

HISTORY OF MEDICINE

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The medical school of Kos is connected with the first creative period of scientific medicine: Hippocratic medicine. Hippocrates, the "father" of rational medicine, worked on the island of Kos before the founding of the Asclepieion. He came from an old local priestly family and travelled extensively. Hippocrates was a famous practitioner and a teacher of the art of healing, so his outlook was necessarily pragmatist, and the view which he took of his patient's case tended to be essentially of a prognosis through to treatment. The Hippocratic diagnostic system, based on observation and logical reasoning, provided the fundamental principles of medical practice. The medical school of Kos had a profound understanding of human suffering and emphasised that the place of the physician is at the patient's bedside and that each disease has a natural cause. Hippocrates believing in "the healing power of Nature" was directed toward the patient as a physical, mental and spiritual whole and denied supernatural explanations and removed the art of medicine from the realm of superstition and magic. He crystallised the existing knowledge of the Koan and Knidian medical schools into a systematic science and he made physicians understand the high ethical and moral inspiration of their profession. Hippocrates was respected not only as a great physician and teacher, but also as an inspired philosopher and thinker. Under his leadership the medical school at Kos produced many fine scholars and pupils who added their experience and other writings to the works of the master himself.

The origins of Hellenic medicine

The history of Hellenic medicine is chiefly concerned with two main invading streams of Greek tribes: that of the Dorians, who travelled to Crete and to the Island of Kos and the opposite peninsula of Knidos, and that of the Ionians, who colonised most of the remaining part of western Asia Minor. These two populations were responsible for the main intellectual output of the Greeks of those early times. The medical system, which they initiated first, took shape in western Asia Minor, and hence spread over the whole of the Greek world. The Greek system of medicine which thus arose in Asia Minor had various roots and a variety of influences as indeed could be expected of the medical practice of a mixed people, living under very complex social conditions. In the first place, Miletus itself an Ionian Greek city on the west coast of Asia Minor, was a place of tremendous activity. According to tradition, being a colony itself, it founded no less than ninety new colonies and through these colonies, one at which was the settlement at Naucratis in Egypt, was brought into contact with older neighbouring cultures and became extremely wealthy.

It is obvious that early Greek Medicine derived knowledge from many older sources (1-7) and had wide connections with other lands and cultures. Due to their geographical location, the Greeks were exposed to the influence of Egyptian, Assyro-Babylonian, Mesopotamian, Phoenician and Minoan (Cretan) civilisations (1-3). Greeks also learned a great amount from lay medicine and from ancient Jewish medicine, especially in the fields of sanitary laws, prevention and prophylaxis (3).

Kos: the homeland of Hippocrates

The birthplace of Hippocrates is the island of Kos. It is the second-largest island of the East Aegean Sea (Dodecanese), second in size to Rhodes, with an area of 112 square miles. It is approximately 27 miles long and six miles wide at its points, and is only 2.5 miles from the mainland, opposite to the ancient town of Halikarnassos, which is now Bodrum and 10 miles from Knidos (Figure 1). During the 6th century BC, Kos belonged to the league of six cities (Hexpolis) along with Halikarnassos, Knidos and Rhodes. It is a fertile, hilly island covered in vegetation, and has been a popular destination since

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a common practice on the island of Kos, up to the 5th century AD, when the cult of Asclepios is found mingled with that of Christian churches.

To conclude, the Greek island of Kos was well known to the ancient Greeks for its wealth and its settlements, but its greatest fame was due to Hippocrates who was born there and to its Asclepieion which, for hundreds of years after the death of Hippocrates, was operating on the basis of some of the Hippocratic principles in matters of therapy and training and had become the most famous medical centre of the Hellenic and the Roman Empires.

The philosophical background of Hippocratic medicine

For practical purposes, the history of rational Greek medicine begins with the schools of Knidos and of Kos, as it is directly from these, and especially from the latter, that the father of Medicine arose (11-14, 18, and 24). From the writings of these medical schools, however, they were much influenced by earlier or contemporary philosophies, such as those of the Ionian and Sicilian schools, usually known as "pre-Socratic" (27). Hippocrates and Socrates were practically contemporary, both belonging to the classical or Porcelain age of Greece. They were acquainted with the same culture conditions, and both, in their own spheres, made a somewhat similar advance therefrom. Hence pre-Socratic thinkers may in a history of medicine be also termed pre-Hippocratic (4, 27-30).

Philosophical speculation seems to have begun on the periphery rather than at the centre of the Greek world (27-29). At any rate the early cosmological speculators hailed from ancient Asia Minor and from southern Italy or Sicily.

The precursors of rational medicine were early Greek philosopher-physicians (2, 5, 27): the Milesians, the Pythagoreans, the Sicilians, who sought to explain the universe by pure reason. Some explained the world process by monistic theories; others projected a dual or multifaceted version of phenomena. For example:

- i. Thales of Miletus propounded the primary principle that water was the cause of all things;
- ii. Pythagoras of Samos constructed an orderly universe base on the harmony of numbers, combining this mystic concept with scientific experiments in music theory and acoustics, and;
- iii. Empedocles of Agrigentum explained the world in terms of four elements: earth, water, air and fire which he called the root of all things (18, 26-29).

The Hippocratic writings clearly reveal much evidence of philosophical influences (11, 19, 29). Whereas some treatises manifest the strong influence of a single philosopher, others are eclectic and select from different philosophers' theories, which suit their particular need. Others again, while adopting no particular philosophical theory, reveal themselves to be none the less deeply influenced by the concepts and categories of pre-Socratic philosophy generally. Although Hippocrates was more interested in recording his clinical observations than philosophising, the "Aphorisms" and the "Oath" (31-32) are exemplary of a blending of the thoughts of a reflective philosopher and the wisdom of an experienced practitioner.

Hippocrates considered ethical behaviour the foremost characteristic of a physician. His ethical concepts are described in five books, namely, the Oath, the Physician, the *Law*, *Medical Decorum*, and his famous Aphorisms (12-14). They explore the ethical attitudes necessary in medicine and underscore the many difficulties inherent in medical practice. The "Hippocratic Oath" (4-6, 31, 32) has been adopted as a pattern by the medical community throughout the ages. It is a code of ethics (not a legal text as some insist) and an ethical guide for those who practise medicine, a one-page text about which hundreds of thousands of pages have been written throughout the ages. It was written "to inspire human feelings in the mind of the students and the younger physicians" as firstly stated by the Latin author Scribonius Largus.

Hippocratic medicine and philosophy combined the 6th century BC concepts of the Ionian philosophers of Asia Minor with Pythagoras' concepts and the theory of his pupil Alcmaeon (School of Croton in southern Italy) and Empedocles (4, 29, 33), regarding the equilibrium of dissimilar elements

The writings of the Koan teachers, presumably by Hippocrates or by his pupils, during or shortly after his time, were collected in the 3rd century BC for the

Alexandrian library by Alexandrian scholars under the title "Corpus Hippocraticum" (38). On the other hand, the "Knidian Sentences" was a collection of medical treatises which has not survived and is only known by mention in the "Corpus Hippocraticum" and through later commentators on Hippocrates, especially Galen in the 2nd century AD (17). Although both Kos and Knidos, where the treatises in the Hippocratic Collection originated, were Dorian settlements, the "Corpus Hippocraticum" itself is written in the Ionic dialect, which became the standard literary medium not only for expounding philosophy, medicine and science generally, but also, initially, for the world history (27).

Some of the most important medical treatises in the "Corpus Hippocraticum" are the following: The Sacred Disease, On Prognostic, On Prorrhethics (book I and II), On the Nature of Man, On Regimen, On Humors, On Affections, On Diseases, On the Physician, On Wounds and Ulcers, On Fractures, On Joints, On Instruments of Reduction (Mochlicon), On Airs, Waters and Places, On Epidemics (book I and III), On Ancient Medicine, On Precepts, On the Surgery, On Law, On Decorum, On the Art, On Nutriment, The Monumental Oath and the Famous Aphorisms (12, 13, 23, 38).

The medical terminology of the "Corpus Hippocraticum" is almost identical with the one today: carcinoma, oedema, hydrops (dropsy), nephritis, hepatitis, arthritis, herpes, erysipelas, cholera, pneumonia, pleurisy, apoplexy, melancholy, tetanus, mania, empyema, emphysema, ileus, thorax, paralysis, ulcer, diarrhoea, dysuria, dysentery, cachexia, hydrocephalus, epilepsy, lethargy, cystitis, leprosy, haematuria, crisis, coma, paroxysm, dyspnoea, orthopnea, asthma (38, 39), and several other scientific words of Greek origin. Unfortunately, no Greek

medical literature prior to the "Corpus Hippocraticum" has survived. The only preHippocratic Greek medical writer, whose views have survived in any form, was Alcmaeon of Croton.

Hippocrates (460-377 BC), about whose life we have sparse information, worked on the island of Kos before the founding of the Asclepieion (16). He came from an old local priestly family and travelled extensively before dying in Larissa, Thessaly. His pupils established a centre of healing here after his death, using the old Hippocratic methods (clinical examination, prognosis and therapy).

The greatest teacher of Kos classified clinical and physical observations (6, 13-16, 34-36), and formulated principles as he taught his pupils under the famous plane-tree which still stands in the main square of Kos (Figure 9). He observed diseases with the eye of a naturalist and established rules by which the physician would know what to expect and what to do at the right time. He had a profound understanding of human suffering and emphasised on many occasions that "the place of the physician is at the bedside of his patient". Hippocrates and his disciples collected scientific case histories as no-one had done previously; for example in "Epidemics" he described the events of illness with cool detachment and in a truly scientific way he declared: "State the past, diagnose the present and foretell the future". He observed pneumonia, pleurisy, tuberculosis, malaria and many other diseases. In "Airs, Waters, Places" appeared the first treatise on public health and environmental medicine. It constitutes the first known systematic endeavour to present the causal relations between environmental factors and disease (23). Hippocrates stressed the meteorological variations and the character of the seasons as the main elements determining the rise and fall of epidemic diseases and their seasonal and annual incidence (22).

In studying the works of Hippocrates no-one can fail to remark on his accuracy of clinical observation, his fundamental skills of recording patient history and his famous doctrine that the pathology of an organ reflects the illness of the whole body (3-12). He was one of the most significant figures in the history of science because he separated the art of healing from the notion of demons, superstition and magic (3, 16, 19, 40). Diseases had a logical interpretation, they were no more a curse of the gods or a punishment to man due to divine wrath. The Hippocratic diagnostic system, based on logical reasoning, observation and belief in the "healing power of Nature" (6-16, 34), formed the basis of medical practice. The healing art, according to Hippocrates, was linked to three conditions: the disease, the patient and the physician; this latter is needed to be moreover a servant of the art (the "techne"). Every patient was a separate case and this individuality precludes a fixed dogma for curative methods.

- ix. "the brain is the most powerful organ (messenger to consciousness) of the human body";
- x. "when more nourishment is taken than the constitution can stand, disease is caused".

To conclude; Hippocrates was the founder of the Medical school of Kos and his name is strongly connected with the first creative period of scientific medicine. His diagnostic system was based on logical reasoning; on careful clinical observation, on a whole humane (psycho-socio-somatic) approach to the patient (holistic v medicine) and on the right way of thinking (rationalism). The greatest figure of the entire history of Medicine was observing diseases with the eye of a naturalist, and established the ethical and moral rules of medical practice. Hippocrates is still a contemporary since modern medicine can draw some useful lessons from his writings.

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References

1. Arnott R. Healing and medicine in the Aegean Bronze Age. *J. Royal Soc. Med.* 1996; 89: 265-270.
2. Marketos SG. *Hellenic Medicine: MedicoHistorical Issues*. 2nd Edition Athens: Parisianos, 1991.
3. Marketos SG and Papaeconomou C. Medicine, magic and religion in Ancient Greece. *Humane Medicine* 1992; 8: 41-44.
4. Marketos SG. *Hippocratic medicine and philosophy at the turn of the 20th century*. Tokyo: MOA Health Science Foundation, 1994.
5. Marketos SG. Medicine is an aspect of civilization. *Microsurgery* 1993; 14: 2-5.
6. Marketos SG. *Hippocrates the Koan: The father of Rational Medicine*. Tokyo: Springer Japan Publishing Inc., 1993.
7. Marketos SG and Poulakou-Rebelakou E. Traditional medicine in Ancient Greece. *Przeglad Lekarski* 1995; 52: 612-614.
8. Gibson WS. Hippocrates' home. *JAMA* 1966; 197: 110-113.
9. Sakula A. In search of Hippocrates: a visit to Kos. *J. Royal Soc. Med.* 1984; 77: 682-688. 10. Richards DW. Hippocrates of Ostia. *JAMA* 1968; 204: 115-122.
11. Mansfeld J. Theoretical and empirical attitudes in early Greek Medicine. *Hippocratica* 1980; 3: 379-391.
12. Jouanna J. *Hippocrate*. Paris. Artheme Fayard, 1992.
13. Edelstein L. The genuine works of Hippocrates. *Bull. inst. Hist. Med.* 1939; 7: 236-248.
14. Adams E. *The genuine works of Hippocrates*. New York: William Wood & Co., 1929.
15. Gouveritch D. *Hippocrate*. Librairie Generale Francaise, 1994.
16. Sigerist HE. On Hippocrates. *Bull. inst. Hist. Med.* 1934; 2: 190-204.
17. Smith WD. Galen on Coans versus Cnidians. *Bull. Hist. Med.* 1973; 47: 569-585.
18. Edelstein EJ and Edelstein L. *Asclepius; a Collection and Interpretation of the Testimonies*. Baltimore: The Johns Hopkins Press, 1945.
19. Temkin O. Greek medicine as science and craft. *Isis* 1953; 44: 213-226.
20. Angeletti LR. Views of classical medicine. Theurgical and secular rational medicine in the healing temples of ancient Greece. *FORUM Trends Exp. Clin. Med.* 1991; 1: 211.