

BETWEEN “SCIENCE” AND MAGIC: PRE-HIPPOCRATIC GREEK ORIGINS OF MEDICINE AND SURGERY

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[Tra “scienza” e magia: gli albori della medicina e chirurgia greca pre-ippocratica]

ABSTRACT

Before Hippocrates Greek medicine and surgery, which certainly has its origins in myth, was influenced by Mesopotamia, the Hittites and the Egyptians. Moreover, the early civilization of Crete and Mycenaean culture influenced all ancient civilizations, demonstrating that trade and circulation of knowledge made the Mediterranean a meeting place between peoples and cultures, including the medical arts, which developed through an initial path of priestly magic, rituals, and knowledge from the east that influenced early Greek civilization.

Key words: Ritual, healing, Greeks, Mesopotamia, Egyptians.

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Evidence of “scientific” thought before Hippocrates isn’t easy to find, in contrast to magical and religious thinking typical of ancient Egyptian and eastern medicine. No documentation has been found of the existence of any schools or therapeutic prescriptions, as there is for the area from the Mediterranean to the basin of the Tigris and Euphrates Rivers. There was a very ancient school of medicine in Babylonia, from which the medical arts spread throughout the Middle East. A hymn to the god of healing, Gula, recorded in writing during the time of Assurbanipal, indicates the kind of knowledge possessed by a Babylonian doctor: “I am a physician, I can heal; I collect medicinal plants; I defeat all diseases...” Doctors were organized in a hierarchy. There were even female doctors, such as Azzari. It’s possible that over time the Babylonian school lost its prestige, since Herodotus wrote that due to the lack of doctors in Babylonia the ill were brought into the square so that anyone with knowledge of the disease by reason of having suffered it himself, or knew of others who had survived it, could recommend a remedy.

Doctors, oracles, prescriptions and rites traveled between Egypt and the Hittite empire⁽¹⁾, and even the statues of divinities venerated for their famed healing powers were transported from one country to another, such as Ištar Sawaska of Nineveh, sent to Egypt to heal the ill Amenophis III. The god of Ahhiyawa was renowned for his therapeutic powers, and Mursilis prayed to him to be healed of aphasia. There is documentation of a long period of diplomatic and commercial contacts, confirmed by names and archeological research, that involve the entire Mediterranean basin. Before the Corpus Ippocraticum⁽²⁾ there is no mention of the existence of treatises on medicine or phytotherapy in Greece, nor lists of diagnoses and treatments. That doesn’t necessarily mean that they didn’t exist, since it is possible that they have been lost. Medical knowledge may have been kept private as a family secret, handed down along with the craft, called *techne*, and a kind of divine power derived from it, denied to common people⁽³⁾.

Since prehistory medical practice must have been attempted in the Aegean. Pregnancy and childbirth, various kinds of trauma, injuries suffered in combat or accidents, all required some kind of appropriate response. Other diseases that were not understood or treatable must have provoked mystery, or suspicion that it was punishment by gods that required appropriate actions to sooth divine anger: sacrifices, spells, or magic. Some concrete evidence has survived from Minoan and Mycenaean history. Some skeletons found in a cult sanctuary at the top of Vrysinas mountain in Crete show evidence of therapeutic operations and votive offerings depicting male or female figures or body parts, dedicated to divinities to ask for relief from disease or to give thanks for health or healing. Such evidence shows knowledge of human anatomy and a connection between healing and divine power. In the Armenoi cemetery in Crete several instruments that may be considered rudimentary surgical tools have been found.

An Egyptian papyrus dated from the reign of Amenhotep III at the end of the XVIII dynasty is conserved in London, and while in very poor condition offers two legible prayers: "...Exorcism of the Asian sickness in the Keftiu language..This spell is uttered over ferment, gas, fluid and urine". The entreaty doesn't specify what the "Asian sickness" is, but it clearly documents the geographical extent of the spread of exorcism in the language of Crete/Keftiu, an island which must have been considered well-thought of. The Ipuwer papyrus in London dated from the 19-20 dynasty laments the interruption of trade between Byblos and Keftiu/Crete, and the scarcity of "perfumed oil" for embalming mummies of important individuals and priests. Egyptian doctors were each specialized in a certain disease: eye doctors who were famous even outside Egypt, specialists in head diseases, dentists, intestinal specialists, and ambiguous diseases. According to Herodotus, they were occupied with the origins of diseases, which they believed they had explained as originating in foods that were consumed.

The debate over disease origins existed in Greece too, since Herodotus claimed that the Egyptians and Libyans were the healthiest people due to their stable climate, an opinion close to Hippocrates' beliefs, who thought that diseases are primarily due to changes, especially seasonal changes. The Iliad speaks of the existence of a medical school for a specialized genos, and Asclepius Kotyleus. Pausanias wrote that Hercules built a temple on the road to Therapne to Asclepius Kotyleus, because his wound in the acetabulum was healed there, during the battle against Hippocoon and his sons. Two of Asclepius' sons, Machaon and Podalirius, were famous doctors at the battle of Troy, among the leaders of the Achaean warriors from Tricca, Ithome and Heraclius.

The Iliad is a rich source of information, which integrates archeological data. It's possible to assume the ritual use of opium poppy in incubation rites and purification rites, and as a narcotic during surgical operations. Since opium contains morphine, it is appropriate as a pain treatment for injuries as well, and may have been used in solution with saffron applied with wool. The use of opium or other substances to induce sleep was widespread in the orient. Rounded bottles, probably used as opiate containers, were in use for a long time in the Mediterranean^(4,5,6,7,8,9). Honey mixed with salt was used as a remedy for ulcers. Dioscuri honey mixed with rainwater or seawater was used for many applications. According to a formula preserved by Plutarch, honey was also an ingredient in kyphi, one of the sacred substances used by Egyptian doctors, which existed in several formulas as indicated in the medical papyrus 3038 in Berlin, and the Ebers papyrus.

Epic narrative offers some very specific indications of the prestige that surrounded doctors. When Machaon was wounded by Paris with a three-pointed arrow, Idomeneus told Nestor to save Machaon by bringing him out of the battlefield because "a doctor, who can extract an arrow and spread curative medicine, is worth many men." After the fall of Troy, Nestor brought Machaon's bones to Gerenia, the location of his tomb and a sanctuary, where Pausanias said it was possible to find cures for various forms of disease.

Tradition provides another clue of the connection between medical knowledge, practice and the divine. In addition to being able to perform surgical operations, doctors possessed knowledge of "palliative drugs," able to sooth pain and originating in a superhuman and mythical world, having been the gift of Chiron, half man and half horse, who became the object of a cult after death. Numerous temples were dedicated to Machaon alone or with his two sons and to Asclepius, who were venerated in Arcadia, Thelpus and Sparta as well, but in the sanctuary at Mesene the largest number of statues were dedicated to him. In addition to the god, there were statues of his sons, Apollo, the Muses, Heracles, Fortune and Artemis Phosphorus⁽¹⁰⁾.

Asclepius also learned from the centaur Chiron the therapeutic virtue of the herbs obtained on Mt. Pelion, where he received the most important element of his cult, the serpent. Asclepius' cult was very com-

plex, with caves and fountains as well as the snake. In Babylonian medicine too, the cosmic forces of the sky, earth, mountains, and rivers were part of cathartic healing rites. In the magical thought of the near east disease was a material, concrete substance, a foreign body, almost alive, with the ability to spread contagiously. Like an evil spiritual force, it could enter the body through the nose, mouth, ears, and it moved through and devoured the body, causing atrocious pain.

The doctor, priest or healer came into contact with the pathological substance, trying to convince it to leave the body, enticing it to come out with special rites, using analogy or substitution, making the evil "attach" to the remedy that had proven to be an effective cure, such as pieces of wool or threads of different colors, each of which possessed a specific virtue, so that it "bound" the disease, allowing the healer to free the patient by cutting the thread, transferring the disease to substitute objects, making it be licked away by animals or even snakes. After treatment the patient was purified along with whoever was contaminated or whatever came in contact with the disease.

Even in Greek thought the individual or group's disease or *nosos* was part of the religious sphere, considered divine punishment for an act of *hybris*, which called for specific cathartic rites to bring back the previous state that existed before the contagion. The island of Crete had an ancient tie with purification. Thales from Gortyn in Crete, had stopped a plague in Sparta. He was called from Knossos to Athens by Epimenides to purify the city, because after the murder of Cylon a plague broke out. According to Epimenides, Thales went into a cave and slept for 40 years, after which he woke up and began purifying several cities.

An examination of near eastern tradition may offer some insight on the offering of oil. The ties between the east, Egypt, and continental Greece go back to very ancient times^(11,12). Oil originating from Crete spread as a luxury across the Mediterranean. Collections of remedies from near eastern documents testify to the knowledge and practice of phytotherapy, in which oil was used either pure or mixed with other substances in rituals containing magical elements. Olive oil was a common element in such therapy, sometimes mixed with aromatic substances, and played a fundamental role. Cathartic rites called for olives and other herbs to be put in a container and swayed over the patient while saying magical formulas. Collections of remedies offer testimony to the knowledge and use of religious rituals and magical elements, such as the ritual of *Zuwio* for the god of the night, in which wool soaked in olive oil was supposed to absorb the patient's pathological substances. Numerous Hittite sources refer to treatments involving magic rituals, some lasting several days, that may be considered psychotherapeutic measures such as absorption rites, substitution rites, attempting to transfer the disease from the patient to another chosen object, such as a statue. The names of several Hittite doctors are recorded, some of whom were specialists in certain diseases such as fevers or eye diseases.

The Egyptians commonly used incense to purify the air during the day and heal body and spirit. It was sometimes burned in large fires in the case of epidemics to purify the air and cure the ill. The doctor Akron became famous in Athens for using that method during the plague. Numerous writings on tablets in Linear B recorded that oil was used as an ointment, and scented with aromatic substances such as rose, salvia and saffron. The use of aromatic oil and medicines during the Bronze Age was widespread throughout the eastern Mediterranean, Mesopotamia and in Egypt^(13,14,15,16). The steps in producing them are clearly visible in a papyrus from Thebes in Egypt from 1500 B.C.

Knowledge of herbal medicine, practices and rituals in the near east were often passed on by female divinities and magicians^(17,18,19). In Babylonia the healing art had a temple dedicated to Ea, the goddess of wisdom. The Hittite world also had many female healing divinities, whose divine knowledge was used by magicians in practicing their rituals. The origins probably go back to prehistory when early healing was focused on the problems of pregnancy and childbirth, and the knowledge of natural remedies derived from plants. Magical therapies were also applied to infections.

In Greece there is no evidence of fertility rites or healing during birth or purification after delivery. The rate of mortality due to complications must have been very high, but there isn't a lot of evidence of that. In heroic and aristocratic Greek culture^(20,21) women had a marginal and silent role. Aeschylus tells us Athena asserted the right to speak in public and express her vote. Since she wasn't born a woman, she is not really female inside. In the same tragedy Apollo asserts the absolutely secondary and passive role of women in conception. It's possible that the lack of women's political participation was responsible for the mystery surrounding ancient knowledge of medicine.

There is much evidence of feminine fertility cults in Sicily, which were celebrated in the sanctuary of Demeter of Bitalemi at Gela. In the area of Agrigento fertility cults seem to have existed in the third temple of Demeter and Kouros. The cult of Butera was a complex area of fountains located on the bank of a river near springs rich in iodine. Terracotta votives of pregnant women and kourotrophoi have been found in the excavated level dated V century. They demonstrate a relationship with the Demeter cult in Gela and Agrigento, and interest in women's lives and their fertility.

The Asclepius medical tradition continued at Cos, where Hippocrates was the 17th descendent in the male line⁽²²⁾. But other schools enjoyed great prestige, such as Croton's Pythagorean school in Magna Graecia. Possibly due to his character and the initiation sect, there are no writings about his school, but even though the information is controversial we need to look for other authors and later biographers. He settled in Croton, where he founded his school and which provided its name. It was said that Pythagoras was a doctor and magician who dominated meteorological forces and could revive the dead. He believed that adolescents were very important and advocated moderation in general, abstaining from meat and beans, which he may have learned in Egypt where no beans were cultivated. Beans were considered impure, and priests could not even stand the sight of them. Pythagoras became a "disciple of the priests of that country." In addition to the "love of knowledge," he also transmitted "his knowledge of sacrificial rites and practices of the sanctuaries." His school at Croton was "internationally" famous. Herodotus wrote that the Croton doctor Democedes performed his *techne* better than anyone else. The philosopher and physician Alcmaeon, who was a student of Pythagoras, was credited with anatomical dissections. His place in the history of medicine merits clarification. Alcmaeon wrote about medicine and was concerned with natural philosophy, but none of his writings survive. We must piece together varied traces primarily from philosophy and later biographers. The Agrigento doctor Empedocles was a member of the Pythagorean school, known as a magician and physician, able to change the direction of winds and bring the dead back to life.

Hippocrates came from the sophist school and was a student of Protagoras, who placed man at the center of his investigations, asserted the independence of medical science from divination and magic, attacking "magicians and purifiers, charlatans and imposters." He demonstrated great courage at a time when criticism of tradition could have been very dangerous, as was seen in the case of Antiphon and Socrates. Relying on the theory of humors, Hippocrates believed disease was an imbalance of the four basic humors of the body: blood, phlegm, yellow bile, and black bile. He grounded medicine on the observation of symptoms to find the cause of the imbalance, asserting the need to establish a criterion upon which a doctor adapts his propositions. That is what distinguishes medical science from non-science, *techne* from hypothesis. The therapy that follows attempts to reestablish equilibrium, with the primary principle: first do no harm, which became the methodological and ethical foundation of all later research.

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