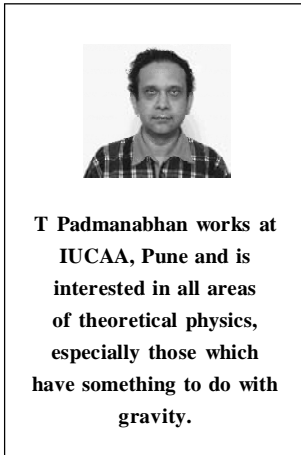


Dawn of Science

10. The Rise of Modern Medicine

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Two persons contributed greatly to the ‘revival of reason’ in medical practice.

The Dark and Middle Ages (AD 900 to around 1200) in Europe were marked by man’s preoccupation with theology and afterlife. Though Christian monasteries did act as a reservoir of knowledge translating the ancient Greek medical works, views like disease is a punishment for sin and should be cured by prayer and repentance, ‘the human body is sacred and dissection of corpses is a sin’ and ‘any point of view contrary to the establishment’s views is blasphemous and must be referred to the inquisition’, did great harm to the advance of medical science.

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It was only by the end of the 13th century that there was a resurgence of interest in the works of ancient Greeks – both scientific and non-scientific. Scholars tried to follow their lines of thinking and out of this arose the modern Western science. An interest in humanities led to the study of human anatomy again and two major Italian schools of medicine came up at Salerno and Bologna.

One of the earliest anatomists from Bologna was Mondino de Luzzi (1275–1326). Until then the dissection of corpses was considered an act beneath the dignity of a teacher. So the medical man would lecture from a high podium while some lowly servant dissected a corpse to illustrate the points. And it was impossible to coordinate the activities of the two; what was more, the servant – not being a man of medicine – could only make sloppy dissections. Mondino changed this practice and started dissecting. His lectures consequently were much more popular and earned him the title ‘Restorer of Anatomy’. In 1316, he wrote the first book in the history of medicine which was entirely devoted to anatomy.

Keywords

Paracelsus, Vesalius, dissections, anatomy.



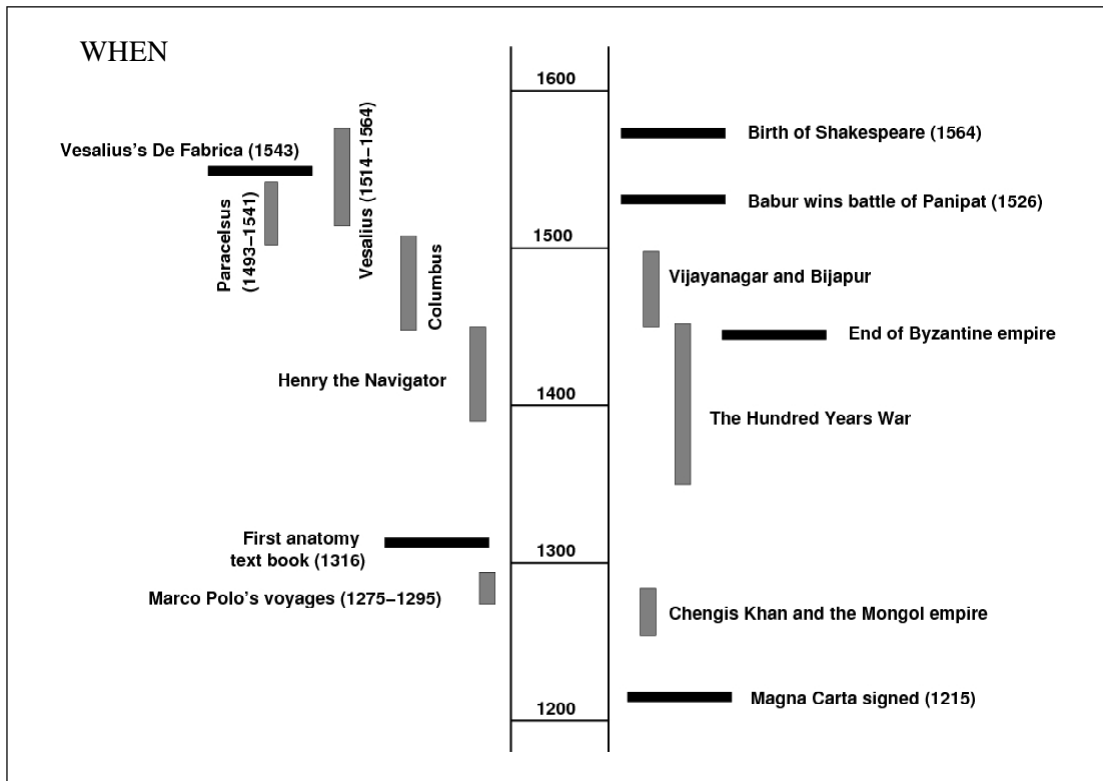


Figure 1.

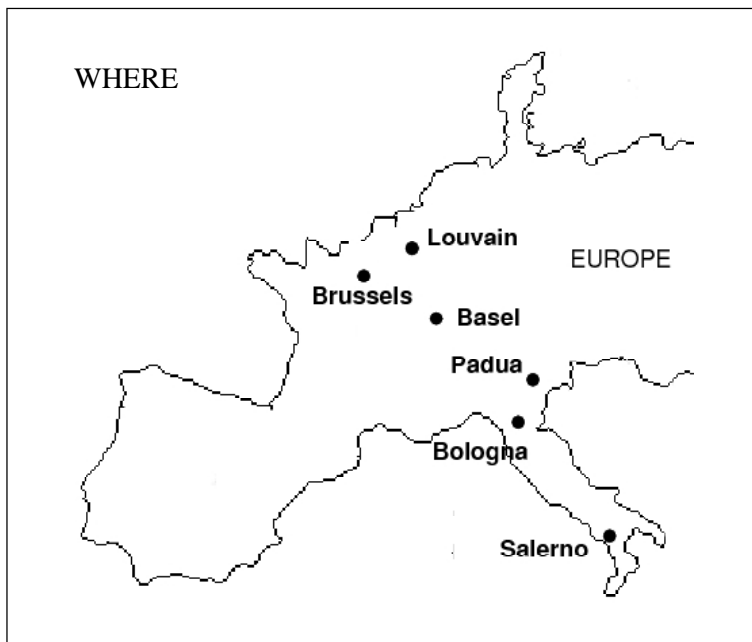


Figure 2.



Unfortunately, the tradition set up by Mondino did not last. His successors reverted to older practices and continued to hold the earlier writings of Aristotle and Avicenna sacred and embodying the ultimate truth. It took early two centuries more for this stranglehold to loosen. The major contributors to this ‘revival of reason’ in medical practice were the Swiss physician and alchemist Paracelsus (1493–1541) and the Flemish anatomist Andreas Vesalius (1514–1564) – two men very different in temperament, talent and outlook.

Paracelsus’s original name was Theophrastus Bombastus von Hohenheim. You can’t blame him for wanting to change that name! But the choice he made very well portrays his character: Paracelsus means ‘better than Celsus’. Celsus was the famous Roman physician whose works had been recently translated and had made a tremendous impact on contemporary thinkers. Paracelsus in fact thought that he was better than everybody else and never hesitated to say so. At a very early age, he acquired a good knowledge of mining, metallurgy and chemistry, and he wanted to pursue the alchemist’s goal of turning lead into gold. He also acquired medical education at several universities in Europe (as he moved from place to place, often following fights he invariably picked up at every place) and realized that chemistry could play a useful role in producing medicines for diseases. In a way, this marks the beginning of the transition from alchemy to chemistry.

Figure 2. Paracelsus.

Courtesy:
<http://en.wikipedia.org/wiki/Paracelsus>; Figure portrait by Quentin Massys.



Paracelsus returned home in 1524 after nearly 10 years of wandering and was appointed the town physician and lecturer of medicine at University of Basel. He began his lecture series by publicly burning the works of Galen and Avicenna in front of the university. Though the authorities were infuriated, the students cheered the eccentric and charismatic teacher. His teachings were a mixture of deep insights and stupid blunders. For example, he produced a clear clinical description of syphilis and treated cases with carefully measured doses of mercury compounds. He could understand that the ‘miner’s disease’ (silicosis) was caused by the inhalation of metal vapours and not by the anger of the



mountain spirits. He also wrote the first book (*Miners' Sickness*) on occupational diseases; cleanliness, he said, was crucial for health. He produced scores of medical compounds containing mercury, sulphur, iron and copper sulphate. Yet, while doing all this he firmly believed in the four elements of the Greeks and was assiduously searching for the elixir of life!

Vesalius's life was prosaic in comparison but more fruitful. Born in a wealthy and powerful family, he attended a medical school in Paris during 1533–36. He made a detailed study of Galen and Rhazes and at first could find no fault with their writings. On receiving the MD degree from the University of Padua, he was appointed a lecturer in surgery. While preparing for his lectures, Vesalius spent much of his time in dissecting corpses. It was very soon clear to him that Galen and others had not based their writings on the dissection of the human body (which was indeed banned in Roman times) but on extrapolations from studies of the structures of animal bodies. He had the courage to declare his conclusions and proceeded to write a textbook on human anatomy based on the correct knowledge.

This book, *De Humani Corporis Fabrica Libri Septem*, (The Seven Books on the Structure of Human Body) was superbly illustrated – probably at the studio of the renaissance artist, Titian – and was printed in 1543. This book represented the culmination of several important trends in medicine, especially the revival of ancient learning and the growth of attention to the human body as an object of serious study. *De Fabrica* also contained an extensive and accurate description of the human body and provided anatomy with a new language for descriptions. Indeed, anatomy came of age with Vesalius. (Interestingly enough, *De Fabrica* was published in the same year as Copernicus published his book outlining the heliocentric theory – another milestone in science which we will describe next time.)

Vesalius was extremely accurate as an anatomist, but his ideas on other branches of medicine were not always accurate. He did believe (quite correctly) that the brain and the nervous system

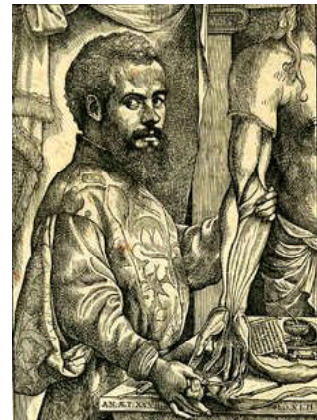


Figure 3. Vesalius.

Courtesy:
http://en.wikipedia.org/wiki/Andreas_Vesalius

Figure 4. An illustration from *De Fabrica*, showing the muscle groups of the human body.

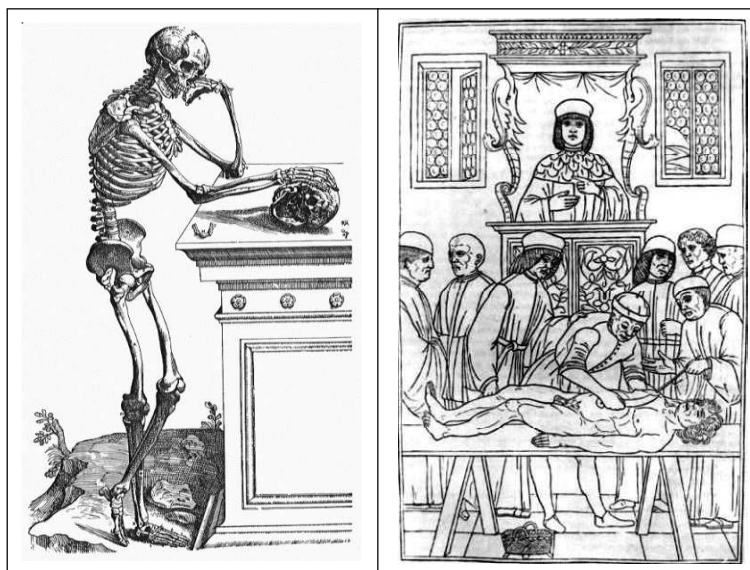


Figure 5. (left) A woodcut from *De Fabrica* shows a skeleton meditating over a skull.

Figure 6. (right) Before the days of Vesalius, the anatomy teacher never did the dissections; while the teacher only lectured, lowly servants, who had very little medical knowledge, dissected a human corpse.

Courtesy:

http://clendening.kumc.edu/dcr/m/m_47p.jpg



represented the seat of emotions and he categorically denied the earlier Aristotlian view that these functions were governed by the heart. This idea fortunately got accepted since then. At the same time, he believed in Galen's view on the circulation of blood and thought that blood must pass from one ventricle to another through some mysterious process.

Success produces enemies and Vesalius met with the same fate. Some of his powerful enemies managed to bring a suit against him on the grounds of heresy, body-snatching and dissection. He would have been executed but for some royal connections he had; the death sentence was commuted to pilgrimage to the Holy Land. It did not really help; on the way back from the pilgrimage Vesalius died in a shipwreck off the Greek coast.

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Suggested Reading

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