

## From Esagil-kīn-apli to Hippocrates<sup>1</sup>

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The readers of this journal will know that the Esagil-kīn-apli of my title was a Borsippian physician of the 12<sup>th</sup> century B.C.E who redacted the Assyro-Babylonian diagnostic-prognostic handbook that was to form the basis of Mesopotamian medicine for the next 700 years. For those who do not know, however, the Hippocrates of my title was an Ionian Greek physician of the 5th century B.C.E who produced a series of treatises which were to form the basis of Western medicine for the next 2,300 years. The question which we shall be examining in the discussion which follows is whether or to what extent the medicine of ancient Mesopotamia and of Persian and Hellenistic Babylonia influenced Hippocrates and his followers.

On the surface of it, the argument for influence seems plausible. Contacts between Greece and Western Asia were particularly strong in the Archaic Period,<sup>2</sup> by which time Esagil-kīn-apli's Diagnostic and Prognostic Handbook had been in existence already for several centuries. It is also now generally accepted that Greek religion and mythology in general and the work of Hesiod in particular bear the stamp of Near Eastern (Hurrian) influence, even if the exact nature and depth of that influence remains controversial.<sup>3</sup> By the latter part of the Neo-Assyrian period (7th-6th centuries B.C.E.), from which stem the majority of known therapeutic texts, the Ionian colonies of Asia Minor were already well established. The annals of Sargon II boast of the payment of tribute to that Assyrian king by the "Yaunaia", as the Assyrians called the Ionians,<sup>4</sup> and the historian Abydenos is reported by Eusebius to have left an account of a sea battle fought between Ionians and Sargon's son and successor, Sennacherib, off the Cilician coast.<sup>5</sup> The arrival of the Persians, whose empire stretched from Ionia to the Indus will only have accelerated cultural contacts,<sup>6</sup> which reached their apogee under the successors of Alexander. It is from these latter periods (Persian and Seleucid) that date the famous "Chaldean" astronomers who are supposed to have introduced the

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<sup>2</sup> See, for example, Ekrem Akurgal, *The Art of Greece: Its Origins in the Mediterranean and the Near East* (New York: Crown, 1966).

<sup>3</sup> See Walter Burkert, *The Orientalizing Revolution* (Cambridge, Mass., 1992); Peter Walcot, *Hesiod and the Near East* (Wales University Press: Cardiff, 1966); Martin L. West, "The Rise of the Greek Epic," *JHS* (1988)151-172; id. *Ancient Near Eastern Myths in Classical Greek Religious Thought*, in *Civilizations of the Ancient Near East*, ed. Jack Sasson (New York: Scribners, 1995), pp. 32-42 (w. bibliography); id., *The East Face of Helicon: West Asiatic Elements in Early Greek Poetry and Myth* (Oxford, 1997).

<sup>4</sup> Wolfgang Röllig, "Ionier," *Reallexikon der Assyriologie* 5 (1976) 150. For references, see Simo Parpola, *Neo-Assyrian Toponyms* (Neukirchen-Vluyn: Neukirchener Verlag, 1970), pp. 186-187.

<sup>5</sup> See Felix Jacoby, *Die Fragmente der Griechischen Historiker* (Leiden: Brill, 1958) 685.5 (6).

<sup>6</sup> On this subject, see especially two books by John Boardman: *The Diffusion of Classical Art in Antiquity* (Princeton: Princeton University Press, 1994) and *Persia and the West* (London: Thames & Hudson, 2000).

horoscope<sup>7</sup> (and the zodiac) to the Western World. Dating from sometime in this late period (exactly when has yet to be completely agreed upon) are a series of Akkadian texts which have been transcribed into Greek characters with the apparent aim of making them easier for Greek students to read, as we do when we transcribe Akkadian texts into Latin characters today.<sup>8</sup> There was thus plentiful opportunity for the transmission of medical knowledge from the Near East to Greece over the course of a quite lengthy period of contact and under circumstances where borrowings in other areas, such as art, religion, and astronomy<sup>9</sup> are generally accepted to have taken place. Opportunity is not, of course, quite the same as destiny, and it remains to be established just what, if anything, was in fact borrowed and if so by whom.

What we possess of ancient Greek medicine is only a fraction of the original. Indeed considering the benign neglect of the Romans which is the real cause for the demise of the library of Alexandria, selective preservation by early Christian fathers on theological rather than scientific grounds, the shift from majuscule to minuscule and the burning of monastic libraries by Northmen in the 9th and 10th centuries C.E., it is a miracle that any Classical learning survived in Western Europe into the Middle Ages. Nonetheless, there still exist a surprising number of treatises attributed to Hippocrates or his school. Of these, many are generally agreed to be extraneous manuscripts which somehow found their way into the collection sometime between the death of Hippocrates and the career of the 2nd century veterinarian, lecturer, and commentator, Galen. Even among those treatises considered genuinely to date from the 5th or at least the 4th century B.C.E, moreover, it is not entirely clear (or at least there is to date no complete consensus as to) which are to be attributed to the master or his pupils and which actually reflect the views of rival schools of medicine.

It is conventional to regard Hippocrates as the "father of medicine" by which is meant not simply knowledge of healing herbs, which everyone knows to have existed since the dawn of time, but of scientific medicine, that is, a system predicated on "rational" as opposed to "magical" thought. Pre-Hippocratic schools of medicine such as the Sacred Disease Specialists, it is further argued, were still on this system of "magical" thought, and might therefore plausibly be supposed to have borrowed from Mesopotamia,<sup>10</sup> but the alleged rejection by Hippocrates of "magic" in favor of

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<sup>7</sup> According to Vetruius, there was a school on Kos founded by Berossos, a "Chaldean" astronomer who is supposed to have invented an instrument for making astronomical calculations, and who also is supposed to have introduced the horoscope into the Greek world. See Amélie Kuhrt, "Berossus' Babyloniaka and Seleucid Rule in Babylonia", *Hellenism in the East*, ed. A. Kuhrt and Susan Sherwin-White (Berkeley: University of California Press, 1987), pp. 37, 39.

<sup>8</sup> Mark J. Geller, "The Last Wedge," *Zeitschrift für Assyriologie* 87 (1997):43-95.

<sup>9</sup> See Otto Neugebauer, *The Exact Sciences in Antiquity* (New York: Dover, 1969). For more details on cultural exchanges between Babylonians and Greeks in astronomy and astrology, see W. Röllig, "Griechen" in *Reallexikon der Assyriologie* III/9 (Berlin: Walter de Gruyter, 1971), p. 647.

<sup>10</sup> See, for example, Marten Stol, *Epilepsy in Babylonia* (Groningen: Styx, 1993). Mark Geller, "West meets East: Early Greek and Babylonian Diagnosis," *Archiv für Orientforschung* 48/49 (2001 / 2002): 50-75 believes "Babylonian" medicine to "represent a more archaic form of medicine which had not developed in the way later Greek medicine had done" and therefore to belong to the medical practices of those whom

"science" will have excluded any possibility of even indirect borrowing by the master and his students from eastern and Semitic parts of the Near East such as Assyria and Babylonia.<sup>11</sup>

This approach is most charitably to be described as self congratulatory;<sup>12</sup> what is worse, it threatens, as we shall soon see, to render impossible any true understanding of Hippocrates. There is no time in a brief article to untangle one of the great mysteries of the history of medicine. What I propose to do instead is to make a fresh start armed with a detailed knowledge of Assyrian and Babylonian medicine, a new perspective on the issue of "magic", "religion" and "science", and some fairly basic text criticism applied to one key Hippocratic treatise, namely *Tradition in Medicine*.

Was There any Borrowing from Mesopotamia?

The Sacred Disease specialists (*The Sacred Disease 4*) allegedly attributed the different noises made by patients having seizures to the influences of different gods. For example, if he neighed like a horse, he had offended Poseidon. Treatment consisted of a special diet involving the avoidance of foods tabooed by the afflicting gods<sup>13</sup> accompanied by a series of purificatory rituals involving transfer rites (*The Sacred Disease 2-4*). If you did not know how Mesopotamians dealt

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Hippocrates and Diocles of Carystus refer to as "the ancients" (pp. 53, 62). Since the last stages of Babylonian medicine were contemporary with Hippocratic medicine, as Geller himself has shown, it is hard to imagine why Hippocratic physicians would have referred to them as "the ancients" In fact, we know that Babylonian science (e.g. astronomy) was referred to by Greek contemporaries of Hippocratic physicians as "Chaldean". "The ancients", were the Greeks' own ancestors, in this case, pre-Hippocratic schools of medicine of whom Hippocrates was not nearly so critical as Geller believes (see below). Geller further attempts to identify Babylonian borrowings on the basis of what of Hippocratic medicine he perceives to be insufficiently individualistic (pp. 51-52), "inadequate and unsophisticated" (p. 53) "muddled and confused" (p. 54) or lacking "a proper understanding" of medicine (p. 53) not to mention "passé and incorrect" (p. 54). His examples are, however, ill chosen to demonstrate these alleged inadequacies. Geller praises Hippocratic physicians for preferring bleeding and purging to herbal medicine (p. 55) and ridicules them for including in a description of ileus references to symptoms produced in parts of the body other than the anus (p. 62), for associating tetanus with wounds and jaundice with alcoholism (p. 59), for observing the patient's symptoms and basing their prognoses on those observations (pp. 64-67, 70) and for testing for coma (p. 67).

<sup>11</sup> The contempt in which Greeks allegedly held Babylonian medicine is usually cited on the basis of the oft-quoted tale of Herodotus to the effect that Babylonians had no doctors but simply put the sick man in the market place to receive advice from passers-by (*Histories I 197*). Herodotus should, however, sue. It was his interest--almost a passion--as an "oriental" himself (from Halicarnassus, modern Bodrum) to shake mainland Greeks out of their ethnocentrism. His point in telling this tale was to make gentle fun of Greek culture, or at least to challenge Greeks to consider whether their customs were indeed the best. For other similar examples, see the tale about the Persians debating whether to have a democracy, oligarchy, or monarchy or their alleged sour comments on phalanx warfare and the Greek agora or the tale of Indians who allegedly ate their dead being horrified about the Greek practice of cremation. In this case, the issue was whether the patient waiting to see a Greek doctor would actually be better off if he were simply placed in the market place where he could have the benefit of everybody's helpful suggestions. Depending on your point of view, this could be taken either as a sour appraisal of the level of incompetence of Greek physicians or a wry comment on the "everybody thinks he's an expert" syndrome.

<sup>12</sup> For a brief bibliography of some of the seminal works of this school, which seeks to celebrate the alleged arrival (usually as an exclusively Western phenomenon) of rational thought with the Greeks, see Wim van Binsbergen and Frans Wiggermann, "Magic in History: A Theoretical Perspective, and its Application to Ancient Mesopotamia" in *Mesopotamian Magic: Textual Historical and Interpretative Perspectives*, ed. Tsvi Abusch and Karel van der Toorn, Ancient Magic and Divination 1 (Groningen: Styx, 1999), pp. 6 n. 4, 12 n. 19.

<sup>13</sup> For a list, see Owsei Temkin, *The Falling Sickness: A History of Epilepsy from the Greeks to the Beginnings of Modern Neurology* (Baltimore: Johns Hopkins, 1945, 1971), p. 11.

with seizure disorders, it would be hard not to assume that this pre-Hippocratic system was borrowed lock, stock and barrel from Babylonia.<sup>14</sup>

In fact, apart from similarities in the basic approach, nothing could be more dissimilar to the Mesopotamian system for dealing with seizure disorders. It is quite ironic that seizures of unknown etiology (or what we call epilepsy) were not generally attributed by the *āšīpu* (ancient Mesopotamian physician) to a supernatural cause. "Hands" of gods, ghosts, and demons certainly appear in the diagnosis of neurological conditions but these conditions typically describe phases of seizure activity to which we also give separate names or conditions which produce seizures but which are not epilepsy. The noises made by patients having seizures were noted, but distinctions between one god and another as causal agent are never made on that basis. If there was any specific set of signs which was helpful in determining attribution of seizure disorders to one or another divinity, it was those relating to the eyes, whose movements (or lack of movement) were very carefully observed by the *āšīpu*. For example, inability to raise the eyes marked Šamaš's post ictal state in contrast to the spectacular eye movements of cerebral malaria (caused by Lugalgirra and Meslamtaea), and the cataplectic's "wide open" eyes were a sign of the *gallû* demon.<sup>15</sup>

Of this Mesopotamian system there is no trace either in what we know of the sacred disease specialists or among proponents of humoral theory (quoted favorably by Hippocratic physicians in the treatise on *The Sacred Disease* 6-20). Hippocratic physicians recognized a single category of epilepsy with a single cause, namely an accumulation of phlegm in the brain aggravated by unfavorable atmospheric conditions, as when the wind blew from the South (*The Sacred Disease* 16). They also thought that what the *āšīpu* recognized as "blood vessels" (*pursīt dāmē*) was primarily designed to circulate air within the body (*The Sacred Disease* 7, 10, 13, 16).

If the system of diagnosis practiced by the Sacred Disease specialists was not particularly Mesopotamian, their curative regimen was even less so. Among Mesopotamian treatments for seizure disorders there are very few in which diet plays a role, the major exception being one treatment for a condition which sometimes presented with seizures, namely *ašû*, a Mesopotamian syndrome which included diseases like measles and chickenpox. In addition to a medicine which was produced by a primitive form of distillation, fatty meat was boiled and the patient was made to consume both the broth and the meat.<sup>16</sup>

A special diet this is, but not the one which inspired the Sacred Disease specialists. With the exception of a fat person trying to lose weight (*A Regimen for Health* 4), a diet containing large amounts of fat was never recommended by Ionian Greek physicians. Instead, the typical Ionian

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<sup>14</sup> So Geller, *AFO* 48/49:54-55.

<sup>15</sup> See JoAnn Scurlock and Burton Andersen, *Assyrian and Babylonian Medicine: Diagnostics and Prognostics* (Champaign: University of Illinois Press, forthcoming), Chapter 13.

<sup>16</sup> BAM 494 ii 16-18//BAM 498 iv 2-6.

Greek diet involved the avoidance of specific foods (as, for example, goat meat)<sup>17</sup> and/or the institution of a specific dietary regimen (*Regimen in Acute Diseases; A Regimen for Health*). This supposedly curative regimen was what we call a starvation diet, consisting of a thin gruel the proper dilution of which was the subject of a number of treatises and which Hippocratic physicians accompanied with purging, sometimes with fatal results.<sup>18</sup>

If, then, even the Sacred Disease specialists did not borrow from Mesopotamia, one might suppose that Hippocratic physicians would have received nothing from that source. Nonetheless, there is a surprising amount of what must be borrowings in those treatises in the Hippocratic corpus which describe infectious diseases: identical systems of classification which can hardly be credited to independent invention, striking descriptions of symptoms which look to be direct translations, and confusions which can only have resulted from misunderstandings of original Mesopotamian material. As might have been expected, Mesopotamian diagnostic categories<sup>19</sup> which look to us like "natural" causes seem generally to have been taken over whole by Ionian Greek physicians. For example, the latter's *kausos* (a fever category which includes malaria and typhoid) is readily recognizable as what the *āšīpu* referred to as *li'bu* (a syndrome which grouped fevers which fell into a particular fever pattern and in which both malaria and typhoid are included). Other examples include *helkos*: "wound, sore" which is probably a translation of Akkadian *simmu* and *eruspelas* which is probably a translation of Akkadian *samānu*.<sup>20</sup> Some curious mistakes also crept in as a result of.

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<sup>17</sup> The mention of goat meat would suggest to a Mesopotamian the suspected involvement of a ghost. However, although ghosts do cause seizures, the avoidance of goat meat is mentioned by the Mesopotamians in connection with headache rather than seizures and exclusively in hemerologies (i.e. you did not eat goat meat on such and such a day and if you did you got a headache as a punishment by the offended ghost). For examples, see René Labat, *Hémérologies et Ménologies d'Assur* (Paris: Librairie d'Amérique et d'Orient, 1939), pp. 168/170: 22-23, 172:46-47; Peter Hulin, "A Hemerological Text from Nimrud," *Iraq* 21 (1959): 42-53 (ND 5545: 27).

<sup>18</sup> The reason that the Mesopotamian doctor ordered the diet high in fat was quite simply that it had been observed to be useful in controlling seizures (a finding which has recently been rediscovered).

<sup>19</sup> Geller, *AFO* 48/49:63 attempts to prove that Mesopotamians made only prognoses and were in any case in the habit of never listening to patients. He offers two pieces of evidence in favor of these assertions. The first is that the *āšīpu* was allegedly forbidden from diagnosing terminal cases. What the *āšīpu* was actually forbidden from doing was giving a favorable prognosis in terminal cases and attempting treatment on that basis, a "no treatment" rule shared also by Hippocratic physicians (see Plinio Prioreschi, "Did the Hippocratic Physician Treat Hopeless Cases?," *Gesnerus* 49 (1992):341-350). In the diagnostic and prognostic handbook, there are entries which are purely prognostic, entries which are purely diagnostic, and entries which give both diagnosis and prognosis. In this last category, terminal illnesses were as likely to receive a diagnosis as were those which were treatable. In a similar vein, the phrases which Geller claims as examples of patients to whom the *āšīpu* was "explaining symptoms which the patient himself does not recognize" (p. 63) are actually descriptions of patients who were either delirious or unconscious.

<sup>20</sup> For descriptions of the range of meaning of the Greek terms, see Mirko Grmek, *Diseases in the Ancient Greek World*, Mireille and Leonard Muellner, trans. (Baltimore: Johns Hopkins, 1989), pp. 125, 129 and for the Akkadian terms, see Scurlock and Andersen, *Diagnostics and Prognostics*, Chapter 3. Geller, *AFO* 48/49:59 n. 95 suggests a further equation of Greek *pachu* with Akkadian *kabātu*. The equation is, however, a false one. *Kabātu* does not mean "thick" but "heavy" or "difficult" and, when in hendiadys with another verb as in several of the examples quoted by Geller, it is properly translated: "it is difficult for him to do x or y". There is, in fact, an Akkadian equivalent to *pachu* but it is *kiširtu* which means, as one might expect, "thick sputum". (see below)

misunderstandings of Akkadian as, for example, the Greek notion (*Regimen in Acute Diseases* 17) that strokes (*mišittu* in Akkadian) were heralded by bruises (also potentially *mišittu* in Akkadian).

Contrary to what might have been expected, infectious diseases attributed by the *āšīpu* to what we would term "supernatural" causes were also taken over by the Ionian Greek physician. He could not, of course, call them after "hands" of gods; although many of the cases are readily recognizable from descriptions by Mesopotamian physicians made in those terms and were presumably taken over from that source. René Labat was able to fill several pages with his list of similarities in phraseology between Mesopotamian prognostics and the Hippocratic Treatises *On Prognosis*, *Prorrhetic* I and *Koan Prognoses* alone.<sup>21</sup> Particularly striking are passages in Hippocratic texts in which reference is made to the patient bleeding from the right nostril (*Epidemics* I 7), an observation perfectly natural to Mesopotamian medicine with its insistence on what are often trivial right / left distinctions. Note also the Hippocratic comparison of urine containing discharge to that of a donkey<sup>22</sup> and the statement that the patient's body feels cold on the outside and hot on the inside,<sup>23</sup> both almost verbatim translations of earlier Akkadian expressions describing the same symptoms.

By comparison, very little Mesopotamian influence is discernible among Hippocratic treatments. Even here, however, there is one procedure (*Diseases* II 61) which appears to have descended from a known Mesopotamian treatment for draining the lungs (BAM 39: 2'-9'//AMT 49/4 r. 1-9).<sup>24</sup> Unlike most of its Hippocratic companions, it is medically correct and is still practiced today. Although the involvement of drainage was sufficient to save it for Hippocratic physicians, the lack of full integration into the humoral system ensured that this procedure was one of those Hippocratic treatments which fell out of use in the Roman period and was not revived until the 19th century C.E.

In short, evidence for borrowing is in fact plentiful, but usually not in the places where current theory would predict it to occur. Current theory would have predicted borrowing from Assyrian and Babylonian medicine if at all only among Sacred Disease specialists and not among Hippocratic physicians whereas, as we have seen, it is the latter rather than the former who seem to have done the borrowing, even among diseases attributed by the Mesopotamians to "supernatural" causes. Since current theory on the potential reaction of Ionian Greek philosophers is predicated on post 17th century C.E. definitions of "magic", "religion" and "science", the applicability of these modern definitions to a pre-modern world is seriously called into question.

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<sup>21</sup> See René Labat, *Traité Akkadien de Diagnostics et Pronostics Médicaux* (Paris: Academie Internationale d'Histoire des Sciences, 1951), pp. XXXV-XLV.

<sup>22</sup> See Grmek, *Diseases in the Ancient Greek World*, p. 147.

<sup>23</sup> See Grmek, *Diseases in the Ancient Greek World*, p. 290).

<sup>24</sup> R. Labat argued that this text described the daining of a liver abscess; however, it is now clear that the lungs are the organ involved. See Scurlock and Andersen, *Diagnostics and Prognostics*, Chapter 3.

## Magic, Religion and Science Before Hippocrates

If by "science" you mean the gathering of information, the generation and testing of paradigms, the practical application of mathematics, astronomy, and medical knowledge to practical problems such as how many man hours are needed to dig a moat, predicting lunar eclipses, and treating patients, then science was actually the invention of ancient Mesopotamia. When a person became ill in 7th century Nineveh, he had many of the same options we have today. He might throw himself on the mercy of the gods, he could repair directly to the pharmacist (the *asû*) or he could first call in a physician (*āšīpu*) to diagnose his problem.<sup>25</sup> What strikes us as odd was that the *āšīpu* was also the source of choice for charms to improve business or to prevent household quarrels, etc. Neither was this *āšīpu* an anti-establishment figure; his office was in a temple.<sup>26</sup>

By the system current in the ancient Near East including the lands of the Bible, interaction between mankind and spirits was readily divisible into two unequal parts. Of these one part (*šangūtu*) was god-centered. The focus was what a particular god might want or need or what would keep him happy and well-disposed towards the community as a group. This might include maximally a house, a statue which was washed and dressed, a wife living in the same temple with whom periodic honeymoons could be arranged, family and friends in temples in neighboring cities to whom visits could be paid, twice daily meals, and periodic festivals and processions. The other part by contrast (*āšīpūtu*) was man-centered. Its focus was on the needs of individual members of the human community, particularly healing from illness, and involved a series of bargains with gods and other spirits. It was also the job of the *āšīpu* to perform occasional purification rites carried out in connection with festivals and the initiation of statues. Between *šangūtu* and *āšīpūtu* there was no source of conflict. On the contrary, the fact that there were priests to keep gods happy and well fed served to provide a mailing address for important members of the pantheon and to keep them as it were on tap for the private needs of the human community. Thus, *šangūtu* made *āšīpūtu* possible and *āšīpūtu* made *šangūtu* necessary.

### The Hellenistic Revolution

What Mesopotamian science lacked, then, was its own unique point of view separate from that of religion and magic and in potential binary opposition to both. This science gained in the 5th century B.C.E. as an indirect result of contact between Ionian philosopher / scientists and practitioners of the new religion (Mazdaism) introduced by the Persians. For Mazdeans, only Ahura Mazda was, properly speaking, a god and he was a transcendent divinity in no need of food or clothing, let alone a statue. He was also a principle of light who could not possibly be held

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<sup>25</sup> See J. Scurlock, "Physician, Conjurer, Magician: A Tale of Two Healing Professionals" in *Mesopotamian Magic: Textual Historical and Interpretative Perspectives*, ed. Tsvi Abusch and Karel van der Toorn, *Ancient Magic and Divination 1* (Groningen: Styx, 1999): 69-79. Geller, *AfO* 48/49 (2001 / 2002): 57 argues that *miqtu* is a severe disease on the grounds that it was to be left to the *asû* to treat. In fact, *miqtu* was a bruise whose lack of severity is precisely shown by the fact that it was left to the pharmacist (*asû*) to deal with.

<sup>26</sup> See previous note.

accountable for diseases. With the advent of this new idea of divinity, the old gods were inevitably reduced to the status of divine beings of whom even the good ones were, theoretically at least, little more than the personified spiritual powers of Ahura Mazda. Ionian philosopher scientists clearly found these new ideas intriguing. Some became astrologers, understanding the old gods of Greek mythology as depersonalized planetary forces of nature whose various conjunctions caused illness.

Even those who continued to believe in the old gods, however, found their understanding of the nature of those gods transformed. The old god-centered religious practices came increasingly to seem unnecessary, superstitious, even sacrilegious. By way of replacement, what naturally suggested itself was to divide up the man-centered part of the old religion in two along natural fault lines.

For the Mesopotamian system of dealing with spirits was no democracy. On the one hand, there were the upper order spirits (the gods) and on the other the lower order spirits. These lower order spirits were rarely if ever given the "god" determinative; they tended to be unindividualized and without character or distinctive personality. Gods were entitled to reverence, to sacrifice, and to respectful address in prayer. Lower order spirits, by contrast, were often mistreated and ordered about. Gods were by nature somewhat like foreigners; they lived far away and they spoke their own language and were for that reason somewhat dense and difficult to deal with. Lower order spirits were the same only more so; they were both more foreign and more dense than upper order spirits.

As a sort of foreigner, any god was liable to be addressed in what the speaker thought was the god's own language, usually in fact an archaic language or a by-now incomprehensible version of a foreign language ("Subarean",<sup>27</sup> barely comprehensible Sumerian and "nonsense" syllables). He also needed to have any really important instructions acted out in sign language. This sign language was not unsophisticated, frequently making use of explanatory analogies which Mesopotamians sometimes spelled out in the accompanying verbal parts of the ritual (viz. "just as a stillborn child will never suck its mother's milk, so may you demon depart, never to return"). The likelihood of a spirit being treated in this way, however, increased dramatically the further down he ranked on the social scale of spirits. In other words, the great gods of the pantheon were the least likely and the amorphous spiritual essence of, say a piece of bread, the most likely to receive such treatment, with a whole sliding scale of probabilities for the ghosts, demons and lesser divinities in the middle.

That part of the traditional man-centered religion that involved practices typical of the way one dealt with upper order spirits (sacrifices and respectful prayers) was absorbed by Greco-Egyptian theurgy (practices designed to discover knowledge and to achieve a personal relationship with god). According to the theurgist Iamblichus, the gods of theurgy could not be bargained with and did not respond to threats. Due to the fact that early Christianity grew up in Egypt in the Greek

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<sup>27</sup> This is actually probably Hurrian; see Doris Prechel & Thomas Richter, "Abrakadabra oder Althurritisch, Betrachtungen zu einigen altbabylonischen Beschwörungstexten" in *Kulturgeschichten: Altorientalische Studien für Volkert Haas*, ed. Thomas Richter et al. (Saarbrücken: Saarbrücker Verlag, 2001): 333-372.



intellectual center of Alexandria, theurgy in turn strongly influenced what we know of as "religion". What remained, then, of the man-centered part of the old religion were those practices typical of the way one dealt with lower order spirits (abracadabra and sign language involving magical analogies, mistreatment, threats and forced oaths). These practices were understood by theurgists such as Iamblichus as motivated by the desire for base practical ends such as forcing love and defined as "magic".

This demonic "magic" stood in sharp contrast to a new "science" predicated on the attribution of diseases exclusively to "natural" causes. This new "scientific" medicine was not the invention of Hippocrates, whose actual role in its development will be explored presently. More to the point, the contrast between the old "magic" and the new "science" in the Persian and Seleucid periods was in no way the same as the contrast between the "magic" of Bruno and the mechanistic "science" of Descartes as is generally assumed. Contrary to popular opinion, Hellenistic philosopher/scientists such as Plotinus had no quarrel with the notion that the cosmos was animated.<sup>28</sup> What they did deny was any continuum between upper order and lower order spirits. For them, upper order spirits (gods and demons) were "divine" or what we would call "super"-natural, that is they were above and beyond and somewhat apart from the natural world. Lower order spirits, by contrast, were an intrinsic part of the natural world. Ionian Greek philosopher/scientists thus drew a line between supernatural and natural causes for disease along the same lines as those proposed by the theurgists to divide theurgy from magic. With the theurgists, they recognized the upper order spirits as divine beings (albeit differing about whether theurgy was an effective means of establishing a relationship with them), and the lower order spirits allegedly used to practice demonic magic were identical with the "natural" causes of science.

As lower order spirits, the magicians' minions could theoretically be bossed around, but many Hellenistic philosopher / scientists were not sure that lower order spirits could actually hear what was being said to them. They were, however, intrigued by the sign language which was used by demonic magicians to communicate with the spirits called upon to perform their magic. The symbolic language used by the ancients to communicate with gods was closely related to the language of omens which, it was believed, gods used to communicate with men. For some Hellenistic philosophers (astrological fatalists), this language of omens was not a language at all but a cosmic conjunction which actually caused the portended event. Other Hellenistic philosophers refused to see the gods as bound by fate; where all could agree, however, was that lower order spirits were an intrinsic part of nature and hence bound to automatic, unquestioning, obedience to natural laws. It followed logically that the sign language used to communicate with these lower order spirits was not a language at all but a process which actually caused the desired outcome. For

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<sup>28</sup> If the mechanistic concept of dead matter were truly essential to science, then Hippocrates was no scientist. But then by that measure, fairly applied, Sir Isaac Newton was also a magician and the modern age has no science either, our world view being predicated as it is on "occult properties" of matter such as gravity and electricity, and the existence of life.

example, one of the things which made demonic magic effective (for those Hellenistic philosopher/scientists who were prepared to think that it worked at all) was the sounds made by the magician in reciting his spells. These were supposed to act as a sort of tuning fork which set off vibrations in the cosmos and affected the music of the spheres. In short, spells involving lower order spirits worked because the practitioner somehow unwittingly tapped into what Hellenistic philosopher / scientists called cosmic sympathies.<sup>29</sup>

Hellenistic philosopher / scientists in the know attempted to tap into these sympathies directly to suggest new treatments (or preserve already available ones). Since they believed the natural world to be made up of four elements, four principles of cosmic conjunction could minimally be postulated: hot, dry, wet, and cold (corresponding nicely to the four humors). Also theoretically available for use were other intrinsic properties of matter such as color, smell, and texture. It was such considerations which led Aristotle to assert that menstruating women stain mirrors red<sup>30</sup> and the gynecologist Aetios of Amidi to recommend slippery egg whites in nostrums designed to induce labor.<sup>31</sup> It was also this principle which forbade cheese to anyone in danger of developing pus.<sup>32</sup>

Modern western observers generally recognize this sort of thing as "magic", and Hippocrates himself only escapes censure because he was a minimalist who believed in a one size fits all generic treatment for illness designed to let nature take its course. Nonetheless, even for Hippocratic physicians, "natural" causes were still dealt with as spirits, by exorcism (bleeding, purging, blistering, and starving them out of patients) or by natural magic (manipulation of cosmic sympathies--as for example putting sweet smelling substances to a woman's nose to persuade her prolapsed uterus to crawl back into its place--*Places in Man* 47).

In short, the philosophy behind this method of treatment is identical with that of those 16th and 17th century (C.E.) self-declared magicians who inspired Frazer's definition of "magic" as a false science. Put in another way, what looks to post-Enlightenment observers like a "magic" vs. "science" issue would more accurately be described as the first salvo of another, less well known, debate involving some of the great thinkers of the Western world, which began in the Middle Ages with the revival of classical learning, received a new impetus in Renaissance Europe, and reached its culmination in the 17th century. This is the debate between learned magicians on the one hand and theologians on the other as to whether there was any such thing as "natural" magic or whether all magic required the consent and cooperation of demons, in short, a debate not between "magic" and "science" but between two different forms of magic, "demonic" and "natural". This being the case, that the actual reaction of Ionian philosopher / scientists to Assyrian and Babylonian medicine was

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<sup>29</sup> Note in particular the comments of the Neo-Platonist Plotinus Enneads 4.4.40-44 (a good English translation is available in Georg Luck, *Arcana Mundi* [Baltimore: Johns Hopkins, 1985], pp.118-121).

<sup>30</sup> *On Dreams* 459b-460a.

<sup>31</sup> *Tetrabiblon* XVI.15

<sup>32</sup> Guido Majno, *The Healing Hand: Man and Wound in the Ancient World* (Cambridge: Harvard University Press, 1975), pp. 142, 162.

not outright rejection but instead cautious acceptance of elements compatible with Ionian Greek systems of thought should come as no surprise. Neither should it come as a shock that the Hippocratic reaction to non-Hippocratic schools of medicine was similarly moderate.

#### The Hippocratic Corpus Unraveled: Diet People and Humor People

It has long been clear that even that portion of the Hippocratic corpus which appears to be 5th or 4th century in date seems to contain a great deal of rather diverse material, raising the interesting question of what made anyone regard this motley collection as a corpus in the first place or, to put it another way, if all these treatises were indeed collected by Hippocratic physicians, to what end? Particularly puzzling is the treatise *Tradition in Medicine* which on first reading appears to shift philosophical gears literally in mid argument. This most puzzling inclusion, however, provides the key to solving the mystery once it is realized that what it actually consists of is a non-Hippocratic text with corrective Hippocratic commentary (*Tradition in Medicine* 1-15, 20 = Text; Commentary = *Tradition in Medicine* 16-19, 21-24).

The text, freed from its appended commentary, proves to be a polemic directed by one non-Hippocratic school against another, the gist of whose arguments seems to have pleased the Hippocratic commentator. The author of the polemic would appear, from internal evidence, to represent a school or schools of Ionian Greek philosopher / scientists whom I call the diet people because their treatments consisted largely of modifications in the patient's diet. Other members of this school or schools are probably the Sacred Disease specialists whom we have already encountered (*The Sacred Disease* 2, 4) who attempted to use special diets to treat seizure disorders. Another treatise, *Prorrhetic* II, may also belong in this category to judge from the fact that the "Sacred Disease" manages to be twice mentioned in it without the characteristic Hippocratic "natural" causes caveat (*Prorrhetic* II 5, 9). In addition to worrying about what people did or did not eat and when they ate it, the diet people attributed diseases to external and, in some cases supernatural, causes and claimed to represent empiricism and tradition in medicine (*Tradition in Medicine* 1-2, 14).<sup>33</sup>

The opposing school who were the butt of the diet people's critique were, again on the basis of internal evidence, those whom I call the humor people because they were the original authors of the theory of the humors and of the regimen of bleeding and purging used to rebalance them. In this category probably belongs the pre-Socratic philosopher Alcmaeon of Croton.<sup>34</sup> Humor people either attributed diseases to disturbances in one particular humor (which was also the primordial substance from which all matter was allegedly formed) or they favored the presence of just two, just three, or

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<sup>33</sup> Originally, the term "disease" (nousos) referred to something with a divine etiology, and this terminology is retained in Hippocrates, who applies the term "disease" (nosema) to infected wounds which, in ancient Mesopotamia as in ancient Greece, were attributed to divine agents. See Grmek, *Diseases in the Ancient Greek World*, pp. 35, 125.

<sup>34</sup> See Grmek, *Diseases in the Ancient Greek World*, p. 40.

all four humors.<sup>35</sup> Humor people seem also to have been fascinated with the number seven. Their treatises probably include *Treatise of Seven, Breaths, and Fleshes*. In addition, they attributed diseases to natural causes and, according to the diet people, represented a theory-first approach and modernism (*Tradition in Medicine* 13, 15).

Once it is realized that non-Hippocratic treatises were collected by Hippocratic physicians, not merely with a view to refutation, but also with the intention of correcting them and incorporating them within the Hippocratic tradition, all suddenly becomes clear. It should long have been appreciated that Hippocrates will have been chosen for canonization by redactors like Galen because his school represented that synthesis so favored by Hellenistic philosophers, the irrefutable Aristotelian golden mean between the extremes represented, according to Hippocratic physicians, by non-Hippocratic schools of medicine.

If one wished to search for truth in medicine or any other discipline it stood to reason that the best approach was to find the extremes and then to chart a path down the middle. What actually happened of course was that contact with the Persians produced a host of angry young men eager to change the world (the humor people) who, in turn, produced a rally in favor of something which was also actually new but which presented itself as defending hoary tradition (the diet people). These quarreling philosophies collectively formed the thesis and antithesis which other schools were then free to combine, each into its own peculiar synthesis.

Thesis and antithesis tend to form along natural fault lines. Modern science is characteristically Baconian, that is, its theories are meant to be derived from facts by inductive reasoning but, more importantly, modern science, like ancient Mesopotamian science, is fact driven. Theories are tested against the facts and theories which fail to fit the facts are, in principle, rejected. Some modern philosophers take an exactly opposite, Cartesian approach. The theories of these philosophers are meant to be derived by deductive reasoning from general principles and, more importantly, this philosophy, like that of the ancient Greeks which inspired it, is theory driven. Where facts are relevant at all, it is to provide corroborative support for the theory; masters of this technique use theory to define, even to create them. It is, then, hardly surprising that Ionian philosopher / scientists should have split along precisely these lines.

The Hippocratic golden mean between the extremes of internal or natural causes and theory-first philosophizing on the one hand and external or supernatural causes and fact-driven science on the other lay in combining the two in such a way as to avoid the extremes of either position. The natural causes of the humor people were favored over the supernatural causes of the diet people, but with great care taken not to show any disrespect to the gods in the process. For Hippocratic physicians, ancient Greek gods could thus no more be causes for disease than Ahura Mazda (*The Sacred Disease* 1; *Airs, Waters, Places* 22). It followed that the attribution to these gods of disease

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<sup>35</sup> For a helpful chart, see Majno, *Healing Hand*, p. 179.

by the Sacred Disease specialists was not merely fraudulent but "impious" as well (*The Sacred Disease* 4).

Having taken one from column A, it was necessary to balance this out by a choice from column B. An attempt was thus made to divorce the humor peoples' natural causes from egg-headed theorizing and to recombine them with an approach which was not exactly scientific but which tried to veer as much as possible in that direction. This is how some of the humor people's and some of the diet people's treatises including *Tradition in Medicine* (albeit with corrective Hippocratic commentary) came to be in the Hippocratic collection.

#### The Hippocratic Corpus Unraveled: The Borrowers

Nor were the diet people and the humor people the only non-Hippocratic schools whose treatises found their way into the Hippocratic corpus. Others include the school of Knidos and the pre-Hippocratic school of Kos whose libraries Hippocrates is supposed to have burned so as to have a monopoly of knowledge.<sup>36</sup> The whole question of what to label as Knidian is a vexed one.<sup>37</sup> However, certain patterns of attribution have emerged. Considered to be Knidian are those treatises which display a style of presentation matching that of a lost work, known only from a few quotes in Galen, called the *Knidian Sentences*.<sup>38</sup> Also known from Galen is a description of a system of classification of diseases<sup>39</sup> characterized by the subdivision of named syndromes into so many types of this or that disease (e.g. three tetanus's).<sup>40</sup>

The *Knidian Sentences* were formatted with a description of symptoms followed by therapy, ending with a short prognostic, exactly like Mesopotamian therapeutic texts.<sup>41</sup> Moreover, the Knidian system of classification is very similar to the Mesopotamian practice of grouping syndromes into overarching diagnostic categories attributed to a single causal agent, such as sorcery, curse and "hand" of ghost, or given a single name, such as *bu'sānu*, an ancient Mesopotamian diagnostic

<sup>36</sup> Loeb editions, vol. I, p. xxix.

<sup>37</sup> For two recent discussions, see Jacques Jouanna, *Hippocrate: Pour une archéologie de l'école de Cnide* (Paris: Société d'Édition "Les Belles Lettres", 1974) and Herman Grensemann, *Knidische Medizin Teil 1* (Berlin: Walter de Gruyter, 1975).

<sup>38</sup> For example, the attribution of Diseases II to Knidos, denied by Geller, *AfO* 48/49: 65, is based on the striking similarity between a passage in this Hippocratic treatise and a section of the *Knidian Sentences* quoted by Galen (see Jouanna, *Cnide*, pp. 17-24).

<sup>39</sup> See Jouanna, *Cnide*, pp. 16-17. This is quoted in Geller (*AfO* 48/49: 58) but again denied as Knidian.

<sup>40</sup> Geller draws from a somewhat confusingly worded English translation of a German translation of the Hippocratic treatise *Regimen in Acute Diseases* 3 the conclusion that Knidian medicine was characterized by "a tendency to treat each set of symptoms as a separate disease" (*AfO* 48/49: 53), i.e. the exact opposite of the actual Knidian position as understood by Jouanna and Grensemann. Geller claims his alleged characteristic of Knidian medicine, namely that it never used the same disease name or the same symptom twice, for ancient Mesopotamia: "In each case when a disease is given, different symptoms are described, and in no case are the symptoms repeated for the same disease name." (pp. 53-54) and "they lacked any discernible system of disease classification" (p. 73). When, however, he discusses Galen, he claims the described system for the classification of diseases also for ancient Mesopotamia (pp. 58-62), and ends by dunning Mesopotamians and their imitators for including in syndromes symptoms which "could equally be related to other ailments and could have been described in terms of another disease instead" (p. 62), in short for using the same symptom to describe more than one disease!

<sup>41</sup> See Jouanna, *Cnide*, p. 22; cf. Grensemann, *Knidische Medizin Teil 1*: 54. The relevance of this formatting for the question of ancient Mesopotamian origins is accepted by Geller (*AfO* 48/49: 64-67).

category which grouped together at least three separate syndromes all involving foul smell and grayish lesions in the mouth. It seems, then, likely that many if not most of the Mesopotamian elements to be found in the Hippocratic corpus reached Hippocratic physicians by way of schools such as that of Knidos, which is why I refer to these schools as the borrowers.

As for what these borrowers' treatises were doing in the Hippocratic collection, the obvious suggestion is that, as with the diet and humor people, the object was to cull material from them. Hippocratic physicians, by their own account (*Regimen in Acute Diseases* 1-3), based much of their own work on a lost treatise or, more probably, collection of treatises known as the *Opinions from Knidos*. They had positive things to say about this collection but wished to assert that they had made more than merely cosmetic changes since, as they claimed, the Knidians had completely missed the golden mean. *Regimen in Acute Diseases* 1 does not fault the *Opinions from Knidos* for not taking signs (as opposed to recording symptoms) but for not taking them frequently enough. Chapter 2 does not criticize the use of milk with purgatives but the use of milk exclusively with no other variation in the diet. Finally, Chapter 3 has no quarrel with dividing up diseases in the Knidian manner; the problem is that the Knidians did not do this properly and ended up with fewer diseases in each category than was right, according to Hippocratic physicians. If this criticism is to be taken seriously, then *Internal Affections* would appear to be the Hippocratic answer to the *Knidian Prorrhetic* I since the latter does indeed consistently group fewer syndromes under a single disease name than the former.

What is interesting about the borrowers' treatises found in the Hippocratic corpus is that three categories can be discerned. The first appear, to judge from the formatting and the complete absence of any trace of humoral theory, to be out and out copies, Mesopotamian material and all, which were simply added to the Hippocratic library as they were.<sup>42</sup> A second category is similar but has had a sort of humoral introduction appended, and the last contain what appears to be originally Mesopotamian material but completely modified to take humoral theory into account.<sup>43</sup> What this would seem to suggest is that Hippocratic physicians made a deliberate effort to collect borrowers' treatises (category 1), that they then thought out and appended what part of humoral theory they thought to be relevant (category 2) with the aim of eventually producing the Hippocratic synthesis

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<sup>42</sup> See next note.

<sup>43</sup> If any of the treatises which we have are the originals, they will be among those of the pure borrowers' type, e.g. *Prognosis, Dentition, Prorrhetic I, Ulcers, Fractures, Joints and Mochlicon* or those of pure borrowers' type with humoral introduction such as *Hemorrhoids and Fistulas*. Although of a piece with these, it is hard not to think that *Koan Prognoses* is from Kos and sentimentality if nothing else would demand attribution of *Aphorisms and Wounds to the Head* to Hippocrates himself but in the style of the borrowers. However, the only work which can be attributed with relative certainty to an author, and that a student of Hippocrates, is *On the Nature of Man* which is visibly (as opposed to invisibly) theoretical, as are *Airs, Waters and Places, Regimen in Acute Diseases, Regimen for Health* and *The Sacred Disease*. Perhaps, then we can think of this last group of treatises as belonging to a mature Hippocrates and the first generation of his immediate students. The collection of borrowers' treatises would have been assembled over the course of time with end product treatises like *Places in Man, Glands, Affections, Diseases* and *Internal Affections* which combine borrowers' data from Knidos and elsewhere with Hippocratic integrated humoral theory following in due course.

seen in treatises like *Places in Man* and *Internal Affections* (Category 3).<sup>44</sup> Most interesting (and probably ultimately the most useful) of these final products is a series in which various plant and animal substances are directed to the correct medical problem through the intermediation of humoral theory.<sup>45</sup>

#### Was This Progress?

Hippocratic borrowings were by no means slavish; Mesopotamian distilled wisdom had to be reconfirmed by modern Greek observation, which is why extensive case histories (*Epidemics*) had to be compiled. Eventually a natural causes explanation would have to be found for all Mesopotamian syndromes attributed to the "hand" of this or that god, ghost, or demon, but in the meantime new names needed to be assigned. This proved an easy matter since, as diseases originally described by Mesopotamian physicians were recognized or as apparently new diseases appeared, they could simply be called after the name of the patient in whom they were first observed (as in our Lou Gehrig's disease). In a number of early treatises preserved in the Hippocratic corpus, diseases are in fact referred to in this way (*Prorrhetic* I 17, 27, 34, 72, 82, 99, 104, 119, 123 and *Humors* 20).

To the resulting descriptions of diseases, Ionian Greeks added the fruits of their own researches, introducing the new material seamlessly into the text and in the same style. This makes it difficult to know what is new and what is original with the exception of a few additions recognizable by their highly theoretical content. For example, *Ulcers* contains what appear to be direct citations from the Mesopotamian series *Šammu šikinšu*. "Nature of Plants" (*Ulcers* 17) check by jowl with a surgical treatment of Greek invention designed to reshape wounds so that they will heal better (*Ulcers* 8, 10).<sup>46</sup> Similarly, *Fractures, Joints and Mochlicon* would appear to be nothing more than a bonesetter's manual if it were not for a highly original (and rather hair raising) treatment for dislocated shoulders, namely cauterization of the armpit (*Joints* 11).<sup>47</sup> Most striking of all is the small treatise entitled *On Wounds to the Head*, which describes trepanning and which is quoted in *Places in Man* 32. Apparently dull and practical, it is actually a revolutionary new approach which was unfortunately horribly painful and produced an open hole in the head inviting infection of the meninges to no good purpose.<sup>48</sup> As these examples indicate, the fruits of direct observations either

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<sup>44</sup> *Internal Affections* is conventionally identified as Knidian on the grounds that it uses the Knidian classification system which identifies groups of syndromes with the same name (viz so many physthises or so many tetanus's). For what it is worth, much of *Prorrhetic* I was copied into the pre-Hippocratic treatise known as Koan Prognoses. Since the latter advertises itself specifically as Koan, we are probably safe in assuming that the sources from which it borrowed were not from Kos. In any case, the fact that *Internal Affections* got its descriptions of diseases from a school of borrowers, whether from Knidos, Rhodes or even Ephesus, is not at issue. What is at issue is the fact that the treatise as we have it has been considerably modified, presumably by Hippocratic physicians, so as to incorporate humoral theory. Geller, *AfO* 48/49:59 asserts that "there is no evidence in *Internal Affections* of any theory of humors". However, he admits that the treatise attributes diseases to excess of things like bile, blood, phlegm and black bile. What he would consider evidence of the presence of humoral theory, if not this, he does not say.

<sup>45</sup> These include *In the Surgery, Regimen, and The Use of Liquids*.

<sup>46</sup> For the principle involved, see Majno, *Healing Hand*, pp. 153-156.

<sup>47</sup> For the principle involved, see *ibid.*, pp. 162-166.

<sup>48</sup> See *ibid.*, pp. 166-169.

borrowed from Mesopotamia or supplemented or reproduced by Ionian Greek physicians were often overridden by theoretical considerations with sometimes disastrous results, especially at the treatment end.

At the diagnosis and prognosis end, the most serious damage will have come in the form of lost knowledge. We may presume that diseases which were not common in Greece and of which Greek physicians had no personal experience will have been omitted for that reason.<sup>49</sup> Similarly unfortunate is the loss in Hippocratic and later Classical authors of the distinction made by the *āšīpu* between grand mal, absence, focal, simple partial, complex partial, sensory and gelastic seizures<sup>50</sup> all of which have the same, positive, prognosis and whose separation from one another must, therefore, have seemed to Ionian Greek physicians like so much irrelevant hair splitting.<sup>51</sup>

More culpably, Mesopotamian observations not in consonance with Ionian Greek theorizing did not always prevail in the final mix. For example, ancient Mesopotamian physicians were aware of contagion and knew that there were "diseases of intercourse". The failure of Classical authors to recognize either phenomenon has nothing to do with the alleged progress of knowledge since antiquity but is instead to be attributed to a Hippocratic doctrine which denied the possibility of human to human contact in the spread of disease.<sup>52</sup>

Theory-driven additions at the diagnosis and prognosis end were usually harmless, if sometimes bizarre, as, for example, the assertion that women are never ambidextrous (*Aphorisms* VII.43), a "fact" to the falsehood of which this author can personally attest. Even more curious is the fact that some of the theoretical override is actually of Mesopotamian origin, although not drawn from the medical corpus but from the astronomical omen series *Enūma Anu Enlil*, which is

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<sup>49</sup> For this as the explanation for the lepra / leprosy problem, see Grmek, *Diseases in the Ancient Greek World*, pp. 165-173, noting however that, if true, the reason for the absence of leprosy in Greece is not that Phoenicians and Persians were comparatively filthy (p. 175!) but that Greeks suffered from childhood forms of tuberculosis which gave them partial immunity to leprosy (pp. 183-197, 203-204).

<sup>50</sup> Ancient Mesopotamian physicians gave descriptions of every different type of seizure known, but even in Soranus of Ephesus (apud Caelius Aelianus, *Chronic Diseases* I 4), only two subcategories of epilepsy survive and that only because complex partial seizures were often attributed to a demon (ardāt lilī) who was believed to have a predilection for attacking adolescents and especially males. This may be the source of the statement of Celsus, *De Medicina* II 1. 21 that epilepsy is characteristic of adolescence and 3. 23 that it occurs more often in men than in women. (see Temkin, *The Falling Sickness*, pp. 31-32).

<sup>51</sup> Geller, *AFO* 48/49's assertion that the Mesopotamian diagnostic handbook was "purely for the sake of prognosis" (p. 55) is refuted by its inclusion of this material, which is relevant only for diagnosis and not for prognosis.

<sup>52</sup> See Grmek, *Diseases in the Ancient Greek World*, pp. 142, 171 w. n. 81, 210. On this point, see also R.J. Hankinson, "Pollution and Infection: An Hypothesis Stillborn," *Apeiron* 28/1 (1995):25-65. Similarly, the failure of Hippocratic physicians to achieve a sophisticated understanding of human anatomy has nothing to do with the alleged failure of Hippocratic physicians to practice autopsies on human beings. That Vesalius was the first European to discover that human and animal leg bones are differently shaped is not to be attributed to any dearth of autopsies in Medieval universities, but to a refusal to allow a few facts to get in the way of a beloved Galenic theory. This attitude is perhaps epitomized by the fact that representations of dissections in Western manuscripts from the Middle Ages to the early modern era show the eyes of all witnesses to be firmly fixed not on the body before them but on the text book being read out from a nearby lectern (personal communication, Saree Makdisi).



presumably reaching humoral medicine by way of "Chaldean" astrology.<sup>53</sup> Particularly striking is a passage in the treatise on *Prognosis* which predicts outcome on the basis of examination of the patient's urine by noting whether "clouds" appearing there are light or dark and high or low (*Prognosis* 12).<sup>54</sup>

The result of the Hippocratic physician's efforts in this direction was a series of treatises on prognosis and on the effects of climate, wind direction, seasonal changes and the like on the prevalence and severity of disease. It was here that he saw his opportunity to make a contribution to medical knowledge. By prognosis, however, he did not mean a mere calculation of the chances of a patient for survival since this, too, had already been done by the *āšīpu*. What the true philosopher/physician needed to know was the course of the disease in such detail that he could describe to the patient what his symptoms were (*Prognosis* 1) and, best of all, to infallibly predict the outcome in each and every individual case. The attempt to achieve this impossible goal required the collection of a lot of detailed information on what modern physicians would consider to be either irrelevant or distracting detail, such as the patient's occupation and city of origin, and peculiarities of individual cases (particularly rare and uncommon developments).

The *Epidemics*, the Hippocratic treatise which preserves this information, receives some rare criticism for including such material, but the criticism misses the point. Unlike modern case studies, this collection was never intended to provide the basis of diagnosis or to suggest treatment. The diseases which are described had already been diagnosed by the Hippocratic physician. This is clear at least in the early books of the *Epidemics* which are quite consistent in listing within each section at most two examples (one fatal and one survived) of each diagnostic category. For example, the fourteen cases of *Epidemics* 1 consist of malaria, typhoid, relapsing fever, a fatal and a non-fatal case of puerperal fever, fever with vomiting, fever with diarrhea, fever with delirium, rat bite fever, mumps, malaria in a pregnant patient, worms, relapsing fever in a pregnant patient and a good candidate for what the modern physician calls GOK<sup>55</sup> and the *āšīpu* "hand" of god.<sup>56</sup>

In short, Hippocratic treatises are characterized by the addition of mostly harmless nonsense to what was originally a basically sound core. Where it is possible to filter out the nonsense and with a bit of help from Mesopotamia to clarify some of the technical vocabulary what emerges are some of the most beautiful descriptions of disease ever penned. A classic is the description of pulmonary tuberculosis buried in the midst of the otherwise "flux" obsessed *Places in Man*.<sup>57</sup>

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<sup>53</sup> For astrological references in the Hippocratic corpus, see for example *Dreams* 89 and *Airs, Waters, Places* 11. For more on "Chaldean" astrology, see J.A. Scurlock, "Chaldean Astrology: Sextus Empiricus Illustrated From Selected Cuneiform Sources" and "Sorcery in the Stars", forthcoming.

<sup>54</sup> For the significance of clouds in ancient Mesopotamian astral omens, see David Brown, *Mesopotamian Planetary Astronomy-Astrology*, Cuneiform Monographs 18 (Groningen: Styx, 2000), p. 212.

<sup>55</sup> "God only knows."

<sup>56</sup> I.e., gods, ghosts and demons only know what it is.

<sup>57</sup> *Places in Man* 14 ca. 308 beginning *empuoi tōde dēloi ginotai*.

The ancient Greek mystery disease *phrenitis* makes a nice illustration of the transformations undergone by Mesopotamian material in the process of transmission. *Phrenitis* is one of four "thick" diseases, a literal translation of Akkadian *murūṣ kiṣirti*, which means illnesses characterized by thick sputum. One thinks immediately of pleurisy and pneumonia, which are indeed two of the "thick" diseases (*Internal Affections* 49-50; cf. *Diseases* III 15-16). *Internal Affections* 47 adds as its fourth a rather bizarre description of something caused by the "heat of the sun" and drinking too much water. "Heat of the sun" is an overly literal translation, favored by all too many Assyriologists, of Akkadian *ṣētu* which actually refers to dehydration and is the term used for what was once called enteric fever, before the advent of modern laboratory techniques made it possible to further subdivide the category into individual fevers accompanied by vomiting and diarrhea.<sup>58</sup> Some of the symptoms listed in *Internal Affections* as caused by the "heat of the sun" would indeed be appropriate to enteric fever including the pneumonia, although the author has miscombined this with tuberculosis and god knows what else. Stripped of extraneous elements, this "heat of the sun" section becomes equivalent to *Diseases* III 6 (*kausos* with pneumonia).

As for *phrenitis* (*Internal Affections* 48), it is unmistakably the Ionian Greek equivalent for Mesopotamian "hand" of ghost.<sup>59</sup> It is presumably the original attribution of this condition to affliction by a ghost that led the author of *Internal Affections* 48 to assert that *phrenitis* "usually attacks abroad, if a person is traveling a lonely road somewhere, and fear seizes him". Unfortunately, the Ionian Greek author was faced with a problem also encountered by modern scholars attempting to puzzle out ancient Mesopotamian diagnostic categories, and that is that "hand" of ghost refers to a wide variety of syndromes which the *āšīpu* knew to be different diseases (and for which he used completely different treatments) but which made sense to him as a single diagnostic category consisting of what a ghost might, for a variety of different reasons, be predisposed to do. In short, "hand" of ghost was not a syndrome but a series of separate syndromes attributed to the same causal agent.<sup>60</sup>

The author of *Prorrhetic* I 1-38 managed to navigate this minefield with unerring step, choosing for inclusion only the obviously appropriate encephalitis or meningitis ("brain fever") which may develop in upper respiratory tract or lung infections, a usage which passes to later authors such as Soranus of Ephesus (apud Caelius Aelianus, *Acute Diseases* I). The Greek name for this disease, however, implies something wrong with the diaphragm, a fact "explained" by the Ionian Greek Methodists as a mistake in the placement of reason in the chest rather than in the head

<sup>58</sup> See Scurlock and Andersen, *Diagnostics and Prognostics*, Chapter 3. The hip disease attributed to this cause in *Internal Affections* 51 is thus reactive arthritis.

<sup>59</sup> Geller, *AFO* 48/49:65 notes correctly the needle-like quality of ghost induced pain as quoted from BAM 216:29. Unfortunately, he fails to find any of the other references to "hand" of ghost and instead includes references which allegedly speak of a "stick in the epigastrium" but which are actually describing a burning pain and peptic ulcer disease. Geller also asserts (p. 57) that "hand" of ghost was almost invariably fatal, which is hardly the case. Some forms were; others were not.

<sup>60</sup> See Scurlock and Andersen, *Diagnostics and Prognostics*, Chapter 19.

(I 54).<sup>61</sup> This is not, however, why the authors criticized by the Methodists located the problem in *phrenitis* in the diaphragm. Instead, what happened was that the Ionian philosopher / scientist who invented the term *phrenitis* was less successful than the author of *Prorrhetic* I in his struggle to disentangle the Mesopotamian causal agents to whom diseases of the upper respiratory tract and lungs were attributed.

The less florid account in *Diseases* II 72 (cf. *Diseases* III 9) reveals that the ancestor of this treatise and of *Internal Affections* selected two syndromes of "hand" of ghost in addition to the encephalitis or meningitis cited by Soranus and the Methodists for inclusion in *phrenitis*, namely a needling pain in the diaphragm ("devil's grip" or Bornholm disease) and vivid nightmares due, most probably, to what we call battle fatigue.<sup>62</sup>

*Internal Affections* 48 describes what it calls *phrenitis* as follows. "Bile collects in the liver ... the liver swells up, and by its swelling, expands against the diaphragm; pain immediately attacks his head, especially the temples; he does not hear clearly, and often he cannot see either; shivering and fever set in". The described encephalitis or meningitis could proceed to coma: "These things affect the patient at the beginning of the disease ... The longer the disease goes on, the more pain there is in the body. The pupils of the eyes are dilated, the patient sees dimly and if you bring your finger up to his eyes, he does not perceive it, because he cannot see; this is how you can tell that he does not see: he does not blink when the finger is brought near. He removes pieces of wool from his blanket, if he does see them, believing they are lice." Separate from this description is another which associates pain in the diaphragm with "derangement" involving nightmares. "When his liver expands even more against the diaphragm, the patient becomes deranged; there seem to appear before his eyes reptiles and every other sort of beasts, and fighting soldiers, and he imagines himself to be fighting among them; he speaks out as if he is seeing such things, and he attacks and threatens ... We know that his starting up and fear are due to dreams from the following: when he comes to his senses, he reports having had dreams that correspond to the way he moved his body and spoke with his tongue." The dreams in question were not entirely coterminous with the pain in the diaphragm which was associated with difficulty in breathing: "Sometimes, he may also lie speechless the whole day and night, taking frequent deep breaths."

For the *āšīpu*, the described problems, albeit all attributed to "hand" of ghost, were three separate syndromes. Giving the Hippocratic physician the benefit of the doubt, however, let us presume that the difficulty breathing and pain in the diaphragm (Bornholm disease), the

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<sup>61</sup> Geller, *AFO* 48/49: 68 accepts this explanation and blames the alleged error on Mesopotamia. In evidence of this is offered Tablet 22 of the diagnostic series which is also allegedly a muddled account of *phrenitis* or "brain fever". In fact, Tablet 22 is a collection of many different diseases none of which even when correctly translated has any connection with "brain fever", i.e. encephalitis or meningitis (see Scurlock and Andersen, *Diagnostics and Prognostics*, Appendix 1). (The patient of l. 21 was not "asking for onions on an empty stomach" as Labat thought; as collation of the text reveals, he was turning gypsum white and smoky black!).

<sup>62</sup> For these identifications and a list of other syndromes attributed to "hand" of ghost, see Scurlock and Andersen, *Diagnostics and Prognostics*, Chapter 19.

encephalitis/meningitis ("brain fever") and the nightmares (battle fatigue) were combined into a single entity because they were observed to occur in the same contexts (viz an epidemic) and at least occasionally in the same patient. Battle fatigue has nothing to do with lung problems as such, but it is conceivable that battle scarred ancient Greek patients subjected to intense pain and difficulty breathing might indeed have had nightmares of the type described. What connects the encephalitis/meningitis with the pain and difficulty breathing has nothing to do with either bile or the liver as maintained by the author of *Internal Affections* but to the fact that Bornholm disease is indeed due to the same invisible external causal agent, *Coxsackie B* virus, as forms of encephalitis and meningitis. That there was some sort of connection would have been obvious to a careful observer, since the "devil's grip" and the "brain fever" can occur together in epidemics and in the case of the meningitis, at least, in the same patient.

The implications of the willingness of Hippocratic physicians to incorporate so many of the borrowers' borrowings are, then, great, for what this means is that, to an unrecognized extent, Hippocratic physicians were not innovators but were instead attempting to build indirectly on the foundations laid by Mesopotamian physicians. This, in turn, means that, as we have seen, important sections of the Hippocratic corpus are barely comprehensible without the aid of the fortunately now partially recovered Assyrian and Babylonian medical texts.

#### The Dangers of Synthesis

In the Hippocratic synthesis of previous schools of knowledge, the diet of the diet people and the bleeding and purging of the humor people were combined with the borrowings of the borrowers into a single cohesive system.<sup>63</sup> The synthesis between diet and humor people provided the theory and the treatments, whereas for the data (descriptions of diseases and the like) and diagnoses, Hippocratic physicians turned largely to the borrowers.<sup>64</sup> It is here that the dangers inherent in basing a system of medicine on something which was put together from such diverse systems of thought become apparent. Using Mesopotamian texts to sort out Hippocratic treatises is very amusing today, when such considerations are merely an academic exercise, but it would have saved many lives in 18th, 19th and even early 20th century Europe if physicians had had the benefit of the Mesopotamian Diagnostic and Prognostic handbook to help sort out what Hippocratic treatises were talking about. More fatally, the Hippocratic combination of one from Mesopotamian influenced column A and one from Ionian Greek column B resulted in a situation in which the diagnosis may have been rational but was combined with a theory-driven regimen of treatment which was largely divorced both from it and from reality, and with disastrous results.

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<sup>63</sup> So, for example, in *Internal Affections*, diseases of the spleen are attributed to one Mesopotamian category (*šētu* or enteric fever mistranslated into Greek as "the heat of the sun"--30-31), the four humors (30-34), and one of the diet peoples' favorite bugaboos, raw vegetables (34).

<sup>64</sup> *Regimen in Acute Diseases* 1 cites the *Opinions from Knidos* as its source for descriptions of diseases.

For many of the fevers described in the *Epidemics*, there were effective treatments known to the *āšīpu*, none of which were applied by the Hippocratic physician. Instead, the latter watched his patients live (or more usually die) in the interests of science (i.e. proving the falsehood of competing theories of medicine). And these were the lucky ones. Those receiving treatment from Hippocratic physicians were bled, blistered, purged and starved, also partly in the interests of experimental science. A particularly grim set of passages in the Hippocratic treatises *Regimen in Acute Diseases* and *The Nature of Man* describe in clinical detail the deaths of patients who were "excessively" purged (*The Nature of Man* 6) or made to eat improperly diluted barley gruel (*Regimen in Acute Diseases* 17).<sup>65</sup>

It is one of the great ironies of history that the medical tradition of Mesopotamia was itself a golden mean between Greek extremes. It attributed diseases in roughly equal proportions to pre-existent supernatural causes on the one hand and to malfunctioning internal organs or causal agents invented to explain a particular complex of symptoms on the other, while maintaining a fact-driven scientific approach. Indeed, Hippocratic physicians would have done mankind a great service, and saved physicians a great deal of grief if, like Pythagoras who borrowed from Mesopotamian mathematical texts for his famous theorem, they had simply plagiarized Mesopotamian medical treatments, demonic magic and all, leaving to the brilliant minds of the 17th century scientific revolution to sort out the "science" from the "magic".

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<sup>65</sup> *Nature of Man* 6 clearly indicates that the vomiting by the dying patient of all four humors and not just the bile or phlegm which the medicine was supposed to have produced was the evidence upon which Hippocratic acceptance of the theory of the four humors was based.