

# Egyptian and Greek Medicine

## MISIR VE YUNAN TIBBI

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### Summary

The author reviews evidence of the influence of Egyptian medicine on ancient Greek medicine and concludes that such influence was considerable although not crucial. The main elements considered are the concept of *perittoma*, tests related to pregnancy, dissection of the human body, and the use of certain drugs. The differences between the two medicines are also discussed and the assumption that Greek medicine differs fundamentally from Egyptian medicine (because of the presence of supernatural elements in the latter and their absence in the former) is rejected. It is concluded that the difference between the two medicines is not of a fundamental nature; it is also underlined that our perception of Egyptian medicine could be distorted by the paucity of surviving Egyptian medical documents.

**Key Words:** Greek medicine, Egyptian medicine, Perittoma, Pregnancy tests, Anatomy, Human dissection

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### Özet

Bu makalede yazar, Mısır tıbbının Antik Yunan tıbbı üzerindeki etkisini gösteren kanıtları inceleyerek, bu etkinin kesin olmamakla birlikte önemli olduğu sonucuna varır. Ele alınan ana öğeler perittoma kavramı, gebelik ile ilgili testler, insan bedeni diseksiyonu ve bazı drogların kullanımınıdır. Aynı zamanda iki tıp yaklaşımı arasındaki farklılıklar incelenmiş ve Yunan tıbbının temelde Mısır tıbbından ayrıldığı varsayımı reddedilmiştir. İki tıp arasındaki farklılığın temelde nitelikten kaynaklanmadığı sonucuna varılır. Aynı zamanda, Mısır tıbbını algılayışımız, günümüze dek gelebilen Mısır tıbbi dökümanlarının azlığı nedeniyle değişebilmektedir.

**Anahtar Kelimeler:** Yunan tıbbı, Mısır tıbbı, Perittoma, Gebelik testleri, Anatomi, İnsan diseksiyonu

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While, in Greece, the Corpus Hippocraticum was being written, in Egypt, on the other side of the Mediterranean, only 400 miles from the Peloponnesus and 250 miles from Crete, medicine was already two thousand years old. Time and geography suggest that the older medicine should have influenced the new. However, possibly because of our admiration for Greece and our perception of the ancient Greeks, our intellectual forefathers, as endowed with unsurpassed originality, the concept of a significant influence of Egyptian on Greek medicine has encountered some resistance. Although others hold a contrary opinion, (2) some authors believe that such influence never existed or was very limited. (3) Yet, there is sufficient evidence to support the conclusion that Egyptian

medicine and Egyptian tradition had a noticeable impact first on Hippocratic medicine and later on Alexandrian medicine as well.

Some of the arguments against such an influence rest on the belief that the two medicines were so fundamentally different that any impact of the former on the latter, if it existed, could be only minor and insignificant. Greek medicine, for example, has been described as unique among ancient medicines because, allegedly, it was totally devoid of supernatural elements:

If we compare [Hippocratic medicine] with other ancient medicines, like the Egyptian, the Indian, and even the Chinese, we see that the Hippocratic medicine is more advanced be-

cause it does not rely at all on magic methods or exorcisms (4).

Actually, not only was Greek medicine not devoid of supernatural elements (see below) but, if the distinctiveness of Greek medicine in developing a naturalistic paradigm is implied, we must remember that all major ancient medical systems (Chinese, Hindu, Mesopotamian, Persian) have independently done the same (5). Comparing Greek and Egyptian medicine, it has been said that the Egyptian medical documents, especially the Ebers papyrus, “reveal a mixture of magical cures and true medical observations which is foreign to the Greek medical tradition,” (6) and that “even the two papyri containing the best observations - Edwin Smith papyrus (c. 1650 B.C.) and Ebers papyrus (c. 1550 B.C.)-are not devoid of incantations and magical charms” (7).

The point, however, is that there are at least as many references to the supernatural in the Corpus Hippocraticum as in the Smith and Ebers papyri combined (8). While there are 12 instances of use of magic-religious formulae in the Ebers and one instance (case 9) in the Smith papyrus, (9) in the Hippocratic Corpus we find not only the well-known passage of the *Prognostic* (10) suggesting a relation between diseases and the supernatural, but many others as well (11). (The subject of supernatural elements in Hippocratic medicine has been recently reviewed (12).

In addition, in Greece as well as in Egypt, supernaturalistic and naturalistic medicine coexisted: the *swnw*, the priest of *Sekhmet*, and the sorcerer (13). practiced side by side, as did the Hippocratic physician and the priest of Aesculapius. Therefore, the statement that in Egypt all medical practitioners “engaged in practices which Greek physicians would have thought fit, at best, for priests and ‘enchanters’ alone,” (14). appears unjustified.

The assertion has also been made that certain elements of Egyptian medicine were so speculative as to be foreign to the Greek medical tradition. In support, it is mentioned that, for example, in the Ebers papyrus “we find the wildest speculations regarding the vessels in the nose and temples

which are said to provide respectively mucus and blood, and to be the origin of ophthalmic complaints, while those of the head are said to cause lack of sleep and baldness,” and it is concluded that “from this type of wild guess at explaining the origins of disease the Greek was very remote” (15). We forget, however, that there are similar “wild guesses” in the Hippocratic corpus concerning the origin of diseases, as, for example, the explanation that the impotence of the Scythians was due to the cutting of the veins behind the ears, (16) and the idea that foamy diarrhea is due to fluxes from the head (17).

During the Alexandrian era, Herophilus referred to drugs as “hands of the gods” (18) and held that some dreams are inspired by gods (19). At the same time the cult of Aesculapius became universally recognized (20) when all the major cities of the Greek world built temples to the god of medicine (21). There is no question, however, that, by Alexandrian times, Egyptian medicine had become the rigid, fossilized corpse of a body that had been vigorous more than a millennium before. *Mutatis mutandis*, Pharaonic medicine appears to have been, at that time, in the same state as Galenic medicine was in the sixteenth century: it had lost its vitality and was immobilized in the past. The passage of Diodorus Siculus referring to the death penalty for physicians who would not treat the sick in the traditional manner (22) underlines this point. The Greek medicine of Alexandria, on the other hand, then represented the dynamic new wave of the future: to continue the simile, it was the Vesalian approach of the time. This, however, did not prevent the old, helped by proximity and lasting reputation, from influencing the new. Although the Greek community of the city was at first quite insulated from the Egyptian population, (23) this insulation declined with time and an interaction developed between the two medicines, as shown by the fact that eventually Egyptian gods of healing (Osiris, Imhotep) were invoked and Egyptian physicians were consulted by members of the Greek community; (24) in addition, Aesculapius came to be identified with Imhotep.

It would appear, therefore, that neither the supernatural elements of Egyptian medicine, nor its “wild guesses” concerning the etiology of diseases, nor, in the case of Alexandrian medicine, the cultural separation of the two communities, can justify the assertion that Egyptian medicine *could not* exert a substantial influence on the development of Greek medicine. The question therefore remains: did Egyptian medicine influence Greek medicine, and if it did, to which extent?

Several elements in Greek medicine are traceable to Egypt. The most important among them are: the concept of *perittoma*, tests related to pregnancy, human dissection, and the use of Egyptian drugs.

*Perittoma*—As Steuer has shown, the Egyptian concept of *whdw* (*ukhedu*) refers to a basic etiological principle of decay associated with intestinal residue after digestion, that is, with the fecal content of the bowels (25). This principle of decay, when absorbed from the intestine, produces heat (fever), alteration of pulse rate, localized lesions, and even death (26). The idea of a toxic substance absorbed from the intestine as cause of disease is also found in Greek medicine, where it is associated with the concept of *perittoma* (or *perissoma*, residue). As *whdw* is the pathogenic derivative of *hesu* (excrement), *perittoma* is the pathogenic derivative of *kopros* (feces) (27).

Although the word *perittoma* does not appear in the Hippocratic Corpus, the concept seems to be expressed in the following passage:

If the food remains in the abdomen for too long and if, in addition, other is ingested, the body becomes full, the veins surcharged, and heat and suffering is produced, faster in Summer, more slowly in Winter (28).

Other passages could be considered as referring to the same concept if we assume that bile and phlegm were understood by the author to be *perittomata*, as they were by Aristotle (see below):

This [disease]. arises from the following: when bile that has become putrid mixes with the blood in the vessels and joints, and when this stands, swelling comes up and becomes

established, mainly in the joints, but sometimes also in the rest of the body. This produces sharp pain (29).

Another. disease: this one arises from putrefied phlegm; the following shows that the phlegm is putrid: the patient’s belches have an odor, from the phlegm, like those of a person that has eaten radishes (30).

However, in the Hippocratic Corpus, the instances in which putrefaction is understood as the primary cause of disease are few in comparison to those in which the humors are believed to be responsible. For this reason, it has been supposed that the *perittoma* paradigm, first transmitted from Egypt to the Cnidian school, (31) was subsequently replaced by the humoral doctrine of Cos (32).

Even if the concept of *perittoma* plays a secondary role in the *Corpus Hippocraticum*, it is quite prominent in the writings of Aristotle and of the *Anonymus Londinensis* (33). In fact, the latter attributes the doctrine of *perittoma* as an etiological principle to Hippocrates himself:

For Hippocrates says that diseases are brought about in the following fashion. Either because the quantity of things taken, or through their diversity, or because the things taken happen to be strong and difficult of digestion, residues [*perissomata*] are thereby produced, and when the things that have been taken are too many, the heat that produces digestion is overpowered by the multitude of foods and does not effect digestion. And because digestion is hindered residues are formed. From the residues rise gases, which having arisen bring on diseases. What moved Hippocrates to adopt these views was the following conviction. Breath (*pneuma*), he holds, is the most necessary and the supreme component in us, since health is the result of its free, and disease of its impeded passage... On this theory, when residues occur, they give rise to breaths, which rising as vapor cause diseases. The variation in the breaths, cause the various diseases. If the breaths are violent [many], they produce disease, as they also do if they are very light

[few]. The changes too of breaths give rise to diseases. These changes take place in two directions, towards excessive heat or toward excessive cold. The nature of the change determines the character of the disease. This is Aristotle's view of Hippocrates (34).

The fact that this theory was attributed by the *Anonymus Londinensis*, that is by Meno, to Hippocrates, suggests that, independently of the legitimacy of such attribution, there was a tradition attributing the etiology of diseases to *perittoma*. In addition, although Meno could have been wrong in attributing such views to Hippocrates, there is no reason to believe that this is the case, as Edelstein has pointed out (35).

According to Meno, his predecessors had recognized two etiological factors of diseases: *perittomata* and *stoichieia* (the elemental component of the body). He lists Hippocrates among those who thought that diseases come from *perittomata* although the word does not appear in the Corpus. It has been suggested that Meno distorts the material he excerpts to agree with his own ideas (36). It would appear instead, as proposed by Steuer and Saunders, that the theory of putrefactive residues, that is, of *perittoma*, remained as a secondary one, in the background as it were, and was never entirely displaced by the humoral one (37). Galen, in fact, in several passages, refers to the doctrine of residues: in *De sanitate tuenda* (38). he writes that the residue from food and drink was called *perittoma* by the ancients; in *De causis morborum*, (39) he mentions residues (*perittomata*) generated by the quality of food; in *De naturalibus facultatibus* (40) he states that the residues (*perittomata*) that are delayed in the body must eventually putrefy; in *De methodo medendi*, (41) he says that whoever attempts to cure fever must prevent putrefaction (*sepsis*).

The concept of a toxic material absorbed from the intestine as a cause of disease was to persist in Western medical thought until modern times in the notions about the etiology of puerperal fever of the prebacteriological era and in the theory of "autointoxication" of the 19th and early 20th century (42).

As mentioned above, the concept of *perittoma* was probably transmitted to the school of Cnidus. The *Anonymus Londinensis*, in fact, tells us that:

Euryphon of Cnidus, for example, thinks that diseases are caused in the following manner. "When the belly does not discharge the nutriment that has been taken, residues are produced, which then rise to the regions about the head and cause diseases. When however the belly is empty and clean, digestion takes place as it should; otherwise what I have already stated occurs" (43).

The *Anonymus* also tells us that the teachings of another Cnidian, Herodicus, were similar to that of Euryphon:

Herodicus of Cnidus, speaking about the cause of diseases, is himself too partly in agreement with Euryphon, but partly in disagreement. In so far as he himself too says that residues (*perissomata*) are the causes of disease he is in agreement (44).

And so were the teachings of Alcamenes of Abydos (45) and Timotheus of Metapontum (46). The concept of *perittoma* continued to be held in Egypt, as suggested by the *Anonymus*' report of the teachings of an otherwise unknown Egyptian physician called Ninyas:

Ninyas the Egyptian is peculiar in dividing affections into congenital and acquired, the congenital, he says, being innate in our bodies. He holds that there is another cause, by which diseases are produced in the following way. Whenever nutriment is taken that is not absorbed into the body, but remains in the organs, the warmth in us generates out of this nutriment residues [*perissomata*] (47).

Aristotle distinguishes various kind of *perittomata*: bile, (48) phlegm, (49) sperm, (50) and milk (51). In addition, he relates sleep to the concept of "residue." According to the Stagirite the brain tempers the heat and boiling of the heart (52) and also produces sleep, whose mechanism is rather complicated:

Just as moisture is vaporized by the heat of the sun, when it reaches the upper region, is

chilled by the coldness of it, and after condensing becomes water again, and is carried down, so in the raising of the hot matter toward the brain, the excrementitious [*peritomatike*] vapor collects into phlegm (which is why catarrhs are observed to arise from the head), while the nutritive and wholesome evaporation is condensed and carried down and chills the hot (53).

For sleep comes. when the solid part [of the evaporation] is carried upwards by the hot through the veins to the head. But when that which is carried upwards becomes excessive in amount and can no longer ascend, it forces the hot back again and flows downwards. And so when the heat with its raising force is withdrawn, men sink down... and the process produces loss of consciousness... (54).

Although not the word itself, the concept of *perittoma* as cause of disease is also found in the works of Plato. In the *Timaeus* (55) we find that some diseases are caused by phlegm or bile, and, as we have seen above, these substances, in Aristotelian language, are called *perittomata* (56). Also, in the same dialogue, a passage discussing how illness arises says “*Pollakis d’en to somati diakritheisen sarkos pneuma engenomenon kai adunatoun exo...*,” which is translated by Jowett “And oftentimes when the flesh is dissolved in the body, wind, generated within and unable to escape...” (57) although it can also be translated “And often, when the flesh is disintegrated, air which is enclosed in the body and is unable to pass out...” (58) The general sense does not seem to change.

*Tests related to pregnancy*—In the medical literature of ancient Egypt are found several tests to determine pregnancy, fertility, or the sex of the fetus. Le Page Renouf and Iversen have shown that some of these tests occur in the Berlin papyrus and in the Carlsberg VIII papyrus, as well as in the Hippocratic Corpus.

In the Berlin papyrus, the following fertility test is proposed:

Herb Bull’s *batatu* [or *buteru* or *boudodou*], (59) crushed in a closed vessel, with milk of a

woman who has given birth to a male infant. Give the mixture to the woman, if she vomits she will conceive; if she has borborygmi, she will not (60).

And this is the Hippocratic equivalent:

If you want to know if a woman can conceive, give her to drink, in the morning when fasting, *boutyron* [an odoriferous plant] and milk of a woman nursing a male infant; if she burps she will conceive, if she does not she will not (61).

Another test of this kind is described in the Papyrus Carlsberg VIII and is also found almost word for word in the Hippocratic Corpus. Here is the Egyptian version:

Another, to distinguish a woman who will give birth from one who will not give birth. You shall let an onion bulb... remain the whole night [in her vulva?] until dawn. If the smell passes through her mouth, she will give birth; if (...) she will not give birth (62).

And the corresponding Hippocratic passage:

Another: clean a head of garlic, take out the skin, place it in the vagina and see if next day the woman smell of garlic through the mouth. If she does, she will conceive, if not, she will not (63).

A similar recipe is also found in the *Aphorisms*:

If a woman does not conceive, and you wish to know if she will conceive, cover her round with wraps and burn perfumes underneath. If the smell seems to pass through the body to the mouth and nostrils, be assured that the woman is not barren through her own physical fault (64).

Although these similarities in the Egyptian and Greek texts could conceivably be due to independent “discoveries,” the possibility of this being the case is very remote. First of all, such tests would not be clearly explained within the framework of Hippocratic physiology, whereas an Egyptian physician would have understood that they verified the patency of the vessels carrying semen (to the uterus) and smells (to the mouth) because it

was a clear datum of Egyptian physiology that the same vessels could carry many kinds of substances practically everywhere in the body (65). As the same vessels carried both substances, their blockage, of course, would cause sterility. In addition, we know that these tests are not valid; therefore, in the absence of a common physiological paradigm, and given the undetermined number of alternatives (there is no limit to the number of *invalid* tests that can be devised), it is very unlikely that Greek and Egyptian physicians would have independently devised identical invalid tests (66).

There is no evidence that these essays became part of Alexandrian medicine, possibly because the pertinent documents have been lost. Von Staden, although recognizing the danger of the *argumentum a silentio*, speculates that Herophilus' "careful study of reproductive anatomy and physiology and of obstetrics convinced him of the absurdity and uselessness of these Egyptian intrusions into Greek medicine" (67). However, this would not necessarily have prevented other health practitioners from using the tests and, in fact, the Egyptian birth prognoses recur again and again in the medicine of subsequent ages, including European folk medicine as shown by le Page Renouf (68) and Iversen (69). The latter underlines the similarity of the following test found in the Carlsberg VIII papyrus:

You shall put wheat and barley into purses of cloth, the women shall pass her water on it every day. (it being mixed with dates and sand.) If both sprout, she will give birth, if the wheat sprouts, she will give birth to a boy (.....) if the barley sprouts, she will give birth to a girl, if they do not sprout, she will not give birth at all (70).

with the one found in the *Dreckapotheke* edited by Franz Paullini in the seventeenth century:

Mache zwo Gruben in die Erde, wirfft in eine Gerste und in die andere Weitzen, in beyde aber giesse den Urin der Schwangern, und bedecke sie wieder mit Erden. Schiesst der Weitzen eher auff als die Gerste so wirds ein Sohn, kommt aber die Gerste eher empor so hastu eine Tochter zugewarten (71).

The seventeenth century German test is found in Galen almost word for word:

Take the urine of a gravid woman and make two holes in the ground, put barley in one and wheat in the other. Pour the urine and cover with earth. If the wheat sprouts first, it will be a male, if the barley, a female (72).

*Anatomy* – The most important contribution of the Alexandrian school is undoubtedly the study of anatomy through human dissection although, in the ancient world, this practice was not limited to Alexandrian medicine. Reference to human dissection is found in the *Huang-ti nei-ching ling-shu* (first century A.D.):

After death the body may also be dissected and a general idea obtained of the appearance, size and capacity of the viscera, length of the blood vessels, the condition of the blood, and the amount of pneuma [*ch'i*]..." (73)

Other accounts, some of legendary nature, are found scattered in ancient Chinese literature. (74). In Hindu medicine a sort of dissection of the cadaver was occasionally practiced. The *Sushruta Samhita* (written shortly after the beginning of our era but reflecting a much older medical tradition) describes this ingenious method to study the anatomy of a cadaver without touching it:

A dead body selected for this purpose should not be wanting in any of its parts, should not be a person who has lived up to a hundred years (i.e., too old age) or of one who died from any protracted disease or of poison. The excrementa should be first removed from the entrails and the body should be left to decompose in the water of a solitary and still pool, and securely placed in a cage (so that it may not be eaten away by fish nor drift away), after having covered it entirely with the outer sheets of *Munja* grass, *Kus'a* grass, hemp or with rope, etc. After seven days the body would be thoroughly decomposed, when the observer should slowly scrape off the decomposed skin, etc., with a whisk made of grass-roots, hair *Kus'a* blade or with a strip of split bamboo and carefully observe with his own eyes all the

various different organs, external and internal, beginning with the skin... (75).

Because, as far as we know, the practice of human dissection arose independently and without external influence in both India and China, there is no reason to doubt that the same could have happened in Alexandria. However, the Greek taboo against opening the human body (76) and the fact that the practice was not known elsewhere in the Greek world suggest that some factors acting in Alexandria, and not anywhere else, may have stimulated its development (77). It has been suggested that the Egyptian practice of embalming may have been such a factor:

The Egyptian practice of embalming influenced the history of European... by familiarizing the popular mind through twenty centuries with the idea of cutting the human body, Egypt made it possible for the Greek physicians of the Ptolemaic Age to begin, for the first time, the systematic dissection of the human body, which popular prejudice forbade in all other parts of the world (78).

Others have ignored or at least de-emphasized the importance of such practice. For example, Fraser states that the Egyptian influence on the Alexandrian anatomists "may be discounted as negligible;" (79) Lloyd attributes the overcoming of the inhibitions toward human dissection to the special situation in Alexandria in the third century B.C., namely "the particular combination of ambitious scientists and patrons of science that existed at that time," and to the fact that because "corpses were desecrated often enough by people other than scientists" and "poisons were tried out on convicts to test their effects," it is not "difficult to believe that the Ptolemies permitted vivisection to be practiced in condemned criminals;" (80) von Staden admits that the practice of mummification may have had a limited effect on human dissection, (81) but seems to feel that other elements played a more important role:

The unusual combination of ambitious Macedonian patrons of science (i.e., the Ptolemies), eager scientists like Herophilus, a new city in

which traditional values at first were not considered intrinsically superior, and a cosmopolitan intelligentsia committed not only to literary and political, but also to scientific frontiersmanship, apparently made it possible to overcome traditional inhibitions against opening the human body (82).

Although there is no documentary evidence proving the relative significance of all possible elements that may have encouraged human dissection in Alexandria, it seems logical to assume that the Egyptian practice of mummification should have been one of the most important - not because the opening of bodies to be mummified resembled in any way the systematic dissection of Herophilus and Erasistratus, not because Egyptian embalmers contributed in any way to anatomical knowledge, not because Egyptian physicians had taken any advantage of the procedure, but, as Smith says, because the procedure familiarized "the popular mind through twenty centuries with the idea of cutting the human body" (83)

Even if the Egyptians were not free of the prejudice common in the ancient world against the cutting of the human body, (84) they had nevertheless cut open cadavers for more than two thousand years before Alexandrian times (85) and it is difficult to believe that such a practice would not have had a major influence on the general attitude toward the handling of cadavers in the sense underlined above by Smith. On the other hand, the enthusiastic assertion that "in this way Egypt exerted the most profound influence not only upon the development of anatomical knowledge, but provided the means by which the foundations were laid upon which the whole fabric of modern medical science has been built," (86) may not be correct. We must remember that Alexandrian human dissection, in fact, had little influence in the development of modern anatomy because the practice was discontinued early and was not resumed until more than a thousand years later in Europe.

*Drugs* – The Egyptian legacy to Greece in terms of materia medica is well known. Homer describes ancient Egypt as the land that "bears the greatest store of drugs, many that are healing when

mixed, and many that are baneful.” (87) In the Hippocratic Corpus, medications referred to as “Egyptian” are common. Natron (or nitron, or litron - used by the Egyptians for mummification (88) and alum are frequently mentioned as components of several drug mixtures. For example: “Mix natron of Egypt, coriander, and cumin with fat and make an ointment with this mixture;” (89) “Cook together white vinegar as strong as possible, honey, alum of Egypt, natron of first quality slightly baked, a little bile;” (90) “For rodent ulcers: baked alum of Egypt and of Melos;” (91) “Take two cotulas of white wine, half a cotula of honey, half a cotula of oil, a quarter of a cotula of baked Egyptian natron...” (92)

Other medications defined as “Egyptian” are also frequently found. As von Staden has pointed out, “The author or authors of Hippocratic gynecological treatises seem to have been particularly keen on Egyptian ingredients - perhaps a reflection of the strong gynecological tradition within pharaonic medicine.” (93) Thus, for example, in *On Women’s Diseases I* we find prescriptions for white Egyptian oil, (94) Egyptian salt, (95) and Egyptian saffron; (96) in *On Women’s Diseases II* for “the *bolbion* [purse-tassels-*muscari comosum*] seen especially in Egyptian grain fields;” (97) in *On the Nature of Woman*, Egyptian perfume and oil. (98) Other references to Egyptian drugs in the Hippocratic Corpus can easily be found. (99)

Not only Hippocratic medicine availed itself of Egyptian medications, Alexandrian pharmacology was also enriched by Egyptian drugs (e.g., Nile milfoil, aloe, “Cyrenaic juice,” rhubarb, ginger, tragacanth) (100) and included ingredients from Egyptian *Dreckapotheke* (hyena bile, crocodile dung, camel urine, etc) (101). After the Alexandrian era, drugs first mentioned in the Egyptian papyri continued to be used in the western world until modern times (102). Many are undoubtedly cases of independent “discovery;” others, however, probably derived from Egyptian medicine.

### Conclusions

The evidence reviewed above supports the view that Egyptian medicine and the Egyptian

custom of mummification influenced Greek medicine. In trying to assess the importance of such an influence we must consider that although the Egyptians developed a naturalistic medical paradigm long before Hippocrates, the Greek one was not of Egyptian origin. As a consequence, if we regard the naturalistic paradigm as the most important achievement of Greek medicine, we must conclude that the impact of Egyptian on Greek medicine was on the latter’s secondary, even if still important, aspects.

We have suggested above that the anatomical investigations of the Alexandrian school were facilitated, perhaps even made possible, by the Egyptian custom of mummification. This can be considered an important influence even though such studies were restricted in time and space; in fact, as mentioned above, they were soon abandoned and the systematic dissection of the human body was not to be practiced again until much later.

The concept of *perittoma* influenced Greek medicine, Aristotelian biology, and even medical thought until modern times; however, it never became the main paradigm of Greek medicine and was, after all, a blind alley. As for Egyptian drugs and tests related to pregnancy, there is no doubt that they had an impact on Greek and even on subsequent medical practices.

Any discussion of Egyptian and Greek medicine contains a stated or implied comparison of the two. Although it would appear that Greek medicine (Hippocratic as well as Alexandrian) represents a more advanced stage of the healing arts, we must consider the possibility that the more limited breadth and depth of Egyptian naturalistic medicine could be due to the paucity of surviving documents (only eight papyri, (103) most dealing with supernaturalistic medicine). A comparable situation would exist if all that had survived of Greek medicine were 377 lines (the length of the Smith papyrus) of the Hippocratic Corpus, 2289 lines (the length of the Ebers papyrus) of Galen, and a few fragmentary texts dealing mainly with Aesculapian medicine. If this were the case, there is no doubt that Greek medicine would appear to us to be much less important.



We must also remember that some of the more advanced elements of Greek medicine (e.g., the anatomical studies of the Alexandrian school) had little impact on the treatment of disease. An average patient consulting an average Greek physician had probably no greater chances of being helped than one consulting an average Egyptian physician. The Hippocratic treatment of baldness (cataplasms of cumin, pigeon's dung, horse-radish, leek, beet, nettle) (104) was surely not more effective than the one advocated in the Ebers papyrus (mixture of fat of lion, hippopotamus, crocodile, cat, serpent, and ibex) (105). On the other hand, a very effective procedure still used today, that is, the maneuver for the reduction of a dislocated mandible, is found both in the Hippocratic Corpus (106) and in the Smith Papyrus (107). As for the treatment of wounds, the Greeks used vinegar and wine (ingredients with antiseptic properties) (108) the Egyptians honey and grease (antibacterial substances) (109).

At this point, our enthusiasm for Greek medicine brings to mind Herodotus' story of Democedes, who succeeded in curing Darius' ankle dislocation after the Egyptian physicians had failed. (110) If we are prepared to indulge in a little medical speculation, however, we may see the episode in a different light: suppose that the Egyptian physicians, by their "forcible wrenching," had, in fact, reduced the dislocation and that the pain that followed was simply due to the trauma of a difficult reduction. After a few days of pain, the situation would naturally improve without treatment, just in time for Democedes, who used "Greek remedies" (what could they have been?) and "gentleness" (of course, as the reduction had already been achieved, there was no need to manipulate the joint further), to receive the credit that was due to the Egyptian physicians.

In conclusion, it would appear that not only was the influence of Egyptian on Greek medicine considerable (although not crucial) but that the differences between the two medicines were not of a fundamental nature but of degree. In addition, many of these perceived differences could be due

to the paucity of surviving Egyptian medical documents.

## REFERENCES

1. The content of this paper is to be found in the General Conclusions of: Plinio Pioreschi, *A History of medicine, Volume II, Greek Medicine*, Omaha, Horatius Press, 1996.
2. E. g., G. Elliot Smith, *Egyptian Mummies*, *Journal of Egyptian Archeology*, I, 189-196, 1914; Henry E. Sigerist, *A History of Medicine*, Oxford, Oxford University Press, 2 vols., 1951, 1961, I, pp. 356-358; P. Ghalioungui, "Dès papyrus égyptiens à la médecine grecque," *XVIIe Congrès international d'histoire de la médecine*, Athènes-Cos, 1960, I, *Communications*, pp. 296-305; J. B. de C. M. Saunders, *The Transition from Ancient Egyptian to Greek Medicine*, Lawrence, University of Kansas Press, 1963, pp. 15-33; J. Yoyotte, "Une théorie étiologique des médecins égyptiens," *Kêmi*, XVIII, 79-84, 1968, on pp. 81, 83, 84.
3. E.g., Allbutt (T. Clifford Allbutt, *Greek Medicine in Rome*, New York, Benjamin Blom, 1970 (reprint of the 1921 edition), p. 133) held that "From pharaonic Egypt medicine probably received little, for good or harm, unless it were an accumulation of drugs;" Fraser (P. M. Fraser, *Ptolemaic Alexandria*, Oxford, Clarendon Press, 3 vols., 1972, I, p. 345), states that "the debt of the professional Alexandrian anatomists of the third century, with their lively Greek tradition of medical science, to the native Egyptian tradition may be discounted as negligible;" Von Staden (Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 30) says that "Egyptian medicine remained a deeply un-Greek amalgam of magic, religion, and science, largely isolated from early Alexandrian culture, and as perennially different from it as a summer breeze on a North Sea island from a sirocco."
4. Antoine Thivel, "Le divin dans la collection hippocratique," in *La Collection hippocratique et son rôle dans l'histoire de la médecine*, Colloque de Strasbourg organisé par le Centre de Recherches sur la Grèce Antique, Leiden, E. J. Brill, 1975, pp. 57-76. "Si on compare [la médecine hippocratique]... B d'autres médecines anciennes, comme les médecines égyptienne, indienne, et même chinoise, on constate que la médecine hippocratique est plus avancée, car elle ne fait plus aucun appel aux procédés magiques et aux exorcismes." Translation by the author.
5. P. Pioreschi, *A History of Medicine: Volume I, Primitive and Ancient Medicine*, Second Edition, Omaha, Horatius Press, 1996, pp. 561ff. The exception is *Biblical Medicine* (pp. 500ff of the same work).
6. P. M. Fraser, *Ptolemaic Alexandria*, Oxford, Clarendon Press, 3 vols., 1972, I, p. 344.
7. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 6.

8. It is true that if the text of the Ebers papyrus were as long as the Hippocratic corpus it would contain many more incantations. This, however, does not necessarily apply to the Smith papyrus which contains a single magic formula inconsistent with the rest of the text.
9. P. Prioreschi, *A History of Medicine. Volume I: Primitive and Ancient Medicine*, Second Edition, Omaha, Horatius Press, 1996, Chapter IV.
10. Prognostic I. The text says that it is necessary to know "if there is something divine in the diseases" (*ama de kai ei ti theion enestin en tesi nousi*).
11. Regimen IV (Dreams), XCIII; Regimen IV (Dreams), LXXXVII; Regimen IV (Dreams), LXXXIX, 110, 120-130; Regimen IV (Dreams) LXXXVII; Regimen I, V; On the Nature of Women, 1; The Sacred Disease, IV; On Decorum, VI. To these we can add the reference to Apollo, Aesculapius, Hygieia, and Panacea who are called as witnesses in the Oath. In addition, the passages referring to the importance of odd and even days and those related to the so-called "theory of the critical days" reflect ideas which may have been influenced by such magic-religious concepts as numerology.
12. P. Prioreschi, "Supernatural Elements in Hippocratic Medicine," *J. Hist. Med. Allied Sci.*, 47, 389-404, 1992.
13. The Ebers Papyrus mentions the three kind of healers (The Papyrus Ebers, translated by B. Ebbell, Copenhagen, Levin & Munksgaard, 1937, p. 115), whereas the Smith Papyrus mentions only the physician and the priest of Sekhmet (Edwin Smith Surgical Papyrus in Facsimile and Hieroglyphic Transliteration with Translation and Commentary, edited by James Henry Breasted, Chicago, The University of Chicago Oriental Institute Publications, 2 vols., 1930, I, p. 104).
14. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 9.
15. P. M. Fraser, *Ptolemaic Alexandria*, Oxford, Clarendon Press, 3 vols., 1972, I, p. 345.
16. Hippocrates, *Airs, Waters, Places*, XXII.
17. *Aphorisms*, VII, xxx.
18. "Fertur [Herophilus] dixisse medicamenta divum manus esse." Marcellus, *De Medicamentis*, (Epistula Cornelii Celsi), *Corpus Medicorum Latinorum*, V, Berlin, Akademie-Verlag, 1968, p. 36. See also: Galen, *De compositione medicamentorum secundum locos*, VI, viii, K, p. 966.
19. Pseudo-Plutarch, *De placitis philosophorum*, V, ii (Moralia, 904f). Quoted by Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 386.
20. Emma J. Edelstein and Ludwig Edelstein, *Asclepius: A Collection and Interpretation of the Testimonies*, Baltimore, The John Hopkins Press, 2 vols., 1945, II, p. 251.
21. Paulys-Wissowa, *Real-Encyclopädie der classischen Altertumswissenschaft*, Stuttgart, J. B. Metzler, 1896, II, pp. 1662-1677.
22. Diodorus Siculus, I, 82.
23. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 25.
24. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 26.
25. Robert O. Steuer, *whdw, Aetiological Principle of Pyaemia in Ancient Egyptian Medicine*, Baltimore, The John Hopkins Press, 1948.
26. Robert O. Steuer and J. B. de C. M. Saunders, *Ancient Egyptian and Cnidian Medicine*, Berkeley, University of California Press, 1959, pp. 4, 5.
27. J. Yoyotte, "Une théorie étiologique des médecins égyptiens," *Kêmi*, XVIII, 79-84, 1968, on p. 81.
28. *On Diseases IV*. *Littré VII*, XLIV, p. 566.
29. *On Internal Affections*, XLI. Translation by P. Potter, The Loeb Classical Library, 1988.
30. *On Internal Affections*, XLXI. Translation by P. Potter, The Loeb Classical Library, 1988.
31. J. Yoyotte, "Une théorie étiologique des médecins égyptiens," *Kêmi*, XVIII, 79-84, 1968, on pp. 81, 83.
32. Robert O. Steuer and J.B. de C. M. Saunders, *Ancient Egyptian and Cnidian Medicine*, Berkeley, University of California Press, 1959, p. 21.
33. Meno (or Menon), a pupil of Aristotle, wrote a compendium of older Greek medicine - *Iatrike synagoge*. A copy, possibly of an earlier copy, was made for private use (possibly as lecture notes, which would explain the unpolished state and the many repetitions and corrections), probably in the second century A.D. (See: *The Medical Writings of Anonymus Londinensis*, translated and edited by W. H. S. Jones, Cambridge, Cambridge University Press, 1947, pp. 1, 5). Such copy, a papyrus, was found in the British Museum in the nineteenth century and became known as the *Anonymus Londinensis*.
34. *Anonymus Londinensis*, V, VI, in: *The Medical Writings of Anonymus Londinensis*, translated and edited by W. H. S. Jones, Cambridge, Cambridge University Press, 1947, pp. 35, 37, 39. Note that "Aristotle's view" means, in this case, Meno's view. Note the integration of the two concepts of *perittoma* and *pneuma*.
35. For a discussion of this question see: Ludwig Edelstein, *Book Review of M. Pohlenz, Hippokrates und die Begründung der wissenschaftlichen Medizin*, in *American Journal of Philology*, LXI, 221-229, 1940.
36. W. D. Smith, *The Hippocratic Tradition*, Ithaca & London, Cornell University Press, 1979, p. 56.
37. Robert O. Steuer and J.B. de C. M. Saunders, *Ancient Egyptian and Cnidian Medicine*, Berkeley, University of California Press, 1959, p. 29.
38. Galen, *De sanitate tuenda I*, in *Claudii Galeni Opera Omnia*, editionem curavit C. G. Kühn, Lipsiae, C. Knobloch, 20 vols., 1821-1833, VI, p. 8.
39. Galen, *De causis morborum*, in *Claudii Galeni Opera Omnia*, editionem curavit C. G. Kühn, Lipsiae, C. Knobloch, 20 vols., 1821-1833, VII, p. 34.
40. Galen, *De naturalibus facultatibus III*, in *Claudii Galeni Opera Omnia*, editionem curavit C. G. Kühn, Lipsiae, C. Knobloch, 20 vols., 1821-1833, II, p. 185.
41. Galen, *De methodo medendi XI*, x, in *Claudii Galeni Opera Omnia*, editionem curavit C. G. Kühn, Lipsiae, C.

- Cnobloch, 20 vols., 1821-1833, X, p. 762.
42. For a recent review of the 19th and 20th centuries theory of "auto-intoxication," see: Robert P. Hudson, "Theory and Therapy: Ptosis, Stasis, and Auto-intoxication," *Bull. Hist. Med.*, LXIII, 3, 392-413, 1989.
  43. Anonymus Londinensis, IV, 31-40. Translation by W. H. S. Jones, in: *The Medical Writings of Anonymus Londinensis*, Cambridge, Cambridge University Press, 1947, p. 33.
  44. Anonymus Londinensis, IV, 40 - V, 3. Translation by W. H. S. Jones, in: *The Medical Writings of Anonymus Londinensis*, W. H. S. Jones (Ed.), Cambridge, Cambridge University Press, 1947, p. 33.
  45. Anonymus Londinensis, VII, 40 - VIII, 10. Translation by W. H. S. Jones, in: *The Medical Writings of Anonymus Londinensis*, W. H. S. Jones (Ed.), Cambridge, Cambridge University Press, 1947, pp. 43-45.
  46. Anonymus Londinensis, VIII, 10-28. Translation by W. H. S. Jones, in: *The Medical Writings of Anonymus Londinensis*, W. H. S. Jones (Ed.), Cambridge, Cambridge University Press, 1947, p. 45.
  47. Anonymus Londinensis, IX. Translation by W. H. S. Jones, in: *The Medical Writings of Anonymus Londinensis*, W. H. S. Jones (Ed.), Cambridge, Cambridge University Press, 1947, p. 51.
  48. Aristotle, *Parts of Animals*, IV, ii, 677a, 25-29.
  49. Aristotle, *Historia Animalium*, III, ii, 511b, 9.
  50. Aristotle, *Generation of Animals*, I, xviii, 726a, 26-28.
  51. Aristotle, *Generation of Animals*, II, iv, 739b, 25.
  52. Aristotle, *Parts of Animals*, II, vii, 652b, 27-28.
  53. Aristotle, *On Sleep and Waking*, III, 457b, 34 - 458a, 5. Translation by W. S. Hett, *The Loeb Classical Library*, 1936.
  54. Aristotle, *On Sleep and Waking*, III, 457b, 20-25. Translation by W. S. Hett, *The Loeb Classical Library*, 1936.
  55. Plato, *Timaeus*, 84 C, D.
  56. See: Ludwig Edelstein, Book Review of M. Pohlenz, *Hippokrates und die Begründung der wissenschaftlichen Medizin*, in *American Journal of Philology*, LXI, 221-229, 1940.
  57. Plato, *Timaeus*, 84e. translation by Benjamin Jowett, in: *The Collected Dialogues of Plato*, edited by Edith Hamilton and Huntington Cairns, Princeton, Princeton University Press, 1963. See also similar translations by H. Martin and even by Marsilius Ficinus (quoted by Ludwig Edelstein, Book Review of M. Pohlenz, *Hippokrates und die Begründung der wissenschaftlichen Medizin*, in *American Journal of Philology*, LXI, 221-229, 1940).
  58. Plato, *Timaeus*, 84e. Translated by R. G. Bury, *The Loeb Classical Library*, 1929.
  59. For the uncertainties concerning the translation of this word and of the butyron (rendered as "butter" by Littré) in the quotation that follows, see: P. le Page Renouf, "Note on the Medical Papyrus of Berlin," *Zeitschrift für ägyptische Sprache und Altertumskunde*, XI, 123-125, 1873; P. Ghalioungui, "Dès papyrus égyptiens à la médecine grecque," XVIIe Congrès international d'histoire de la médecine, Athènes-Cos, 1960, I, *Communications*, pp. 296-305 (Note).
  60. P. le Page Renouf, "Note on the Medical Papyrus of Berlin," *Zeitschrift für ägyptische Sprache und Altertumskunde*, XI, 123-125, 1873.
  61. On Sterile Women, 214, *Littré VIII*, p. 414.
  62. Erik Iversen, "Papyrus Carlsberg VIII with some remarks on the Egyptian origin of some popular birth prognoses," *Det. Kgl. Danske Videnskabernes Selskab. Historisk-filologiske Meddelelser*, XXVI, 5, 1-31, 1939.
  63. On Sterile Women, CCXIV. *Littré VIII*, p. 416.
  64. Aphorisms, V, LIX. Translation by W. H. S. Jones, *The Loeb Classical Library*, 1931.
  65. Edwin Smith Surgical Papyrus in Facsimile and Hieroglyphic Transliteration with Translation and Commentary, edited by James Henry Breasted, Chicago, The University of Chicago Oriental Institute Publications, 2 vols., 1930, I, pp. 110-111. According to Hippocratic physiology, the seed may have been carried in the veins from the various sites of formation to the genital organs (see: On the Seed, I). Even assuming that a vascular transport was understood, it would have been difficult, however, for the Hippocratic physician to explain the conveyance of odor from the vagina to the mouth.
  66. Obviously, the likelihood that the same invalid solution for a given problem is reached independently is related to the number of possible solutions. For example, two polytheistic societies could independently reach the conclusion that the gods are all males (or all females, or a mixture of the two sexes) because the options are only three, but, given an indeterminate number of alternatives, how likely is that both societies would independently conclude that the number of gods is 143?
  67. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 22.
  68. P. le Page Renouf, "Note on the Medical Papyrus of Berlin," *Zeitschrift für ägyptische Sprache und Altertumskunde*, XI, 123-125, 1873.
  69. Erik Iversen, "Papyrus Carlsberg VIII with some remarks on the Egyptian origin of some popular birth prognoses," *Det. Kgl. Danske Videnskabernes Selskab. Historisk-filologiske Meddelelser*, XXVI, 5, 1-31, 1939.
  70. A similar test, found in the Berlin papyrus, helped to restore the missing parts in the Carlsberg VIII papyrus. Concerning the restored text, Iversen says: "The meaning is as a whole quite clear and absolutely certain, though there can be doubt as to the correct reconstruction of the details." See: Erik Iversen, "Papyrus Carlsberg VIII with some remarks on the Egyptian origin of some popular birth prognoses," *Det. Kgl. Danske Videnskabernes Selskab. Historisk-filologiske Meddelelser*, XXVI, 5, 1-31, 1939.
  71. "Make two holes in the ground, put in one barley and in the other wheat, in both pour the urine of the pregnant woman and cover with earth. If the wheat sprouts before the barley, it will be a son, if the barley sprouts first, expect a daughter." Quoted by Erik Iversen in: "Papyrus Carlsberg VIII with some remarks on the Egyptian origin of some popular birth prognoses," *Det. Kgl. Danske Videnskabernes Selskab. Historisk-filologiske Meddelelser*, XXVI, 5, 1-31, 1939.

72. Galen, *De remediis parabilibus* II, xxvi, in *Claudii Galeni Opera Omnia*, editionem curavit C. G. Kühn, Lipsiae, C. Knobloch, 20 vols., 1821-1833, XIV, p. 476.
73. K. Chimin Wong and Wu Lien-teh, *History of Chinese Medicine*, New York, AMS Press, 1973 (reprint of the Shanghai, National Quarantine Service, 1936 edition), p. 196. The *Huang-ti nei-ching ling-shu* ("The Most Important Parts of the Yellow Emperor's Scripture of Internal Medicine") was compiled from the first century A.D. on by unknown authors. The more important *Huang-ti nei-ching su-wen* ("Candid Questions from the Yellow Emperor's Scripture of Internal Medicine"), compiled by Wang Ping (eighth century A.D.), from texts of unknown authors written from the second century B.C. on, is commonly referred to as the *Huang-ti nei-ching* ("The Yellow Emperor's Classic of Internal Medicine").
74. P. Pioreschi, *A History of Medicine. Volume I: Primitive and Ancient Medicine*, Second Edition, Omaha, Horatius Press, 1996, Chapter II.
75. *An English Translation of The Sushruta Samhita*, by Kaviraj Kunjalal Bhishagratna, Varanasi, India, 3 vols, 1963, II, p. 172. The infrequency of such "dissections" is inferred by the approximate knowledge of anatomy characteristic of Hindu medicine and by the passage of the *Caraka Samhita* (written at about the same time as the *Sushruta Samhita* but also reflecting an older tradition) which says: "Thus the body-parts which have been described here correctly are visible as far as the skin; parts interior to the skin are to be only inferred." (*The Caraka Samhita*, translated by the Shree Gulabkunverba Ayurvedic Society, Jamnagar, India, 6 vols, 1949, III, p. 1110.)
76. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 29. See also: Ludwig Edelstein, "Die Geschichte der Sektion in der Antike," *Quellen und Studien zur Geschichte der Naturwissenschaften und der Medizin*, Berlin, Julius Springer, 1932, Band 3, Heft 2, pp. 50-106.
77. If Fraser's controversial opinion that Erasistratus never worked in Alexandria (P. M. Fraser, "The Career of Erasistratus of Ceos," *Istituto Lombardo (Rend. Lett.)*, CIII, 518-537, 1969) were to be accepted, we would have to assume that the same factors acted in Antioch as well, a concept that Harris finds difficult to accept (C. R. S. Harris, *The Heart and the Vascular System in Ancient Greek Medicine*, Oxford, At the Clarendon Press, 1973, p. 178). Franz Susemihl and Julius Beloch held, earlier, the same view as Fraser. See: Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 142, footnote 7; C. R. S. Harris, *The Heart and the Vascular System in Ancient Greek Medicine*, Oxford, At the Clarendon Press, 1973, p. 177.
78. G. Elliot Smith, *Egyptian Mummies*, *Journal of Egyptian Archeology*, I, 189-196, 1914. Harris seems to accept Smith's main point (C. R. S. Harris, *The Heart and the Vascular System in Ancient Greek Medicine*, Oxford, At the Clarendon Press, 1973, p. 178). Note Smith's error in believing that human dissection was prevented "in all other parts of the world."
79. P. M. Fraser, *Ptolemaic Alexandria*, Oxford, Clarendon Press, 3 vols., 1972, I, p. 345.
80. G. E. R. Lloyd, *Greek Science after Aristotle*, New York, W. W. Norton & Company, 1973, p. 77.
81. "Mummification might have a momentary, indirect, emancipating impact upon enlightened Alexandrian Greeks eager to dissect human cadavers..." Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 149.
82. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 141-142.
83. See endnote 77, above.
84. See Diodorus Siculus, I, 91, 4, and also Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 149 and footnote 26 on the same page.
85. The earliest evidence of mummification may go back to the second Dynasty (c. 2700 B.C.). See: G. Elliot Smith, "Egyptian Mummies," *Journal of Egyptian Archeology*, I, 189-196, 1914.
86. G. Elliot Smith, "Egyptian Mummies," *J. Egyptian Archeol*, I, 189-196, 1914.
87. Homer, *Odyssey*, IV, 229-230, Translation by A. T. Murray. The Loeb Classical Library, 1924.
88. P. Pioreschi, *A History of Medicine. Volume I: Primitive and Ancient Medicine*, Second Edition, Omaha, Chapter IV.
89. *Epidemics* II, VI, 9. *Littre* V, 134.
90. *On Wounds*, XIV. *Littre* VI, pp. 416, 418.
91. *On Wounds*, XVIII. *Littre* VI, p. 422.
92. *On Internal Ailments*, XXVI. *Littre* VII, p. 236.
93. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, pp. 16.
94. *On Women's Diseases* I, XXXVII. *Littre* VIII, p. 90.
95. *On Women's Diseases* I, LXXXV. *Littre* VIII, p. 168.
96. *On Women's Diseases* I, LXXXVIII. *Littre* VIII, p. 186.
97. *On Women's Diseases* II, CLXXXI. *Littre* VIII, p. 365.
98. *On the Nature of Woman*, VII. *Littre* VII, p. 322.
99. See *Littre's* index under "Égypte" (*Littre* X, p. 572).
100. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 17.
101. Heinrich Von Staden, *Herophilus: the Art of Medicine in Early Alexandria*, Cambridge, Cambridge University Press, 1989, p. 18.
102. P. Ghalioungui, "The Relation of Pharaonic to Greek and Later Medicine," *Bull. Cleveland Med. Library*, XV, 96-107, 1968. The author states that in Dioscorides' *De materia medica* twenty per cent of the drugs "had kept their Egyptian names."
103. The main Egyptian medical papyri, with the approximate date of the copy that has reached us, are: Kahun (1900 B.C.), Smith (1600 B.C.), Ebers (1550 B.C.), Hearst (1550 B.C.), Zaubersprüche für Mutter und Kind (1550 B.C.), London (1350 B.C.), Berlin (1350 B.C.), and Chester Beatty (1250 B.C.).

104. On Women's Diseases II, CLXXXIX. Littré VIII, p. 370.
105. The Papyrus Ebers, translated by B. Ebbell, Copenhagen, Levin & Munksgaard, 1937, p. 79.
106. On Joints, XXX, Littré IV, 144.
107. Edwin Smith Surgical Papyrus in Facsimile and Hieroglyphic Transliteration with Translation and Commentary, edited by James Henry Breasted, Chicago, The University of Chicago Oriental Institute Publications, 2 vols., 1930, I, p. 304.
108. Guido Majno, The Healing Hand: Man and Wound in the Ancient World, Combridge, Harvard University Press, 1975, pp. 186-188.
109. Guido Majno, The Healing Hand: Man and Wound in the Ancient World, Combridge, Harvard University Press, 1975, pp. 115-120.
110. "Darius, while hunting, twisted his foot in dismounting from his horse, so violently that the ball of the ankle joint was dislocated from its socket... [the Egyptian phy-

sicians] by their forcible wrenching of the foot did but make the hurt worse; and for seven days and nights the king could get no sleep for the pain. On the eighth day he was in very evil case; then somebody who had heard in Sardis of the skill of Democedes of Croton, told the king of him. Darius bade Democedes be brought to him without delay.... Democedes applied Greek remedies and used gentleness instead of the Egyptian's violence; whereby he made the king able to sleep and in a little while recovered him of his hurt." Herodotus, III, 129-130. Translation by A.D. Godley, The Loeb Classical Library, 1921.

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