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THALES TO GALEN: A BRIEF JOURNEY THROUGH RATIONAL MEDICAL PHILOSOPHY IN ANCIENT GREECE

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Part III: Galenic Medicine

ALEXANDRIAN ERA

With the deaths of Hippocrates and Aristotle and the concomitant decline of the medical schools of Cos and Athens, Alexandria became the new centre for scientific and medical excellence. However, Athens was still to retain some of its scholastic pre-eminence in the field of philosophy. The three great philosophical schools in the fourth century BC Rhetoric (founded by Isocrates),¹ the Academy (Plato) and the Lyceum (Aristotle), were to pass with only the Academy, along with the rival current philosophies of the Stoics and Epicureans, surviving until the sixth century AD when they were closed by the Emperor Justinian. Before turning to Alexandria it is worth discussing the achievements of one of the last eminent Athenian medical scholars, Diocles of Carystes.^{2,3} Although none of his treatises are extant he is credited with many diligent and rational observations on human embryology, having examined fetuses at various stages of gestation.

The empire of Alexander the Great was divided by his generals after his death in 323BC. Macedonia came under the control of Antigonous the grandson of Alexander's commander of the same name; in Asia Seleucus ruled the former Persian Empire, and in Africa Egypt came under the control of Ptolemy. The fusion of Hellenistic, European and Egyptian cultures under the Ptolemies created fertile grounds in which a cosmopolitan and intellectual community flourished. Alexandria has often been regarded as the centre of medical innovation in antiquity, free of influence from the Greek mainland's social and religious taboos. The Ptolemies offered an environment conducive to free rational medical research. Even Ptolemy Philadelphus broke with the social taboos of mainland Greece with marriage to his sister, Arisonë II. In Alexandria the Ptolemies' patronage of the Temple of the Muses (the *Museum*) attracted distinguished scientific and medical scholars to this vibrant port. The Museum also possessed one of antiquities most magnificent libraries, eclipsing those of Peisistratus in Athens, Polycrates in Samos, and the ancient libraries of Cappadocia, Babylonia and Jerusalem. The library possessed the complete treatises of Aristotle and the official texts of the Athenian tragedies, as well as rooms and equipment for the practical aspects of science, medicine and philology.⁴ Two of the most notable contributors to this period were Herophilus and Erasistratus.

Herophilus.

Herophilus studied at Cos under Praxagoras prior to research in Alexandria.⁵ We know from Celsus (*De Medicina* Ch23) that he vivisected criminals from the prisons of Alexandria, the only recorded description of this practice in antiquity.^{6,7} It has been argued by some scholars that the Alexandrine knowledge of anatomy, including that of Herophilus, was a product of ancient

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Egyptian literature and the practices of the embalmers.^{8,9} However, this overlooks two points. Firstly, there was a wide social barrier between the Ptolemaic Greeks and the native inhabitants, and secondly, the Egyptians had many social and religious taboos surrounding the burial customs of the deceased's body.^{10,11} The beautiful Alexandrine descriptions of brain anatomy were unlikely to have benefited from the ancient Egyptian embalmer's knowledge, where the brain was removed either by liquifaction or, piece by piece with a hook, transphenoidally.

Herophilus was the author of eleven medical treatises, now all lost, the majority of which were devoted to the study of anatomy.¹² His research into the anatomy of the nervous system was a diligent exercise in systematic and rational research. Like Aristotle, he distinguished the cerebrum (*enkephalos*) from the cerebellum (*parenkephalos*).^{13,14} Within the cerebellum his description of the posterior angle of the floor of the fourth ventricle, and its resemblance to the point of a pen, the *calamus scriptorius* or *calamus Herophili*, remains in the dictionary of modern anatomical terminology.¹⁵ Herophilus further recognised the three membranes of the brain (*chorioeidé*), and observed the depression in the occipital bone where the sinuses of the dura mater meet (*torcular Herophili*).¹⁶ He went further with his descriptions of the central nervous system, separating sensory and motor nerves (*neurán*), and tracing optic nerves from the brain to the eye.^{17,18} Aëtius of Amida (6th century AD) tells us that Herophilus devoted an entire treatise, a Herophilan ophthalmology, to this latter study.¹⁹ Herophilus's work inaugurated a new era of rationality with further dissections and descriptions of the hepatic and reproductive systems. However, in theorising on the function of reproduction, Herophilus still demonstrated points of irrationality. He believed that human semen was a product of the blood, a form of surplus nutriment, a belief that can be traced back to Empedocles.²⁰

Erasistratus.

Our knowledge of Erasistratus compared to that of Herophilus is greater for the fact that Galen devoted a number of treatises specifically to refute many of his theories.²¹ Like Herophilus, he vivisected criminals from the prisons of Alexandria.²² The bedrock of his rational medical research lay in his anatomical descriptions. He was probably the first person to discover the co-ordinated function of all four main valves of the heart.^{23,24} His descriptions of both lung and general vasculature have led many to believe that there was a classic understanding of the circulation of the blood which pre-dated Harvey.²⁵ Unfortunately Erasistratus' irrational physiological descriptions of blood flow, including his principle of *horror vacui* (vol. 26, p. 313) all but negate this interesting theory. Erasistratus was unable to form the connection between blood and arteries, still believing that air (*pneuma*) was their major constituent. In his view blood did not circulate but rather replenished dead tissue. However, it would be unfair to tarnish all of his physiology with the label of irrationality. Rather his attempts to depart from formal Hippocratic concepts through the avenues of Peripatetic philosophy laid many of his physiological innovations open to erroneous conclusions. His most celebrated rational innovations concerned the development of Herophilus's neurology.²⁶ Erasistratus carried his inquiry into the brain and nervous system considerably further than Herophilus. Both Alexandrines, under the patronage of Ptolemies, achieved great advances in anatomy and physiology that were to add much to the development of rational medicine in the post-Hippocratic era.

In 145 BC the Museum in Alexandria was temporarily destroyed by Ptolemy Euergetes II, and although it was to survive for another 250 years its 'Golden Age' had ended. As well as the contributions of Erasistratus and Herophilus to medicine this period had also seen great advances in mathematics by Archimedes, Euclid and Apollonius.

Impact of Rome.

Although immensely powerful politically Rome during this time had remained culturally and scientifically barren. Such great minds as the Elder Cato (184 BC) were impassive to the Greek philosophical and scientific heritage, preferring to remain entrenched in Latin texts. It was not until the Roman rhetorician and statesman Marcus Tullius Cicero (106–43 BC) began to translate Greek texts into Latin that it became intellectually fashionable to embrace Greek language and learning. The Graeco-Roman epoch had arrived and by Horace's time (65 BC) educated Romans were well versed in Greek. Although the centre for scientific and medical studies remained in Alexandria, many of the doctors in Rome were Greek. Asclepiades of Bithynia²⁷ brought his mechanistic views, that of treatment according to opposites (diseases of relaxation treated with astringents and vice-versa), to challenge the Hippocratic doctrines (vol. 26 p. 314). The anti-teleological views of the Epicureans laid the philosophical foundations for those, like Asclepiades, who wished to view physicians as the only hope for cure by their use of various panaceas. Their wish was to empower a rational form of medicine that had emancipated itself from the shackles of philosophy.

Some of the finest accounts of Roman medicine during the early Graeco-Roman period came from Romans who were not ostensibly true physicians. Aurelius Cornelius Celsus²⁸ (25–50 BC) was a nobleman who wrote the voluminous *De Re Medica* (30 AD), which dealt with diseases to be treated by diet and lifestyle (I–IV) as well as diseases amenable to surgery and medication (V–VII). A further illuminator of the medical practices of this period was Gaius Plinius Secundus, or Pliny the Elder (23–79 AD) (Fig 5), whose *Natural History*, Books XX–XXXII deal with matters medical.²⁹ Although both Pliny and Celsus propagated many of their forefathers irrational notions, such as the anti-epileptic properties of hot human blood from dying gladiators (a view shared with the pre-Mohammedan Arabs), they were also the first to suggest that human fertility and sterility were linked with conception.³⁰ Dioscorides (Fig 6), an army surgeon in the service of Nero from 54–68 AD, completed a pharmacopoeia *De Materia Medica*. It was a masterpiece of rational descriptive science cataloguing some 700 medicinal plants and herbs. Its influence was to last well into modern times, and ninety plants are still used in medicine today.³¹ Also of note was Soranus of Ephesus³² (98–138 AD) who wrote, amongst his forty other treatises, *Gynaecology*, 'the most brilliant and rational account of contraceptive technique prior to the 19th century'.³³ Practising in Rome during the reigns of Trajan and Hadrian, he was also a follower of the Methodist school of Asclepades.

CLAUDIUS GALENUS

Galen, a Greek was born around AD 129 in Pergamum, Asia Minor³⁴ (Fig 7). His death, traditionally placed in AD 199, is now thought not to have taken place before 210.³⁵ From an early age he was educated by his father Nicon, a respected architect, who tutored him in arithmetic, logic, and grammar. This was



FIGURE 5

Pliny the Elder studying the eruption of Mt. Vesuvius (background) where he met his death. (Wellcome Institute Library, London).

followed by education at each of the four philosophical schools in Pergamum, the Platonists (by a pupil of Gaius), the Peripatetics, the Stoics, and the Epicureans. Balancing these differing schools of philosophy was a theme running through his subsequent medical writings. These studies were to be cut short by a dream of Nicon,³⁶ in which he was urged to enrol his son in medicine. At the age of sixteen, Galen formally began to study medicine in Pergamun, initially at the school of the Rationalists and then later with the Empiricists. With the death of his father, he left Pergamum in 152 in search of the finest medical teachers the civilised world had to offer, travelling to Smyrna, then Corinth and finally to

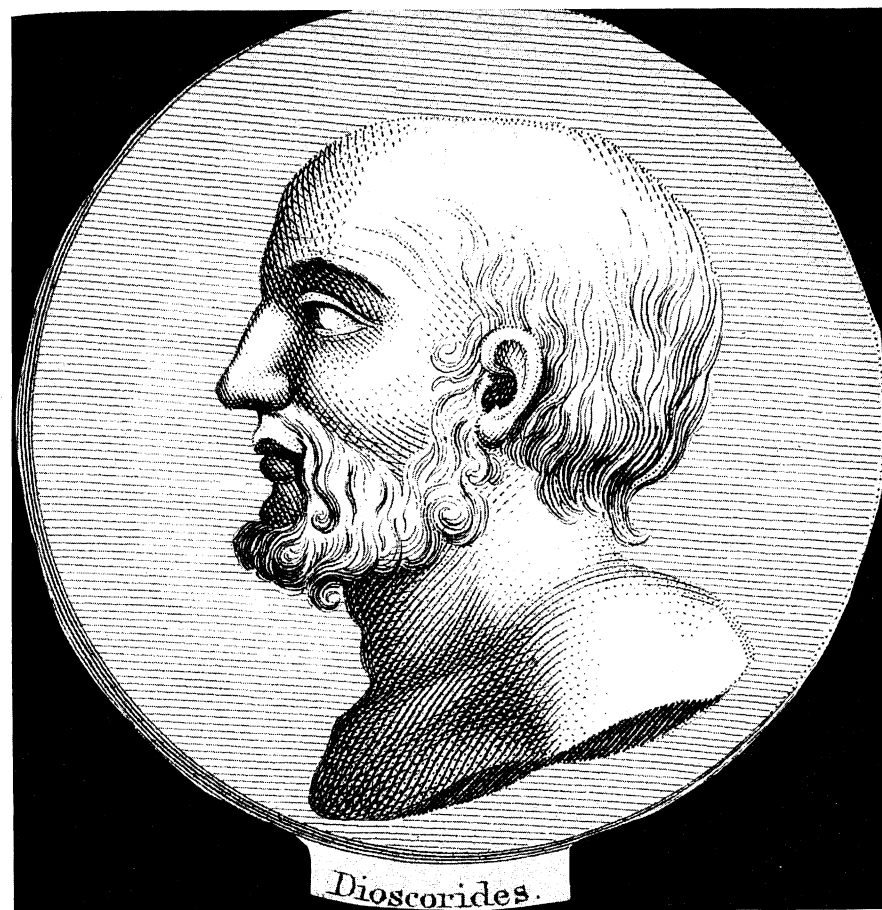


FIGURE 6

Pedanius Dioscorides. Line engraving by R. Burgess. (Wellcome Institute Library, London).

Alexandria.³⁷ He returned to Pergamum in 157 and became the gladiatorial physician, but in 162 left for Rome, where he settled after a brief spell at the winter camp of the Emperor Marcus Aurelius at Aquileia.³⁸ Initially the physician to Emperor Marcus Aurelius's son Commodus, Galen later administered to the Emperor himself. It was amongst Roman society that Galen lived and worked until his death.³⁹

Galen has often been accused of being eclectic in his approach to medicine and philosophy.⁴⁰ By his own admission he was an adherent of no philosophical school (*Aff. Dig.* V. 42),* and it is pejorative to label Galen as either eclectic or a syncretist.^{41, 42} Perhaps if we are to treat eclecticism as a respectable exercise we are further forward to understanding Galen's approach to medical rationality. An eclectic selects diverse elements from differing schools to create a new philosophy,

*Standard Galenic texts are quoted from: Kühn CG, 20 volumes in 22, Leipzig, 1821-23, reissued in facsimile from Hildesheim in 1965. Abbreviated references are Roman numerals, followed by Arabic numerals indicating respectively volume & page number in Kühn.

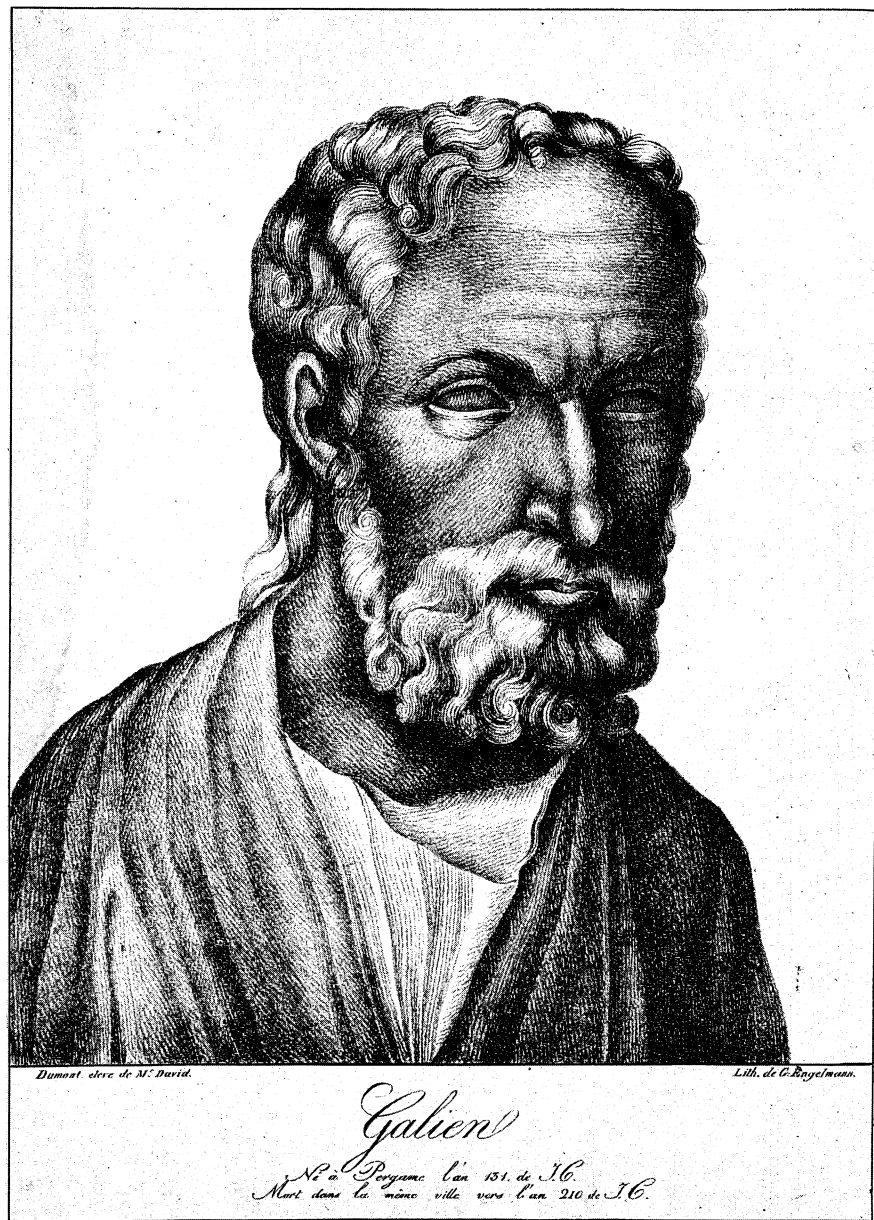


FIGURE 7

Galen. Lithograph by Dumont. (Wellcome Institute Library, London).

while a syncretist attempts to show how apparently different and distinct doctrines in fact amount to the same thing.⁴³ Although acknowledging his debt to the rationality of Plato (*On the Doctrines of Hippocrates and Plato* V. 181–805), Galen was careful not to align himself with any particular philosophy. His development of the theory of nature, and the structure of natural causality, owed much to Aristotle and to Stoicism.⁴⁴ Galen's regard for the practicality of

geometry also enabled him to link metaphysical theory with practical considerations, especially on matters of clinical judgement via medical philosophy. His regard for the ethical and moral issues of medicine was also notable. He believed passionately that genuine scientific and medical advances could only be made by those with principles. Indeed, he wrote a short treatise *That the Best Doctor is also a Philosopher* (Opt.Med.I.53–63), in which he stresses that not only must doctors be of logical thought and well schooled in natural philosophy; they must also be morally impeccable:

It is not possible to be successful in science and medicine unless one is hard-working; and it is not possible to be hard-working if one is a drunk, a glutton, or excessively addicted to sex: in short, a slave to belly and genitals.
(Opt.Med.I.59)

The corpus of Galen's medical writing presents itself as the sum of ancient medical knowledge. It was a systematic, critical appraisal of the whole tradition of Greek medicine from Hippocrates onwards.⁴⁵ Apart from Soranus's *Gynaecology* and Dioscurides' *Materia Medica*, Galen replaced the whole of the earlier medical literature. The prolific nature of Galen's works is self-evident from his extant treatises, of which some one hundred and six, twenty-nine of questionable authenticity, have survived. Those extant in Greek fill twenty volumes, others are extant only in Arabic, such as *On Medical Experience*, and in medieval Latin, *Outline of Empiricism*.⁴⁶ Overall his literary works covered three major spheres: medicine, philosophy and philology. Unfortunately, when the Temple of Peace in Rome burned down Galen's philosophical writings deposited in the library were lost.⁴⁷

Galen's rationality was distinct from his ability as a medical encyclopedist. He was able to draw on a tradition, many centuries long, in forming a rational Galenic Corpus of medical texts.⁴⁸ His rationality was derived from three philosophical schools, the Methodists, the Empiricists and the general tendencies of the Dogmatists.^{49, 50} The Galenic theme that reason (*logos*) and experience (*empeiria*) can function as routes to the same truths was derived as the sum of these philosophical approaches.⁵¹ From the Methodist standpoint causes were therapeutically useless, and therefore ignored, whereas the Empiricists observed the relevance of the course of events to the disease. In Galen's view the best approach was the marriage of theory from Methodism with the practical application of the Empiricists.⁵² This rational approach to clinical judgement and therapeutic dogma was to be the forefather of our modern medical system.

Galen extended Hippocratic rationality to emphasise that empirical testing (*peira*) was an essential part of medical justification. Without it correct diagnosis could not be made as the practitioner would come to rely solely on potentially harmful Dogmatic practices. This rationality was to have special implications for Galen's subsequent medical treatises. Thus Erasistratus (BC 310–250), who described the major blood vessels, had thought that they carried air from the lungs to all parts of the body. Galen, by careful experimentation, was able to disprove this hypothesis.⁵³ He demonstrated that the arteries of living creatures carried blood, and that this was their normal state and not the result of disease or damage. His procedure was to isolate and then tie off with ligatures a portion of an artery. Then opening the isolated portion, he was able to demonstrate that it was full of blood, and not air.^{54, 55}

His work on neurology, however, has episodes of irrationality. In his explana-

tion of the nature of nerves he describes each nerve as having an inner part as well as two envelopes. The inner part is likened to the 'pith' of a tree '*meson . . . analogon te ton dendron enterione*',^{56, 57} many of which spring from the brain. However, unlike his rejection of Erasistratus's circulation-*pneuma* hypothesis, Galen had no difficulty in reconciling the irrational notion of air (*pneuma*) flowing through the nervous system.^{58, 59}

One of the more interesting Galenic medical treatises concerns the disease of leprosy. The Hippocratic use of the words *lépra*, or *leúke* cannot be taken as descriptions of lepromatous leprosy, since they also included lichens, scabies, exfoliations, ulcerations and so forth.^{60, 61} In fact the Greek word *lépra*, derived from the biblical Hebrew word *tsara'ath*, was not used to describe lepromatous leprosy until AD 800 by the Arab physician John of Damascus.^{62, 63} It was the author of *Prorrheticon, II* who considered 'the *leúke* among the fatal diseases, like the so-called Phoenician disease'.⁶⁴ Galen was later to comment on this passage, 'the Phoenician disease: common in Phoenicia, and in other Oriental regions; the disease in question seems to be elephantiasis'. What Galen actually meant by elephantiasis is unquestionably lepromatous leprosy or Hansen's disease.⁶⁵ Galen was able to apply his considerable medical experience and logic to identify the epidemiology of lepromatous leprosy and correctly identify it as *leúke*.

The case history of Philiscus, described in the appendix to the first book of the Hippocratic *Epidemics*, was also extensively commented upon by Galen.⁶⁶ In *Epidemics I*, the Hippocratic writer notes that Philiscus's breathing was 'deep and infrequent, as though he was trying to recall it'. Deep and infrequent breathing immediately suggests Kussmaul's dyspnoea, but the expression *hóspēr anakaleoméno* indicates that it is rather paroxysmic dyspnoea of the Cheyne-Stoke type, a deep and noisy respiration that gradually diminishes and gives way to an apnoea that can last as long as twenty to thirty seconds. According to Galen's comments, the word *anakaleoméno*, in this context, should be taken in the sense of the verb *anamemneskomai*, to remember or recall. Authors of antiquity often used this phrase to denote invocation, especially of a dead soul from Hades.⁶⁷ By this description Galen presented, perfectly, the clinical description and emotional impact of a patient struggling for breath.

Galen's views, like those of Aristotle before him, were fundamentally teleological, and he concurred with the Aristotlian dictum that 'Nature does nothing in vain'. Galen was also able to incorporate the humoralism of Hippocrates and make it traditional, but, despite his theorising, he always tested his hypotheses by the canon—whether they were, or were not *biopheles* 'useful for life'. Academia and clinical practice are not mutually exclusive practices, and it is a point that perhaps one should consider in the increasingly polarised world of medicine and science.

AFTERMATH—FROM GALEN TO HARVEY

Byzantine period

With the death of Galen (c. 210) and the demise of Alexandria as antiquity's centre for medicine, it was the Byzantine compilers who were to store much of the corpus of Greek medicine. This was by no means a sudden transition; the Graeco-Roman period continued until 576, the Byzantine period traditionally starts at 395. The first of the Byzantine compilers Oribasios (c. 325–403) studied medicine under Zenon of Chyprus and wrote the encyclopaedic *Medical Collec-*

tion, as well being physician to the Apostate Emperor Julian. Aëtius of Amida, a physician to the Byzantine court of Justinian I (527–565), was the first physician converted to Christianity. His contribution was a medical encyclopaedia, the *Tetrabiblion*, written in Greek and composed of sixteen discourses.⁶⁸ Following Aëtius was Alexander of Trolles (525–605) whose work *Practica*, based on the teachings of Galen, contained some original thoughts on rational medical practice. The final compiler of the Byzantine period, Paul of Aegina (625–690) preferred the task of arranging all existing medical knowledge into his huge work *Epitome of Medicine*.

Arabic and Judeo-Arabic period

It was not until the time of the Arabic and Judeo-Arabic period (732–1096) that the texts of Aristotle, Galen and other notable Greeks were properly conserved. A new medical school in Gondeshapur, Persia, founded in 42 by Nestorian heretics who were followers of the patriarch of Constantinople, became the centre and repository of medical science. During the reigns of the Abbaside Caliphates in Baghdad a large corpus of the texts of Hippocrates, Paul of Aegina, Rufus of Ephesos and Galen were collected and translated into Arabic. Notable for these achievements were Johannes Mesuë the Elder (777–837), who also wrote a book on medical aphorisms, *Selecta Artis Medicinae*, and the Nestorian Honain ben Isaac (809–873). There were also physicians who added their own works to this impressive feat of translation. Rhazes or Al-Razi (860–932) wrote a wonderfully rational and elegant work, based on Galenic theory and Hippocratic practice, which covered original observations, experiments and clinical histories, the *Kitab-al-Hawi* or *Continuus*; another treatise on the organs of reproduction, *Khulasai-al Tajarib* or *Quintessence of Experience*, covered methods of contraception such as pessaries (some of the formulas were surprisingly close to those recommended in an ancient Egyptian papyrus on gynaecology (p. 135). After Rhazes Ibn Sina or Avicenna (980–1037), *Princeps Doctorum*, became the most influential scientific and medical figure of Islam. His principal work *Qunaen fit Tibb* or *Canon Avicennae*, based on the medical systems of Galen and Aristotle, contained the codification of the whole of ancient and Muslim medical knowledge.⁶⁹ So vast and learned was his work that it was to stifle all original medical thought for centuries.

The rule of the great Saracen leader Saladin (1171–1193) was notable for many of its achievements. Religious and intellectual tolerance was typified by Saladin's choice of royal physicians. According to the medical historian Ibn Abi Usaybi'a he had twenty one physicians, eight of whom were Moslems, eight Jewish, and five Christians.⁷⁰ The most influential was Rabbi Moshe ben Maimon, now known as Maimonides, whose ten extant works included extracts from Galen, a commentary on Hippocratic Aphorisms his own Aphorisms, based on the teachings of Galen. His medical writings included discourses on haemorrhoids, asthma, sexual intercourse and poisons, mostly at the request of Sultans. However, it is not for his clinical acumen that he is best remembered, but rather as a medical theologian and philosopher. Although devoutly religious he was perceptively rational in his medical philosophy.⁷¹

... religion prescribes all that is useful in the next world; while the physician has to indicate what is useful and warn against what is harmful in this world.
(*Maqala fi Bayan al-A 'rad*—Discourse on the Explanation of the Fits)

His influence was to last well into the 16th century where Latin texts often quoted him with the preceding words... *Dixit Rabbi Moyses*.

The Latin texts preached the inferiority of surgery as a separate branch of medicine, advising the use of cautery to the knife, and setting this discipline back by hundreds of years. The rationale behind this objection to surgery may have been another legacy of ancient Egyptian medical practice and the ties it had with religious decrees on the handling of the dead.⁷² The Arabs learnt their medical theory from the Greeks via the Nestorian monks, and practical details from the Jews, as well as abstaining from all forms of surgery. Surgery with obstetrics and gynaecology, they left to wandering practitioners and midwives.

Medieval period and the Renaissance

In the West medieval medicine was shackled by the Church and feudalism. Dialectic became the driving force of medical philosophy; challenging Galenic dogma was considered heretical. Surgery under Galenic and Arabic theological influence became the practice of barbers and market stall attendants; surgeons did not begin to gain an equal footing with physicians until the Renaissance and not finally until the time of John Hunter.⁷³ Their professional standing improved with the arrival of Monastic medicine (Vth century to the Renaissance). It was with the appearance of Monastic medicine that broke the bondage and allowed rational medical practice, embracing experiment and surgery, once again. The medical school at Salerno was largely responsible for this transition.⁷⁴ A decree by the Emperor Frederic II in 1240 allowed human dissection to become once more acceptable in Europe.

However, in the 16th century and the Renaissance, Galenic medicine still held the dominant position, but many were now willing to challenge this established medical philosophical dogma. Aureolus Theophrastus Bombastus von Hohenheim (Paracelsus, 1493–1541) rejected Galenic and Avicennic approaches, publicly burning their works, and instead embraced Hippocratic and experimental medical philosophy.⁷⁵ His ideas and concepts were rational, and he is often regarded as the most important medical thinker of the 16th century. The study of ancient Greek medicine was also revived by the secular physician Jean Francois Fernel (1497–1558) who, as well as helping Catherine de Medici conceive, is also credited with further 'shaking off the yoke of medievalism' with works such as *Universa Medicina*. Even though he was an adherent to the humoral theory of disease his works were on the whole rational and systematised.⁷⁶

Even with the rejection of some of Galen's theoretical dogma, many of his treatises were still of practical importance. Galen's anatomy particularly enjoyed a revival and, based on its teachings, Andreas Vesalius (1514–1564) became the pioneer of modern anatomy with his work *De Humani Corporis Fabrica Libri Septem*. This work was translated by the Frenchman Ambroise Paré (1590) into the vernacular, which revived the position of surgery as a rational medical discipline. Paré discredited the widespread and wholly irrational practice of treating open wounds with boiling oil, but he still followed many of the erroneous beliefs of his predecessors, for example, Aëtius before him, that exophthalmic goitre was due to an aneurysm.⁷⁷

Rational medical development continued apace with the invention and use of the microscope. A Jesuit scholar, Athanasius Kircher of Fulda (1602–1680) was probably the first to use one for the practical investigation of disease. However it

famous in this particular field. A professor of anatomy in Bologna, he observed and illustrated much of early embryological histology. No comment on rational medical progress in the 17th century can be complete without William Harvey (1578–1657). A physician at St Bartholomew's and leading experimental physiologist, his major work first describing the circulation *De Mortu Cordis* (On the Movement of the Heart) was published in 1628. He went on to publish an equally fine and rational treatise *De Generatione Animalium*, which was to establish him as a pioneer of embryology and endocrinology.⁷⁸

The great and the good, the rational and the irrational, have filled the history of medicine from its earliest times. The progress of rational medical thought and practice has never been smooth. Great advances have been followed by periods of stagnation and retrospection. Even some of the finest works of rational medicine philosophy have been misused by rigid application. Rational dogma can be a veritable devil, and has been responsible for entrenching the development of medicine at various periods in history. However, it was this adherence to medical dogma with its moral and ethical code that was to protect ancient Greek medical philosophy for posterity. It is a legacy on which we have rightly modelled our own system of medical care, and one for which we should not forsake now that the supreme rationality of technology becomes our medical philosophy.

Life is short, the Art long, opportunity fleeting, experience deceptive, judgement difficult. The physician must be ready, not only to do his duty himself, but also to secure the co-operation of the patient, of the attendants and of externals.

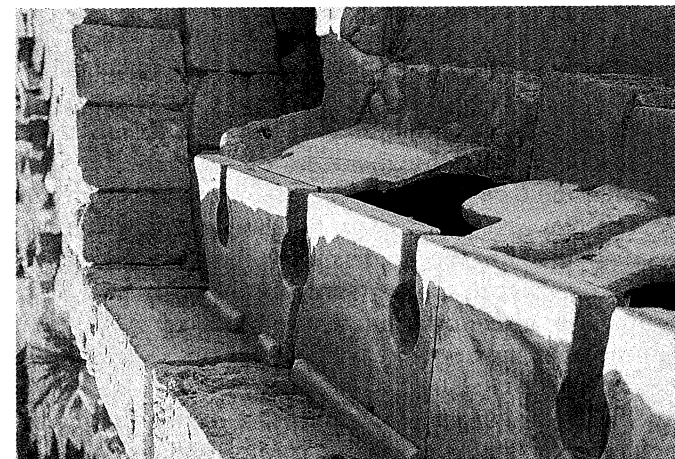
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Roman Public Lavatories. A latrine in the Theatre Baths in the Roman city of Tabratha, Libya. The city was begun near the end of the 1st century BC. (Photograph by David H. A. Boyd).