

Dawn of Science

5. The Healing Art

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It was in the field of surgery that ancient Indian medical practice achieved the most.

Primitive tribes used a variety of plants and plant products for food and realised that some of these are poisonous and some curative. Those in the tribe who were quick to appreciate these effects could assert considerable power over others. These were the earliest among ‘witch doctors’. Healing soon got inextricably mixed with magical practices and with gods and demons. And medicine was in the hands of godmen and witch doctors as it is, to some extent, even today. To retain their special status, it was also necessary for them to shroud the details of their practices in magic and mystery.

It is, therefore, rather surprising that the science of medicine developed to a high degree in two of the ancient civilisations – Indian and Greek – in spite of their abounding supernatural beliefs. The earliest concepts of Indian medicine are presented in one of the four *Vedas*, the *Atharvaveda*, which probably dates back to 2000 BC. Several diseases like fever, cough, diarrhoea, abscesses, etc., and their herbal remedies are mentioned in the *Vedas*. Unfortunately, the cures are mixed up with spurious magical practices to allow an objective evaluation.

The golden age of Indian medicine, however, occurred in the post-vedic period, during 800 BC to AD 100. Two major medical treatises, *Charaka Samhita* and *Sushruta Samhita*, appeared during this period. These texts discuss several aspects of medicine: symptoms, diagnosis and classification of diseases, preparation of medicines from plants, diet and care of patients, etc.

Indian medicine believed that diseases are caused by the imbalance among three vital entities acting in the body: air (*vayu* or

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Keywords

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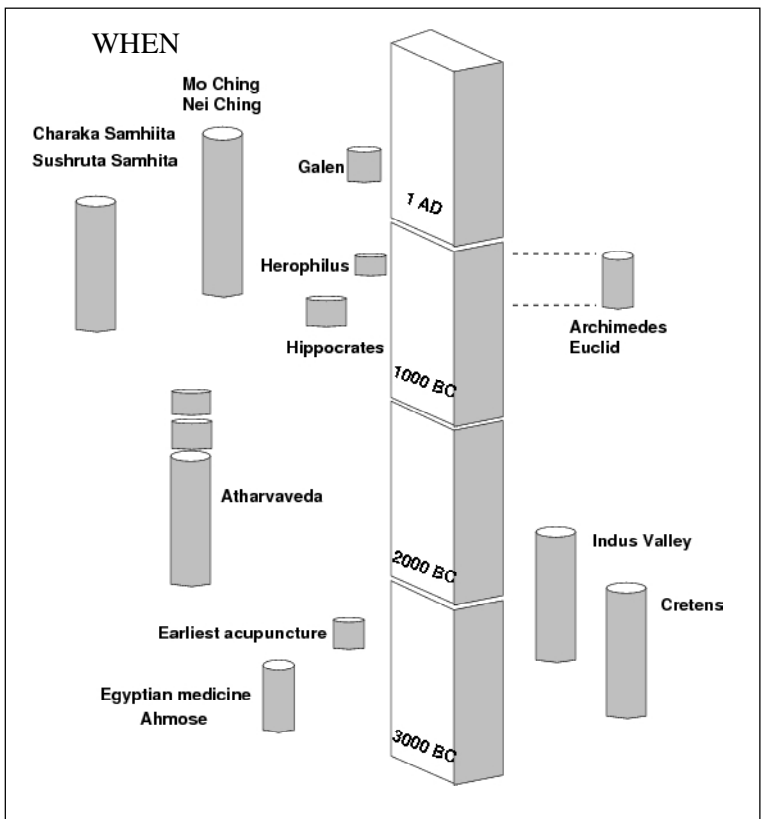


Figure 1.

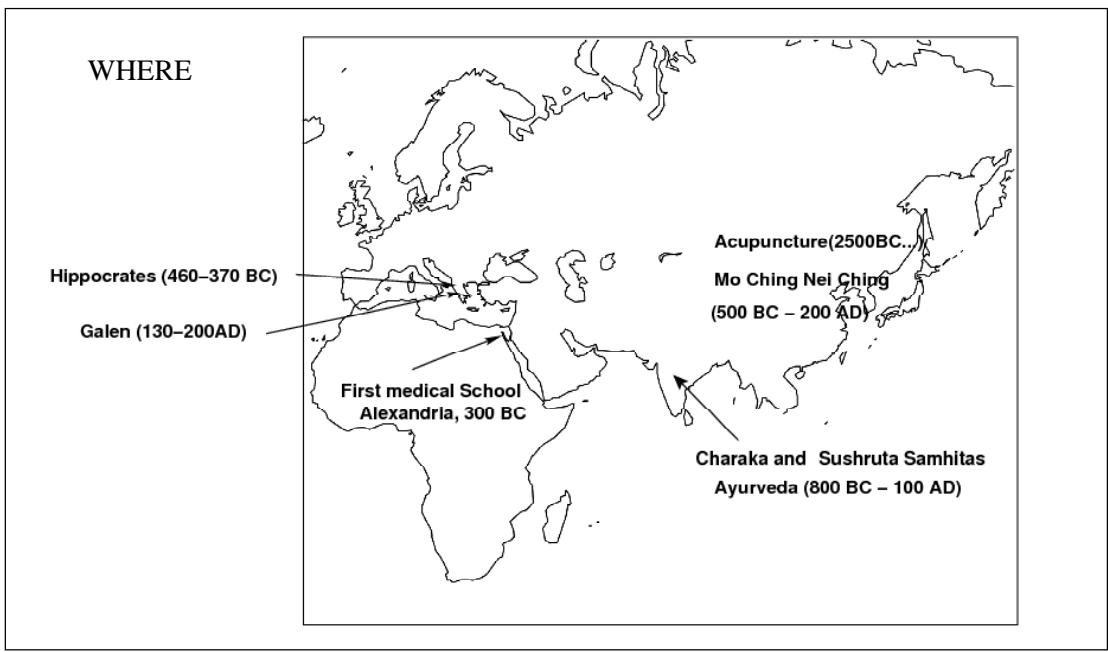


Figure 2.





Figure 3. A noted physician in India, Sushruta, was known for a range of writings.

Courtesy: <http://www.blatner.com/adam/consctransf/historyofmedicine/1-overview/brief.html>

vata), phlegm (*kapha*) and bile (*pitta*). The seven constituents of the body – blood, flesh, fat, bone, marrow, chyle and semen – are supposed to be produced by the action of these three entities. Most of the cures involved restoring the balance between these three entities by dietary and herbal means. *Charaka* lists 500 medicinal plants while *Sushruta* has a more extensive list of 760. In addition, several animal products and minerals were used. The Indian medical man could administer emetics, purgatives, enemas and also sneezing powders and herbal fumes.

But it was in the field of surgery that Indian medicine achieved the most. By about AD 100, several surgical procedures were known and practised; these included excision of tumours, incision of abscesses, removal of fluids from parts of the body, probing of fistulas and stitching of open wounds. The classical texts give very detailed instructions about these operations and about the choice of instruments. *Sushruta*, for instance, describes 20 sharp and about 100 blunt instruments – knives of different kinds, scissors, trocars (for piercing tissues), saws, needles, forceps, levers and hooks. Most of the instruments were made of steel and the operations seem to have been performed using alcohol as an anaesthetic.

Almost around the same time, medical art was thriving in Greece as well. Hippocrates (460 BC–370 BC) seems to be the first person to state categorically that diseases are due to natural causes and not curses from Gods. Very little is known about his life and work; historians think that most of the works attributed to



Figure 4. Hippocrates.

Courtesy: <http://www.blatner.com/adam/consctransf/historyofmedicine/1-overview/brief.html>



him could have been written by several other people who lived much later. (Since Hippocrates' name carried much weight in Greece, people probably preferred to attribute their own ideas to Hippocrates.) Whatever the truth, the books that make up the collection *Corpus Hippocraticum* has earned him the title the 'father of modern medicine'. Here he describes the symptoms and the courses of illnesses clearly and concisely. Hippocrates repeatedly emphasized the natural cause for illnesses and sought to cure them in a methodical way. He laid much stress on the effects of diet, occupation, climate and environment on health. His greatest legacy perhaps was the code of conduct for medical practitioners, the 'Hippocratic Oath', which is still used at the time of medical graduation.

The first, formal medical school was established in Alexandria around 300 BC and thrived under the Greek anatomist, Herophilus. He was the first to dissect human bodies in public. (In the pre-Christian era, there was no taboo on dissection and the Greeks took advantage of it. In contrast ancient Indians desisted from cutting open bodies. *Sushruta Samhita* recommends an elaborate procedure for soaking a body in water so that parts can be removed without cutting!) Herophilus gave particularly detailed descriptions of the brain, parts of the eye, ovaries and uterus; he named the retina, the duodenum and the prostate gland. These investigations were continued by Erasistratus (304–250 BC) who also taught at Alexandria. By now medical science had detailed knowledge of the various organs of the body though it had very little idea of its functions.



Figure 5. Galen's work around 140 AD in Rome ended up being authoritative in Europe until the 16th century! Here he is using the technique of 'cupping', creating small vacuums in heated cups to 'draw the poisons out'. This technique continued in folk culture through the early 20th century.

Courtesy: <http://www.blatner.com/adam/consctransf/historyofmedicine/1-overview/brief.html>



Box 1. Chinese Medicine

The Chinese system of medicine also has great antiquity. Several medical texts originated in China during the period 500 BC to AD 300. The most famous amongst them were the compilations *Nei Ching* and *Mo Ching*.

Traditional medicine in China is based on the theory of *Yin* and *Yang*. Illnesses are supposed to be caused by the imbalance between these two active principles in the body. However, the Chinese understanding of anatomy was primitive – again because of the religious restrictions on the dissection of the body – but they made good progress in diagnostics. *Mo Ching*, for example, describes detailed rules for the interpretation of the pulse, which is to be measured not only at the wrist but also certain other parts of the body!

The mysterious and typically Chinese concept in medicine is acupuncture. This consists of insertion of hot or cold metal needles into the body; the needles may range in lengths from 3 to 25 cm. These needles provide the cure, the practitioners claimed, by changing the distribution of *Yin* and *Yang* in the body and restoring the balance between them. Acupuncture dates from before 2500 BC and is strangely different from the widely practised concepts of modern (Western) medicine.

Soon after Erasistratus, the study of anatomy declined because of religious objections to the dissection of the human body. Later workers, notably Galen (AD 130–200), had to rely on animal dissections to understand anatomy. In spite of such constraints, Galen could make progress. He noticed that arteries carried blood, which was set into a rhythmic motion by the pounding of the heart. He used the pulse as a diagnostic test but narrowly missed discovering the circulation of blood!

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Suggested Reading

- [1] There are several articles on the history of medicine at <http://dodd.cmcvellore.ac.in/hom/thumbnails.html>
- [2] Isaac Asimov, *Asimov's Biographical Encyclopedia of Science and Technology*, Doubleday, 1982.

