

The Genesis of Medicine The Emergence of Medicine in Classical Greece

La génesis de nuestra medicina

El nacimiento de la Medicina en la Grecia clásica

*In fact, many physicians seem to me to be
in the same plight
as bad pilots, who, if they commit
mistakes while conducting
the ship in a calm do not expose themselves, but when
a storm and violent hurricane overtake them, they then,
from their ignorance and mistakes, are discovered to be
what they are, by all men, namely, in losing their ship*

HIPPOCRATES, *On Ancient Medicine* (1)

INTRODUCTION

Until shortly before the 6th century BC, a magical view of reality prevailed in Greece. Medicine also operated with the dynamics of magic; but the social and political struggle of the polis (Greek state-cities) was replacing the aristocracy in power by emerging democratic forces, and therefore that magical thinking underwent a radical change.

As a result of those struggles and the increasing slavery, groups of free, impoverished, and unsettled citizens of the polis in central Greece moved to other places, particularly to trading areas on the Aegean Sea shores. That was the beginning of the so-called colonization of Magna Graecia, with colonial settlements to the east (Mileto, Ephesus, Kos, among others) on the banks of Asia Minor (west coast of today's Turkey) and to the west towards the south of Italy (Syracuse, Naxos, Agrigento, Crotona, among others).

In Ionia, a group of philosophers, partly influenced by the events mentioned above, but also encouraged by their trading needs and with a spirit of contemplation and reflection, began to consider the universe in a totally new way: the cosmos, which meant order and harmony (metaphorical use of the word indicating the arrangement of troops for battle), would not be created by the gods (cosmogony) but by the *physis*. (2)

The earliest mention of the term *physis* is to be found in Book X (lines 302-306) of Homer's *Odyssey*; in this poem, Homer tells us that Ulysses (Odysseus) observes a plant Hermes offers him to be protected from Circe's magic: "He plucked from the ground a medicinal plant (*pharmakon*), whose *physis* was revealed to me: the root is black, while the flower is as white as milk; The gods call it moly. Dangerous for a mortal man to pluck, but not for the gods. All lies within their power." (3)

Everything Hermes says about the *physis* of the

pharmakon (medicinal plant) is a true definition of it, including "visible" elements that are part of its appearance (the color of the flowers) and also "invisible" components like its root (not seen if unplucked), its name and the difficulty to pluck it. All those reasons enable us to argue that the *physis* of the *pharmakon* goes beyond its appearance and is close to what we now call definition of its essence. (4)

The root word "*phy*" means "to sprout", "to grow", and the suffix "*-sis*" always refers to an activity: "something that sprouts". The usual translation as "nature", which has come to us through the scholars, does not seem appropriate. It could be translated as "reality" –a term of Latin origin– but would lack the Greek suffix "*-sis*", equivalent to the Latin "*-tion*". The translation of *physis* would then result in a ridiculous term, literally meaning "realization".

Addressing everything as a "realization" led the first cosmologists to ask themselves what it is that achieves realization. The answer was not long in coming: if all the things shared something in common, that something was also an essential part of the cosmos, a basic principle or an *essential constituent*. Obviously, it could not be seen, and thus they began to develop hypotheses that ended up in theses and even theories (*theory* means "contemplation" in Greek). (5)

To conceptually express this speculation on the principle of all things, which man could thoughtfully address, the word *physis* was used, which seems to have survived as a dead metaphor. This first epistemological break will give rise to Western thought, with gradual withdrawal from magic ideas and openness of reason to explain the cosmic phenomena.

Cosmology had been born. Some time later, Aristotle, in *Metaphysics*, called these philosophers *physikoi* (physicists). (2) But it is evident that, in Aristotle's view, the development of *physis* deserved the creation of the term *physiologoi* (physiologists) for those philosophers. (6)

PHILOSOPHY OF NATURE

At the beginning, when medicine was incorporated into the history of Greek culture, it received more than what it contributed. The fact that all the medical literature of the two classical centuries (*Hippocratic Corpus - School of Kos*) –which has come to us as complete works– is written in Ionic prose is the best

example of that situation. Only a small part of the preserved work does come from Ionia. For example, Hippocrates was born and lived in Kos, an island with Doric population and language; the fact that both Hippocrates and his disciples wrote their works in Ionic – a language that most probably was used for their scientific conversations – can only be explained by the influence and superiority of the Ionic culture and science at those times.

“Historically, we see that Ionic thought turns Greek medicine into a conscious and methodic art influenced by the Ionic philosophy of nature. The awareness of this fact should not be overshadowed by the marked anti-philosophical attitude of the school of Hippocrates, in whose works we find the first thoughts on Greek medicine. Without the inquiries of the first Ionic philosophers of nature, who searched for a “natural” explanation of all phenomena, without their proclivity to trace everything to a cause and to find in cause and effect the existence of a general and necessary order, and without their total conviction in finding the key to all the world’s mysteries through unbiased observation and the strength of rational knowledge, medicine would have never become a science.” (7)

This spirit of the Milesian school of natural philosophy finds just as clear a voice in the memorable words of the essay *On the divine disease* (i.e. epilepsy), which express that this disease is no more nor less divine and human than any other, and arises from the same natural causes as others do.

“During the 5th century, the relationship between the philosophy of nature and medicine began to change: medical knowledge, particularly in the physiological field, was taken over by philosophers like Anaxagoras and Diogenes of Apollonia; and there also appeared philosophers who were themselves doctors, like Alcmaeon, Empedocles and Hippo, all of whom belonged to the Western Greek School. At the same time, this blending of interests influenced physicians, and they began to take over some of the systems worked out by philosophers, as the basis for their own systemic physic theories, as observed in some of the Hippocratic treatises... It is in that period – a critical one for the independent existence of medicine – that the earliest extant Greek medical literature begins.” (7)

As mentioned, some of the later natural philosophers – like Empedocles of Agrigento – broke through the barriers and in turn mastered medicine. He created the philosophical theory of the four elements: fire, air, water, and earth, which lives on in medical science for centuries in the doctrine of the four basic qualities, hot, cold, dry, and wet, criticized by the author of *On Ancient Medicine* (possibly Hippocrates). They coalesce in different, curious ways with the medical theory of the fundamental humors of the body (yellow bile, black bile, phlegm, and blood) and even drive out all other basis to become the sole foundation of medical theory.

MEDICINE AS TECHNÉ

While “physiological medicine” began with the philosopher-physician Alcmaeon of Croton, who holds – according to the political metaphors he uses – that which preserves health is the equality (*isonomia*) of the powers, and the supremacy (*monarchia*) of any one of them causes disease. The emergence of medicine in Greece as a “technical knowledge” (*techné iatriké*) – *ars medica* in Latin – is owed to Hippocrates and the Hippocratic school.

Hippocrates, a figure of whom little is known, was born on the Greek island of Kos in about 460 BC, a contemporary of his friend Democritus of Abdera, who developed with particular sharpness the atomistic theory, as opposed to random, and his concept that man is “a universe in miniature (*microcosmos*).” He was also a contemporary of Socrates, of whom he was ten years younger. Hippocrates was probably trained in the island of Kos by his father, Heraclides, whom Soriano – his biographer 500 years after his death – traced back to Asclepius, and his mother Praxitea to Heracles himself. (8)

He may have been disciple of Herodicus of Selymbria – a famous doctor who cured illness through diet and gymnastics – and been in close contact and taken lessons with Gorgias, a well-known sophist and brother of Herodicus of Selymbria. He is said to have been Polybus’ father in law, author of part of the treaty *On the Nature of Man*, and that he had two sons, Tesalo and Draco. Plato compared his importance as physician with that of Polyclitus and Phidias as sculptors.

The *Hippocratic Corpus* founded the “medical knowledge” (*techné iatriké*); so we must recognize what *techné* was for the Greeks. They used the concept of *techné* to designate the process by which man’s thinking could organize ideas and categories that provided him with knowledge of the *physis*; this word was translated as “art” or “*technique*” by scholars, and that is how we use it today. But serious doubts are raised as to the accuracy of that translation.

Despite debates, there appears to be a fair agreement on some key characteristics of the pre-Aristotelian concept of *techné*. As a point of departure, the four key characteristics of *techné* are: 1) it is knowledge of a *specific field*; 2) it is oriented to a *specific end*; 3) it produces a useful result; 4) it requires mastering general *rational principles* that can be explained and therefore taught.

In short, *techné* is a deliberate application of human intelligence to some part of the world, yielding some control over chance.

Therefore, according to the main conception of the *Hippocratic Corpus*, in the medical field *techné iatriké* is characterized by: 1) the *specific* subject matter of medicine is the diseased human body; 2) the *specific* end of medicine is to heal and help the patient; 3) the *useful product* of medicine is health for the individual patient; 4) medicine investigates its *general principles* and gives a rational account of its actions. (9)

Based on all of the above, a philosopher (*doctor*) or demiurge (*professional*) had the possibility of approaching the essence (*physis*) of a phenomenon (*illness*) through knowledge (*techné iatriké*) in a tangible dimension (*the patient*). And even more, as a result of this “intellectual operation”, knowledge of man was produced (*microcosm*) and hence as a sort of synthesis, the method could be transferred to the cosmos (*universe*).

Therefore, the patient is seen from the interaction between a holistic approach and a specific perspective of details. In his dialog *Charmides*, Plato puts these strong words in the mouth of Socrates: “*Good doctors say when a patient comes to them with sore eyes that they cannot attempt to heal his eyes alone, but that they must also treat his head at the same time, if his sight is to recover. To think that one could ever treat the head by itself without the whole body is foolish. On that principle, then, they apply their regimens to the entire body and attempt to treat and heal the part (meros) in conjunction with the whole (holon).*”

But Plato, in *The Laws*, also warns: “*A physician in charge of curing the whole... but neglects the parts and the details, will he perceive the whole in good condition?*”

Hippocratic medicine represented an intellectual effort to find order in the succession and dispersion of individual phenomena, to see how their regularity is similar to that in cosmic events, and how –by means of methodic observation and ideation– predictions on the course of a morbid process could be made; this process, being inherent to man (*human physis*), becomes intertwined with the whole (*cosmic physis*). (2)

Until then, philosophers were not aware of the demand for accuracy. Medicine is the natural science that sets this demand before any other, since it depended on the positive results obtained by accurate observation of concrete empirical evidence (*empeiria*) of human life. As stated in *On Ancient Medicine*, the problem lies not in what man is in himself, but in “*what he is in relation to what he eats and drinks and how he lives and how all that affects him.*” (1)

But for the Hippocratic researcher, the details are not enough. Truth can never be found in the infinite variety of individual cases; it would be meaningless for both doctors and patients. Hence, for the first time medical thought arrived at the conception of form (*eidōs*), the formal, visible characteristics of a group of individuals, compared with those of another group, extending to any multiplicity of analogous phenomena, and acquiring especially in the plural the meaning of “type” or “kind”.

The doctor investigates the field of nature, to which he devotes himself with the *techné iatriké*, not as shapeless collection of facts, but aimed at discovering the normative principle in the natural bodily structure that prescribes medical behavior. The doctor calls this norm of physical existence, health.

In *Charmides*, Plato makes Socrates say that “*tech-*

né iatriké is the episteme (the knowledge) of health.” (10)

Therefore, empirical Hippocratic medicine, under the compulsion of facts, began to “*focus*” on individual cases of the same character, which they had defined by long study, and group them into types or forms.

Techné differs from experience (*empeiria*) in that the latter knows the facts of a good number of data but cannot explain why they occur. Instead, *techné* – particularly *techné iatriké*– focuses on the norms and causes, and teaches them.

We could briefly conclude that *techné* consists of knowing the nature of the object intended to serve man and, therefore, is realized as such knowledge through practical use.

MEDICINE AS A MODEL FOR PHILOSOPHY

For the first time, Greek medical science, under the Hippocratic approach, transcends the boundaries of a simple profession and becomes an influential antecedent of Socratic, Platonic and Aristotelian philosophy, and furthermore, turns into a leading cultural force in the life of Greek people. Nowadays, medicine –despite or because of its development and highly professional expertise– will never recover that place.

It was not by accident that, when Plato was establishing his science of ethics and politics, in *Gorgias*, (11) he modelled it not on the philosophy of nature but on medical knowledge (*techné iatriké*), deriving from it its main features.

“According to Plato, the doctor is the man who recognizes the sickness because of his knowledge of its opposite, health, and can therefore find ways and means to bring that which is sick back to its normal condition. That is Plato’s model for a philosopher, who is to do the same for the soul of man and its health. The comparison Plato establishes between his science, the ‘healing of the soul’, and the science of the doctor explains and brings to life two features which they have in common. Both kinds of knowledge base their judgments on the objective knowledge of nature itself: the doctor works on his insight into the nature of the body, the philosopher on his understanding of the nature of the soul. But each explores his special realm of nature not merely by treating it as a series of facts, but by expecting to find in the natural structure of either the body or the soul the guiding principle which prescribes the conduct both of the philosopher and the doctor. The doctor calls the norm of physical existence, health; and it is as health that Plato’s ethical and political teaching approaches the soul of man.” (7)

In another dialog, *Phaedrus*, (12), Plato is concerned with the physician’s method, and argues that medicine should be the model for true rhetoric.

“Hippocrates, he says, teaches that we should first of all ask whether the nature of the object about which we wish to acquire genuine knowledge and genuine skill has a single or complex nature. If it is simple, we should then inquire what power it has to affect or be

affected by another object; while if it has many forms, we should count them, and study each of them as a simple object, by inquiring how it affects or is affected by others.” (7)

Plato's description of the Hippocratic method meets the genuine observer's procedure that is employed all through the best works in the *Hippocratic Corpus*.

In *Phaedrus*, Plato highlights that in every field of knowledge it is necessary to grasp the function of the part within the whole and thereby to define the appropriate treatment for the part. Medicine is precisely the science (*techné*) that illustrates this method of approaching a problem.

Aristotle, based on the example of medicine, discovers the adequate ethical behavior as a fair means between excess and deficiency, by analogy with a healthy physical diet. Hence, ethical conduct consists in “aiming” at the fair mean between the surplus and paucity that is right for each individual. The terms and criteria used by Aristotle are borrowed directly from medicine, and modeled on the treatise *On Ancient Medicine*.

THE HIPPOCRATIC PHYSICIAN AND HIS RELEVANCE IN CLASSICAL GREECE

For the Hippocratic physician, the adequacy of the action of nature is particularly revealed in patients' illnesses and treatment, because treating does not mean to intervene against nature; symptoms –especially fever– mean the beginning of restoring normal condition. Nature channels the body; physicians only try to find how they can help the natural process towards healing. “Nature helps itself” is the supreme axiom of Hippocrates' medical theory and teleological conception.

Many classical Greek physicians — were itinerant, traveling from city to city and some were public physicians. To become a public physician, they had to pass an oral examination of their knowledge before an audience in order to be hired by the city and practice their profession. They had to maintain their results and the confidence of the city to renew the contract annually. (13)

One of the treatises of the Hippocratic Corpus, *Airs, waters and places*, addresses the regimen an itinerant doctor who arrived at an unknown city should observe for the correct assessment of the health conditions of the place. Another treatise, *Epidemics*, reveals all the local circumstances an itinerant physician had to consider in his practice. (1)

With the concept of illness as a process, and considering the course of the illness over time, the Hippocratic physician was able to make a prediction (*prognosis*), his most valuable skill. Therefore, he was able to know the past, present, and future of the illness. The knowledge of its history was possible by questioning the patient on how ailments began (*anamnesis*), and through the study of the signs (*semeia*) the physi-

cian arrived to the present state where he performed the diagnosis and was able to predict the course of the illness (*prognosis*). What we call today medical record. (8)

For the Hippocratic doctor, his main task was “caring”, in concordance with the term *terapeia* –“caring”, “watching”, “serving”–, which is not “curing”, as it is usually translated.

In ancient Greece, physicians were -far more than in recent times- doctors of healthy rather than sick individuals, hence the enormous value of preventive medicine over healing medicine.

The *Palatine Anthology* discloses the beautiful epitaph in honor of Hippocrates, engraved on his tomb, in Larissa:

Here lieth the Thessalian Hippocrates, by descent a Cosan,

Sprung from the immortal stock of Phoebus.

Armed by Hygiea he gained many victories over Disease,

And won great glory, not by chance, but by Science.

It clearly emphasizes that Hippocrates succeeded in defeating the illness not by chance (*tyche*) but by science (*techné*).

It also states that he combated illness “armed by Hygiea”; it is a reference to the daughter of Asclepius, a mythological demigod of Greek medicine. The cares of “hygiene” (*Hygiea*) concerned “diet”. For the Greek, “diet” meant not only the regulation of a sick person's food, but a man's whole routine of living –including physical exercise in the gym–, especially the rules governing this food and the exertions demanded of him. Therefore, the doctor was imposed a great educational mission.

If medicine was able to reach such a representative position within the Greek culture as a whole, it was because it impregnated the Hellenic ideal of human culture with the ideal of healthy man.

Hippocratic physicians brought their profession to the highest levels of dignity and prestige, not only for themselves but also for their *techné*.

The Hippocratic Corpus highlights the criteria a doctor should have: veracity and accuracy, knowledge and expertise, evaluation of symptoms and reflection on prognosis, help and not harm, inform and administer diets, be kind and not conceited, make correct prognosis, and allow as few errors as possible; we could not ask for more from those texts. (14)

ON ANCIENT MEDICINE, THE PARADIGMATIC TEXT OF THE HIPPOCRATIC CORPUS

The doctor initiated and educated the layman in medical thinking, naturally, in the process of treating the sick. In *The Laws*, Plato gives an amusing description of the difference between the slave-doctor and the scientifically trained physician who treated free men. The slave-doctor hurried from bed to bed, giving out prescriptions and orders without discussion, simply working on routine and expertise, as if he were

an absolute tyrant. “If one of those doctors heard a free doctor talking to free patients in a manner very like scientific instruction, and defining the origins of the disease by going back to the nature of all bodies, he would laugh heartily and say what most so-called doctors retort in such cases: ‘You fool, you are not curing your patient, you are educating him, as if you wanted not to make him healthy, but to make him into a doctor’.”

That is not what the author of *On Ancient Medicine* (1) thinks when he says: “It is particularly necessary in talking about this art to speak so that laymen can understand, since there is no need to investigate or talk of something other than the diseases they are actually suffering. Being laymen, they certainly cannot understand their diseases, why they start and stop, and the causes of their development or decrease, but if someone else has discovered and explains them, then it is easy to understand them, because everyone, by listening has only to remember his own experiences. And if you fail to be understood by laymen, and they do not become predisposed, you are out of reality. “The book begins with an attack from the expert on medical knowledge (*techné iatriké*) against the use of the physiologists’ (*philosophers of nature*) method in medicine.

“Whoever having undertaken to speak or write on Medicine, have first laid down for themselves some hypothesis to their argument, such as ‘hot, or cold’, or ‘moist, or dry’, or whatever else they choose (thus reducing their subject within a narrow compass, and supposing only one or two original causes of diseases or of death among mankind), are all clearly mistaken in much that they say. And this is the more reprehensible as relating to a *techné* which all men avail themselves of on the most important occasions, calling on the good operators and practitioners that they hold in special honor.” The following phrase resumes the author’s criticism to all those who undermine science using methods that are alien to them.

“If anyone should discuss topics like heavenly bodies and underground worlds, and undertakes to declare how they are constituted, the reader or hearer could not find out whether what is delivered is true or false; for there is nothing that can be referred to in order to discover the truth.”

It has been a long time since Medicine has everything it needs to be a *techné*; since that era, a starting point and way have been found out by which many and valuable discoveries have been made over time. And others will yet be found in the future, if a person possessed of these discoveries and the proper ability should proceed from them to carry out his investigations.” A starting point and way with which many and valuable discoveries have been made over the years.

What does it mean to be a good Hippocratic doctor? “Hence, the accurate mastery of a science is a great achievement, and it would give great praise to the physician whose mistakes are small, for perfect ac-

curacy is seldom to be seen. But it is very difficult to discern where the absolute certainty is.”

“In fact, many physicians seem to me to be in the same plight as bad pilots, who, if they commit mistakes while conducting the ship in a calm do not expose themselves, but when a storm and violent hurricane overtake them, they then, from their ignorance and mistakes, are discovered to be what they are, by all men, namely, in losing their ship”. Similarly, the errors of bad doctors –and they are the majority– are not apparent in the case of most diseases, which are not particularly threatening (they are numerous and affect humans much more than threatening diseases); laymen do not see their errors, but when a doctor errs in a serious case, his incompetence and ignorance quickly become clear to all. And the consequences, in both cases, occur immediately.”

CONCLUSIONS

The Hippocratic medicine shows a renewed commitment to empiricism and to detailed observation of the requirements for each case, grouping the cases with similar characteristics into types and forms, thus predicting what happened, what is happening, and what is going to happen. The field of medicine is established as an independent *techné* and definitely distances itself from the simple philosophy of nature –which helped medicine achieve the status of science–, turning it indeed into a medical science (*techné iatriké*). It is mainly the unknown author of *On Ancient Medicine* who strongly proposes this orientation. And he was certainly not alone in his time but was the spokesman of what we can indeed call a school. He writes: “Certain sophists and physicians say that it is not possible for any one to know medicine who does not know what man is, and that whoever would cure men properly, must learn this in the first place. But this saying rather appertains to philosophy, as Empedocles and certain others, in their treatises *On Nature*, have described what man in his origin is, and how he first was made and constructed. But I think whatever such has been said or written by sophist or physician concerning nature has less connection with the art (*techné*) of medicine than with the art of painting. And I think that one cannot know anything certain respecting nature from any other quarter than from medicine.”

When he expresses that “this saying rather appertains to philosophy, as Empedocles and certain others, in their treatises *On Nature* have described,” he does not mean to attack Empedocles –as is generally believed–, misinterpreting his words, but he defines the word “philosophy”, which at that time had a different sense from the one we usually give to it today, by the expression “as Empedocles and certain others.” And he opposes the tendency to raise medicine to the allegedly higher rank of philosophy of nature with these words full of pride: “And I think that one cannot know anything certain about nature from any other quarter than from medicine.” (7)

And later on, he rounds off: "Wherefore it appears to me necessary to every physician to be skilled in nature, and strive to know, if he would wish to perform his duties, what man is in relation to the articles of food and drink, and to his other occupations, and what are the effects of each of them to every one."

On Ancient Medicine begins with an attack against the use of the "physiologists" (philosophers of nature) method in medicine. "Whoever having undertaken to speak or write on Medicine, have first laid down for themselves some hypothesis to their argument, such as 'hot, or cold', or 'moist, or dry', or whatever else they choose (thus reducing their subject within a narrow compass, and supposing only one or two original causes of diseases or of death among mankind), are all clearly mistaken in much that they say. And this is the more reprehensible as relating to an art which all men avail themselves of on the most important occasions, calling on the good operators and practitioners that they hold in special honor."

He argues that ancient medicine is worthy of admiration, for its discoveries were by reasoning rather than by *chance*.

"But I assert that the ancient art of medicine should not be rejected as non-existent or not well investigated because it has not attained exactness in every item.

Much rather, since, as I think, it has been able to come close to perfect exactness by means of reasoning where before there was great ignorance, its discoveries should be a matter of admiration, as well and truly

the result of discovery and not of chance."

We can conclude with the fine ending words of *On Ancient Medicine*: "If a man can in this way conduct with success inquiries outside the human body, he will always be able to select the very best treatment. And the best is always that which is farthest removed from the unsuitable."

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