health?

**Source One:** (adapted from Boyle’s *Certain Physiological Essays* (1661), *Works of Boyle*, vol. 2, p.19: addressed to his nephew, Richard Jones):

Perhaps you will wonder why, in most of my scientific essays, I speak so doubtingly, using words and phrases such as: *Perhaps*, *It seems*, *It is not improbable*, and such other expressions .... And also why I should be so shy of laying down principles and trying to put forward explanations.

**Source Two:** Adapted from Boyle’s preface to ‘**Medicinal Experiments**’, vol 2, *Works of Boyle*, vol. 12, pp. 210-11.

I was the thirteenth or fourteenth child of a mother who was about 42 or 43 years old when she died of consumption (tuberculosis). It is therefore no wonder that I have not inherited a healthy constitution. Some have said that I made myself sickly by too much study. I think my infirm condition is a result of a fall from a horse; as a result I was very bruised and I feel the bad effects of it to this day. This fall happened in Ireland and as a result of the bad weather there, I then had a fever which did not go until I returned to London. After this I got a violent tertian ague (fever) ... I have not enjoyed much health, despite being acquainted with the best medicines ... I also got kidney stones and had bloody urine.

141

June ye 27 1691

Yesternight ye D of S answered saying  
 that as to those ~~of~~ suggestions or  
 insinuations suggestions or insinuations  
 that he mentioned were more effect  
 of Dispersal of ye body or ye bones  
 of more mechanical effects, and as  
 it were scheme of Ideas or thoughts  
 ye rose arose in ye mind from  
 ye kinds of Dispersal of ye  
 Animal Spirits without any cause  
 manifest to us And for the  
 sin agt ye ... he said it was  
 scarce possible it could be committed  
 in or Age unless one could see a  
 miracle, & being convinced it was  
 a true one, should nevertheless seem  
 to reject it & really speak ye  
 Christian Religion confirmed by it, out  
 of unexpressed malice. And that in  
 ye Epistle to ye Hebrews, the sin  
 mentioned seems to be an Apostasy  
 from ye Christian Religion notwithstanding  
 ye clear & convincing Proofs  
 by Miracles & otherwise of ye  
 truth of it; especially in those  
 times when those ye apostatized  
 from Christianity, did as much as  
 in ye lay expose it to open  
 shame by apprehending those  
 that crucified him as a sedition  
 & an Impostor, & much more by  
 joining themselves to ye Jews  
 who in those times cursed him  
 publicly in their Synagogues  
 In short he said not to think  
 that any Christian remaining such  
 is guilty of unpardonable sin  
 and that suggestions rather abt  
 that or other things relating  
 to God were not to be disputed  
 with, but forthwith rejected and  
 slighted. For saying ye should so attend  
 to them pleasing us at least more  
 with

The first page of Boyle's notes, dictated to an amanuensis, on an interview about matters on his conscience with the Bishop of Salisbury, Gilbert Burnet, on 27 June 1691. (Boyle Papers 3, fol. 141 © The Royal Society).

### **Section C. What was the state of Medical Knowledge in the early 17<sup>th</sup> century?**

High-level medicine in the 17<sup>th</sup> century was dominated by the ideas of **Claudius Galen** (c. 130-201 AD), who flourished at the time of the Roman Empire. Galen drew on the ideas of Aristotle and the medical ideas of the Greeks and Romans to produce a remarkable **synthesis** which had no serious rival for centuries.

Galen argued that the human body consisted of a balance of **four humours**, the **sanguine**, the **phlegmatic**, the **choleric** and the **melancholic**. Each of these had a proper proportion in the human body in general. Galenic health care thus tried to analyse what this proper balance of humours was, and restore it if it went wrong.

The first step was to ensure that the balance of humours did not go wrong. Hence much effort was invested in ensuring a healthy lifestyle which included a good diet, plenty of sleep, exercise and healthy air. However, the body's balance might still go wrong and, if it did, the aim of medication was to restore it by **therapy** involving the **expulsion** of the bodily fluids representing the **humour** that the doctor diagnosed was in excess. **Blood** was let if the balance of humours was too **sanguine**, **phlegm** if too **phlegmatic**, **yellow bile** if too **choleric** or **black bile** if too **melancholic**.

By the 17<sup>th</sup> century, the art of medicine involved doctors in spending much time assessing people's state of health through talking to them and diagnosing them according to **Galen's** principles. Then, once a diagnosis had been reached, the patient was subjected to brutal **remedies** such as blood-letting or **vomiting** to expel the humour that was deemed to be present in excess. For this, **purgatives** were used such as **laxatives** (eg rhubarb), **emetics** (eg wormwood) and **diaphoretics** (e.g. a concoction called 'Venice Treacle'). Fashionable doctors, such as Gideon Harvey (pictured below) who were good at **diagnosis** commended high fees and could afford to indulge in a luxurious lifestyle.



**A picture of Gideon Harvey** (c. 1640-c. 1700), a **Restoration** doctor. Note his fashionable dress, and the allusion to his expertise through the skeleton on which he rests his hand, and the statue of his ancient mentor, Galen, in the background.



## **Section C Tasks**

1. What bodily balances did Galenic doctors try to restore?
2. Although modern doctors treat patients very differently to Galenic ones, there are still some aspects of the Galenic theory that are recommended by our government today. What do you think they are?
3. Read source three, extracts dated 1662 and 1668 from a diary written by Samuel Pepys, a **contemporary** of Boyle. What does it reveal about the popularity of Galenic therapies in the mid seventeenth century?



**Portrait of Pepys:** This portrait, accompanied by a specimen of his handwriting, comes from John Thane's *British Autography* (1788 et seq.) Samuel Pepys lived from 1633-1703. He lived in London and worked in government administration, and was responsible for matters relating to the navy. He kept a diary from 1660 until 1669. It has become one of the most famous sources for the history of seventeenth century England.

**Source Three:** 4 May 1662 'I rose from bed and Mr Holliard came to me and let my blood ... I begun to be sick, but lying upon my back, I became well again and gave him 5 shillings for his pains ... I then dined well ... with my arm tied up with a black ribbon.

5 May 1662 My arm was not well and I stayed in all the morning and dined alone at home.

13 July 1668 This morning my blood was let and I did bleed about 14 ounces, in order to cure my eyes.'

Adapted from R. Latham and W. Matthews eds., *The Diary of Samuel Pepys*, 11 vols (London, 1970-83), vol. 3, p. 76-77, vol. 9, p. 261.

## Section D. What were the alternatives to Galenism?

Although Galenism was a popular doctrine in the 17<sup>th</sup> century, it was not universally held. A strong challenge to Galenic ideas had been mounted in the 16<sup>th</sup> century by the Swiss-German doctor, **Paracelsus** (1493-1541). Paracelsus rejected **orthodox** medical doctrine as propagated by Galenic physicians. Instead, he advocated the use of **chemical remedies**, suggesting the use of substances like **mercury** for treatment. These were often very powerful, sometimes almost disastrously so. They were also illness-specific. In other words, in contrast to Galenic medicine with its focus on the bodily well-being of the patient as a whole, the followers of Paracelsus (**Paracelsians** or '**chemical physicians**') presumed that the disease was an alien force to be attacked, and that all those suffering from the same disease could be treated using the same remedy.

By the 17<sup>th</sup> century, some of the '**chemical physicians**' became quite bold in their challenge to **Galenism**, claiming that their cures were based on experience, in contrast to the useless theory at the heart of Galenic medicine. Such medication particularly appealed to those who could afford a **remedy** but not an elaborate **diagnosis** by a learned doctor. George Thomson who flourished in the 1660s and 1670s, was a well-known chemical physician who used chemical remedies.



**George Thomson: one of the most active chemical physicians, who was tireless in his critique of Galenic medicine.**

Matters were complicated by professional rivalry. **Galenic** physicians had always found a place for **herbal** and other remedies as part of their **therapy**. These were provided, not by the doctors themselves, but by a kind of medical underclass called **apothecaries**, whose job it was to prepare the drugs that doctors prescribed. **Apothecaries** had often supplemented the role of doctors by doing low-level diagnosis. With the onset of chemical medicine, it was tempting for them to claim that they could dispense with doctors altogether, since they could supply the remedies which were what were needed to cure patients' **ailments**. In many ways, it is the apothecary rather than the Galenic doctor who represents the origins of the modern GP.

The result was that the 17<sup>th</sup> century saw long battles between Galenic and chemical physicians, overlapping with a rivalry between doctors and apothecaries. This tended to place the power in the hands of the patient. Many patients used a wide variety of medical practitioners and medications. In effect, anything that worked was worth trying. Doctors and apothecaries knew this, and they therefore had to adapt themselves to what was truly a ‘medical marketplace’. Indeed, many Galenic doctors themselves developed a blend of traditional and chemical therapy, using treatments that they had seen to work, but explaining their effects in Galenic terms.

### **Section D Tasks**

1. Read section D. What was the name of the new type of physicians who challenged older Galenic medicine?
2. What were the main differences between the theories of the Galenic and chemical physicians? To answer this question effectively, make a list with two columns using the headings: ‘theories of Galenic physicians’; ‘theories of chemical physicians’.
3. Read source four, another extract from the diary of Samuel Pepys. In what ways does it support the statements made in section D about the importance and role of apothecaries in seventeenth-century medicine?

**Source Four:** *8 February 1663* ‘For two days I have been troubled with an itching all over my body ... my body is inflamed and my face red, swollen and pimped ... In bed I had a very bad night, for I was in great pain in my stomach and I had a great fever.

*9 February 1663* I could not rise ... but kept in bed; and according to the apothecary Mr Battersby’s+ advice, I am to sweat soundly and the problem will be solved; ... (it being some disorder of the blood) ... I do not know what caused it, unless it was my recent eating of gherkins. In the evening my friend Sir John Mennes\* came and he advised me to do the same thing. But he would not have me take anything from the apothecary. Instead he offered me his Venice Treacle, as a recommended medicine. I took this and then fell into a great sweat and about 10 o’clock came out of it and slept. And in the morning, most of the itching and pimples were gone. I stayed in bed all day and sweat again at night, and I expect to be very well tomorrow.’

Adapted from R. Latham and W. Matthews eds., *The Diary of Samuel Pepys*, vol. 4, pp. 38-39.

+ Mr Battersby was one of the best and most prosperous apothecaries living in London at that time.

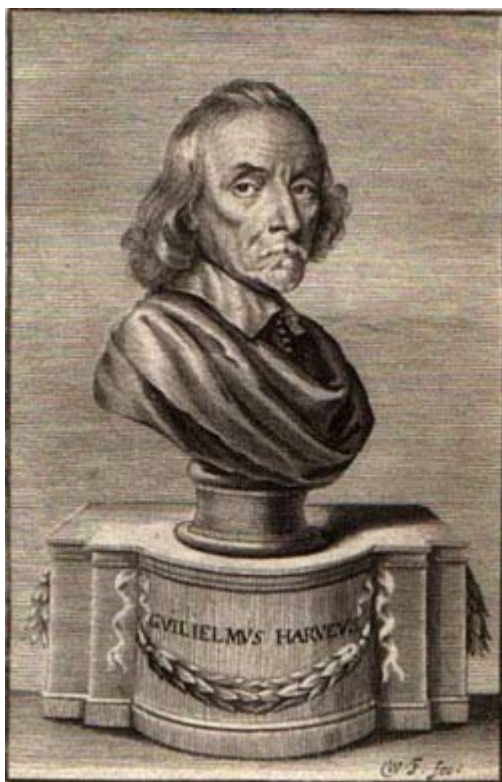
\*Sir John Mennes worked with Pepys as a top government administrator. He was also known as a learned chemist who dabbled in medicine. It is possible that Pepys was suffering from some food allergy (after eating gherkins).



### **Section E. What role did Boyle play in seventeenth-century medical reform?**

Robert Boyle was critical of Galenic medicine and **Galenic physicians** and there were many reasons for this. For one thing, his experimental work, and particularly his interest in preparing remedies in the laboratory, aligned him with the **chemical physicians** and followers of Paracelsus. Like them, he had become sceptical about the effectiveness of the principles of **Galenism**, believing that it might be more appropriate to find medicines that were 'specific' to individual diseases rather than to place undue stress on the patient's overall state of health.

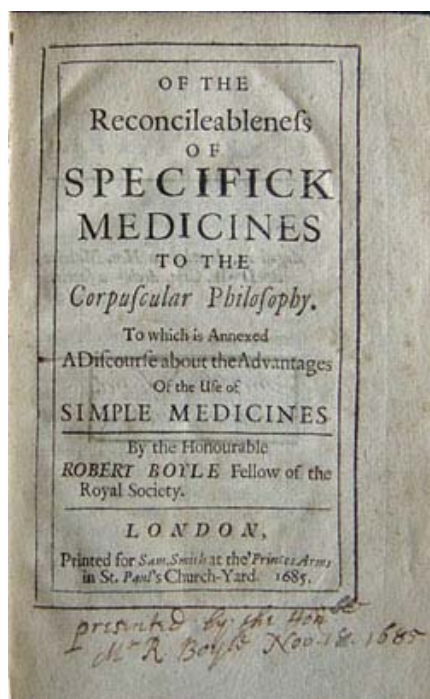
In addition, Boyle was convinced that the **mechanical philosophy** offered a complete explanation of natural things. This meant that it must also offer an explanation of the human body. In his book, *The Usefulness of Natural Philosophy*, he wrote extensively about medicine, arguing strongly in favour of the plausibility of mechanical explanations. He wrote this at Oxford in the 1650s, where he was associated with experimenters like **Thomas Willis** (1621-75) and **Christopher Wren** (1632-1723) who pioneered mechanistic explanations of the working of the human body. They were building on the tradition of anatomical study going back to **Vesalius** (1514-64) in the 16<sup>th</sup> century and **William Harvey** (1578-1657) in the early 17<sup>th</sup>, which had undermined many of Galen's ideas about how the body worked.



**William Harvey, whose discovery of the circulation of the blood laid the basis for an improved understanding of the working of the human body. Engraved portrait by William Faithorne.**

Boyle thought that the effectiveness of specific medicines could be explained in mechanical terms. In his view, certain medications might be effective because they comprised particularly potent particles, to which the body – or a part of it – was **receptive**. This was spelled out in his book, *Of the Reconcilableness of Specific*

*Medicines to the Corpuscular Philosophy*, published in 1685, which grew out of ideas that Boyle had first formulated in the 1650s (sources 6(a) and 6 (b)).



Title page of Boyle's *Of the Reconcilableness of Specific Medicines to the Corpuscular Philosophy*, published in 1685. This copy was presented by Boyle to the Royal Society on publication. (© The Royal Society)

Boyle was unhappy with Galenism as a system, because he felt that it made sense of fewer phenomena than its **advocates** claimed. Boyle's dissatisfaction with Galenic medicine reached a peak in the 1660s, so he wrote a book, in **manuscript** form, entitled *Some Considerations & Doubts about the Vulgar Method or Practice of Physick*. Boyle never actually published this book, and most of his manuscript was lost. However, historians know what was in the book because its table of contents and a few other pages have survived (source five).

### **Section E Tasks**

1. What were the titles of the two books that Robert Boyle wrote which challenged older Galenic medical theories?
2. Read source five, the table of contents of Boyle's book entitled *Some Considerations & Doubts about the Vulgar Method or Practice of Physick* (1660s). Which numbered chapters do you think relate to Boyle's new, anti-Galenic ideas concerning the appropriateness of using 'specific' medicines or remedies? Write in full sentences, explain your answer using the word 'because' and include examples or quotes from the source.
3. What does source five tell us about some of the criticisms Boyle made about the Galenic physicians (hint: look at chapter titles 2, 3, 4, 5, 6, 7)?
4. What does source six (a) reveal about Boyle's belief in the effectiveness of 'specific medicines'?
5. In section B you learnt that Boyle was often cautious about how he presented new ideas, especially when these attacked orthodox or traditional views or understandings.

Read source six (a) with this in mind. How does this source show that Boyle was a cautious writer? In order to answer this adequately, try to analyse the language he uses, noting what kinds of words he chose (some of these are underlined to help you).

5. Read source six (b). What does it tell you about why some people thought that specific medicines would *not* work? What example did Boyle use to counter this criticism?

6. How does the evidence of sources six (a) and six (b) support that of source five about Boyle's views on the new idea of specific medicines?

**Source Five:** Adapted from the Table of Contents from Robert Boyle's Lost Manuscript Book *Some Considerations & Doubts about the Vulgar Method of Practice of Physick* (1660s) [Boyle Papers, vol.18, fol. 48v]

- 1 In different countries the method of physick (medicine) varies.
- 2 The Galenic method is good for some diseases, but not for others
- 3 Galenic method is built on artificial theories; recent anatomical discoveries have shown these theories to be false
- 4 Galenic diagnosis claims to be complete, but is in many ways inadequate
- 5 Often diseases have several causes not known to the Galenic physician and therefore his diagnosis and treatments are unsuitable.
- 6 Experience shows the imperfections of popular remedies of Galenic physicians
- 7 Other physicians use non-Galenic cures, and still cure diseases
- 8 Specific medicines have been known to cure formidable diseases even when Galenic methods have not been used at all
- 9 The received methods of the Galenists are not as safe as men suppose; curing by using specific medicines for specific symptoms is better
- 10 Galenic physicians vary their diagnosis and treatment according to the age, general health and constitution of patients. It would be better to simply use specific medicines for specific diseases.
- 11 Galenic physicians have not yet made a sufficient study of diseases using empirical methods
- 12 Galenic physicians have not made an adequate study of the medicines they use and have not determined a way of finding out whether they are impure

*Some Considerations & Doubts about y<sup>e</sup>  
 Vulgar method or Practice of Physick.*  
 That in different Countreys the method of Physick  
 is considerably vary.  
 That the common method may be good in  
 some Diseases and yet not in others.  
 That method is built upon artificiall (or  
 particular) indications, and these for y<sup>e</sup> most  
 part as they are the grounds of methods are  
 built upon Theories, w<sup>ch</sup> Anatomical, or  
 other Discoveries show to be false, or imperfect.  
 That the Compleatnes of Method supposes a  
 sufficiency in its Instruments whereas really Physi-  
 cians have not tooles to answer its Application.  
 That oftentimes a Disease may proceed from  
 severall causes unknown to y<sup>e</sup> Physician, or at-  
 least not fully consider'd by him, and so may  
 make the method improper or at least inferior  
 to another.  
 That common Experience shows the languishing  
 and imperfections of vulgar remedies & method.  
 That there are some that follow quite differing  
 methods from that w<sup>ch</sup> is receiv'd, and yet cure  
 Diseases as successfully, if not better than those  
 that practice it.  
 That where Specificks are known there even  
 formidable Diseases are often successfully cur'd  
 without the help of a method built on Artificiall  
 Indications.  
 That the receiv'd method is not so safe, as  
 men suppose, or as that of curing by Specificks  
 where they may be had.  
 That whereas method is so much employ'd  
 in varying Remedies according to the Ages, Con-  
 stitutions, &c. of Patients, If we were well fur-  
 nish'd w<sup>th</sup> Specificks, so much Nicety would  
 not be necessary.  
 That our Methodists have not yet such  
 Philosophical Historys of Diseases as are fitt  
 to be wish'd and possible to be obtain'd.  
 That our Methodists have not yet sufficiently  
 examin'd the Materia Medica, nor chalk'd out  
 the possible & practicable way of discovering the  
 genuinenes or adulterations of Drugs & Me-  
 dicins whether Natural or factitious.

**Facsimile of Table of Contents from Robert Boyle's Lost Manuscript Book *Some Considerations & Doubts about the Vulgar Method of Practice of Physick*. This list of 'heads' of the lost work survives along with other similar lists in Boyle Papers, vol. 18, fol. 48v (© The Royal Society).**

This source shows you what the actual original table of contents looks like. It is kept in the Royal Society in London.

**Source six (a):** Adapted from Robert Boyle's book *Of the Reconcilableness of Specific Medicines to the Mechanical Philosophy* (1685) (*Works of Boyle*, vol. 10, pp.369-70)

I wish to debate whether the mechanical hypothesis can be used to explain why specific medicines work ... Note that there are few writers more inclined than I am to admit that there is still much more to know about the body and why specific medicines work ... I intend to give only possible explanations as to why specific medicines usually work, without claiming that they always certainly do so ... Some people may object to the use of such medicines .... and I give you this important caution, that specific medicines do not always, though sometimes may, relieve a patient by a single method; they may also relieve it by several methods.

**Source six (b):** From Robert Boyle's book *Of the Reconcilableness of Specific Medicines to the Mechanical Philosophy* (1685) (*Works of Boyle*, vol. 10, pp.366-7)

Some people object that, because so small a quantity of a specific medicine will arrive at the bodily part it should work on, it will have little power to relieve the disease. However, it is unsafe to measure the power of a chemical or medicine according to what amount you have taken ... For example, I know a man who went to Africa, who reported that the natives there had a poison that was mortal (deadly) even when given in a dosage so small that it could be hidden under a fingernail.

### **Section F. The book that was never published**

In the end, Boyle decided never to publish his *Considerations & Doubts* manuscript book in which he attacked Galenic medicine. As the book was not published, it was not placed in the public domain for people to buy, so few knew about his ideas. Why did he make this decision? Unfortunately he did not tell us in so many words but, on the basis of what we know of Boyle's character, various explanations can be put forward. In part, it seems likely that Boyle was uncomfortable taking up a position in as controversial a field as **contemporary** medicine. Also, Boyle had close links with the **establishment** (the governing classes), which meant he had to control what he said in public. In addition, some of his best friends were doctors. Therefore, he had to be a little careful how much he was associated with those who *attacked* the medical profession, because some of these were thought to be dangerous and have **subversive** intent.

Perhaps more important was Boyle's **diffidence** (lack of confidence) and his anxiety to do justice to a wide range of points of view. Clearly, he respected many physicians for their long experience and their effective bedside manner. In other words, the best of Galenic physicians developed a therapy that **transcended** the principles on which it was based and may have been truly effective. How much is it sensitivity, rather than technical knowledge, that makes a good doctor today?

Lastly, Boyle was insufficiently confident in the alternative. Although specific medicines often seemed effective, it was not clear that an entire system of medical explanation could be based on them, contrary to the views of their more uncritical supporters. In addition, though Boyle could suggest how specific medicines might be compatible with the mechanical philosophy, he could not prove it. As he put it in his book on specific medicines: 'I do not assert that the ways I suggest are the true ones

by which medicine does act ... I do not try to be **dogmatic** - I simply offer you possible explanations .' (*Works*, vol. 10, p.403)

Instead, Boyle published various treatises in which he showed how science could be used in medicine - in understanding the composition and function of the blood, for instance, or in analysing substances used in medication. This was less controversial, and it forwarded the more positive side of his agenda, making a small but significant contribution to the process by which Galenic explanations were ultimately dethroned.

### **Section F Tasks**

1. Why did Boyle never publish his attack on Galenic medicine? Do you think he made the right decision? Explain your answer fully.