

Aulus Cornelius Celsus and ‘empirical’ and ‘dogmatic’ medicine

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Introduction

An enduring debate in the history of medicine exists between groups we might call empiricists and rationalists. The empiricists hold that actual observations of ill health and treatment effects provide the main basis for trustworthy knowledge. The rationalists insist that to identify the cure of disease, we need to understand the underlying (and often hidden) causes and mechanisms that explain how the treatment works. The first mention of this debate of which we are aware comes from the Roman encyclopaedist Aulus Cornelius Celsus.

Though it is generally accepted that Celsus lived between about 25 BC and 50 AD, his date of birth is unknown. In previous ages, his first name was thought to have been Aurelius; but this was not a Roman *praenomen* and it is now widely accepted that his name was Aulus Cornelius Celsus. His place of birth is also unknown. It may have been in *Gallia Narbonensis* – roughly the region of modern France west of the Gulf of Lions. But this conjecture is based solely on his mentioning a grape variety said by Pliny to originate there. Arguments (that have not been resolved) have long continued about whether Celsus himself practised medicine or had only read about and observed its practice.

What we do know from Celsus’ famous book *De Medicina* is that he lamented the practice of medicine for money and, more importantly, that he distinguished between those he designated ‘Empirics’ and ‘Dogmatics’. The Empirics can be classified as empiricists, while the Dogmatics can be classified as rationalists. In *De Medicina*, which was rediscovered in the 15th century,^{1,2} Celsus distinguishes between the ‘Empiric’ (empiricist) and the ‘Dogmatic’ (rationalist) schools. Celsus describes empirics as proponents of empirical observation to decide whether a treatment was followed by its hoped-for effects, based on empirical observations. Dogmatics insisted that theory about how a treatment works is essential for choosing effective treatments. Celsus also identified a

third school – the Methodic School – which shared some characteristics of the Empiric and Dogmatic schools.

The Empirics believed that since many causes in nature are hidden from view, they were bound to remain obscure to us, so it was necessary to rely on observations. In Celsus’ words:

On the other hand, those who are called ‘Empirics’ because they have experience, do indeed accept evident causes as necessary; but they contend that inquiry about obscure causes and natural actions is superfluous, because nature is not to be comprehended. That nature cannot be comprehended is in fact patent, they say, from the disagreement among those who discuss such matters; for on this question there is no agreement, either among professors of philosophy or among actual medical practitioners. Why, then, should anyone believe rather in Hippocrates than in Herophilus, why in him rather than in Asclepiades? If one wants to be guided by reasoning, they go on, the reasoning of all of them can appear not improbable; if by method of treatment, all of them have restored sick folk to health: therefore one ought not to derogate from anyone’s credit, either in argument or in authority. Even philosophers would have become the greatest of medical practitioners, if reasoning from theory could have made them so; as it is, they have words in plenty, and no knowledge of healing at all. They also say that the methods of practice differ according to the nature of localities, and that one method is required in Rome, another in Egypt, another in Gaul; but that if the causes which produce diseases were everywhere the same, the same remedies should be used everywhere; that often, too, the causes are apparent, as, for example, of ophthalmia, or of wounds, yet such causes do not disclose the treatment: that if the evident cause does not supply the knowledge, much less can a cause which is in doubt yield it. Since, therefore, the cause is as uncertain as it is incomprehensible, protection is to be sought rather from the

ascertained and explored, as in all the rest of the Arts, that is, from what experience has taught in the actual course of treatment: for even a farmer, or a pilot, is made not by disputation but by practice. That such speculations are not pertinent to the Art of Medicine may be learned from the fact that men may hold different opinions on these matters, yet conduct their patients to recovery all the same. This has happened, not because they deduced lines of healing from obscure causes, nor from the natural actions, concerning which different opinions were held, but from experiences of what had previously succeeded. Even in its beginnings, they add, the Art of Medicine was not deduced from such questionings, but from experience; for of the sick who were without doctors, some in the first days of illness, longing for food, took it forthwith; others, owing to distaste, abstained; and the illness was more alleviated in those who abstained. Again, some partook of food whilst actually under the fever, some a little before, others after its remission, and it went best with those who did so after the fever had ended; and similarly some at the beginning adopted at once a rather full diet, others a scanty one, and those were made worse who had eaten plentifully. When this and the like happened day after day, careful men noted what generally answered the better, and then began to prescribe the same for their patients. Thus sprang up the Art of Medicine, which, from the frequent recovery of some and the death of others, distinguished between the pernicious and the salutary.

The Dogmatic school was founded by Hippocrates' son-in-law Polybus (c. 400 BCE). Their name was derived from the term 'dogma', which means tenet or opinion, because they professed to follow the opinions of Hippocrates. In Celsus' words:

For they believe it impossible for one who is ignorant of the origin of diseases to learn how to treat them suitably. They say that it does not admit of doubt that there is need for differences in treatment, if, as certain of the professors of philosophy have stated, some excess, or some deficiency, among the four elements, creates adverse health; or, if all the fault is in the humours, as was the view of Herophilus; or in the breath, according to Hippocrates; or if blood is transfused into those blood-vessels which are fitted for *pneuma*, and excites inflammation which the Greeks term *φλεγμονή*, and that inflammation effects such a disturbance as there is in fever, which was taught by Erasistratus; or if little bodies by being brought to a standstill in passing through invisible pores block the passage, as Asclepiades

contended — his will be the right way of treatment, who has not failed to see the primary origin of the cause. They do not deny that experience is also necessary; but they say it is impossible to arrive at what should be done unless through some course of reasoning. For the older men, they say, did not cram the sick anyhow, but reasoned out what might be especially suitable, and then put to the test of experience what conjecture of a sort had previously led up to. Again they say that it makes no matter whether by now most remedies have been well explored already... if, nevertheless, they started from a reasoned theory; and that in fact this has also been done in many instances. Frequently, too, novel classes of disease occur about which hitherto practice has disclosed nothing, and so it is necessary to consider how such have commenced, without which no one among mortals can possibly find out whether this rather than that remedy should be used; this is the reason why they investigate the occult causes.

Celsus proceeds to a ghoulish commentary on how these uncertainties were being addressed. (Note that while Celsus does mention human vivisection it in this passage, there is no evidence that it was widespread in the classical period, and there is no evidence that Celsus commends the practice in any way—in fact in some of his other writings he seems to condemn it.)

Moreover, as pains, and also various kinds of diseases, arise in the more internal parts, they hold that no one who is ignorant about the parts themselves can apply remedies for these; hence it becomes necessary to lay open the bodies of the dead and to scrutinize their viscera and intestines. They hold that Herophilus and Erasistratus did this in the best way by far, when they laid open men whilst alive — criminals received out of prison from the kings — and while these were still breathing, observed parts which beforehand nature had concealed, their position, colour, shape, size, arrangement, hardness, softness, smoothness, relation, processes and depressions of each, and whether any part is inserted into or is received into another.

Celsus himself is perhaps best classified as a proponent of the Empiric School, who deplored human vivisection:

Therefore, to return to what I myself propound, I am of opinion that the Art of Medicine ought to be rational, but to draw instruction from evident causes, all obscure ones being rejected from the practice of the Art, although not from the practitioner's study. But to lay open the bodies of men whilst still alive is as cruel as it is needless; that of the dead is a

necessity for the learner, who should know positions and relations, which the dead body exhibits better than does a living and wounded man. As for the remainder, which can only be learnt from the living, actual practice will demonstrate it in the course of treating the wounded in a somewhat slower yet much milder way.

Celsus and the debate over the relative value of empirical observations in history

There is no evidence that Celsus was known in the Medieval Arabic tradition, primarily because Latin authors like Celsus were rarely translated. Yet much of Celsus' work draws on Greek sources that were familiar to Arab authors. What Medieval Arab scholars would likely have read is Galen's (129 CE – c.200 CE) 'On the Sects', in which Galen outlines the characteristics of empiric, dogmatic, methodic schools.³ Galen's own view was a middle ground between the empiric school (he valued direct observation) and the dogmatic school (he also performed animal vivisection to investigate underlying causes of health and disease).³

Despite probably not having read Celsus, Al-Razi (c. 854 CE–c.932 CE) emphasised the importance of empirical observations. In the following passage, he describes a treatment comparison without referring to any theory:⁴

When the dullness (thiqal) and the pain in the head and neck continue for three and four and five days or more, and the vision shuns light, and watering of the eyes is abundant, yawning and stretching are great, insomnia is severe, and extreme exhaustion occurs, then the patient after that will progress to meningitis (sirsâm) . . . If the dullness in the head is greater than the pain, and there is no insomnia, but rather sleep, then the fever will abate, but the throbbing will be immense but not frequent and he will progress into a stupor (lithûrghas). So when you see these symptoms, then proceed with bloodletting. For I once saved one group [of patients] by it, while I intentionally neglected [to bleed] another group. By doing that, I wished to reach a conclusion (ra'y). And so all of these [latter] contracted meningitis. (Al Razi Kitab)

Ibn Sina,⁵ for whom we similarly have no evidence that he read Celsus, claims that empirical observations are on a par with theoretical considerations:⁶

Someone might say to us that medicine is divided into theoretical and practical parts and that, by calling it a science, we have considered it as being all theoretical. To this we respond by saying that some

arts and philosophy have theoretical and practical parts, and medicine, too, has its theoretical and practical parts. The division into theoretical and practical parts differs from case to case, but we need not discuss these divisions in disciplines other than medicine. If it is said that some parts of medicine are theoretical and other parts are practical, this does not mean that one part teaches medicine and the other puts it into practice – as many researchers in this subject believe. One should be aware that the intention is something else: it is that both parts of medicine are science, but one part is the science dealing with the principles of medicine, and the other with how to put those principles into practice.

A few centuries later, the English friar Roger Bacon⁷ claimed that 'without experiment nothing can be known',⁸ establishing himself as a proponent of empiricism.

Until the dawn of modern medicine, the theory of the four humors dominated western medical practice, with the consequence that bloodletting and purging were rational, theory-based treatments, reflecting supposed humor imbalances.⁹ Treatment based on the theory of the four humors was not based on observation (systematic observations would have revealed it as useless or harmful for most of the things it was used for) and is therefore appropriately classified as 'Dogmatic' medicine. Much more recently, the evidence-based medicine movement has promoted the value of systematic observations and can therefore be classified as empiricist. Using systematic observations, proponents of evidence-based medicine have overturned beliefs about treatments believed to be effective based on theoretical rationales. For example, people having heart attacks were given drugs known to suppress heart rhythm abnormalities. Theory predicted, without conducting the crucial experiments, that the drugs would also reduce mortality. However, clinical (empirical) trials showed that the drugs actually increase mortality.^{10–12}

Philosophical roots of the debate about the relative importance of empirical observations

Debates about the relative importance in medicine of empirical observations compared with theoretical considerations also have philosophical roots. Descartes (1596 CE–1650 CE) believed that everything in the world – including human beings – are 'mechanisms' or 'machines',¹³ and he hoped that his mechanistic view would improve the practice of medicine.¹⁴ Descartes's view is rationalist because he believed that we need to understand these

mechanisms in order to diagnose and treat patients. Indeed, Descartes himself thought that his medical discoveries would help him lead a long life. However, he died when he was relatively young and his philosophy was largely applied in the physical sciences.

In a more recent iteration of the rationalist tradition, a ‘new mechanist philosophy’ has emerged,¹⁵ which parallels Descartes’ views but is mostly applied to the biological sciences and medicine. Some proponents of this new mechanist philosophy claim that evidence of mechanisms is required to discover and establish the effects of new treatments.¹⁵ These philosophers argue that unless we have evidence of a mechanism explaining how a treatment works, we cannot know whether it works.¹⁶ Russo and Williamson,¹⁶ for example, state that ‘To establish causal claims, scientists need the mutual support of mechanisms and dependencies’. This leads them to assert, for example, that Semmelweis did not know that washing hands had prevented deaths from puerperal sepsis because he only had strong empirical data but did not propose an ‘acceptable’ mechanism.^{17,18}

Yet just as the Dogmatics were opposed by the Empirics, the new mechanist philosophers have been challenged by empiricist proponents of evidence-based medicine, who have pointed out the numerous examples where treatment benefits were established long before mechanisms were understood.¹⁹ Much harm would have been caused by failure to use interventions that were supported by empirical evidence (but which did not have a rationalist explanation), including unpolished rice to prevent beri-beri,²⁰ fruits and vegetables to prevent scurvy,²¹ liver diet to prevent pernicious anaemia,²² babies to sleep on their backs,²³ and aspirin reducing cancer incidence.²⁴ Or, as in the anti-arrhythmic example cited above, evidence from controlled clinical trials suggested the opposite of what alleged mechanistic evidence suggested. Far from understanding the mechanism linking anti-arrhythmic drugs before establishing they caused harm, the ‘best’ mechanistic knowledge suggested that they would save lives! Considering these examples, it is difficult to understand how, despite 2000 years of well-regarded thinkers saying that empirical and rational approaches can both be valuable as evidence for treatment benefits, philosophical proponents of the new mechanist philosophy refuse to believe an empirical result without a rational (mechanistic) explanation.

Conclusion

The debate between empiricist and rationalist approaches to establishing treatment benefits appears to be a recurring theme in the history of medicine,

and it is certainly active today. While not always referred to, it appears that Celsus’ description of Empirics and Dogmatics is the earliest account of the opposition between rationalists and empiricist approaches in establishing treatment effects.

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