

**MESOPOTAMIA, THE CRADLE OF CIVILIZATION AND MEDICINE****Nasser Pouyan\***

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Author****Nasser Pouyan**Nāsir pūyān (Nasser  
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18893, Iran.**ABSTRACT**

Mesopotamia in Southwest Asia, tilled for over ten thousand years has been called the Cradle of Civilization. Man from this fertile land attempted to develop a system of writing and here the first cities of world were built. In the course of the fourth millennium BC, the most prominent of the city- states, Sumer gave its language to the area and became the first great civilization of mankind. This very Sumerian records report of euphoric effect of the poppy plant in about 4000 years BC. The next leading civilization was centered on Babylon, and the most famous king of the Old Babylonian dynasty was Hammurabi (reigned 1728-1686 BC) who established a set of laws called the Code

which have Seventeen laws related to medicine including rewarding or punishing physicians for the outcome of their treatments. The second tablet of a medical treatise called “if a man has cough.” which comes from Nineveh and dates about 700 BC, details several stomach disorders and recommends various medical remedies. Although the origins of medicine are in the mists of time, archaeological evidences reveal that in ancient Mesopotamia complex medicine was practiced, intertwined with religion and magic. In fact, three were there principal evil gods who were responsible for disease: the demon of phthisis, the demon of diseases of the liver, and the demon of abortion and infant death. Treatment was largely through prayer and incantation. Mesopotamian (the Sumerian, Amorites, Babylonians, and Assyrians) carried out surgery, washed and bandaged wounds and used hundreds of remedies ranging from prunes to lizard droppings. Their specific remedies were linked to certain diseases, and medicine was combined with chants and spells.

**KEYWORDS:** Mesopotamia, Medicine, Babylonia, and Assyria.**INTRODUCTION**

Mesopotamia (Greek mesos, “middle”, and potamos, “river”, denoting “the land between the rivers”), the name applied by classical writers to the upper part of the valley of the Euphrates

and Tigris. Modern writers use the name to designate the whole region between these rivers, extending from the mountains of Armenia South to the Persian Gulf and from the Syrian Desert east to the Iranian Plateau.<sup>[1]</sup> Northern Mesopotamia inhabited since the Mousterian (the name is derived from Le Moustier in France) period (circa 50,000 BC), was later one of the regions in which settlement in permanent villages with a food-producing economy began. This transition is shown at the Neolithic site of Jarmo (circa 5000 BC). City of Eridu expanded in circa 4000 BC and Ur founded about 3500 BC. Cuneiform script appeared in Sumer circa 3500 BC. In about 3100 BC Byblos city founded on the eastern Mediterranean coast, and also experimental bronze work emerged. In the Jemdet Nasr phase (circa 2900 BC), the flowering period of this culture, Mesopotamia influenced cultural development in Egypt, an historic country of North Africa. The following half millennium (designated “Early Dynastic Period” witnessed the development in southern Mesopotamia of Sumerian city-states. Sumerians built the canal system (Figure 1) and also established much of the framework of Mesopotamian society for the next two millennia. During this period, Semites were entering Mesopotamia from the western desert, and by about 2350 BC, the first Semitic empire (the world’s first empire), centered at Agade, was founded by Sargon the Great who united the city-states in the South and founded the Akkadian dynasty.



**Figure 1: Map of irrigation system on royal estate near Nippur and surrounding villages marked by circles.**

The next leading civilization was centered on Babylon, and the most famous and powerful ruler of Old Babylonian dynasty was Hammurabi (reigned 1728-1686 or 1792-1750 BC), whose reign’s events are known chiefly from date-formulae and letters and the “Code of

Hammurabi". A large number of inscribed clay tablets from this era still exist and make it one of the best-known cultures of Near Eastern antiquity. The civilization of Mesopotamia exerted influences on their neighbors not only in their own time but also in subsequent centuries. Hebrew, Greek, Christian, and Islamic Cultures owe many debts to Mesopotamia. Perhaps Mesopotamia's most important contribution to the world was the introduction of a writing system (about 3000 BC). Although the Sumerian language did not long survive, the writing, called cuneiform, was adapted to Akkadian and its Babylonian dialect and was used to preserve the records of literature and medicine on clay tablets. Many of these tablets list representative plants, animals, and implements and provide a rudimentary zoological and botanical survey of the area. Many other innovations also came from Mesopotamia: metallurgy, the wheel, the arch, clock dials, and uniform weights and measures. The sexagesimal system from which we derive our sixty-minute hour had its roots in Babylonian mathematics. The earliest known regulations of practice of medicine were found in the Code of Hammurabi<sup>[2]</sup> discovered at the site of ancient city Susa (now in Iran) in 1902.

### **Concepts of Disease and Medical Treatments**

Mesopotamians somehow knew the natural origin of numerous illnesses, which may occur of overexposure to heat or cold, overeating, eating spoiled foods, or drinking too much of an alcoholic beverages. The fact that some diseases were contagious was certainly recognized, but there was obviously no perception of how contagion occurred. In general, however illness was perceived as an intrusion coming from outside a person and entering the body in some fashion. It may be that this concept helps to explain the use of purgatives and enemas even for illnesses that do not involve the digestive system or for complaints that we would tend to see as psychological in origin.<sup>[3]</sup>

The illnesses were often blamed on pre-existing spirits including gods, ghosts, etc. Each spirit was held responsible for only one illness in one part the body. So, usually the hand of god of stomach corresponded the diseases of stomach. Some diseases simply were identified by names "bannu" for instance. Also, it was recognized that various organs could simply malfunction, causing illness. Gods could also be blamed at a higher level for causing named diseases or malfunctioning of organs, although in some cases this was a way of saying that symptom X was not independent as usual, but was caused in this case by disease Y. It can also be shown that the plants used in treatment were generally used to treat the symptoms of the disease, and were not the sorts of things generally given for magical purposes to such a

spirit. Presumably specific offerings were made to a particular god or ghost when it was considered to be a causative factor, but these offerings were not indicated in the medical texts, and must have been found in other texts.<sup>[4]</sup> (Figure 2)



**Figure 2: Mesopotamian mother and child, probably a fertility image (c. 1400- c. 1200 BC).**

### Remedy

In Mesopotamia, healing remedies have taken an enormous variety of forms; from preparation using plants, animals, and minerals, to remove of infected or diseased parts, to prayers or incantations for spirits or gods to restore health. The therapeutic medical texts combined the two types of treatment, the magical and the medical cures. Prayers, recitation, sacrifices were common religious means of beseeching the gods for a cure; however, along with these a real pharmacopoeia of drugs was used in the treatment of disease. In addition to clay tablets which report illnesses with their symptoms and diagnosis, prognosis, and treatment, others were found that list drugs and their appropriate uses. Many plants, minerals, and animal substances were the therapeutic agents, and were given by mouth in compositions, applied as salves and fomentations, blown into orifices, inhaled as vapors and fumigations, and inserted as suppositories and enemas. Oil was apparently the principal balm for open wounds, probably preventing the adherence of overlying dressings. The medications were administered according to rituals, the time of the day, and the positions of constellations.<sup>[5]</sup>

Very many elaborations could be given, for example, quantities of specific ingredients, the time of day, and the number of days to administer the medication. In a few instances, warnings on toxicity of certain ingredients are given. An example of a prescription is the followings: “If a man’s tongue is swollen so that it fills his mouth, you dry tamarisk leaves, leaves of the adāru- plant, leaves of “fox-grape,” (and) “dog’s tongue”-plant; you chop them up finely and sift; you knead them with juice of the kasū- plant; you rub the top of his tongue with butter; you put (the medication) on his tongue, and he will get well.” (Hunger, *Spätbabylonische Texte aus Uruk*, no. 46, lines 1-5.)

Particularly in the case of magical treatments, instructions may include such specifics as “such- and- such plant to be pulled up before sunrise,” or “set outside under the stars overnight.” Containers normally made of leather were often included in instructions for magical treatments. They might contain, for example, hair from a black dog, a piece of a dirty (menstrual) rag, or pig manure to be worn around the neck. The corpus of medical texts, being in large measure a compilation of material from what may have been separate corpora of texts of the magical and medical treatments, contains treatments from both sources mixed together. A considerable number of the medical texts from Assur have colophons showing that they belonged to a man named Kišir- Assur, who identifies himself as an exorcist of the temple of the god Assur. If he was not merely a bibliophile but made professional use of these tablets, it would appear that there was considerable fluidity and overlap in the use of prescriptions by both categories of healing professionals.<sup>[6]</sup>

### Practitioners

Medical practice probably was in the hands of three types of priests; baru, ashipu, and asu. The baru as a diviner dealt with diagnosis and prognosis, but not only of illness. He also had to discover the causes and probable outcome of many other kinds of catastrophe. The ashipu, as an exorcist who drove out evil demons, was called on to rid a house, a farm, an area, and also sick people of occupying spirits. The asu (the name of Biblical king Asa or Asa-El, “healer of god,” may have derived from the Babylonian asu) apparently acted as a physician, employing charms and divination but also drugs and operations. The healing priests received their education in schools that were associated with the temples. The source of their learning, in addition to practical instruction, was the large number of tests available in the form of clay tablets. By the seventh century BC, for instance, the library of Ashurbanipal contained over twenty thousand tablets, which were only discovered about a hundred and fifty years ago at

the site of ancient Nineveh. They are still the most extensive source of knowledge about Mesopotamian society, including medicine, but recently tablets have been unearthed that date back to Sumerian times.

The priest- physician ministered mainly to the court, nobility, and upper classes, but apparently there were also barbers who performed some surgical procedures and did the branding of slaves. Veterinary practice may have been handled by either the low- class “doctors of oxen or asses,” is not known.

### **Fees and Punishments**

The Code of Hammurabi devotes ten statements out of 282 provisions to the fees due medical practitioners and their punishments for failure.

- 1- If a doctor has treated a freeman with a metal knife for a severe wound, and has cured the freeman, or has opened a freeman’s tumor with a metal knife, and cured a freeman’s eye, then he shall receive ten shekels of silver.
- 2- If the son of a plebeian, he shall receive five shekels of silver.
- 3- If a man’s slave, the owner of the slave shall give two shekels of silver to the doctor.
- 4- If a doctor has treated a man with a metal knife for a severe wound, and has caused the man to die, or has opened a man’s tumor with a metal knife and destroyed the man’s eye, his hands shall be cut off.
- 5- If a doctor has treated the slave of a plebeian with a metal knife for severe wound and caused him to die, he shall render slave for slave,
- 6- If he has opened his tumor with a metal knife and destroyed his eye, he shall pay half his price in silver.
- 7- If a doctor has healed a freeman’s broken bone or has restored diseased flesh, the patient shall give the doctor five shekels of silver.
- 8- If he be the son of a plebeian, he shall give three shekels of silver.
- 9- If a man’s slave, the owner of the slave shall give two shekels of silver to the doctor.
- 10- If a doctor of oxen or asses has treated either ox or ass for a severe wound, and cured it, the owner of the ox or ass shall give to the doctor one sixth of a shekel of silver as his fee.<sup>[7]</sup>

A notable feature of the Code is that there is here enshrined a code of ethics, which raised the standard of medical practitioner to a very high level, first by fixing the remunerations which they are to receive at a substantial figure, and secondly by punishing them for transgressions

due to ignorance. As such transgressions were surgical errors, a by- product of this code was the virtual suppression of surgery. To this high standard the physicians of ancient Iran succeeded and from this high standard they never fell.<sup>[8]</sup>

### **Code of Hammurabi**

Code of Hammurabi, collection of laws promulgated in the early second millennium BC by Hammurabi, King of Babylonia (reigned 1728-1686 BC or 1792-1750 BC), son and successor of Sin- muballit of the Amorite dynasty. He owed his success not only to military ability but also to attention to administration and economic justice, reflected in his correspondence and his laws. Most of the Code of Hammurabi is extant on a diorite monument, 8.2 ft. high, discovered at Susa (now Shush, Iran) in 1902 and now in the Louvre, Paris. At the top of the stele a relief shows Hammurabi paying homage to the sun- god Shamash, also the god of justice; below is engraved the cuneiform text, in finely executed writing reading vertically from top to bottom in a series of horizontal bands. Portions of the text are extant on clay tablets from Babylonia and Assyria from periods down to the middle of the 1st millennium BC.

The text comprises (1) a prologue telling of Hammurabi's divine call and his piety, (2) the corpus of laws, and (3) an epilogue extolling Hammurabi's establishment of justice in the land. The laws, arranged largely according to subject matter, deal with such topics as offenses against the administration of justice and property, land tenure, trade and commerce, marriage, family, and inheritance, assault, regulations governing surgeons and builders, agriculture wages and slavery. Penalties included death by drowning and impalement, mutilation, scourging, banishment, enslavement, and the payment of reparations.

Similarities between certain laws in the Pentateuch (first five books of Bible: Genesis, Exodus, Leviticus, Numbers, and Deuteronomy, which contain the major collections of ancient Israelite laws and are frequently called the Law, or Torah) and those of Hammurabi formerly led to the suggestion of direct borrowing by Moses. This theory has been discountenanced by the discovery of other collections of Mesopotamian laws, which show that Hammurabi was neither the only nor the first lawgiver in the ancient Near East.

Though commonly referred to as a code, Hammurabi's laws have been shown by F.R. Kraus and others to be not a codification of statute law, but a collection of specimen decisions given by Hammurabi as judge, arranged in the literary form, "if so- and- so happened, so- and- so

will follow,” known as “omen- form.” The epilogue recommends the judgments and decisions recorded on the stele to future rulers and people.

The contents of the “code” show that its authors were familiar not only with the specific decisions incorporated, but also with earlier related documents such as the “code” of Ur-Nammu and Lipit- Ishtar. (Consult The Babylonian Laws, ed. By G.R. Driver and J.C. Miles (2 vols., 1952-55). H.W.F. SAGGS, School of Oriental and African Studies, University of London.)<sup>[9]</sup>

The Code of Hammurabi (Figure 3), is engraved in 49 columns and sandwiched between a prologue and an epilogue in a rhyming style giving the titles and achievements of Hammurabi and proclaiming the authority of his laws.

The middle section is divided into 282 codes of Law by the modern scholars. The subject-matter of the Code are:

#### **Administration of justice**

1-5- False witnesses; corrupt judges.

#### **Offences against property**

6-14- Theft, including kidnapping of a minor.

15-20- Runaway and stolen slaves.

21-25- Housebreaking, robbery, looting.

#### **Land and Houses**

26-41- Tenure of land held as a fief from the king.

42-48- Cultivation of arable land by tenants.

49-52- Regulations governing the financing of tenant- farmers.

53-56- Offences arising from negligent irrigation.

57-58- Trespass of cattle on corn- land.

59- Unauthorized cutting of trees.

60-65 & A- Cultivation of palm- plantations.

B-E,G,H- Regulations concerning renting, building and repairing of houses.

F,J,L- [Fragmentary].



**Figure 3: Polished black diorite stele (circa 1792-1750 BC), found near Susa, Iran, with Code of Hammurabi inscribed and bas-relief at the top showing the king of Babylonia receiving laws from sun god Shamash. The monument on which is engraved most of Hammurabi's Code discovered in 1902.**

### **Merchants and agents**

L-R- Loans from merchants' interest rates.

S,T- [Fragmentary].

U- Division of profit and loss between partners.

100-107- Regulations governing transactions of merchant's agents.

108-111- Regulations concerning (female) inn- keepers, (who apparently also served as small brokers).

112- Fraud by a carrier.

113-117- Distraint for debt.

118-119- Delivery of dependents into bondage for debt.

120-126- Deposit of goods.

### **Women, marriage, family property and inheritance**

127- Slander of high- priestess or married woman.

128- Wifehood; cohabitation without contract does not give a women the status of wife.

129-132- Adultery.

133-136- Remarriage of wife: this permitted in the husband's absence only in certain circumstances, though unconditional for voluntary desertion.

- 137-143- Divorce.
- 144-149- Concubinage and a circumstance in which bigamy is permitted.
- 150- Inheritance of property settled by husband on wife.
- 151-152- Liability of spouses for debt.
- 153- Penalty for wife who murders husband impalement.
- 154-158- Incest.
- 159-161- Breach of contract after betrothal.
- 162-164- Disposal of dowry after death of wife.
- 165-167- Division on inheritance amongst sons.
- 168-169- Dishersion.
- 170- Legitimation of sons of concubine.
- 171-174- Rights of concubine and non- legitimated sons; widow's property.
- 175-176- Rights of free woman married to a slave.
- 177- Disposal of previous husband's property at re-marriage of widow.
- 178-184- Rights of cult women to dowry or paternal inheritance.
- 185-193- Adoption.
- 194- Substitution of changeling wet- nurse.

### **Assault and personal injury**

- 195- Assault by a son on his father.
- 196-205- Penalties for inflicting bodily harm- talon when the victim is freeman, a fine when is a villain or slave.
- 206-208- A man inflicting accidental injury is subject only to a fine or costs, not to talon.
- 209-214- Assault upon a woman resulting in miscarriage.

### **Professional fees and responsibilities**

- 215-225- fees payable to surgeons and veterinary surgeons for successful operations, and penalties incurred where result of an operation is unfavorable.
- 226-227- Penalties for existing of procuring the excision of a slave mark.
- 228-239- fees for builders and shipmasters penalties for negligence.
- 240- Collision between a galley and a sailing ship.

### **Agriculture**

- 241-249- Distraint, hire death and injury of oxen.

250-252- Responsibility for damage by goring ox.

253-256- Wrongful conversion by a bailiff.

257-258- Hire of ploughman an ox- herd.

259-260- Theft of agricultural implements.

261- Hire of stockman or shepherd.

### **Rates of hire**

268-277- Rates of hire of animal, wagons, laborers, craftsmen, ships.

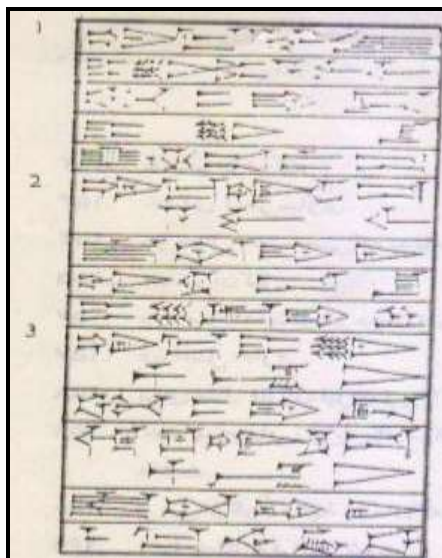
### **Ownership and sale of slaves**

278-279- Liability for slave sold when suffering from sickness or subject to a legal claim.

280-282- Re- claiming of slaves bought abroad and returned to Babylonia. (List after Staggs, 1962, 207-9).

### **Three articles in Mesopotamian pronunciation and English language**

1. Šum- ma a w- wi- lum i- in duma a- wi- lim úh- tap- pí- id i- in- šu ú-ha- ap- pa-du  
šumma awīlim īn mār awīlim uhtappid īnšu uhappadū.
- 1- Article 196: If someone causes loss of the eye of an aristocrat, then he deserves to have his eyes destroyed.
2. Šum – ma gir-pad- du a- wi- lim iš- te- bi- ir gir- pad- du- šu i-še- eb- bi- ru šumma esmet awīlim ištebir esmetšu isebbiru.
- 2- Article 197: If he breaks someone's bones, then his bones should be broken.
3. Šum- ma i- in maš- en- kak úh- tap- pí- id ú lu gir- pad- du maš- en- kak iš- te- bi- ir 1  
ma- na kù- babbar i- ša- gal šumma in muškenim uhtappid u lu esmet muškenim ištebir 1  
mana kaspam išaqqal.
- 3- Article 198: If he destroys the eyes of a layman or breaks the bones of a layman then he should pay one silver enamel.<sup>[10]</sup> (Figure 4)



**Figure 4: A portion of the Code of Hammurabi in cuneiform.**

### **Medical Documents and Drugs**

In addition to magic and sorcery, Mesopotamians used herbal, mineral, animal products, and drugs for medical treatment. To demonstrate fever and febrile status, they drew a chafing-dish. The prescriptions on Sumerian steles reveal that Lulu, a physician who practiced medicine in Ur, ancient Sumerian and Babylonian city in southern Mesopotamia, practiced medicine without the help of magic and sorcery. A Sumerian physician who lived over 3000 years ago, has left a twelve- page medical document inscribed on a stele, “15.9 × 9.6” centimeters. The medical documents were interpreted by Martin Louis and Somerset Moham in 1953. They reveal that Sumerian physicians classified drugs into three categories including herbal, mineral and animal products. The herbal drugs included cassia, asafetida, myrtle, time, willow, pear, and spruce. For making herbal drugs, they used seeds, roots, branches, gum, resin, and fruits of various plants and trees. Different powders, ointments, drops, and suspension were also used. Mesopotamians mixed various plants and dissolved them in a special wine called Kushumma, and added oil extract from cypress- three or other trees to the final product. Sometimes clay in powder form were added to the mixtures. Finally, they mixed water, honey and the water of the bottom of the sea to the final product.

For making medicine in the form of drops, minerals including sodium chloride or potassium nitrate were used. Animal products such as milk, snake skin and the shell of tortoise, were popular. Generally, in Mesopotamia (Sumer, Babylonia, and Assyria) animal and mineral drugs were used less than herbals.

The Mesopotamian medical prescriptions indicate that they extracted medical decoction from tree bark; the solution of it was added minerals or alkaloids. Saltpeter was obtained by scraping the inner surface of sewer lines, where organic nitrous waste was deposited.

### **The oldest medical documents**

In the excavations of Nippur (modern Niffer, in Iraq), ancient city of central Babylonia (an important city as a Sumerian and Babylonian religious center), the oldest documents which are preserved in Pennsylvania Museum (in the USA) shows the methods of treatment of patient. One of the documents says: "After grinding the tree of white pear and the root of moon plant dissolve the mixture in beer, and administer the product to the patient. Grind the seed of the plant, harvest, the markasi resin and thymus in a container and dissolve the mixture in beer and then administer it to the patient."<sup>[11]</sup>

### **Social Setting**

From Middle Babylonian Nippur (ancient city of central Babylonia) there is various letters from physicians who practiced medicine. Among their patients, a group of them were females; probably they were musical students. In any case, it appears that they were housed as a group. It seems unlikely that this should be considered a hospital setting, however. These letters are addressed simply to "my lord," not otherwise identified, but surely a high official. An example of such a letter is given here in translation: "[Say to my lord]: [thus (says)...-muball] it, your servant: I am ready to die as my lord's substitute. [As to...] about whom my lord wrote me, their [...] are well. The patient whose chest is sick was prescribed a dressing, and is kept bandaged; he is also taking a potion against tracheitis. And the other one whose chest [...]...; when I assigned a poultice for him, no ašû herb was available, and my lord knows that if only a single herb is missing, it will not succeed. I asked the mayor to send word to a gardener, and[...]. The daughter of Muštālu who was coughing but not spitting out has started to expectorate after I gave her [appropriate] potions; but [...] now she is constipated. I gave her a potion for constipation to drink, and she is taking it, (but) there is no šarmadu herb and drawn wine available. Let my lord send (some) so that I can have her drink, lest she develop "Hand of Curse." The princess who had repeated attacks of fever has now calmed thanks to the dressing and potion. As to the herbs of which I spoke to my lord, let my lord not forget about them. [A list of specific but unidentifiable plants follows.] (Parpola, Letters from Assyrian Scholars, pp.494-495.)"

There are a number of letters from the court physicians dating to the time of the Assyrian King Esarhaddon. In these letters there are not only herbal medicines being prescribed (a practice we also saw at Mari in the letter cited above), but the use of magical treatments as well. Esarhaddon's illnesses have been studied in considerable detail. (See Erle Liechty, "Esarhaddon, King of Assyria," in *Civilizations of the Ancient Near East*, vol. 2, pp. 949-958.).<sup>[12]</sup>

### **Surgery**

About three thousand years before the birth of Christ the Egyptians prepared the earliest known treatise on surgery. For the next 4000 years surgery progressed slowly impeded by beliefs in magic and devils as sources of illnesses and by unwillingness to dissect the human body after death to discover the cause of disease and to obtain accurate anatomical knowledge.<sup>[13]</sup>

There has been discussions over many years about the extent to which physicians in Mesopotamia practiced surgery. Such discussions most often concern the eye operation mentioned in the Code of Hammurabi, sections 215-220. Whatever the procedure may have been, it is unlikely that any very complicated surgery was undertaken. The physician's scalpel was most likely used mainly to lance boils and for bloodletting- the latter sparsely attested in the medical texts. It is not known whether bloodletting was a widespread practice.

Very little paleopathological study has been published on human remains from ancient Mesopotamia for, unfortunately, it used to be that human bones were rarely preserved by archaeologists excavating sites of the historical periods. Probably the most extensive collection is from the excavations of J. N. Postgate at Abu Salabikh from the third millennium. Some of the graves have been published, but detailed paleopathological studies have not yet appeared.<sup>[14]</sup>

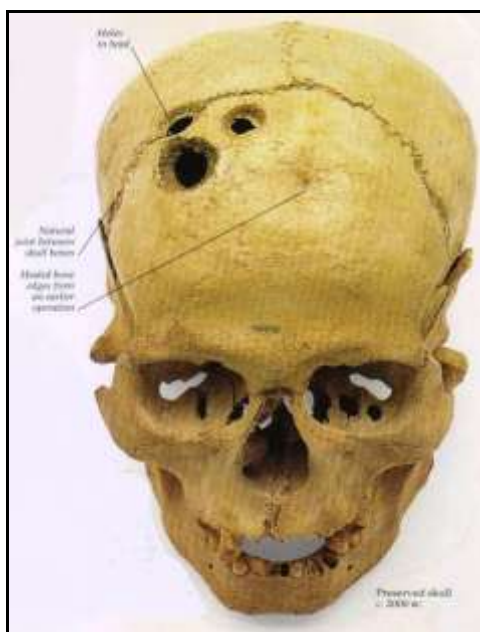
### **Trephining**

It is the oldest- known surgical procedure. Skulls of ancient peoples from thousands of years ago have been found with trephine (a small drill or bit with central points, which acts as a pivot) holes (Figure 5). The procedure was probably used for supernatural reason, but may also have been used to relieve increased intracranial pressure, as it is today.<sup>[15]</sup> But there is no evidence in Mesopotamia for trephination (drill to bore a hole through the bony table, or layers, of the skull, and the use of such a drill), though it appears that it was practiced at least

occasionally in other parts of the Near East, especially Egypt. As far as we know, circumcision was not practiced in Mesopotamia, though, of course, it was widely practiced in other areas of the Near East, including Jericho (modern Ariha, Jordan), ancient city in the Jordan valley of Palestine.

### Human Anatomy

An early interest in the study of the structure of the human body and animals is reflected in the cave drawings of prehistoric times, the clay representations of human figures from the pre- Greek Minoan civilization of the Mediterranean, and models of supposedly prophetic sheep livers from Mesopotamia. The Egyptian gained some anatomical knowledge from the practice of embalming the dead, although this same practice apparently prevented dissection of human bodies. Egyptian papyri and account of surgery from Mesopotamia also indicate some anatomical sophistication.<sup>[16]</sup>



**Figure 5:** This skull which comes from Jerico, is 4000 years old, has three trephined holes. Drilled holes were roughly circular, whereas knife- cut ones were usually more square. A few skulls have up five holes- the largest ones measuring more than 5 cm (2 ins) across. Some people, including this individual, survived the process- this can be deduced from the fact that the bone signs of healing. (S. Parker Eyewitness Medicine, p.9)

Knowledge of human anatomy was probably rather limited in Mesopotamia because, dissection was not performed. Nevertheless, it seems likely that there was some understanding of the body parts (if not necessarily their true functions) by analogy with

slaughtered animals, particularly sheep, for which there was very detailed knowledge because of the practice of inspecting the internal organs as form of divination. Some knowledge of internal organs may have been acquired by physicians when they attempted to treat patients who had been gored by a bull or wild pig, or had been wounded in battle.

Without knowledge of the true etiology of specific diseases, physicians could treat only their overt symptoms. It is recognized that in traditional medical systems the practitioner need not necessarily know the cause of an illness to deal effectively with it. It is also a fact that most diseases (degenerative diseases excepted) are self limiting, and the patient either recovers or dies.<sup>[17]</sup>

### **Childbirth and Caesarian**

Childbirth, process of giving birth to a child, occurs about 280 days after last menstrual period, unless the child is delivered prematurely. Various complications may develop when the child passes through the narrow opening of the pelvis. If the child is too large for the pelvic opening, delivery may have to be accomplished by Caesarean section. The term Caesarean section though probably derived the Latin word “caedere” (“to cut”), is popularly thought to be named after Julius Caesar (102-44 BC, Roman statesman and general, and one of the greatest figures of antiquity), who was said to be so large at birth that a normal delivery was impossible.<sup>[18]</sup> Caesarean section was performed with close attention to technique in order to save both mother and infant. For a dead child still in the womb, dismemberment through the vagina was painstakingly carried out to avoid the risks to mother of opening her abdomen. Recognizing the hazard of abnormal presentations at delivery, writers gave instructions on how to turn a child into the proper position.<sup>[19]</sup>

Oppenheim believed he had found evidence for the cesarean section in Babylonia, his proposal has often been taken as fact. Despite the addition of further texts and continued discussions by several scholars, it must be said that a convincing case has not been made and that it remains an unproved suggestion. But female problems connected with pregnancy and childbirth are often addressed in the Mesopotamian medical texts. There are many prescriptions for a physician in the medical texts that physicians helped the delivery of babies. Rather, the assistance was provided by a midwife, probably aided by a female relative very many texts, however, offer prescriptions for giving birth easily and for making a barren woman conceive. An instance is “Total: 21 stones to help barren woman become pregnant; you string them on a linen thread and put them around her neck.”

There is a text that gives prescriptions for abortion. The relevant line reads, “to cause a pregnant woman to drop her fetus.” The prescriptions include of eight ingredients to be administered to the woman in wine and to be drunk on an empty stomach. The section ends with the sentence, “that woman will drop her fetus.”

Illnesses of infants and children are detailed in chapters of the omen collection known as SA.GIG (see below), but children’s illnesses are not mentioned in the therapeutic medical texts. However, we find out from the Mari letters that physicians did in fact treat children. Children’s illnesses are also addressed in the magical series Lamaštu. (See Walter Farber, “Witchcraft, Magic, and Public Health in Ancient Mesopotamia,” in *Civilizations of the Ancient Near East*, vol.3, pp. 1895-1907.)<sup>[20]</sup>

### **Leprosy**

Leprosy or Hansen’s disease, is a chronic infectious disease which involves primarily the skin and the peripheral nerves, would not at present be justified in suggesting its occurrence in ancient Mesopotamia at an earlier time. But evidence now suggests its occurrence in Palestine and the Byzantine period. Plagues and epidemics were mentioned often in the Bible (sacred writings of the Christian church, comprising the Old and New Testaments), with special attention given to leprosy, which was feared and isolated, but, as among the Assyro-Babylonians, many skin diseases considered to be leprosy probably were not. There were, however, references to many other types of illnesses and symptoms in the Bible. The precepts and prohibitions of Biblical times on personal and public health were continued in the Talmud (collection of ancient writing on Jewish law and tradition) and the leper was regarded unclean and his or her cloths were to be burned.<sup>[21]</sup>

### **Pharmacopeia**

Pharmacopeia, also spelled pharmacopoeia, a book containing a list of medicinal substances with descriptions, formulas, properties, identification tests, quantitative assays, safe dosages, and other standards to determine their strength and purity. Although descriptive lists of drugs are known from ancient China, Mesopotamia (including Sumer, Babylonia, and Assyria), and Egypt, the precursor of the Pharmacopeia is generally considered to be a book entitled *Compositio*, written by the Roman physician Scribnus Largus about 43 AD. The “*Nuovo receptario composito*,” published by the Florentine guild of physicians and apothecaries in 1498, was made official and thus became the first pharmacopeia of the Europe.<sup>[22]</sup>

In Mesopotamia, about three to four thousand years BC (5000 to 6000 years ago) “most of the medical treatments” consisted of herbal remedies. As in other traditional societies, the most common purposes for which herbal medicines were used were to treat gastrointestinal, dermatological, and respiratory ailments. As we know from research into the use of herbal medicine in modern traditional societies, some of these remedies quite likely produced the desired effect, especially in the case of emetics, purgatives, and expectorants. The beneficial effects of some common products (such as wine and honey) are well known and have been demonstrated in modern experiments. It is well known that certain herbs can produce vomiting (in fact, emetics are often toxic to some degree, which is why the body’s natural defense system causes them to be expelled) and that others are effective purgatives. A good many herbal remedies were probably pharmacologically ineffective, however, with benefits largely limited to calming a patient’s anxiety.

The Babylonian medical texts prescribe a great many plant products, usually specific parts of the plant such as leaves, blossoms, seeds, or roots to be prepared in various ways (crushed, cooked, or dried, for example) and mixed with an appropriate carrier (water, beer, wine, or milk for a potion, for example). Knowledge of plant chemistry as such in traditional societies, there must have been some knowledge of toxicity in plants, for, indeed, only specific parts of many plants are toxic or are toxic only at a particular stage of their grow cycle. In fact, many of the plants used in medicine are normally not consumed as food, and thus presumably had some disadvantage such as toxicity or unpalatability. Of course, in using many of these drugs, care had to be taken to use a concentration that was therapeutically effective but nontoxic. Many prescriptions call for a large number of ingredients, often combining plant products and minerals. In many cases, the ingredients are summarized as, for example, “these fourteen ingredients you take and prepare (as follows).<sup>[23]</sup>

### **Dentistry**

In Mesopotamia, it was believed that demons inhabiting in the body were responsible for illness. Filthy and disgusting remedies concocted from worms and insects were used to sicken and drive out these evil spirits. The Code of Laws now preserved in the Musée de Louvre, clearly spells out the punishments and rewards due practitioners of medicine:

Law 196: If someone injures the eye of an equal his own eye is destroyed.

Law 198: If someone injures the eye of an inferior he is fined a mina of silver.

Law 200: If someone knocks out the tooth of an equal his own tooth is knocked out.

Law 201: If someone knocks out the tooth of an inferior he is fined a third of a mina of silver.

It is interesting to note that, although an eye was clearly considered more valuable, nevertheless a substantial sum was placed on the value of a tooth. Among the clay tablets in Ashurbanipal's library are a number devoted exclusively to diagnosis and prognosis, and the state of the teeth was used as a means of determining the course and source of an illness:

“If he grinds his teeth the disease will last a long time.

If he grinds his teeth continuously and his face is cold he has contracted a disease through the hand of the Goddess Ishtar.

Since grinding the teeth was considered both very dangerous and pathognomonic, a remedy was proposed. A human skull was placed upon a chair, and for three days, morning and night, sacrifices were placed before it. Then conjurations were to be spoken seven times into the skull, and the skull was kissed seven times seven by the patient before retiring, and then he would become well. The royal libraries yielded an intriguing letter written by the court physician of the Assyrian king Essarhaddon (ruled 681-669 BC), which reads, in part, “As regards the cure of the [aching] teeth about which the king wrote to me, I will [now] begin with it; there is a great lot of remedies for [aching] teeth.” Unfortunately, the letter does not tell us what those remedies were. Another letter, in response to a king's inquiry about his son's illness, states, “The inflammation where with his head, hands, [and] feet are inflamed is due to his teeth (Figure 6). His teeth must be drawn... then he will be well.”<sup>[24]</sup>



**Figure 6:** At the site of Tepe Gawra, about twenty miles from ancient Nineveh, archaeologists found this four- thousand- year- old set of toilet articles, which includes a makeup applicator, an ear scoop, and a finely crafted toothpick.

This belief that a tooth worm causes dental caries (decay in teeth) was first documented in Babylonia. A clay tablet found in royal library gives us a detailed account of dental caries (Figure 7) with poetic starkness:

- After Anu [had created the sky],
- The sky had created [the earth],
- The earth had created the rivers.
- The rivers had created canals,
- The canals had created the marsh,
- The marsh created the worm.
- The worm went forth weeping, before Shamash.
- Before Ea in tears (saying),
- “What will you give me to eat?
- What will you give me to suck on?”
- “I will give you ripe figs, armanu fruit, and apples?
- Of what use to me are ripe figs armanu fruit, and apples?
- (Instead), raise me up and let me live between the teeth and the jaw!
- I will suck the blood from the teeth!
- I will chew upon the food in the jaw!”
- (Instructions to dentist) Drive in a pin and seize its foot.
- “Because you have spoken thus, O worm,
- May Ea strike you with all the strength of his hand!”
- Text for tooth trouble.
- Procedure: you mix together beer, a lump of malt, and oil;
- You recite the (above) incantation over it three times;
- You put it on his teeth.
- The colophon, indicating that this is an old text, reads as follows: “Copy of a long tablet, according to the wording of an old baked tablet belonging to Marduk- nadin- akhi; Nabu- nadin- ipri, descendant of Kudurranu, copied it.”<sup>[25]</sup>”

There were also barbers who treated tooth disorders and did extractions.



**Figure 7: The belief that tooth worm causes dental caries stubbornly clung to until the 18th century. An artist in southern France carved an ivory replica of a human molar tooth, about four inches high, which can be opened to reveal on the left a tooth worm devouring a man. On the right, the torment of toothache is equated with the tortures of hell.**

### **Public Health and Hygiene**

Today, in highly industrialized part of world each citizen is enveloped in a network of vital public health services (the organized efforts of the community to protect its members against diseases), which, although inconspicuous and often unappreciated, have helped to extend his average length of life about 20 to 30 years within the span of over a century. But circa 4000 BC in Mesopotamia and other parts of the world, water was not purified of typhoid and cholera bacteria and other disease- producing microorganisms. The milk was not pasteurized to destroy the germs of tuberculosis and undulant fever. Early in life, the Mesopotamians were not immunized against smallpox, diphtheria, whooping cough, plague, and other communicable diseases. There were no sewage- disposal systems, supervised by public health agencies to prevent the human wastes from becoming a source of infection<sup>26</sup>. Therefore, epidemics must have occurred often; the many wars and invasions were likely to foster pestilence. Frequently, plagues of some kind were reported in the cuneiform tablets of the eighth century B.C., and fevers, probably of varying causes, were mentioned frequently in the medical texts. The shaking chills which Alexander the Great suffered in his last illness while campaigning in Mesopotamia in the fourth century B.C. may have been due to malaria.

A sick person of any rank in Mesopotamia was in a special category and was excused from work and even from service to the king. On the other hand, since disease was caused by spirits having possessed the body, the afflicted person was shunned as much as possible to avoid transference of the offending demon. This relative isolation was hygienically beneficial to the community although its purpose was based on religious- magical reasoning. The taboo against touching the sick was carried over into Hebrew culture, where it became a key factor in a system of public hygiene- just one further example of Mesopotamia's long- lasting influence on contemporary and later cultures.<sup>[27]</sup> For instance, one of the earliest public health programs is detailed in the Biblical account of the Exodus of the Jews from Egypt. Moses introduced a strict hygienic code which included many principles observed in modern public health programs. The Jews were required to wash their hands before and after eating and to bathe before entering the synagogue.<sup>[28]</sup>

In Mesopotamia, it is clear from the letters from Mari (early second millennium) that measures were taken to try to control the spread of apparently contagious illnesses among the population. A number of letters refer to populations of whole villages being moved elsewhere, normally to higher ground. There was indeed a realization that some illnesses could be transmitted easily from one person to another, so, at least to some degree, there was isolation of the ill when their illnesses appeared to threaten the community. The following letter illustrates such a situation: "I have heard that the woman Nanna is ill with simmum disease, but she has (nevertheless) been in contact a great deal with the palace (servant women) and that she has infected many of the women around her. Give strict orders that no one drink from a cup she drinks from, that no one sit on a chair she sits on, and that no one sleep in a bed she sleeps in so that she does not infect (any more) of the many women around her. That simmum disease is (easily) caught!" Indeed, the chances of encountering infectious microorganisms or viruses must have been quite high in the close quarters of palace life.

Some illnesses which gave every appearance of being contagious were surely mycotoxicoses- illnesses caused by consumption of cereal crops contaminated by toxic molds (the toxins in these molds are unaffected by cooking and baking). The evidence is necessarily circumstantial, but it is surely significant that some texts mention illness affecting both humans and domestic animals, especially cattle. It is known that the livers of cattle are less able to process toxins than are the livers of sheep, and therefore it is not surprising that the texts specifically mention illnesses of cattle. Descriptions of the condition of sick bulls in

Mari letters are consistent with modern evidence concerning cattle poisoned by toxic molds, particularly when the poisons result in gangrene of the extremities.<sup>[29]</sup>

### Temple of Gula

Beyond the medical practitioners (ashipu and asu), there were other means of procuring health care. One of these alternative sources, the Temple of Gula which often envisioned in canine form, was one of the more significant gods of healing. While excavations of temples dedicated to Gula have not revealed signs that patients were housed at the temple while they were treated; these temples may have been sites for the diagnosis of illness. In his book *Illness and Health Care in the Ancient Near East: the Role of the Temple in Greece, Mesopotamia, and Israel*, Hector Avalos states that not only were the temples of Gula sites for the diagnosis of illness, but that these temples were also libraries that held many useful medical texts.

The primary center for health care was the home, as it was when the ashipu or asu were employed. The majority of health care was provided at the patient's own house, with the family acting as care givers in whatever capacity their lay knowledge afforded them. Outside of the home, other important sites for religious healing were nearby rivers. The Mesopotamian believed that the rivers had the power to carry away evil substances and forces that were causing the illness. Sometimes a small hut was set up for the afflicted person either near the home or the river to aid in the families centralization of home.<sup>[30]</sup>

In his "The History of Islamic Civilization", G. Zeidan writes medicine was one of the sciences that was founded by priests of Babylonia. They were the first people of the world who studied the knowledge of medical treatment. The methods they used were unique. They left patients on foot- pavement and roads, and those passer-bys who were inflicted with similar ailment and had succeeded in treating their illness, would voluntarily reveal their information. Chaldean priests would write such information on clay plates and hang them in the temples for the benefit of people. Obviously, they practiced medicine in this way.<sup>[31]</sup> Other nations including Arabs and Greeks followed Mesopotamian's medicine (Temples known as "asklepiea" were built to Asclepius, god of medicine, throughout the Greek world and sufferers spent the night at the temple and the next day described their dreams or visions of him to the temple priests, who gave them a advice.<sup>[32]</sup>

Herdotus (circa 484- circa 425), Greek historian, called the father of history whose travels took him to the coast of Asia Minor to the shores of the Black Sea and Skythia, to Phoenicia, Mesopotamia, and Egypt states: “They do not have physician, therefore, they leave their patients on side- walks and streets. When a passerby who has proper medical knowledge on the basis of personal experience or visiting similar cases, encounter these patients, he may give advice. Usually the passerby would stop beside the patient and advise him on the treatment that was successfully administered to him or someone he knew. Passing by the patient without stopping or being indifferent about the situation was not ethical and everybody had to converse with the patient and ask about the patient’s illness.<sup>[33]”</sup>

### **Beginning of Public Health Mentality**

In Assyria, another feature of their medicine was the beginning of a public- health mentality, produced by a strict code of religious ceremonial laws. A woman after childbirth was considered unclean and contaminated everything she touched. A similar impurity was attached to those who came in contact with corpses. These ideas are reflected in the earliest Persian medical works which we know, the surviving books of Zoroaster, and it is clear that the Persians, even before they conquered the Assyrians in 538 BC, had largely adopted the medical and sanitary ideas of their neighbors on the plains.

### **An Ideal in Babylonia**

To enjoy good health and to have contentment, to be viewed favorably by the gods and fellow humans and to enjoy a long life with one’s descendants were the ideal of Babylonians. A long life included having children who would provide funerary offerings after one’s death. A statement attributed to Adad- guppi to female diviner and the mother of the Babylonian last king Nabonidus (556-539 BC), telling of her long and contented life (which she attributed in part to her piety and zealous worship of the moon- god) illustrates the point: “He (the moon- god) added many days and years of happiness (to my life) and kept me alive... one hundred and four happy years. My eyesight was good (to the end), my hearing excellent, my hands and feet were sound, my words well chosen, food and drink agreed with me, my health was fine and my mind happy. I saw my great- great grandchildren, up to the fourth generation, in good health and (thus) had my fill of old age. (Translation by Oppenheim in James B. Pritchard, *Ancient Near Eastern Texts Relating to the Old Testament*, 3rd ed. 1969, p.561.)

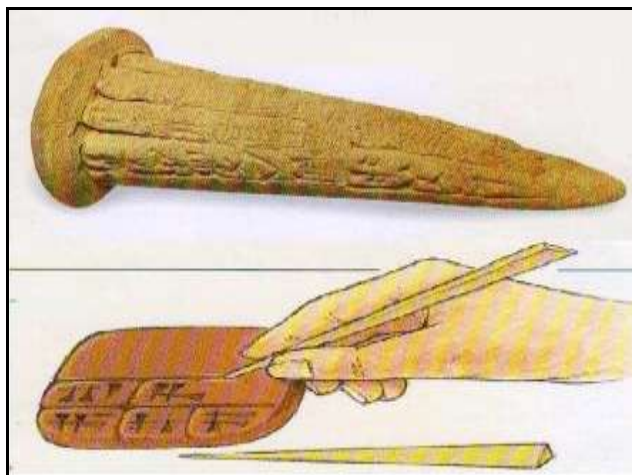
This quotation gives an indication of what approximated an ideal. In real life, however, there were many deviations from this ideal, and prayers seeking deliverance from troubles often enumerate some of them: crying spells, insomnia, nightmares, fears, inability to enjoy food or drink, sexual inadequacies, and so on.

One can assume from the medical texts that generally a person who considered himself ill was considered so by those around him. The symptoms described usually include those perceived by the patient, such as localized pain or itching, nausea, or the inability to get up and walk. In other cases, it is those around the ill person who perceive him to be ill, as when his behavior is irrational, he keeps forgetting what he has said, or he does not recognize people he knows.

It is probable that home remedies were administered in many cases, and these were most likely fairly simple traditional treatments, utilizing medications that did not carry any unusual risks. The various apothecary's inventories that have been preserved may indicate, however, that a good many of the most commonly utilized ingredients were readily available to whoever sought them. Whether or not a professional healer had prescribed them for a particular illness.<sup>[34]</sup>

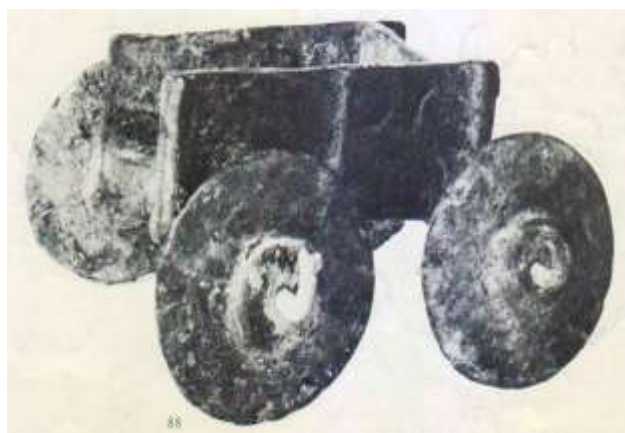
### **The highlights**

- Circa. 8000 BC, Trephining of the skull with use of stone tools practiced by Neolithic man.
- Circa. 5000 BC, First cities founded in Sumer, Western Asia. Also copper first used in Mesopotamia.
- Circa. 4000 BC, City of Eridu in Mesopotamia expanded.
- Circa. 4000 BC, Sumerian discovered the euphoric effect of the poppy plant.
- Circa. 3500 BC, City of Ur founded in Mesopotamia, and cuneiform script (wedge-shaped symbols) appeared in Sumer (cuneiform script was an adaptable form of writing and by a variety of peoples). (Figure 8)
- Circa. 3100, Byblos city founded on eastern Mediterranean coast.
- Circa. 3000 BC, Wheel appeared in Mesopotamia. (Figure 9)
- Circa. 2700 BC, King Gilgamesh reigned at Uruk in Sumer.
- Circa. 2300, Sargon II of Akkad dominated Sumer.
- Circa. 1700 BC, Hammurabi Commissioned the Code of Hammurabi.



**Figure 8: Cuneiform, tablet and pen. Cuneiform was complex, so it was usually only specially trained scribes who wrote on tablets.**

- Circa. 1100- C. 900, First Assyrian civilization of northern Mesopotamia declined.
- Circa. 721-704, Reign of the great King Sargon II in Assyria.
- Circa. 689, Sennacherib invaded Babylonia and sacked the city of Babylon.
- Circa. 1200- 500 BC, This period saw the rise and fall of the Assyrian Empire, while neighboring Babylonia enjoyed a few decade of rule over West Asia. This ended when Cyrus the Great of Persia (Iran) founded the Persian Empire and conquered Babylonia<sup>35</sup>.
- The medical evolution of the Babylonians began about 6000 years ago, nearly 4000 years before Greek medicine emerged. The cardinal feature of their system was a polytheism. Certain gods caused illness as a punishment for sin: other gods cured disease as a reward for goodness. The action of the gods upon man was direct; the action of man upon the gods was indirect, the intervention of a priest being required.



**Figure 9: Assyrian cart model (restored) of third millennium BC, indicating early use of wheel.**

- Like all other primitive peoples, it is probable that the early inhabitants of Mesopotamia (Iraq) and Persia looked to the priests to save them both from sin and disease. But it is notable that the Babylonians, as compared with their contemporary Egyptians, were from a medical point of view in a more advanced stage. Their priests appear to have been less powerful for they relied less on magic. They were more intellectual and without caste. It was even possible for a foreigner to enter the ranks of the priesthood. Moreover, the separation of spiritual and physical functions, that is between the priest and the physician, had already appeared among these early Babylonians.
- The conquest of the Babylonians by the Assyrians was a Gradual process, not a sudden and violent invasion. It is roughly true to say that the Assyrian supremacy over Mesopotamia was complete from 1270 to 538 B.C. Such medical views as the Babylonians had either inherited or evolved became the inheritance of the Assyrians. They, too, believed that health and disease were the gifts of the gods.<sup>[36]</sup>
- Whatever limited surgical procedures may have been undertaken- and these might have included cases of battle wounds or injuries sustained by being gored by a bull or a wild pig- they are not covered in the medical compendia. Such techniques as were used were probably learned in an apprentice relationship with a more experienced physician or developed in emergency situations. It is easy to believe that the infection rate in any surgical procedure must have been high and that serious surgical interventions were undertaken only in dire cases as a last resort. This is only speculation, however, for the ancient texts are silent on the question.
- A considerable number of medical texts deal with eye problems, surely reflecting the widespread occurrence of eye diseases in ancient Mesopotamia. The common Akkadian words for “blind” do not occur in the medical texts, however, and it does not appear that any treatments were attempted. Marten Stole has proposed that the rare term “sinlurmâ” (and variants) in medical texts is to be identified as both day blindness and night blindness. Because one of the principal causes of blindness in children is a deficiency of vitamin A, it seems likely that the disease xerophthalmia (one of whose early manifestations is night blindness) was widespread in ancient Mesopotamia, as it still is in many parts of the world where foods containing vitamin A are either unavailable or underutilized.
- There are also a number of texts that deal with problems of the ears, including earaches, ringing of the ears, and hearing loss (the word for “deaf” does not occur in the therapeutic

medical texts, however). One of the most frequently prescribed remedies for ear problems was the application of pomegranate juice, possibly considered effective because of its astringency.

- Many texts deal with gastrointestinal problems, as would be expected in a society in which there was water contamination, food contamination, inadequate food preservation, and other factors that encourage intestinal problems. Common problems are passing blood, rectal stricture, constipation, and flatulence. Such problems were treated by a variety of means, including suppositories and enemas. While it seems unlikely that there was much understanding of the liver's function, it appears to have been recognized that the gall bladder could be involved when jaundice (amurriqānu) occurred. Timothy Johns has suggested that the treatment of parasitic diseases is fundamental to the origin of human medicine. Indeed, many treatments in Mesopotamian medicine involving the gastrointestinal system may have been intended to control intestinal parasites. It seems likely that parasitic diseases such as bilharzia were endemic in southern Mesopotamia, but we cannot identify in the texts the treatments that were given to their various manifestations.
- Some texts appear to describe bladder or kidney stones, which, when passed, cause considerable pain and bleeding. Other texts mention incontinence in such phrases as "he keeps dribbling his urine and cannot hold it in." Such a case might be treated by introducing medication into the urethra through a bronze tube.
- As one might expect in the sunny, arid Mesopotamian climate, skin problems were very frequent, and a considerable number of medical texts reveal prescriptions for treating skin conditions. Diseases such as chicken pox (it is not certain that it existed in ancient Mesopotamia), one of whose manifestations is lesions on the skin, would have been treated as a skin problem. Because of the intense exposure to the sun, skin cancers may well have occurred, but there is no direct evidence. A protozoal infection such as leishmaniasis ("Baghdad boil") would also have been treated as a skin disease. Vegetable oils and the fat of various animals were often used for applications to the skin.
- Because of imprecision in the descriptions of symptoms in the medical texts, it would be difficult to distinguish specific examples that could be confidently identified as "heart attacks or strokes." An example, however, can be cited from a Mari letter in which it appears that a man was struck with a sudden attack and died immediately: "(He said)

There is something wrong with my foot. As soon as he said my foot, he said there is something wrong with my hand, and immediately he passed away.<sup>[37]</sup>”

- A study of the prescriptions of these ancient Assyrians shows that for the most part their physicians chose drugs which were the rarest and most difficult to obtain. Frequently they were revolting and their material disgusting. The theory underlying this choice was that just as the patient was nauseated by the sight and smell of the cure, so the evil spirit, which was the cause of the disease, would be disgusted with what was offered to him and would quit the diseased part. The natural corollary was that the more serious the disease the more nauseating should the remedy be. From this sprang the doctrine that like cures like, an homoeopathic theory which underlies all later Persian medicine.<sup>[38]</sup>
- The ancient Mesopotamians probably had knowledge of medicinal qualities of herbs, better the most of us today this knowledge has handed on through stories, songs and dances, and was buried in chants and rituals and became part of magical ceremonies. To a great extent they probably relied on magic to cure their ills, but they did have some practical knowledge of bones and anatomy, and were able to perform the very delicate operation on skulls to relieve the pressure on the brain.<sup>[39]</sup>
- Eyeglasses, although used in China prior to 13th century, but is not known whether eyeglasses were worn at that time to improve vision or to bring good fortune.<sup>[40]</sup> The first authentic mention of the use of lenses for reading was made by Meisner (1260-1280 AD). Centuries earlier than Meisner, polished crystal, excavated at Nineveh (ancient Assyrian city on the east bank of Tigris opposite the modern city of Mosul in Iraq, which began as a Neolithic settlement more than 5000 years ago), that may have been used as lens, considering high state of Mesopotamian science.<sup>[41]</sup> (Figure 10)



**Figure 10: Polished crystal, excavated at Nineveh, that may have been used as lens (piece of glass with one or more craved surfaces, for use in spectacles, camera, etc.)**

- Sheep liver, in Mesopotamia used as reference in divination and prognosis of illness while examining liver of sacrificed animal.<sup>[42]</sup> (Figure 11)



**Figure 11: Inscribed Babylonian clay model of sheep's liver (19th- 18 century BC).**

- The oldest known Sumerian medical handbook (c. 2200 BC), a collection of empiric prescriptions (Figure 12), indicates that medical treatment in Mesopotamia was not always religious or magical.<sup>[43]</sup> (Figure 12)
- Oannes, Babylonian god of mathematics and learning who is supposed to have risen from the Erythrean sea, had the body of a fish combined with a human head. He instructed men in the knowledge of writing and other sciences including medicine.<sup>[44]</sup> (Figure 13)



**Figure 12: The oldest known Sumerian medical handbook (c. 2200 BC).**

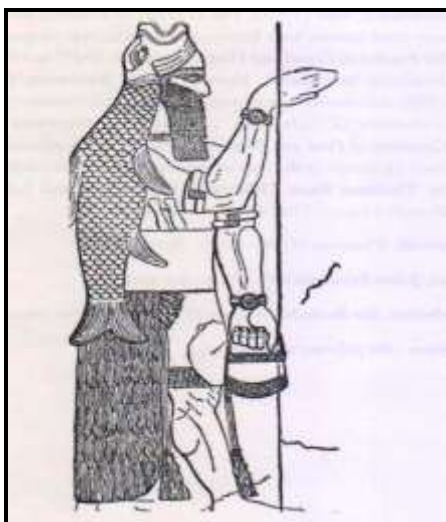
### Conclusion and Impact

Mesopotamian civilization and medicine, gives clear proof in various forms over more than three millennia, remained enormously within the traditions of herbal medicine such as has

been practiced in different parts of world. They probably had knowledge of medicinal qualities of medicinal herbs, better than the most of us today. The Chaldean, a late Babylonian people, under Nebuchadnezzar (reigned 605-562) who is noted for his restoration of Babylon including the creation of hanging gardens and the construction of the city's walls developed immense information on astronomy as well as concepts of astrology which were used in the medicine of Greco- Roman, Arabic, and during the Middle Ages (metallurgy, the wheel, the arch, and uniform weights and measures were also their innovations). A possible skull trephining has been unearthed, but no examples of trephined skulls have yet been found in this fertile land. However they have been uncovered in nearby Judea or Judaea (mountainous region around Jerusalem, west of Jordan River which became the center of Jewish life) that got its medical knowledge from the land of "between rivers" (Mesopotamia). There are evidences that Egyptians medicine might have been influenced by Mesopotamian's medical practices, but ancient Greek medicine almost had no significant root.

Similarities between some laws in Pentateuch (first five books of the Bible) and those of the Code of Hammurabi led to the idea of direct borrowing by Moses, Biblical Hebrew leader.

Touching the sick that was forbidden in Mesopotamia, because of strong religious or social, and or medical customs carried over into Hebrew's intellectual development of health and medical practices, has become a key factor in a system of public health, is just another example of Mesopotamian's long- lasting impact on contemporary and later cultures. Other example can be the beneficial effects of some common products, such as wine and honey today are well- known and have been demonstrated in modern experiments.



**Figure 13: Oannes, Babylonian god of Mathematic and learning.**

Mesopotamians (Sumerians, Babylonian, and Assyrians) transferred their findings including a curious mixture of gods, magic, and scientific observations to their neighbors not only in their own time but also in subsequent centuries. Hebrew Greek, Christian and Islamic culture owe many of debts to the civilization and medicine of Mesopotamia

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