FACULTY OF ARTS AND PHILOSOPHY

Mesopotamian Medicine in Practice: when Archaeology meets Philology

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Samenvatting

In deze thesis werd er onderzocht hoe de praktische kant van de geneeskunde in het Oude Nabije Oosten in zijn werk ging. Er wordt vooral gefocust op de wetenschappelijke aanpak. Een groot deel van deze thesis zal besteed worden aan de geneesheren.

De belangrijkste artsen waren de *asû* en *āšipu*. De *asû* kan vergeleken worden met een dokter in onze hedendaagse definitie. Niet alleen beoefende hij de relationele kant van de geneeskunde maar hij had ook een uitgebreide kennis van anatomie, chirurgie en plantkunde waardoor hij dus ook deels aanzien kan worden als apotheker. Zijn collega, de *āšipu*, beoefende een andere kant van de geneeskunde en hield zich vooral bezig met het magische. Hij voerde rituelen uit om ruimtes te zuiveren en om patiënten te genezen van ziektes die veroorzaakt werden door hogere machten. Uit deze thesis zal blijken dat zowel de *asû* als *āšipu* hoogstwaarschijnlijk dezelfde wetenschappelijke basis kregen in hun opleiding.

Er zal in deze thesis eveneens nagegaan worden of de medische praktijken ook toegepast werden in de tempel en of we deze kunnen vergelijken met deze uit de Griekse wereld. Hierbij wordt er in detail ingegaan op de Gula tempel te Isin. Architecturale elementen en bijzondere structuren en vondsten zullen hierbij belicht worden om zo de hypothese van tempelgeneeskunde trachten te bewijzen. Verder zal er ook ingegaan worden op de vraag hoe de praktische kant van de geneeskunde georganiseerd werd in de maatschappij, waarbij het paleis een belangrijke rol speelde. Bijzondere objecten zoals zegels en aardewerk zullen eveneens besproken worden. Niet alleen de tempel speelde een rol in de organisatie van gezondheidszorg. Een case studie over het paleis in Ebla toont aan dat het paleis een rol speelde in de verdeling van medicijnen voor het volk.

Uit dit onderzoek kan er geconcludeerd worden dat de geneeskunde in het Oude Nabije Oosten een zeer sterke wetenschappelijke basis had, wat een voorbeeld moet geweest zijn voor de volgende beschavingen.

Abstract

This dissertation will investigate the practical side of medicine in the Ancient Near East. The focus lies on the scientific procedures as opposed to the magical and ritual side. A large part of this dissertation will include the practitioner. The most important healers were the *asû* and *āšipu*. The *asû* can be compared with a doctor. He practiced the rational side of medicine and had knowledge of anatomy, surgery and botany. Therefore, he can be seen as an apothecary as

well. His colleague was the *āšipu*. This healer practiced the more ritual side of medicine. He performed rituals to cleanse houses but also people who were struck by disease inflicted by ghosts. This dissertation will give a new interpretation on these two healers which suggests that both had the same training and that social status was an important factor if someone wanted to be an *āšipu*.

Another part of this dissertation will focus on the matter of temple medicine. I will investigate if this was practiced in the Ancient Near East and if it is comparable with the temple medicine practiced in the Greek world. This question will be approached by a discussion of the excavations done on the Gula temple in Isin. Architectural features and special elements and objects, such as ceramics, show that there is a possibility that temple medicine was practiced.

Not only the temple played a part in the organization of health care, but so did the palace. A case study from the palace in Ebla shows that the palace probably had a role in the distribution of medicine and drugs to its people.

From this dissertation we can conclude that the practice of medicine had a very strong scientific foundation and it was probably an example for later cultures throughout history.

Key words: Mesopotamia, medicine, healers, archaeology, philology.

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List of Abbreviations

AbB: Altbabyolonische Briefe in Umschrift und Übersetzung (Leiden 1964 ff.).

AMT: Assyrian Medical Texts in Thompson 1923.

AEM: Archives épistolaires de Mari (Paris 1988 ff.).

ADD: Assyrian Deeds and Documents (Cambridge 1898 – 1923).

AOAT: Alter Orient und Altes Testament. Kevelaer-Neukirchen-Vluyn 1969 ff.

ARMT: Archives Royales de Mari, traduction (Paris 1950 ff.).

BAM: Babylonisch-Assyrische Medizin, in Köcher 1963.

CAD: The Assyrian Dictionary of the Oriental Institute of the University of Chicago.

CT: Cuneiform Texts from Babylonian Tablets in the British Musuem (London 1896 ff.).

K: Museum siglum of the British Museum in London (Kuyunjik).

KMI: Keilschrifttexte medicinischen Inhalts, in Ebeling 1922 – 1923.

SAA: State Archives of Assyria (Helsinki 1987 ff.).

TDP: Traité Akkadien de Diagnostics et Pronostics Médicaux, in Labat 1951.

TM: Topographische Karte von Urartu, in Kless, Hatuptmann 1976.

1 Introduction

The concept of health is quite difficult to comprehend in the Mesopotamian society since scholars of their time did not leave any commentaries or treatises. This is especially the case for the field of medicine. No definition of health, sickness or treatment has been found until this day on clay tablets. Therefore, Assyriologists focus primarily on data from therapeutic and diagnostic texts or other non-medical written sources (Fales 2014, 6).

What is often forgotten in this field of research is the importance of archaeology and how buildings and objects, how little in number they may seem, could benefit our understanding of health care in the Mesopotamian world.

Avalos was with his "Illness and Health Care in the Ancient Near East" (1995) the first to give an interpretation of temple medicine in Mesopotamia. A substantial part of this dissertation will be dealing with the question if there was a practice of temple medicine as we know in the Greek world.

1.1 Research question

The research questions that will be addressed in this dissertation are the following:

"Is there a scientific approach to medicine and on what scale was it practiced?"

"Was there a practice of temple medicine, and is it comparable with the temple practice as we know in the Greek world?"

The aim of this dissertation is to combine written and archaeological sources in order to make an assessment of the scientific approach to medicine and health care in Mesopotamia. In the past much has been written on how the people of the Ancient Near East approached their health care and how they dealt with sickness. However, the archaeological evidence is only rarely integrated in these studies. By combining these aspects, we have noticed several similarities with the cult of Asclepius and thus with the Greek world. Moreover, some of the sources are in need of a new interpretation on the practice of medicine, this interpretation will be explained later in this dissertation.

Part one of this dissertation will address the methodology and which sources were used for the production of this dissertation. Further, the approach to medicine and health care in the Ancient

Near East will be discussed and a *status quaestionis* on the topic will be given. Part two gives a general overview of the medical staff and some interesting case studies on the life of two healers. Part three focusses on the archaeological sources such as the Gula temple and the Asclepeia. Objects, medical instruments, *materia magica* and ceramics will be incorporated in this part. Part four addresses the role of the palace and the general practice of medicine. The last part of this dissertation will be the conclusion.

1.2 Methodology

The sources used for this dissertation can be divided into two major groups, consisting of written sources and archaeological sources. The written sources include several personal and administrative letters. However, the medical corpus which was assembled by the practitioners of medicine of their time over the course of several millennia, is still the largest among this group. Translations of these texts and commentaries by modern Assyriologists were analyzed with a critical view. A *status quaestionis* has been given on the subjects of health care, the practitioners and other medical related matters in the Ancient Near East.

1.2.1 Written sources

We have to take into account that all found text material only represents a fraction of the original text corpus. The largest amount of texts was found in two important cities: Assur and Niniveh.

These tablets date from the end of the second millennium until 612 B.C. Very few date from the second half of the first millennium. There are two tablets which can be dated back to the Ur III period (2110 – 2003 B.C). This means that medicine was already practiced and recorded in the third millennium and that these tablets, and thus medical knowledge, were carefully copied during several centuries and even millennia (Prioreschi 1996, 388-389; Foster 1994, 231).

What is important to keep in mind is that tablets have been destroyed in antiquity, are scattered and some still have to be published and catalogued (Scurlock, Andersen 2005). Therefore, only a fraction of the material can be studied which is why it is often difficult to make a clear interpretation of the medical practitioners when only a little of information is at hand. Scholars of today often use one specific type of source and this is where differences in judgments originate.

Often, scholars limit themselves to one text genre when investigating Mesopotamian medicine. Some only use uses the medical corpus, such as the prescriptions written by the practitioners in

Mesopotamia, while another group limits themselves to private letters, for example contracts of purchase. A third groups bases their analysis only on the study of hymns and so on. This is why the distinction between practitioners is difficult to comprehend this day and this means that researchers are biased according to which source they use (Couto-Ferreira 2013, 407).

Figure 1: Mesopotamia around 1200 BC., which show the location of Assur and Niniveh © Ian Mladjov.

1.2.2 Medical corpus

The practitioners were called *asû* and *āšipu* and they used catalogues and medical texts. The catalogues were several lists which had prescriptions for certain diseases. The medical texts used by the *asû* and *āšipu* can be divided in three major groups: the first one consists of symptoms and diseases and their respective prognosis and are prognostic-diagnostic. They give a set of symptoms following the recovery or death of the patient and are considered to be magical and religious. The second group consists of therapeutic or recipe texts which give more detailed information about preparing a remedy. The ingredients most used in these texts are medicinal plants such as *anḫullû*.

There is a standard formula to these texts which often begins with “if the patient’s (body part) is (symptom) you prepare x ingredients” followed by the prescription on how to use said mixture.” (Biggs 2005, 4). The third and last group of tablets mainly consists of pharmaceutical content. An example can be plant descriptions, these texts mention several simple drugs. One of the most important pharma logical lists which was probably used by the *asû*, is the *šammu šikinšu* or the nature of plants. In this series of tablets a specific order is used. These texts always start where the plant can be found, then a comparison with other plants, the name of the plant and at last for which disease it was used and how (Scurlock 2014, 281).

We can conclude that most of the texts from antiquity were organized thematically. They were standardized over several millennia and reached their highlight in the first millennium (Böck 2006, 105-106).

The following paragraphs will give an overview of the magical corpus as it is classified today. The most important works are quoted and a short explanation of their content is given.

Magical texts including diagnostic omens, were mostly used by the *āšipu* (Scurlock 1999, 69). These texts (group one, cfr. supra) are collected by René Labat in *Traité Akkadien de diagnostics et pronostrics médicaux* (TDP) and are now known as the Diagnostic and Prognostic Series. This series is mostly published by Scurlock regarding the ghost induced illnesses (Scurlock 2006) and by Heeßel in his *Babylonisch-assyrische Diagnostik* (AOAT 43). Additional information about ghost induced illnesses is published in the work of Scurlock and Andersen: *Diagnoses in Assyrian and Babylonian Medicine*. The Assyrian medical texts of Niniveh (AMT) were collected by Thompson in 1923 and a parallel publication, *Keilschrifttexte medicinischen Inhalts* (KMI), was made in the same year by Ebeling of the Assur series (Thompson 1923; Ebeling 1923).

The series considered for *asû*, the so-called therapeutic or recipe texts, are now published into six volumes. These series were mostly found in Assur and Niniveh, where some of the tablets in Assur were copies of the ones found in Niniveh (group two, cfr. supra). Later on, after new studies and joins of tablets, an updated version was given by Köcher in 1963 in *Die Babylonisch-Assyrische Medizin in Texten und Untersuchungen* (BAM) (Köcher 1963; Foster 1994, 231). (Scurlock 1999, 69; Böck 2006, 105-106; Kocher 1963).

The more recent published articles and books focus more on specific diseases and subjects regarding medicine. Important researchers for the more specific diseases are Stol with his

Epilepsy in Babylonia; Medizin in the Reallexikon der Assyriologie (7: 623-629) and Geller with “Renal and rectal diseases”.

The large canonical series, such as the ones published in BAM, AMT and TDP, are very important to get an understanding on how medicine worked in general in ancient times. However, other written sources cannot be forgotten. Personal archives and archives of temples and palaces may offer more information about the personal life of healers.

These works show that there is a separation in content. The rational treatment is considered for the *asû* and is explained in several BAM texts such as the recipe text BAM 9 line 55 where it is said that “when you want to cure a persistent attack of a ghost, which the *āšipu* was not able to cure, you have to do…” This also occurs in the opposite direction, with the *āšipu* taking over the case from the a*sû* (Scurlock 1999, 70). As visible in certain BAM texts, where a more ‘rational’ treatment is recommended, the *āšipu* is not explicitly mentioned, but implied by the use of the second person singular, since the specialist who has to act after the failure of the *asû* to cure the disease (Scurlock 1999, 71).

The separation of the corpus is somewhat artificial. This is a current problem since the distinction between ‘magic’ and ‘medicine’ in Mesopotamia is difficult to make. In most medical texts the reader has to guess which specialist is meant in any given context (Scurlock 1999, 70). In reality, the separation of these two professions in antiquity was probably clear to everyone. Today several interpretations arise. Scurlock concludes that the two specific skills were combined to treat illnesses in Mesopotamia, as the professions of physicians and pharmacists are still combined today (Scurlock 1999, 79; Geller 2018, 259).

1.2.3 Archaeological sources

The other sources which were used for this dissertation are objects from archaeological excavations and buildings or parts of buildings which have been excavated. The temple of Gula located in Isin is of key importance for this dissertation since there is a possibility that temple medicine was practiced in this temple. The excavation reports of the archaeological project conducted in the seventies and eighties were carefully studied and a new interpretation was given where needed. Remarkable structures and finds are discussed below. A comparison was made with the temples of Asclepius, god of medicine.

Case studies and other archaeological reports, such as the ones from Nippur and Ebla, were used as well. For example, marks on human or animal bone material can be telltale signs of

surgical practice, examples will be discussed below. Of course, the primary objects of interest for any medical study are the surgical instruments. Several instruments like spatulas, tweezers and even scalpels have been found in several places and are shown below. Herbs, salves and other fluids which were helpful for the practitioners and had to be stored in vessels and jars which have been recovered. For example, several jars with inscriptions mentioning its content have been found. One particular interesting case for the storage of medical salves and herbs is known from the palace situated in Ebla (10.1). Less evident objects have to be taken into account as well, such as amulets and seals. Seals are important for their iconography and some healers are known because of their seals. Some show scenes where patients are treated. They benefit the reconstruction of how the process worked when the *asû* or *āšipu* visited or were visited by their patients. Amulets and seals are all part of the *materia magica* (cfr. chapter 6). Although they do not often make their way into the archaeological record, because a large part of them were made out of organic material or recycled in ancient times, some of them survived. The *materia magica* was seen as a viable form of medicine, which could be as equally effective as real medication, such as herbs or salves.

2 The approach to medicine and health care in the Ancient Near East

2.1 A Status Quaestionis

2.1.1 Religion vs. science

An important aspect in the study of medicine that scholars and researchers of today need to be aware of, is the difference – or rather absence thereof - between religion, magic and the scientific approach to medicine that was practiced in the Ancient Near East. Things that are now seen as ritualistic or magical were in ancient times maybe approached with a different and scientific background. Examples of this will be given later on in this dissertation. There have been two angles to the study of Mesopotamian medicine. Some researchers believe in a more religious and magical approach to medicine and others who focus more on the scientific side. This dissertation will focus more on the scientific approach of medicine. Although religion and magic was an inseparable part of society, the Mesopotamian people were pioneers when it comes to culture, astronomy, writing and science. Therefore, I believe that medicine was in a much more advanced and scientific stadium than most people believe or interpret.

Medicine was a process of trial and error which was written down by the physicians. Some prescriptions and treatments were written down far more poetic and religious or magical. Researchers interpret this often too literally and do not mention or think of the science behind the process. However, the magical and religious part cannot be forgotten or denied. The Mesopotamian society was deeply religious and this religion played a role in every aspect of life. The religious and magical side is shown mostly by the use of the *materia magica* which will be explained in the last chapter of this dissertation. A similar practice even exists in modern society. If a patient gets sick and is (very) religious, he or she will pray to his or her god and ask for healing and maybe for forgiveness. Some of them will seek medical help if they do not see results after prayer. If they were given treatment and were healed they would thank both their god and the doctors.

An example of a treatment where the process is written down in a poetic way is the case for a prescription for the NAM.BUR$_2$.BI disease where someone has been struck by a ghost. The treatment for this particular disease requires treatment by the application of a salve according to the practitioners. Some of the prescriptions state that the process of making this salve requires

an overnight wait or a longer time. As the texts states: the salve has to be put "under the stars" and this is where confusion arises. An interpretation could be that this is only a magical process and that the stars or gods infused the salve with their powers. Some people probably did believe in their time that the salve only worked because of that, and the gods were probably given credit if the treatment worked. However, this prescription is only given when a salve was made using water or oil. Attestations of the same process are absent when the salve includes beer or wine (Scurlock 2006, 21). The overnight wait was necessary so that the ingredients were fully incorporated and melded into the salve. The reason for placing the mixture under the stars has thus a simple scientific reason. Physicians of their time knew that the salve needed time to be fully melded and were certainly aware of the scientific approach they needed the follow. Specific instructions were given when it came to time and the exact moment for using medicine (Scurlock 2006, 21-22). If they did not follow the exact steps, things would go wrong and this was not the fault of higher powers.

2.2 The full picture of healing: The different uses of the *Anḫullû* plant, protector of Marduk[1]

A comprehensive description on how the actual practice worked is sometimes difficult to find and understand, but the following text is one of the most complete examples. It gives a general overview how patients were treated.

In the course of the excavation of Niniveh by the British Museum in the 19th century, four manuscripts were found. These manuscripts consist of five fragments (K 163 + 218 + 15538 + 15430 + 20155). Three other similar tablets have been found, two in the same library and one in Assur. All fragments date from the 7th-8th century B.C. (Abusch, Schwemer 2016, 231).

In these fragments the complete healing process of a patient is explained. What makes this tablet interesting is that both rituals and the scientific approach are described. The text consists of 120 lines (Abusch, Schwemer 2016, 230 - 246). The first line describes the purpose: "So that hate-magic, distortion-of-justice magic, cutting-of-the-throat magic, (and) confusion not approach a man (Abusch, Schwemer 2016, 240)." After the purpose an explanation is given how the ritual should be performed. The ritual has to take place at night, the roof has to be swiped, and pure water has to be placed on an altar dedicated to Marduk (Abusch, Schwemer 2016, 240).

[1] Some of the names of plants and diseases are written with their Akkadian name, the reason why, is that scholars of today have not yet determined what the species of plants are, or do not know a modern term for the disease.

Incantations have to be recited and a lot of instructions are given on the next lines of the tablet. One of the objects that has to be made is a necklace and two salves. The first salve is made of different ingredients which are mixed with oil. Afterwards they are placed at the altar of Marduk (Abusch, Schwemer 2016, 230). For the second salve *anḫullû* is used, a medicinal plant that was very effective against witchcraft. The plant is until this day unidentified (Abusch, Schwemer 2016, 508). When the salves were made and placed on the altar, another incantation had to be recited with help of the practitioner (Abusch, Schwemer 2016, 230). After the incantation the salve is applied to the patient. The next step in the process is to make the necklace and recite incantations on it (Scurlock 2006, 25). The necklace consisted of four parts where *anḫullû* is used. The four parts could be included as some kind of knot. Alabaster, gold, lapis lazuli and *mēsu*-wood is used and had to be strung on a thread of flax (Abusch, Schwemer 2016, 243). The disease was caused by witchcraft and is attested as "horrible disease" and where the patient is "clad in his illness as in a garment", it is possible that this description fits a skin-disease (Abusch, Schwemer 2016, 230). Abusch' and Schwemers interpretation can be proven by comparing this text with another one (BAM 6 580) where the same rites are used. The disease mentioned in BAM 6 580 is caused by the commitment of a sin and is punished by Sîn, the moon god. It is a more or less standardized curse which causes the *saharšubbû* sickness.
Other authors like Stol interpreted the disease as a form of leprosy (Stol 1993, 128). Biggs addresses this and explains that it is unlikely that leprosy already occurred in the Ancient Near East. There is evidence that leprosy occurred with certainty in Palestine during the Byzantine period, which is much later than the 7^{th} – 8^{th} century B. C. (Biggs 1995, 1917).

This text gives a general overview how health care could be practiced in the Ancient Near East. The location of the process is not specified, but it that a healer/doctor is involved, namely the *asû* or *āšipu* (cfr. Infra). Both *materia magica* (cfr. Infra) (necklace) and medicine (salves) are used. It is clear that the surrounding area had to be clean as it is stated that the "roof has to be swiped" and "pure water" had to be used. The disease is said to be caused by a ghost but there were real medicines involved. Rituals and a scientific approach to treat illness go hand in hand as we learn from several texts such as the one explained above. Rituals seem to make up the majority of treatments according to the written sources, such as incantations. This is because of several reasons. The first one is that the material record, with the exclusion of cuneiform tablets, is far less visible than written sources. Medical instruments are attested but they are rarely found in archaeological context. Salves, herbs and other mixtures which were used on the patient do

not find their way into the archaeological record while parts of the *materia magica* and written sources do.

2.3 *asû* and *āšipu*

Medical practice seems to be conducted mainly by two different specialists, the *asû* and *āšipu*. Both are very important since they are the main practitioners of medicine. Though, there is a difference and a distinction between them. The distinction between the two professions of *asû* and *āšipu* is difficult to make and has been the point of academic discussion for the last decades. There is a duality that has been recognized by both Assyriologists and medical historians (Ritter 1965, 299; Couto-Ferreira 2013, 406). In an article written by Ritter, she argued that the *āšipu* is considered the exorcist while the *asû* is the physician (Ritter 1965, 299; Geller 2018, 259). Therefore, she makes a distinction between magic and medicine and irrationality vs. rationality (Ritter 1965, 299 – 322; Heeßel 2009, 13). Because of new insights and paradigmatic shifts a new study on the *asû* and *āšipu*, and thus a revision on Ritter's work was necessary (Heeßel 2009, 13). The distinction between the two professions however is not that easy to make as will be explained further below.

Ritter was the first one to discover two professions that were connected to healing and medicine in the Ancient Near East (Ritter 1965). Biggs rejected Ritter's distinction as he said that there is no such thing as a distinction between magic and medicine in ancient Mesopotamia (Biggs 2005). Von Soden describes the *asû* as a water or fluid expert because the word in Sumerian is azu or A.ZU  which was often interpreted as "the one who knows the water". Other readings of *asû* are a-zu$_5$  and azu  (Von Soden 1994, 163; Attinger 2008, 72).

This dissertation will focus mainly on to the *asû* and *āšipu* although other practitioners have to be taken into account such as the *bārû* and *gallābu* (cfr. Infra). Scurlock mixes the roles of the *asû* and *āšipu* on a certain level and minimizes the work of the *asû* but she emphasizes their teamwork (Scurlock, Andersen 2005; Scurlock 1999; Geller 2018, 259; Couto-Ferreira 2013, 406). She argues that the *asû* is more of a pharmacist while the *āšipu* can be seen as a diagnostician (Scurlock 1999, 78). According to Avalos the *asû* can be seen as a combination of a pharmacist and a nurse in today's definition (Avalos 1995, 167).

According to Scurlock it was only the *āšipu* who used incantations and associated rituals. Therefore, he was the one that practiced the magical/religious side of medicine, while the *asû* used medical prescriptions which consisted of several pharmacological ingredients (Geller 2018, 259-260). Scurlock translated the word MAŠ.MAŠ-*ti* as "medicine" (Scurlock, Andersen 2005, 456). However, the correct translation is 'exorcism'. The most accepted definition of the *asû* is a person who uses medicinal plants and surgery to help a patient. Hence, he can be seen as a doctor, pharmacist or physician (Geller 2010, 44; Geller 2018, 259; Couto-Ferreira 2013, 406; Böck 2006, 109; Biggs 2005).

The *āšipu*, written as MAŠ.MAŠ  practiced the *āšiputu* or *mašmaššūtu* which is the art of exorcism (not medicine as Scurlock translated) and the *asû* practiced the *asûtu* or the art of healing (Geller 2018).

By their names a distinction can be made but some confusion arises from the repertoire of the *asû*. He should have had his own incantation corpus which was different from the corpus of the *āšipu* (Geller 2018, 259-260). This can be textually proven by a hymn of Gula, a healing deity (cfr. Infra), where the goddess describes herself as a great physician or *azugallatu* and where it is written that "she is a physician who can heal, who uses healing herbs and drives away disease and has a leather bag containing health-giving incantations" (Biggs 2005, 10, Charpin 2017, 2). In the hymn, it is not stated that the *asû* used surgery of any kind on patients. Another aspect that renders the distinction (unnecessarily) complicated is the fact that the practitioner in the medical text corpus is often described by the second person singular, in an instructional manner addressing the healing. The general conclusion is that the *asû* practiced the art of healing and was probably part of a group who focused on the scientific approach to medicine. They were probably connected to the healing cult of Gula (cfr. Infra). The *āšipu* focused on the magical/religious side of medicine and had a higher status in society than the *asû* since he belonged to the temple personnel. His responsibilities included the cleansing of houses, temples, palaces and other official duties which were connected to his profession (Couto-Ferreira 2013, 407).

2.4 Temple medicine

In several sources from the Greek world we know that temple medicine was practiced. Yet, we cannot speak of a hospital in the modern sense of the word but it served more likely as a spa which was often situated in the area around or in the temple. In the text (cfr. 2.2) given above

it is stated that the “roof had to be swiped” and that “pure water” had to be used, a place is not mentioned, can we therefor speak of temple medicine in the Mesopotamian world?

With his book “Illness and Health Care in the Ancient Near East” (1995), Avalos was the first to give an interpretation of temple medicine in Mesopotamia. He concludes that the temple had three functions and that we could not speak of actual temple medicine that was practiced in Mesopotamia because of the lack of evidence.

Recently, Charpin addressed the topic again and substantiated his hypothesis that medical practice was conducted in the Gula temple with convincing evidence, which will be presented below (Charpin 2017).

3 Medical personnel

In the next chapter a general introduction is given for the professions regarding the practice of medicine. There is a focus on the *asû* and *āšipu* since these practitioners are most frequently attested and had a prominent role in society regarding health care.

It is important to discuss the medical personnel in this dissertation because the study of these people is essential for the reconstruction of the general practice of medicine. Letters and other documents about their personal life and personal objects, could give us more information how they dealt with their profession and how they approached it. Did each of them include ritual and magic in their practice, did they follow a purely only the scientific approach or a mix of both? More information on these healers will be discussed in chapter four.

3.1 The *asû* and *āšipu*

The *asû* and *āšipu* dedicated most of their lives to healing people in a scientific and magical/religious way, although there were no modern techniques available to diagnose and cure a patient. Most of these healers and diviners had a religious background (Goff 1956, 19). Because of their experience, they knew what would work and what would fail. Most of the disease and misfortune was believed to be connected to magic and was caused by the bad behavior of demons, gods and people. In general, the physicians did not address the cause in their treatment, but only reacted symptomatically. Patients were treated with herbs, salves, stones, amulets, incantations and even (primitive?) surgery (Goff 1956, 19). We can be certain that the practitioners had knowledge of certain infections, contaminations and patterns of certain illnesses (Scurlock, Andersen 2006, 21; 549; Biggs 2005, 16). According to Scurlock the same scientific approach to medicine and healing only reached the same level in the western world at the end of the 19th century (Scurlock, Andersen 2005, 87).

3.2 Other practitioners

Other practitioners of medicine and health care should be taken into account if we want to give a complete overview of who practiced medicine in ancient Mesopotamia. Most of the authors such as Scurlock, Böck and Biggs focus only on the *asû* and *āšipu* while there are more people involved in the process of health care. Of course we need to consider the “at home remedies” which everyone knew and which were used just like we use them today. These remedies are

mostly passed on in an oral tradition since every class in the society used it and there was no necessity to write these remedies down.

Only the prescriptions used for people who could pay for a more decent and professional health care were written down. Texts mention the *bārû* or 'diviner' but also the *gallābu* or 'barber'.

The barber practiced surgery especially on slaves; a paragraph in the code of Hammurabi mentions the penalty when he fails an 'operation' (Code Hammurabi 226: 'If a barber shaved off the mark of a slave without an owner (and) not his own, they shall cut off that barber's hand'). The surgery he practiced was mostly surgery involving the branding and shaving/grooming of slaves (Geller 2010, 60-61). Because the *gallābu* mostly dealt with slaves he was cheaper than a regular *asû*. His position in the Mesopotamian society was lower than the *asû* or *āšipu*. Tooth decay and other diseases connected with teeth were treated by the *gallābu* as well (Spiegel, Springer 1997, 73).

Stol was one of the first researchers to take another profession into account: the *bārû*, who was another "diviner" comparable to the *asû* and the *āšipu* according to him (Stol 1993, 56-57). The *bārû* practiced the *bārûtu* or art of divination (Geller 2018, 259). This means that the *bārû* used animal intestines to determine the future of the patient's fate. Most importantly, he could tell how long the disease would last and sometimes what the outcome would be (Biggs 2005, 13; Stol 1993, 56-57). If a patient had doubt about his disease he could ask the *bārû* what he should do and where he should go, to the *asû* or *āšipu* or sanctuary of a certain god (*aširta šite''û*). The *aširta šite''û* is mentioned in BAM 3 line 318 III 39 where it is written that "he will enter the sanctuary (E2 DINGIR = *aširtu*) and sooth the wrath of the god" (Stol 1993, 57).

It could have been that he examined patients, but we do not know this with certainty. There is an inscription that describes how a patient had to blow into the nose of a sheep. This animal was then sacrificed and examined if the intestines had certain abnormalities. Depending the kind of abnormality the *bārû* told the patients what he or she should do and how long the disease would last (Spiegel, Springer 1997, 73). For this dissertation we will now focus more on the *asû* and *āšipu* and especially their training.

3.2.1 *Mašmaššu*

The profession of *mašmaššu* is according to scholars the same as the profession of *āšipu*. Is this really the case or is the *mašmaššu* a specialized profession? If we take a look at the word *mašmaššu* in the CAD, the translation is exorcist, which is the same translation for *āšipu*. This

does not have to mean anything since the volumes A and M of the CAD are now outdated. However, it is quite remarkable why the Mesopotamians would use two different words for the same profession, and that when the words were analyzed by modern scholars, no one posed the question if this was a coincidence or if there was something more to it.

In texts of the first millennium we often see (lu_2)maš.maš  and this is the most used term for exorcist. The word is derived from a Sumerian equivalent. For Assyriologists, this logogram creates confusion, since there is doubt on how to translate this word, to *mašmaššu* or *āšipu* (Geller 2010, 49; Jean 2006, 22). Sometimes the syllabic form is used: *a – ši – pu* but far less than (lu_2)maš.maš (Jean 2006, 23). In that case we know for certain that the *āšipu* is meant. Geller suggests that both professions are different but then we should find both names on documents. There has no document found until this day that list both names (Geller 2010, 49). This could be of course a coincidence. We do know from Neo-Assyrian letters that the *mašmaššu* practiced the *āšipūtu* but in other texts they practiced the *mašmaššūtu* (Geller 2010, 49).

Maybe the difference is only in the translation of (lu_2)maš.maš. Scribes have different writing styles, one uses the Sumerian equivalent, the other scribe uses the Akkadian syllabic form. In formal letters it could be better to use the Sumerian equivalent to show of the scribe his or her knowledge of the Sumerian language. In other documents the syllabic form of *āšipu* could be used, but eventually they mean the same thing. The same example can be made with LUGAL which is the Sumerian equivalent for *šarrum* which means for both words king.

Geller suggests that the *mašmaššu* is a special category and that *mašmaššu* derives from the actual parlance of practice and everyday life (Geller 2010, 50). We know other categories of professions such as the "plant-grower" or šim.mu_2, or the one that is responsible for the mouth-washing rituals (ka.pirig). Yet, they are called *āšipu* but with their additional skills.

Therefore, I believe that the word *mašmaššu* is just another reading for *āšipu*. Jean is also convinced that the two words are synonyms (Jean 2006, 22).

To not overcomplicate things, the word *āšipu* will be used for the rest of this dissertation because this is how most scholars address and translate (lu_2)maš.maš. The term *mašmaššu* however will be mentioned and discussed again in a case study in 4.2.

3.3 Training

It is assumed that the *asû* should have had a training, where he had to learn several treatments by heart and add new findings to the catalogues (Spiegel, Springer 1997, 73). He treated patients using several plants and even stones and made a diagnosis by listening to patients explaining their symptoms. After stating diagnose and symptoms he treated them accordingly with medicine or surgery[2] (Spiegel, Springer 1997, 74; Geller 2010, 44; Böck 2006, 109). It makes sense that he had to learn several procedures. According to Biggs 2005, 11, the student-teacher relationship was not proven to exist considering the lack of evidence for it. However, more recent discoveries prove that medical schools existed as the one in Assur (Fales 2016, 21; Geller 2007). In the text AO 11447, translated first by Labat and later on by Geller, similarities are shown with other texts. AO 11447 is written by a scribe student, Šulgi-enu, who is identified in the text as the *šandappû* or son of Urad-Nanaya. This man is known to scholars today, because he has written several letters to the king Esarhaddon. Urad-Nanaya was known as the great *asû* of Assur. The strange thing is that Šulgi-enu is the "son" of several other scribes known in Assur. In general cases the word *māru* is used for son, in this case the meaning of the word *šandappû* could be something like apprentice or student. *Šandappû* is in all likelihood a loanword from the Sumerian SAG.DUB which means "first son". Therefore, a student-teacher approach was probably the case in these texts (Geller 2007, 4).

There is one indirect source that gives more information about the appearance of the *asû* and his possible training. However, this source of information is questionable considering the genre of the text is satire. In the tale "The poor man of Nippur" the hero shaves his head and disguises himself as a doctor from the city of Isin to present himself to the king of Nippur. Because he told everyone he originated from Isin, everyone considered him to be a professional healer and gave him entrance to the quarters of the king. This tale but also other tales like "Ninurta-pāqidāt's Dog Bite" and "The Aluzinnu" gives us an insight how the common people looked at the healers. The humor in the tale of The Poor man of Nippur is actually based on the fear of the healer; they cause discomfort and people often do not want to visit the *asû* or *āšipu*. In "The Tale of The Dog Bite" the people are laughing with the jargon and lack of social skills of the healer (Worthington 2010, 29-31; Geller 2010, 44).

[2] There is no textual evidence that the *asû* used surgery to heal patients. Though surgical instruments have been excavated and are attested in texts but we cannot be certain if it was only the *asû* that used them.

It is no coincidence that the city of Isin is often mentioned in these tales, since Gula was the principal goddess of the city (cfr. Infra). It is thus possible that a physician always had a shaved head and that the experts originated or had their training in Isin (Biggs 2005, 11; Avalos 1995, 177). Chief physician or "*azugallatu*" is used in texts such as the Gula hymn (Biggs 2005, 10) and therefore, it is possible that *asû's* were organized in a professional group. They had to learn before they could get the title of chief physician. If this is true, then there had to be some kind of examination and a certain list of skills had to be acquired, but in any case the *asû* was strictly a lay expert and until today there has no evidence been found for a sacral supervision (Biggs 2005, 11-12, Geller 2010, 50).

The *āšipu* however dealt with illnesses of supernatural origin[3] and was considered an exorcist. The cause of these diseases and illnesses include witchcraft, ghosts, demons and other supernatural things (Böck 2006, 109). The *āšipu* was a cultic performer who was responsible for several rituals. These rituals involved reciting incantations together with acts. He performed rituals in the private sphere but also in the public sphere (Couto-Ferreira 2013, 408).

There is no evidence about the training of *āšipu*'s. Obviously, they had to have a knowledge of writing, just like the *asû*, as they had to consult several written sources such as incantations which go back as far as the Sumerian period from the middle of the third millennium (Biggs 2005, 13-14). Biggs states that the distinction between the two professions is more theoretical than real. He bases his interpretation by a hymn of an *asû* which reads that he "carries around texts". These texts are interpreted by him as incantations and thus a form of magic (Biggs 2005, 10). The *āšipu* is considered an exorcist and one of his responsibilities was to cleanse everything that had been touched by bad magic. He cleansed temples, houses and people (Biggs 2005, 13). He sought the cause of sickness just like the *asû*. Sometimes, if the *āšipu* expected a disease which was caused by "a hand of a god", the *bārû* helped him with making the diagnoses. The text AEM 1/1 27 describes how the diviner looked for abnormalities in the intestines of animals to confirm the suspicions of the *āšipu* (Stol 1993, 57). The *āšipu* was connected to the palace and the temple and he had to stay there, which is why we do not find documents of traveling *āšipu's* but we do find attestations of *asû's* traveling around to help patients (Geller 2010, 51).

[3] It is supernatural in a modern point of view. For the Mesopotamian society this was equally as normal as illnesses from eating bad food (Biggs 2005, 12).

4 Every *āšipu* is an *asû* but not every *asû* is an *āšipu*?

In the next chapter the focus lies on the training and activities of the professional healers. Two case studies will be analyzed in order to answer the question if every *āšipu* was an *asû* but not every *asû* was an *āšipu*? This is an important question since it could mean that even priests had a scientific background and thus medicine was far more scientific than texts would let us suspect.

Every statement and interpretation about the *asû* and *āšipu* contains speculations. From the current evidence there is no definitive conclusion about their respective roles, and it remains difficult to make the exact distinction. This is due to the nature of the sources, which have a practical function and do not give task descriptions or educational programs. Rather, we have a large number of jigsaw puzzles pieces at our disposal, which still leave us with even larger gaps. Libraries such as the one of Gula in Isin have not yet been found or excavated; these could give a lot more information and even the solution for the distinction problem between the *asû* and *āšipu* (Couto-Ferreira 2013, 408).

The information about the activities of the healers dating from the Late Bronze Age is far lower in number than the sources we have dating from the first millennium (Couto-Ferreira 2013, 408). Medicine and healing was always practiced, even during prehistoric times, but in the course of the centuries, the practice of medicine evolved and the medical practice in the third millennium will not be the same that was practiced during the first millennium.

Texts of the first millennium combine treatments based on rituals and incantations, but also on drugs such as the text which involves the *anḫullû* plant (cfr. chapter 2). The majority of these texts do not mention the performer, but when they do it is often the *āšipu*. In other cases we have to guess if the *asû* or *āšipu* is meant (Scurlock 1999, 70). In general, scholars reserve the texts with a more rational treatment for the *asû*, while the *āšipu* is considered for the more magical procedure (Scurlock 1999, 70). This is not a strong argument and is rather speculation than prove. When texts explicitly state that the *āšipu* is the actual performer of the complete process, scholars do not know how to interpret this. As was mentioned in chapter two, the complete process involved rituals and the use of drugs. According to Scurlock and several others, the *āšipu* should only deal with the magical/religious side of the process and not the parts where drugs were involved. Why is the *asû* not mentioned? Could it be that the role of the

āšipu evolved during several millennia and reached a specialization in the first millennium where the more scientific approach infiltrated the magical and religious practice?

According to Couto-Ferreira this is a grey area among the researchers and it is not quite clear what the function of the *asû* and *āšipu* was during the first millennium. There is textual evidence on healing where both the *āšiputu* and *asûtu* seem to overlap and share certain elements (Couto-Ferreira 2013, 407).

Since the *asû* is less attested in sources of the first millennium, Couto-Ferreira states that the *asû* focused more on the practical and technical through direct practice and oral teaching. However, this does not mean he was less educated than the *āšipu* (Couto-Ferreira 2013, 408; Geller 2010, 50). What is clear is that the *āšipu* gained a higher status than the *asû* which makes sense since the *asû* was not involved in temple functions and had a personal relationship with the healing goddess Gula (Geller 2010, 50).

Therefore, it is also possible that the *asû* dealt with diseases which were less complicated or less important such as nose bleeds, broken bones, etc. The *āšipu* was aware of these methods, but was probably later involved in the process if the patient developed complications and did not have time to help the patients with minor ailments because of his temple duties.

In the text CT 23 44 a 8 it is mentioned that a disease called "hand of the ghost" could be treated by both the *asû* and *āšipu* but only one practitioner was assigned at different stages of the disease (Avalos 1995, 158).

This means that the boundaries between *asû* and *āšipu* were fluid during the first millennium B.C. (Biggs 2005). Geller emphasizes the difference between the two professions and is convinced that both are not connected to each other. The *asû* dealt with matters that were by no means connected to the religious or magical side of medicine. He considers the *āšipu* as a priest who was specialized in the art of exorcism but who did not deal with the scientific side of medicine (Geller 2018, personal communication 15/03/2018).

Although Geller, Scurlock and others make a convincing statement, my personal interpretation is slightly different. One thing that can be considered is that the *asû* and *āšipu* had the same basic training. I believe that the profession of *asû* and *āšipu* was different once they reached a certain age or when they inherited the title of *āšipu*. In the end the magical aspect was separated from the scientific as Geller stated (Geller 2010). But the *āšipu* had to have a scientific background before he could practice the profession of *āšipu*. The *asû* on the other hand did not

have this professional religious background since he and his family were lower in status and could by no means be part of the temple professions. To illustrate my interpretation I will use the case of two healers, Kiṣir-Aššur and Urad-Gula.

4.1 The life of Urad-Gula

Urad-Gula is known by scholars today because of his correspondence with several kings (Biggs 2005, 13, Parpola 1987, 257-278; Parpola 1993). He wrote seven letters (Perdue 2008, 77; Parpola 1993). He lived during the second half of the first millennium and therefore, he fits in the grey zone which Couto-Ferreira mentions.

Urad-Gula was the son of a royal court exorcist Adad-šumu-uṣur, because of which he had to follow into his father's footsteps and learn the *āšipūtu/mašmaššūtu* (Jean 2006, 133-136). Adad-šumu-uṣur was chief exorcist at the court of Esarhaddon, by which he was hired to perform rituals in connection with astronomical phenomena, the expulsion of demons and the caring for the health problems and diseases of the members of the royal families on a day-to-day basis (Fales 2016, 24; Jean 2006, 124). Urad-Gula was a student of the chief of medical practitioners (Urad-Nanaya) under the reign of Sennacherib (688 – 681 B.C.). He is a witness in a contract (ADD 277, 6) and attested on the reverse on line 8 and 9 as *asû* (lu_2 gal a.zu) (Biggs 2005, 13; Van Der Toorn 2007, 61; ADD 277, 6; Van De Mieroop 2016, 359; Parpola 1993). This is a remarkable attestation since it indicates that he first was an *asû* before he became *āšipu*.

But the question arises if Urad-Gula, the lu_2 gal a.zu, is the son of Adad-šumu-uṣur. I believe this is the same person. Adad-šumu-uṣur was chief exorcist of the court and had a son which had to follow into his footsteps when time was ready, just like he did with his father (Jean 2006, 133). Therefore, Urad-Gula could enter the court and needed to have an education before he would become chief exorcist. Urad-Nanaya could have been the right tutor, since he was already active at the court and had spare time to educate Urad-Gula while the exorcists probably had not because of their more personal relationship with the king (Geller 2010, 08).

Under the reign of Esarhaddon (680 – 669 B.C) Urad-Gula became exorcist of the court like his father. In 668 B.C. Assurbanipal ascends the throne. At this stage Urad-Gula suddenly gets demoted for unknown reasons. He and his father, wrote several complaint letters to the king stating that he was always faithful and loyal to the court (Van Der Toorn 2007, 61; Jean 2006, 133, 136; Parpola 1993, 177 - 178).

At first nothing changed for Urad-Gula and according to his letters he had a horrible life where he has to go on foot and that he does not own a pair of sandals (Parpola 1987, 265).

Things took a turn when his father wrote to the king again and asked for forgiveness. This request seems to have to been granted, since Urad-Gula received a position back at the court. However, we do not know if he was granted the same social status as before (Van Der Toorn 2007, 61; Geller 2010, 77; Jean 2006, 136).

This is most likely not the case, because he is probably attested as lu $_2$a.zu in 649 BC. on an astrological tablet (lower edge line 2 of K 2077 + K 3771). Pingree and Reiner translated lu$_2$ a.zu as "scribe", which should have been "*asû*".

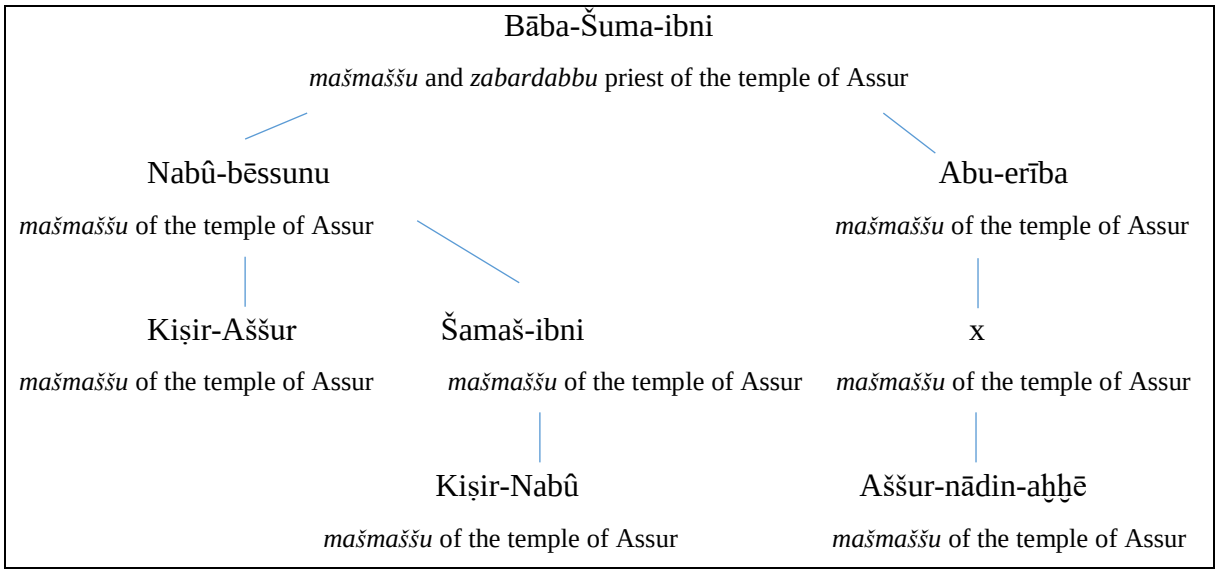
The text is written in Old-Babylonian script but an addition was made on the lower edge in Assyrian script. This is important because the known texts of Urad–Gula, are all written in Assyrian script. However, [X] – Gula is mentioned in the addition as lu$_2$ a.zu and not as scribe (dub.sar). The writer of the tablet is not mentioned.

The question arises if this [X]-Gula is the son of Adad-šumu-uṣur. It probably is because of several reasons. First, the time period is possible. The text can be dated around 649 BC, which means that the history of his misfortune had already passed and he received a position back at the court. Second, it was probably written by scholars of the court of Esarhaddon and Assurbanipal. We know this from the astrological content of the tablet. For example, Adad-šumu-uṣur was hired to study these phenomena. Third, the addition was written in Assyrian script and could have been made by Urad-Gula himself to show that he was still part of the court scholars as a.zu but not as "scribe" as Pingree and Reiner translate (Pingree, Reiner 1974, 50-53).

We can conclude after studying these letters that Urad-Gula would never have received the title of exorcist of the court if it was not for his father. If it was not for his father, Urad-Gula would have remained a physician. It is remarkable that he became an *asû* again when he lost his title of exorcist. This also implies that an exorcist could have had a training which included the training of a physician as well.

4.2 The life of Kiṣir-Aššur

An important new study by Arbøll gives new insight in the life of an Assyrian healer. His name was Kiṣir-Aššur and he practiced healing in Assur in the late seventh century B.C (Arbøll, personal communication 16/02/2018). An archive of his family has been unearthed in this city and at least 66 texts deal with his life. Kiṣir-Aššur was a *mašmaššu* just like most of the male family members which can be interesting. His genealogy is the following (Maul 2010, 203):



The genealogy shows that the profession of *mašmaššu* could be inherited. This is not a rare practice and the inheritance of temple functions is often attested. It was in most cases the eldest son who inherited the profession (Maul 2010, 206). Kiṣir-Aššur was apparently not able to have a biological son which is why his nephew Kiṣir-Nabû received the title of *mašmaššu* (Maul 2010, 207). In the archives found of Kiṣir-Aššur and his family, some of their daily activities are attested, including the part of the practices and tasks they had to do. It is clear that they were active as healers, exorcists and protectors (Maul 2010, 2012). One of the tasks that Kiṣir-Aššur had, together with his colleges was to copy and make texts for the library of Assurbanipal in Niniveh (Maul 2010, 205). Kiṣir-Aššur is also known to have visited the temple of Gula located in Assur to consult and copy several medical and magical incantations (Wiggermann 2005, 211). One of these texts he consulted is now part of the BAM series which are often reserved for the *asû* (Arbøll 2018). Overall, this means that he and his family achieved a high position in society. The king would ask the best scribes and scholars to make texts for his library.

Researchers such as Wiggermann, Maul and Arbøll chose to translate the profession as *mašmaššu* instead of *āšipu*. As stated in 3.2.1 this is one way to translate the Sumerian form. The reason why Arbøll chose for this translation will be explained in his upcoming publication of his dissertation on Medicine in Ancient Assur (Arbøll 2018, personal communication).

On the basis of the letters that Kiṣir-Aššur wrote, we can conclude that he had training. The first phase of this training consisted of studying anatomy, diagnostics and physiology. Later on in his training he started to focus on the magical and religious side of medicine and he had to supervise rituals and perform house calls. In the final phase of his training he focused on official duties and the treating of patients. Not only did he treat humans, but animals as well and in particular horses, snakes and scorpions. This could explain why the scholars used for the translation *mašmaššu* instead of *āšipu*, because a clear specialization is seen here.

This could mean that he experimented on venom and how to cure it. The fact that he trained or experimented on animals was probably to get a better understanding on anatomy and to practice certain skills he could later on use on humans (Arbøll 2018). This could imply that he was active in surgery. It seems very likely that Kiṣir-Aššur had the training of an *asû* and later became a *mašmaššu* after he inherited the title from his father. Kiṣir-Aššur knew that he would inherit the title of *mašmaššu* one day since his father was one. Therefore, he had to acquire additional training to become proficient in his occupation. What is also interesting is the fact that he studied snakes and scorpions even though his main profession was being a *mašmaššu*.

However, just because priest consults a medical book, does not mean that he is a trained doctor. The opposite is equally true. But if the doctor uses a prayer as part of the prescription he cannot harm the patient, if the priest uses prayer and, let us say a salve, he could do more damage to the patient. Thus, the statement remains true and the *āšipu* should have had knowledge on how to make a certain drug or do a certain procedure.

More on Kiṣir-Aššur will be published later on in 2018 by Arbøll after this dissertation is published. Therefore, I do not know if Kiṣir-Aššur used real medicines in his prescriptions for the healing of patients. More about his experiments will be published in the dissertation of Arbøll.

The case studies above show that the boundaries of the professions are fluid and that it is very likely that both *asû* and *āšipu* had a same basic training but the difference in the end was made by their social position in society. Therefore, I believe that every *āšipu* is an *asû* but not the other way around.

5 Medical instruments and utensils

In this chapter several medical instruments will be shown and discussed. The instruments are physical proof that surgery must have existed in Ancient Mesopotamia.

As we can read in several written sources such as the code of Hammurabi and others, multiple instruments were used by medical practitioners such as scalpels, knifes, spatulas, tweezers, etc. They were used by the *asû*, *gallābu* and even maybe the *āšipu*. Medical instruments are rarely found in archaeological contexts in Mesopotamia, although they were mentioned in the medical text corpus used by the practitioners.

Reconstruction of these instruments have been difficult because of the lack of finds and because they are rarely pictographically attested (Sternizke 2012, 649). Therefore, archaeologists and Assyriologists have to focus on scattered sources around Mesopotamia.

Human remains are an important factor in this research because they can be examined on marks made by medical instruments. Despite of these conditions, a general and standardized repertoire of these instruments probably existed and the lack of finds and instruments is probably due to recycling, bad preservation of the instruments and a lack of professional and systematic excavations that were executed in 19th and 20th century.

It is not only due to poor professional excavations but most of all because these instruments are so small and fragile that they can break and a great deal of the instruments were probably made out of organic material which does not preserve as well as the metal versions. The ones that have been found are shown below and are made out of bronze, copper or iron. Another important factor that needs to be taken into account is recycling. The instruments were made of metals which were of good quality (Archi 2015, 304).When they were broken or no more of use for the physicians, they were probably recycled. This explains why very few instruments have been found despite the fact that written sources such as the code of Hammurabi and contracts, suggest that they were used from time to time.

5.1 Surgical instruments

As mentioned before, the biggest problem is that medical equipment is rarely found in an archaeological context, thus we have to rely mostly on written sources (Sternitzke 2012, 649). There is one document (TM.75.G.2462) dating from the second half of the third millennium which was found in Ebla that describes a purchase of several tools made for an *asû*. In this case

we know for certain that the *asû* is meant and not the *āšipu* since the buyer is attested as a.zu$_5$ (Archi 2015, 301). The total amount of bronze that was used for these instruments was around 480 grams which is the total for around 23 instruments where the weight varies from 23.49, 19.57 and 15.66 grams. This means that the avarage weight is around 19,57 grams (Sternitzke 2012, 653; Maul 2001, 7). The bronze used for the instruments was of good quality since the percentage of tin is around 13.15%, this means that the bronze is harder than tools with a lower tin percentage (Archi 2015, 304). Instruments mentioned in the list are hammers, saws and blades (dub.nagar SAL, *šum* and UŠ.KID$_2$). Pincers, needles and razors are mentioned as well (*mašawa*, *maraqa* and *naglabu*). A pestle (*madakku*) is mentioned among these tools (Archi 2015, 304). This means that the *asû* was involved in surgery and preparation of salves.

Medical instruments were often misinterpreted in text material as commercial goods which were mostly destined for women and their cosmetical habits. This was also the case for a text which originated from Ugarit (Stieglitz 1981, 52). It was Gordon C. H. who was the first to give another interpretation on the instruments based on a comparison he did with objects carved in the wall of a temple in Egypt. These objects definitely had a medical context (Gordon 1979, 141-145). The following is stated in the text:

Obv.	spr . npṣ . krw	[4]Document of the belongings of Krw:
	tt ḫtrm . ṯn . ksm	two strainers, two cups,
	spl. mšlt . w . mqḫm	a bowl; a whetstone, and forceps
	w . mdh	and its sheath
5	arn . w. mznm	a chest, and scales;
	ṯn . ḫlpnm	two scalpels,
	tt . mrḫm	two lancets
	drb	a tine;
rev.	mrbd	a coverlet
10	mškbt	a bed.

This list shows that the instruments were grouped. Group one consists of pharmaceutical material while there is also a group which can be specified to surgery: the scalpel, lancets and the tine. In addition, furniture is listed as well.

[4] Translation by Stieglitz R. R.

The question arises if they were indeed medical instruments used by the professionals or by the public. Context is quite handy in this case. Instruments that are found in graves are probably the property of the person him/herself and were used for their personal hygiene. In some cases some people are buried with their professional tools. This could mean that instruments found in graves give us more information of the person buried and his profession. Several instruments have been found in Babylon, Assur and the Hittite kingdom.

The instruments that were found during excavations are catalogued below and are provided by the online database of the Vorderasiatisches Museum of Berlin. The first sixteen instruments have been published by Heeßel (Heeßel 2008), the others still need to be published. Unfortunately, most of these instruments have an unknown archaeological context.

This instrument is considered an ear scoop and is catalogued with the number VA Bab 07562. It was found in Babylon in the Amran area in an outer wall, in the north east corner of an ash layer. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 14.3 cm and the material is bronze.

This instrument is considered a mirror probe and is catalogued with the number VA Bab 07570. It was found in Babylon in the Amran area in a street. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 12.6 cm and the material is bronze.

This instrument is considered a salve tool for wounds and is catalogued with the number VA Bab 07571. It was found in Babylon in the Amran area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 10.9 cm and the material is bronze.

This instrument is considered a spatula and is catalogued with the number VA Bab 07582. It was found in Babylon in the Amran area on surface level. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 14.7 cm and the material is bronze.

This instrument is considered a spatula or scalpel and is catalogued with the number VA Bab 04183.002. It was found in Babylon in the southern part in the temple of Ninurta in the Ischin-Aswad area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 12.8 cm and the material is bone.

This instrument is considered a spatula or scalpel and is catalogued with the number VA Bab 04183.003. It was found in Babylon in the Merkes area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 13.3 cm and the material is bone.

This instrument is considered a spatula or scalpel and is catalogued with the number VA Bab 04183.001. It was found in Babylon in the temple of Ninurta in the Ischin-Aswad area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 13.3 cm and the material is bone.

This instrument is considered a spoon (broken) and is catalogued with the number VA Bab 07591. It was found in Babylon in the southern area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 14.4 cm and the material is bronze.

This instrument is considered a chisel with a round angular cross–section (broken) and is catalogued with the number VA Bab 07568. It was found in Babylon in the southern area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 9.3 cm and the material is bronze.

This instrument is considered an ear scoop and is catalogued with the number VA Bab 07569. It was found in Babylon in the Kasr area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 14 cm and the material is bronze.

This instrument is considered an ear scoop and is catalogued with the number VA Bab 07576. It was found in Babylon in the Kasr area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 12.4 cm and the material is bronze.

This instrument is considered a tube and is catalogued with the number VA Bab 07584. It was found in Babylon in the Merkes area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 12.1 cm and the material is bronze.

This instrument is considered as a tool for cleaning ears and is catalogued with the number VA Bab 07585. It was found in Babylon in the Amran area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 7.4 cm and the material is bronze.

This instrument is a needle and is catalogued with the number VA Bab 07592. It was found in Babylon. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 4.1 cm and the material is bronze.

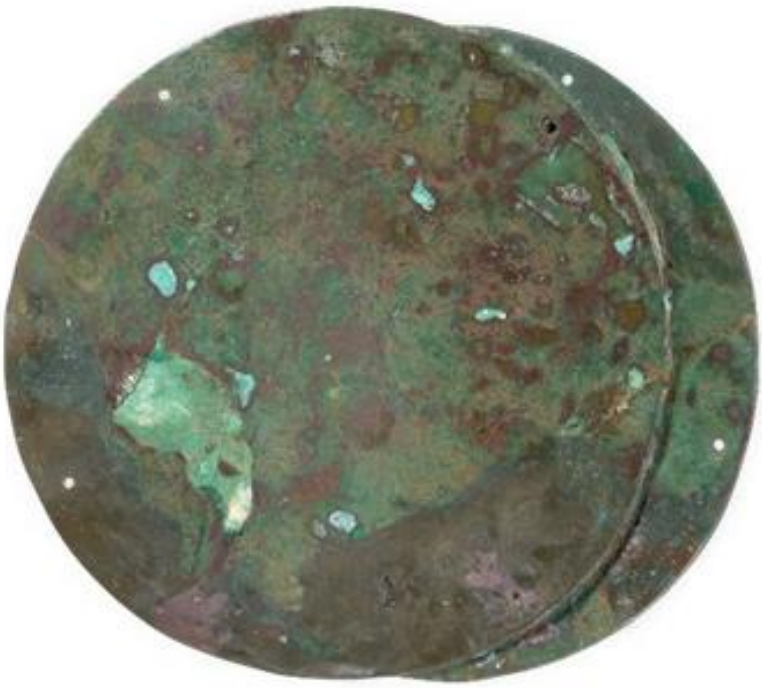
This instrument is a bent needle and is catalogued with the number VA Bab 07589. It was found in Babylon. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 4.5 cm and the material is bronze.

This instrument is a long hook and is catalogued with the number VA Bab 07594. It was found in Babylon in the Merkes area. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 24 cm and the material is bronze.

This instrument is a double spoon and is catalogued with the number S 06508. It was found in Sam'al. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 8.8 cm and the material is bronze.

This instrument is a pincer and is catalogued with the number S 03763. It was found in Sam'al. More information on the archaeological context is unknown. It can be dated around 1000 B.C. The length is 7.8 cm and the material is bronze.

This instrument is a double spatula and is catalogued with the number VA 05011. It was found in the Assur temple in a copper hoard. More information on the archaeological context is unknown. It can be dated around the last quarter of the third millennium B.C. The length is 7.6 cm and the material is copper.



This instrument is a double scale and is catalogued with the number VA 17034. Notice the holes on the side of the scales. It was found in the Assur temple in a crypt 75 on a brick floor. More information on the archaeological context is unknown. The date is uncertain. The diameter is 7.3 cm and the material is bronze.

This instrument is a spatula with a bend end and is catalogued with the number VA 05032. It was found in the Assur in the inner side of wall in quadrant c E 9 IV. More information on the archaeological context is unknown. The date is uncertain. The length is 18 cm and the material is bronze.

This instrument is knife and is catalogued with the number VA ass 04207. It was found in the Assur in the old part of the Ishtar temple in quadrant e C 6 V. More information on the archaeological context is unknown. The date is uncertain. The length is 8.1 cm and the material is bronze.

This instrument is knife and is catalogued with the number VA ass 05019. It was found in the Assur. More information on the archaeological context is unknown. The date is uncertain. The length is 10 cm and the material is bronze. It has cuneiform writing on it. Unfortunately it is not readable.

This instrument is pincer and is catalogued with the number VA 17248. It was found in Uruk. More information on the archaeological context is unknown. The date is 800 – 700 B.C. The length is 10.8 cm and the material is bronze.

This instrument is spatula and is catalogued with the number VA 15745. It was found in Uruk. More information on the archaeological context is unknown. The date is uncertain. The length is 14.2 cm and the material is bronze.

Some of these instruments are found in certain areas. The Kasr area is the northwest area of the palace; Merkes is the area where the private houses were found. The Amran and Ischin-Aswad areas consist of temples and private houses in the southwest and southeast of Babylon (Biggs 2009, 112). Most of the instruments found in Babylon are dated around 1000 BC. On the website of the Vorderasiatischen Museum, but further research by Heeßel dates them to the second half of the first millennium BC. It is remarkable that some of these instruments have been found in temple context. This does not mean that surgery was practiced, since the tools could be used for offerings or for extispicy done by the *bāru*. Nonetheless, it does not exclude the possibility. The spatulas and scales found in temple context could suggest that salves were applied or made in this context.

5.2 Ceramic containers

Not only knifes, pincers and spatulas were important for the physicians; they had to store their mixtures and salves in containers. Several of these containers have been found in excavations.

5.2.1 Ebla

An example is the excavation of the palace in Ebla, were these storage jars have been found. This is one of the few excavations where they analyzed the jar's contents. Several samples were taken in the room itself, on the floor and in the jars themselves which were still in their original position. Analyses showed that the content of these jars consisted of several herbs (Vacca et al. 2017, §3). What is surprising is that most of the herbs analyzed were wild herbs. Only 21.6% of the found plants were edible whereas 78.4% were non-food species. Species found are calendula, chamomile, poppy, cleavers and hawthorn (Vacca et al. 2017, §6). The inside of the jars were very dark and had several incrustations. Some of them had a melted and glossy appearance. Because of the different appearances in some of the jars we can conclude that several practices were used to prepare the plants for usage. They could have been boiled, or used as resin extraction, which leaves a crusty, milky residue. Most jars and cooking pots had a capacity from 40 to 70 liters, this multiplied by eight "cooking" stations which were in the room where the jars were found, make huge quantities of beverages (Vacca et al. 2017, §9).

What is also important in this case is the place where they were found, but more about this and the archaeological context will be given below in chapter 10.

5.2.2 Inscribed vessels

Figure 2: Inscribed vessels © The British Museum in Walker 1980.

The vessels shown above are considered a set or part of a set. The second jar, starting from the left, was purchased by George Smith during his last visit in Baghdad and was registered as coming from Babylon. The other vessels are from the excavations by Rassam at Babylon. All vessels are of Neo-Babylonian date which is around 600 B.C. They are made from pale chaff-tempered clay and the writings were done before the vessels were fired. The jars probably formed a set or at least part of a set which was probably used by a medical practitioner, we do not know if these vessels were property of the *asû* or *āšipu* (Walker 1980, 86-86). They are now on display in the King's Library at the British museum.

The vessels are particularly interesting for this dissertation since they bear the inscription of the contents of these jars. From left to right: incense for heart-break (*qu$_5$-taru ša hīp libbi* (GAZ. ŠA$_3$.GA)), incense of the he-goat (*qu$_5$-taru ša$_3$ kizzi* (MAŠ.ZU)), incense for fever (*qu$_5$-taru ša ummi* (IZI)), and incense for epilepsy (*qu$_5$-taru ša$_3$* AN.TA. ŠUB.BA). Walker translated the

word *qutāru* as “incense” but a better translation would be “fumigant”. In practice the jars probably held the incense which was used as fumigant. However, we cannot say that these jars are a special type of vessel used only for fumigation. They could be used as a storage jar for the fumigants or they could be used in practice were the incense was lit and held before a patient so he or she could breathe in the smoke. The former seems to be most likely (Walker 2018, personal communication). The inside of these jars have not been analyzed at the time of writing nor is there anything written about any incrustations or other remarkable spots inside the jars. Three of the four jars have been restored in 1997 and were probably cleaned, there for any traces of burning or other practices are lost and cannot be analyzed anymore. If there were traces of burnt material we would be certain that these jars were used in practice.

Although fumigation was often used during the healing of a patient some ritual practice can be connected to it. Incense was often placed in a censer which were often placed in temples or other places to purify the room. These censers were called *nignakku*. According to a list of tools from Nimrud, they were made in gold, bronze and copper (Parker 1961, 33-34). The question hence arises if these jars were used in a medical or ritual context or even both but because the inscriptions mentions that the incense or fumigants were used to treat fever or epilepsy it is most likely they were used in a medical context. The practice of fumigation has been found on seals such as the one below. As we can see on the scene, a woman is holding a vessel above the patient to purify the room. The dog above the room gives the symbolic presence of the healing goddess Gula (Collon 1987, 173).

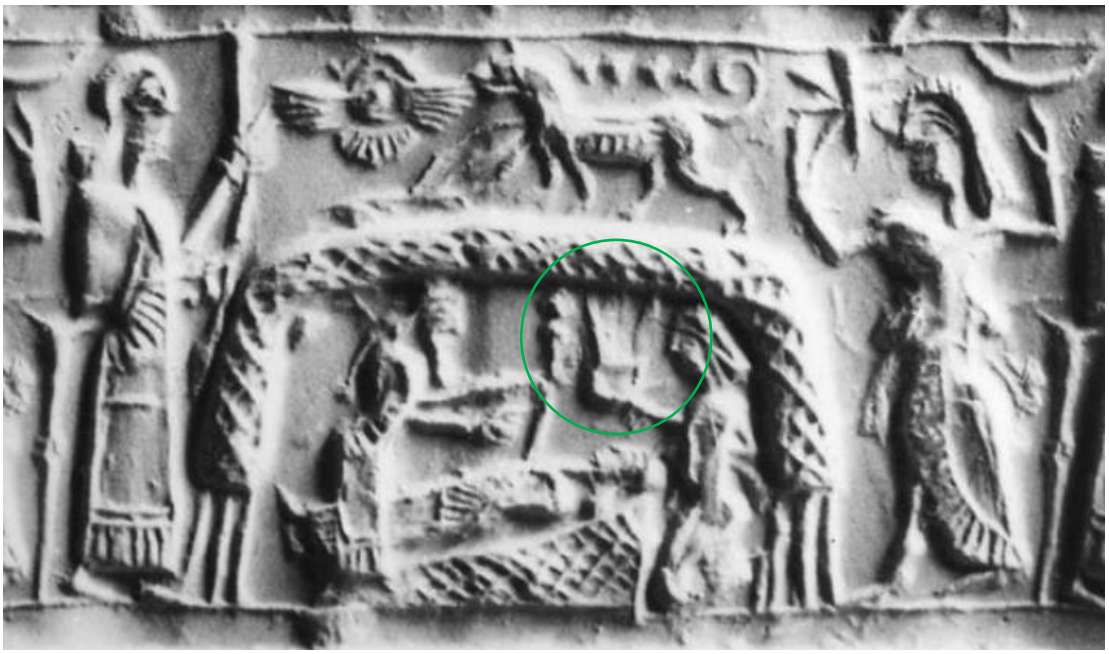


Figure 3: Seal which shows the practice of healing, a fumigation jar is used in Collon 1987, no. 803.

6 Materia Magica

Although medicine was a scientific practice there is a religious side we cannot deny. People were certainly aware that they could get sick if they ate something bad, but in general people believed that misfortune and sickness was caused by demons or gods and by incantations or curses made by men (Finkel 2014, 113).

Patients believed they could get better by using *materia magica* or that they could prevent sickness if they used these materials, since they could ward of evil and "hands" of the ghosts, demons and even gods or goddesses. Treatment was in most cases a combination of the use of *materia magica* and real medicines.

A clear definition of *materia magica* cannot be found and the term is interpreted differently by researchers. For what we can conclude is that *materia magica* is the general term for objects which have several functions regarding healing, happiness, fortune, misfortune. The objects are all associated with rituals.

Then, the question arises, what is magic? Once more, a clear definition cannot be given but an attempt will be made to explain it into an archaeological and medical context.

Several objects are considered *materia magica* when they look unusual and strange. Often exotic materials are used and they can be inscribed with words of no meaning, but also with curses or prayers (Wilburn 2012, 12; Finkel 12/07/2017, personal communication).

Anthropomorphic images such as human-like figurines with animal heads occur relatively often. Finkel interprets the combination of strange images and gibberish in the following manner: when a demon is wandering in the streets looking for a prey, he sees himself in an amulet. Finkel assumes that the demons are attracted to and at the same time frightened by the strange words. However, when they see these strange words with no meaning they get scared since they do not know the meaning behind them and thus they ward off to another house or person (Finkel 12/07/2017, personal communication).

These objects often cause interpretation problems with the modern archaeologist and other researchers. Distinctions between inexplicable elements which are considered magical and those who are not are very difficult to make. An object can look strange to the modern eye but can also be the most simple and common thing in the ancient time it was used. To help this problem, the archaeological context of the object is of key importance, since it can tell much

more about its function and use in ancient times (Wilburn 2012, 13). Magic was a practice, this can be explained by several texts and by the nature of some objects. Wilburn suggests the following and forms a definition with caution (Wilburn 2012, 15):

"Magic was firmly grounded in ritual actions, including spoken or written words and the manipulation of objects. These rituals typically are performed with the expectation of a particular result."

"Magic may draw on religious traditions for both efficacy and exoticism."

"Magic is frequently a private or personal activity, although certain practices might be undertaken in the public sphere."

One of the best known and found *materia magica* are amulets and they come in several shapes and sizes. They were used to protect the owner from evil, sickness and to ward of any misfortune in general. The color, material and texture of the amulet is of high importance and each aspect of the amulet has its function (Budge 1930, xv; Gonzales-Wippler 1991, 1). The most common and found kind of amulets are probably necklaces since they were made out of stones. Other amulets that frequently occur in written documents are figurines, both in human form and in the form of animals. Cylinder seals and plaques were also regarded as amulets (Bertman 2003, 233).

6.1 Necklaces

They consist mainly of stones that are bound together with vegetable matter. Every stone had its meaning and the process of making a necklace was quite delicate. Prescriptions are even given when a necklace had to be repaired (Schuster-Brandis 2008, 265-266). The stones are often shaped in the form of pearls where some of them take the *kunuku* or seal form. The number of stones varies in general from two to ten stones. Exceptions are found where the necklaces consisted of twelve to twenty-four stones. There is even one necklace attested which had sixty-six stones (Schuster-Brandis 2008, 52). Amulets like this were used to treat and prevent epilepsy, muscle diseases, types of fever, strokes, "broken-heart[5]", visual impairment and mood and language disorders (Stol 1993, 109). The most important link between these diseases is that they often have different phases and return in waves. Moreover, almost all diseases have a common characteristic: they are visible to other people (Schuster-Brandis 2008, 104). The

[5] It is not entirely clear whether heartbreak or a heart condition is meant.

amulets had to ensure that a new attack could be avoided (Stol 1993, 109). We can divide necklace amulets into three large groups. The first group was used to treat one single symptom. The second one protects against a diagnosed disease and the third group was used against diseases which were caused by specific demons such as Lamaštu (Schuster-Brandis 2008, 104). The material that was used for these necklaces apart from stones consisted of plants and herbs. They were tucked inside a leather bag and hung around the patient (Geller 2010, 36-37; Stol 1993, 108-109; Abusch-Schwemer 2016, 11). These necklaces are now seen as an amulet but for the Mesopotamian society they were as effective as real medicine (Geller 2010, 36).

6.2 Horns

Horns of bulls were often used as some kind of amulet where herbs and oils were incorporated. The horn was often placed in the left hand of the patient. If the horn was placed in the right hand it would cause misfortune (Goff, 1956, 19). Other use of horns are that they were filled with a mixture, often this mixture consisted of holy water, oaths and bread. When doing this ritual incantations had to be read and recited by a person who had the authority to use incantations (Goff 1956, 19).

6.3 Knots

Knots are a special kind of amulet. They were often made by an enemy who used witchcraft to make them. To undo the curse only incantations would work (Goff 1956, 13). Since the knots were made in organic material there are no knots found to this day, but there is textual evidence that they were often and widely used. The texts are some kind of prescriptions on how to make them. Plants and other organic material was often used, stones were no exception as well (Scurlock 2006, 25; Goff 1956, 15).

7 Location where patients were treated

In this chapter a short introduction on the location where patients were treated will be discussed. The main focus of this dissertation lies on the possibility that people were treated in temples (chapter eight) but other places have to be taken into account as well. These will be discussed in this chapter.

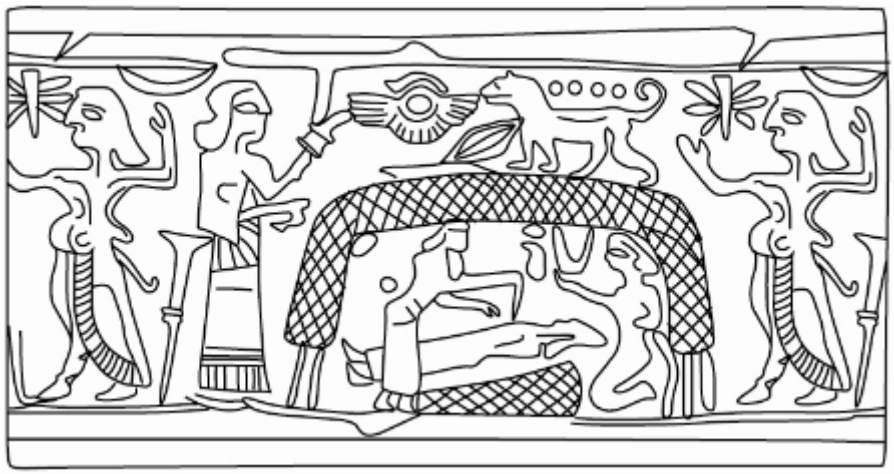


Figure 4: Sick person in a hut on an Assyrian cylinder seal after Teissier 1984, no. 231 in Ornan 2014, 20.

Was there an actual building where the patients were treated? Until this day there has been no evidence of a hospital. No excavated building has been interpreted as hospital and we have no indications of written sources describing a hospital. The treating of patients was thus location-independent but sometimes a bed especially for the patient was mentioned.

The *āšipu* is known to have been visiting patients at their home as is attested in the diagnostic handbook of Esagil-kīn-apli: "*enūma ana bīt marṣi āšipu* (ka.pirig) *illaku*" which means literally "when the *āšipu* visits a patient his home" (Worthington 2006, 56; Scurlock 2006, 22).

The other way around was possible as well: the patient visited the healers in the *bīt asê* (CT 56, 618). The tablet records the deliverance of 1 *kurru* dates for the *bakuja bīt asê* or for "Bakûya of the house of the physicians". The texts can be dated to the Old Babylonian period. It has been attested in administrative documents that rations were delivered to the sick (Worthington 2006, 57). It is thus likely that Bakûya stayed in the house of the physicians to obtain a certain treatment or to be taken into care of the physicians. The letter mentions *bīt* which is literally translated as "house", though it is not likely that the physicians were all grouped together and lived there (Worthington 2006, 57).

The *bīt asê* could be seen as a workplace. If we hold on to this interpretation and use it on other Old Babylonian letters, the practice seems to happen quite often. In AbB XIII 66: 5 – 10 it is written that a slave girl stayed in the house of Nabium-Mušallim because she had several stomach complaints.

In most incantations the place where the ritual has to take place is not mentioned. If the place is documented it often states a steppe, a secluded place or a place somewhere at the bank of a river. Sometimes the ritual takes place in open air (Scurlock 2006, 22).

8 Archaeological sites

In this chapter the research question "was there temple medicine in Mesopotamia as we know in the Greek world?" will be addressed. The chapter will be a comparison between the cult of Asclepius in the Greek world and the Gula cult in Mesopotamia. A general overview of the functions will be given but this dissertation does not go into detail about the temple of Asclepius. The temple of Gula was carefully studied using the excavation reports. First, an overview of respective skills of the god Asclepius and the goddess Gula will be given. Second, the temple of Asclepius and Gula will be discussed followed by comparing the different functions of the temple.

A few questions arise when we take a closer look at the Gula temples. We know from Greek sources and excavations that Asclepeia had several functions as some kind of spa, recovery center and even a place where patients were treated (Sigerist 1987, 63). Does the Gula temple in Mesopotamia have the same function and can we speak of temple medicine? Is there a difference with other temples we see in Mesopotamia such as the differences we can distinguish in the Greek world between the Asclepeia and others? Can we link textual information about medicine with archaeological finds other than herbs and objects but actual buildings?

8.1 Gula, goddess of medicine

Gula was known as the goddess of medicine and is the daughter of An. She was the principal goddess in Isin and thus more important there than in other places. The very first attestation of Gula or ^{d}gu.la$_2$ can be dated to the Early Dynastic Period IIIa (2600-2450 B.C.) (Böck 2014, 9; Van De Mieroop 2016, 45). She is also known under other names: Ninkarak, Nintinuga and Baba are used in texts and also Ninisina which means "the lady of Isin". (Böck 2014, 9).

These differences in name are determined per region. From the first millennium on, she is attested only as Gula. She was called the great physician, reviver of the dead, giver of life and carer for life as is described in several hymns for Gula (Böck 2014, 15). She has several attributes which make her recognizable in the iconography.

She often has a knife in her hand which is, according to the king of Isin, Iddin-Dagan, "sharp as the claws of a lion to enter the flesh,…" (Böck 2014, 18). In the other hand she holds a bandage which is often interpreted as a cuneiform tablet. Both are possible. If it is indeed a tablet, the contents are most likely incantations which were used both by the *asû* and *āšipu*.

The cuneiform tablet is mentioned in the Gula Hymn of Bulussa-rabi which mentions "I carry documents of healing", some other Assyriologists, such as Stol, interprets this line as "I carry the *masdaru* lancet for healing". *Masdaru* can be translated as *mašṭaru* (=documents) or as a name for a lancet. Both interpretations make sense in this case. In most cases she is accompanied by her companion, a dog (Böck 2014, 21).

The dog plays a special role in the iconography of the goddess and the animal was loved and feared by the Mesopotamian people. It was probably associated with Gula due to the healing effects of the saliva (Böck 2014, 38; Fuhr 1977, 139-145; Ornan 2004, 18).

Several temples were dedicated to Gula in different cities but Isin was probably the most important since she known as the lady of Isin.

People who were ill or had been cursed by people or demons made offerings to her and asked for healing. Several figurines of humans and dogs have been excavated on several archaeological sites. More on the figurines and dogs will be explained further below.

Not only was Gula loved but she was also feared. Texts mention that Gula could not only heal people but also curse them and make them sick when asked for (Geller 2010, 61). This makes her different from Asclepius (Avalos 1995, 191).

8.2 Asclepius, god of medicine

Asclepius is known as the god of medicine in Greek mythology. He was the son of Apollo and a mortal woman Coronis. He gained his medical knowledge from a Centaur named Chiron. He could even revive the dead. Because of this power, Zeus feared that Asclepius would upset the natural order of life. Therefore, Zeus killed him and Asclepius became a plant: serpentaria (Grimal 1986, 62-63).

His cult originated in Epidauros, where a temple has been found. This temple was founded in the sixth century B.C. (Avalos 1995, 47). A medical school is known to have existed in this city. The students were called Asclepiadae and one of the most famous student was Hippocratos (Grimal 1986, 63).

Asclepius was associated with several companions: a snake around a staff, a nanny-goat and a dog (Grimal 1986, 63).

The link with Gula is in the name of Asclepius and the association with the dog, as will be explained below in 9.2.2.

8.3 Temple of Asclepius

First, we should explain how Asclepeia functioned and how they distinguish themselves from other temples in the Greek world before we go into further detail about the Gula temples we find in Mesopotamia.

Several temples dedicated to Asclepius have been found or are attested in textual records. There are temples found in Thessaly, Peloponnese, Cos, Pergamum, Athens and Corinth (Avalos 1995, 47). The site and the lay-out of these temples show similarities with other temples in Greece. Most of them were in caves or in open air near water such as springs or rivers. They were mostly located outside the city and often on high and 'clean' places (Avalos 1995, 48-49). The guild around Asclepius grew in numbers and power in the middle of the first millennium B.C.

A possible reason this period for Asclepius' increasing popularity around this time is the increased incidence of disease during the fifth and fourth centuries B.C. Population numbers started to grow and this was correlated with diseases since many diseases need a certain population number to thrive (Avalos 1995, 41).

Inside the temples, several characteristic objects were found such as a statue of the seated god, holding a staff and snake, a dog laying at his feet, a table for food offerings, mural decorations. Rooms and furniture for the patients were added to rest in or to spend the night.

Most Asclepeia had a joined building called the *abaton*. In this *abaton* a well was built, most of the time in the corner of the room. In this room a patient could spend the night (Melfi 2007, 23-24). A bathhouse was sometimes adjoined. Near the *abaton* was another room called the *tholos* of which the function is still unclear (Avalos 1995, 51-52). The Asclepeia did not differ much from other temples (Avalos 1995, 52). There are two features to differentiate the Asclepeia from other temples: they had extra buildings attached and Asclepeia let people spend the night or several days to house them and for necessary means for their treatment which is unknown for other temples in Greece (Avalos 1995, 52-53, Melfi 2007, 23).

8.4 Functions of the temple

Avalos distinguishes three functions to these kind of temples: a petitionary function, a therapeutic and a thanksgiving function (Avalos 1995, 56- 66).

The first function plays a role in any temple. Individuals went to the temple for support, for fortune, or for a child. In the case of Gula and Asclepius, good health was asked for. Prayers are often combined with the thanksgiving function because it was some act of gratitude. If a person was unable to get to the temple and could not be carried, people would make figurines and include offerings for the god (Avalos 1995, 56).

The second function or the therapeutic function for the Asclepieia is clear: it served as a place to make people better and if it was possible, heal them. Procedures and prescriptions were also made at these temples, surgical instruments have been found at Pergamum (Avalos 1995, 59). Some of the Asclepieia specialized in one particular disease. Diseases that have been attested in textual material are lice infestation, leprosy, blindness, aphasia, tapeworm, headaches, insomnia and lodged implements (Avalos 1995, 57). This has been proven by archaeological excavations in Athens and Corinth where objects resembling a human eye were dominant at Athens and genitals and breasts were dominant at Corinth (Avalos 1995, 57-58).

The third function focusses on the gratitude of the patient: if the treatment of the god worked, the patient was supposed to bring an offering. Most of these offerings consisted of food and money but also votive offerings were made. They would vary from inexpensive poultry to oxen (Avalos 1995, 65).

9 Gula temple

9.1 Gula temple in Isin

Several temples of Gula have been found or attested throughout Mesopotamia. One of the best documented and excavated temples is the one of Isin where Gula was the principal goddess of the city.

9.1.1 Excavation history

The city of Isin, now known as Išān Bahriyat is located in the south of Mesopotamia between the Euphrates and Tigris and was close to Nippur. The site of Isin was approximately 1.6km long and 1km in width with a maximum height of 12.8m with small height differences (Becker 1977, 13).

One of the most extensively excavated temples is the one of Gula. As mentioned earlier, Isin was the place where professional physicians originated according to the story the old man of Nippur and where Gula was the leading goddess of the city (Biggs 2005, 11; Avalos 1995, 177).

Isin was excavated initially by A. T. Clay and S. Langdon in the early twenties of the twentieth century. The excavations were afterwards continued by a team of German and Iraqi archaeologists led by B. Hrouda in several campaigns starting in 1973 and ending in 1989 (Hrouda et al. 1977, 1987, 1992; Bryce 2006, 338).

The occupation of the city extended from the Ubaid period until the Persian period (Bryce 2006, 338). The most important and promising building excavated was a temple dedicated to Gula with an additional cellar for her husband Ninurta. Several other buildings such as houses and archives have been found in the excavated area around the temple. Small finds such as figurines and seals were also excavated during several archaeological campaigns (Bryce 2006, 339). A remarkable dog cemetery has been excavated as well.

9.1.2 Procession road

The first German-Iraqi campaign started in 1973. The excavated area into two parts. In the northern part of the mound, a brick paved road was found with its reference point in the south and not in the northern part. The road was around 4.5m in width. The road was well preserved for approximately 32.5m long and lead south to the temple of Gula (Hrouda 1977, 17-18). The

road was established during the reign of king Adad-apla-iddina I. This accurate dating has been proven by several stamps (6) that were imbedded into the bricks of the road which all led to the reign of Adad-apla-iddina I (Hrouda 1977, 18). The temple itself was located on the highest point of the mount.

The road was of high and probably religious importance since it led to the temple of Gula and was quite remarkable in its width. In the area around the road and close to the temple, a dog cemetery was found dating from around 1050-900 B.C., 33 skeletons were found (Hrouda 1977, 18-19; Bryce 2006, 339).

9.1.3 Dog cemetery

This cemetery can be dated to the same date when the road was constructed around 1050 B.C. dating to Adad-apla-iddina I. A dog cemetery is quite remarkable. Because of its position close to the temple and the road one would suggest that there are some rituals involved in the burying of these dogs.

It is certainly no coincidence that the cemetery was located on this particular spot in the city. As stated above 33 skeletons were found:

One stillborn puppy, fifteen puppies, four dogs younger than four years, four dogs between one and two years and nine adult dogs (Boessneck 1977, 97-109).

Several skeletons of these dogs show severe bone fractures which did not have the time to heal properly, though the fractures cannot be proven to be the cause of death of these dogs (Boessneck 1977, 101).

One possible interpretation is the case of dog offerings. 24 of the 33 dogs are young individuals. If the dogs died of natural causes, we would suggest that the age would be higher. Therefore, it is possible that some of them were offered, and this would explain the bone fractures on some of the dogs. The ones without marks on the bones could have been offered too since other methods could have been used such as strangling, poisoning or drowning, although we do not know what age dogs reached in that time. The offering of dogs could have been a thanksgiving ritual or offer to the goddess.

Dog offerings are rarely attested in written sources or excavated but there are some similar cases to be compared with. Several dog cemeteries were found in Ashkelon, which were excavated

by Stager in 1985 and he is convinced that there was no emotional connection with the animals and humans since a lot of the dogs were puppies at their time of death (Stager 1991, 91).

Instead he argued that these animals were linked to a healing cult of the Phoenicians. The dogs were part of the temple of the healing god Apollo-Amuklos (Stager 1991, 92). Because they were "temple staff" they were respected and thus given a proper respectful burial. Stager also mentions that the event of buying dogs as they did in Ashkelon is a unique event in history and there is no comparison to make with other dog burials (Stager 1991). Halpern agrees in some extent with Stager in his interpretation of a healing cult but links it to Mesopotamia and to the healing cult of Gula (Halpern 2000, 138).

Although just 33 dogs were found at Isin and several hundred at Ashkelon the similarities are remarkable (Halpern 2000, 134). Approximately 72% of the dogs buried in Isin were puppies. For Ashkelon the percentage is even higher with in some cemeteries around 80% puppies. The bones which were found on both sites were not damaged or could not have been proven that the breaking of the bones lead to the death of the animals. Several dogs had severe bone fractures in Isin but were not the cause of death and could have been caused by a trauma during their life span. Halpern argues that the dogs of Isin were kicked but this cannot be proven and is just one of the interpretations as was stated by the archaeologists from the Isin excavation (Boesnneck 1977, 97-109). The kicking of dogs is in contrast of Stagers interpretation that the people had respect for dogs, which is also attested in several sources. Thus, kicking them seems not the case.

The question arises if the death of these dogs were indeed ritualistic or just a form of respect. The fact that the dogs were all buried the same way and have the same characteristics on the bones suggests a ritual burial for Ashkelon. Isin the earliest known examples of a dog cemetery and shares several characteristics with Ashkelon. However, it cannot be proven that the burial was ritual but it is very likely.

The interpretation, bases on the excavated material, is strengthened by written evidence and individual dog burials.Texts mention ritual killing of dogs. Small quantities of these texts are known to us and are attested in Hurrian, Mesopotamian and Hittite sources (Edrey 2008, 271). In one of these texts it is stated that puppies had the "power" to absorb impurities from people and places (Edrey 2008, 271). This explains the fact that they were buried, as in the case of the Isin burial, on a cemetery around a temple of the healing goddess. Ritualistic burials of dogs

have been found in Tell Mozan, Urkesh and Sardis. In Greece we find the same kind of burials such as the one in Caria (Edrey 2008, 272).

What has to be kept in mind is the difference in time period between the Isin burial and the one of Ashkelon. Isin is dated approximately around 1050 B.C. while the dogs of Ashkelon are 500 years younger. Not only the time difference is troublesome but also the location of both sites. Nonetheless, the ritualistic burial of dogs has been attested in several places such as Egypt, Greece, Mesopotamia and Anatolia and this in several time periods.

The most important question is, if Isin was indeed the predecessor for Ashkelon and more importantly did the Gula cult spread all the way to Ashkelon and eventually to the Greek world?

It is indeed possible that the cult of Gula spread to the Levant region and afterwards to the Phoenicians and in the end to the Greek world. This is a process that probably would have taken several centuries and even millennia. Evidence of this is still quite sparse but cannot be denied (Halpern 2000; Edrey 2008, 269). The cult of Gula either spread westward during the Assyrian and Neo-Babylonian period and returned to Ashkelon in the fifth century B.C. in the form of the cult of Asklepios or that the Gula cult was brought back by deportees of the Assyrian period to their home in the Levant. The cult was later on introduced on Cyprus by the Phoenicians and found its way eventually to the Greek world (Halpern 2000; Edrey 2008, 269).

As mentioned earlier, not only was Gula known as the great lady of Isin but also by the name of ‘azugallatu’, which later became the name of the healing god Apollo in the Greek world. Apollo was known on the island Anaphe as Askelates which was then given to his son, Asklepius (Halpern 2000, 140). It was Burkert who believed that this was not a coincidence. Therefore, the Gula cult was transmitted from Mesopotamia to the Greek world. His interpretation is strengthened by the fact that dogs also played a significant role in the cult of Asklepius and that the dog, just as with Gula, was his faithful companion (Burkert 1992).

On this basis, we can conclude that the spread of the Gula cult does not mean that there was already a form of temple medicine in the temples of Gula as we can see in the temples of Asclepius (Avalos 1995, 37-54). But it does not exclude the possibility either. The practice evolved over a long time span but the spread of the Gula cult suggests that the rituals around the dog cult are connected to the Greek world. Therefore, it is most likely that the temple practice is connected too and that the basics were formed in Mesopotamia where Gula, the dog and of course the practitioners of medicine played a central role.

If we go back to the excavation of the road and the cemetery of Isin, several statements can be proved and a few others are left for interpretations only:

What can be proven is the fact that dog figurines were given/offered to Gula. This can be proven by a dedicatory inscription for Gula found on a dog figurine buried under the first plaster layer in the same area where the road was excavated. The figurine is 9,5cm by 4,4cm (Edzard, Wilcke 1977, 90). On the inscription we read:

[1][*a-n*]*a* ^{d}*gu-la* GASAN? É-g[a]l-m[a]ḫ [2]*be-le-et ba-*[*la-ṭ*]*ì a-z*[*u-g*]*al-la-at* x (x) x *ti* [3]*qa-i-ša-at na-ap-ša-at ba-la- ṭ ì be-el-ti-i-šu* [4]*ì-lí*-x-x-*da-a-ja* [*i*]*k-ru-um-ma ik-ri-bi-i-šu iš-m*[*e*] [5][x] x *a-ta-na-aḫ*-AN- ìr TUR x [(x)] UR.GI$_7$ *ú-še-li*	[1]For Gula, mistress of the Egalmaḫ, [2]lady of life, the great physician, [3]she who gives the breath of life, his mistress. [4]Ili-[x]-dāja prayed, and she has heard his prayer, [5]Atanaḫ-ili, the young slave[6], the dog he devoted (to her).

As we can read in the text, the dog is given to Gula after she heard the prayers. In this case it does not concern a real dog but a figurine of a dog. Figurines were representations of animals but also of human figurines. They were often seen and treated in the same way as a real physical animal or human. For example, when a person was sick, the *āšipu* would make a figurine of the person and perform several rituals on it hoping the real patient would heal and recover from his or her illness (BM 47806; Schwemer 2010, 64; Abusch, Schwemer 2016, 89).

It is even attested in some cases that real humans were used as a substitute in the same way as a figurine. Most of the time this was the case for kings or his family (Scurlock 1995, 1885). In this special case a real dog could have served as a thanksgiving offer where the illness was so severe it would have killed the patient but in the end did not against all expectations. Such a recovery could have asked a real dog as thanksgiving offer for Gula.

The thanksgiving function is quite clear for the Gula temple. People brought clay figures of dogs and figurines of humans representing an illness to certain body parts to the temple to thank the goddess for her help. Terracotta objects of arms, legs and other parts have been found in

[6] 'slave of (his) son' is also possible.

and around the temple (Hrouda 1981, 61). This ritual is not foreign and it is known in several other cultures as we can see with in the Greek world (Charpin 2017, 26).

Not only were dog figurines and human figurines found in Isin, but also in the Gula temple of Nippur, which was excavated by the team of McGuire Gibson (McGuire 1990). The same figurines have been unearthed on several places in Mesopotamia but the archaeological context is often unknown. Only a few objects are known to have been unearthed at temples of Gula. The ones without context are likely to come from Gula temples as well (Charpin 2017, 21). Some argue that the function of these dog figurines could serve as protection for the temple as we can see in houses. The dog figurines found in private houses are different from the ones found in relation to Gula (Charpin 2017, 26). Charpin mentions that the Gula temple at Isin had a kennel and that the dogs played an active role in the healing of patients who came to the temple. The statement he makes that a kennel was incorporated in the temple is proven by two foundation nails which mention building a kennel or how it is written "a dog house (é-ur-gi$_7$-ra)" (Charpin 2017, 27). Additional prove can be found in administrative texts which mention food for a pack of dogs for the goddess Gula, the text is from the Ur III period (Charpin 2017, 28).

9.1.4 Other finds

Not only the dog cemetery and the road were excavated in the temple p recinct and the road but also objects such as copper pendants, human figurines and loads of pottery (Hrouda 1977, 17). Dog figurines on bronze plates are a special kind of figurine, because they were attached to some kind of pedestal. This means that some of the dog figurines were placed inside of the temple and were incorporated into the temple's furniture. It is in these finds that the thanksgiving function of the temple becomes clear. More than seventeen objects such as legs, hands and feet have been found around the temple (figure 5). They were used as ex-voto statues and used by the people to ask Gula for healing especially for these parts of the body (Charpin 2017, 8). On some of the body parts, inscriptions can be found such as one of a woman who asks for the healing of her foot:

"May I place my foot on a way of life, I will be your servant then"

The same practices have been found in several excavations in Corinthe (Charpin 2017, 8).

Figure 5: Ex voto statues of feet and legs found in the Gula temple precinct in Hrouda et al. 1977, plate 8.

The southern part of the temple is complicated: much of the higher ground was eroded and foundations have been lost during this erosion and former excavations. However, several interesting objects were found in this area. Terracotta figurines were found and some of them were life-size. Unfortunately these have only been preserved fragmentarily (Hrouda 1977, 17).

Lamaštu objects have been unearthed in this part and are interpreted to be located in the center of court A (Hrouda 1977, 39). However, due severe erosion of this particular part of the site we do not know precisely if it was placed in the courtyard itself or was located in what could have been a small room attached to the central court, as we can see around court B. Several sources attest the placing and wearing of Lamaštu objects as a protection of the patient and in most

cases of women during pregnancy and labor. In this case the object is fragmentary and we do not know if it was a necklace or plaque. No holes have been found in the object itself, therefore, we cannot be certain if it was a wearable amulet or not. Nonetheless, it is an amulet which was always close to people and was most likely not placed in a room where people only came for a quick prayer, unless the room was especially reserved for women having a difficult pregnancy/labor.

Another very interesting find is a figurine of a dog which was found in Tello (figure 6). The inscription on the dog links it to the cult of Gula. Its purpose was a thanksgiving offering. A remarkable feature of this figurine is that the dog held a little container on its back, which must have held a certain herb or salve. Chemical analyses have not been conducted but on the inscription is written that the dog holds the plant of life (Charpin 2017, 44). This could mean that containers as the one shown below, belonged to the temple of Gula, and were used by the practitioners who were treating patients inside the temple.

Figure 6: Dog figurine found in Tello © Musée Du Louvre in AO 4349.

9.2 Text material

Text material can give us more insight on the temple as well. A text, written by Enlil-bani describes the temple of Gula as "a house of relaxation" (é.ni$_2$.dub$_2$.bu) (Frayne 1990, 83). This description could mean that people went to the temple and were given some kind of help to relax them. Charpin interprets the Gula temple as a pharmacy, where herbs were stocked and possibly given to the sick people (Charpin 2017, 39). He states his interpretation due to the fact that Gula often has an epithet before her name which is "plant grower" (šim.mu$_2$), we see this sometimes for *āšipus* as well. Finds such as the dog with the container on its back strengthens the interpretation.

9.3 Architecture

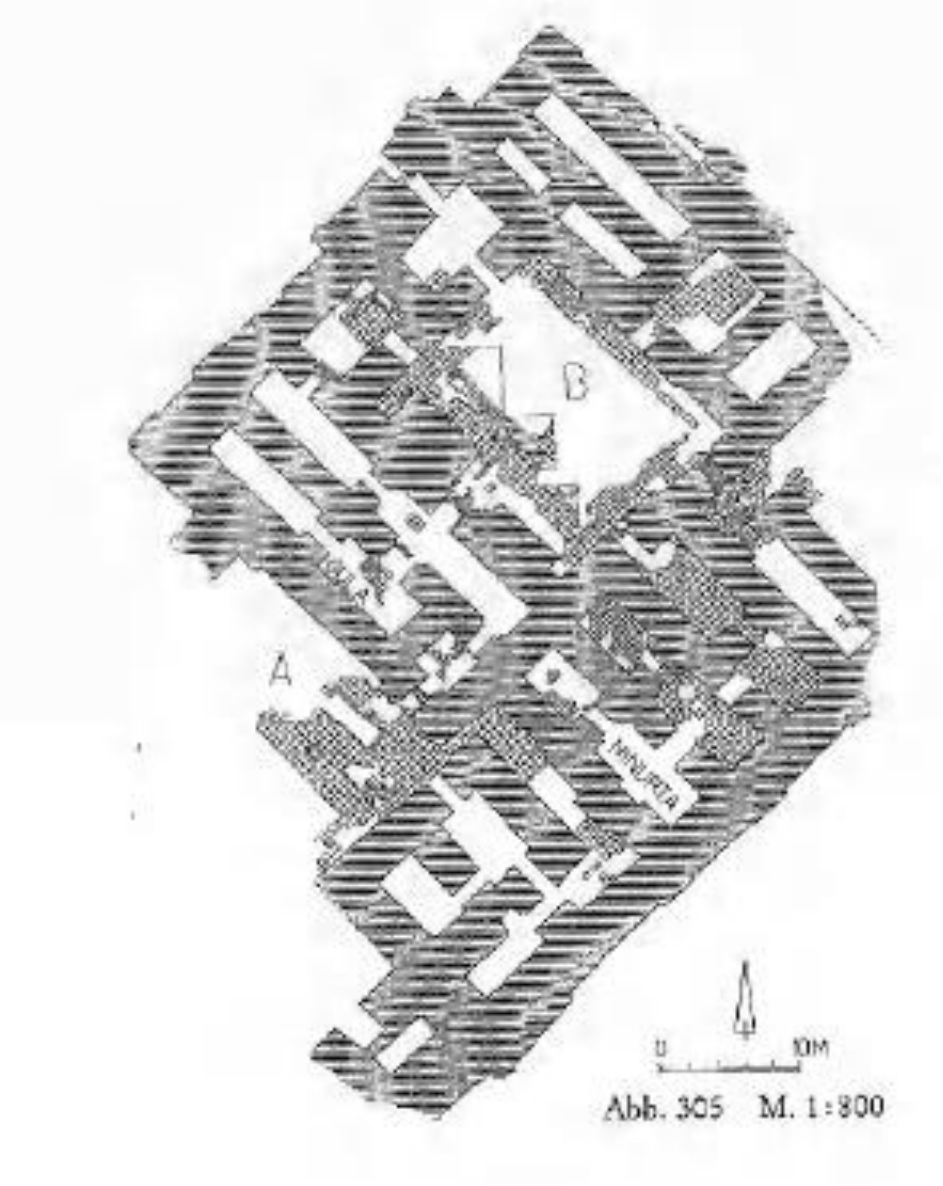


Figure 7: Lay out of the Gula temple in Isin in Heinrich 1982 figures 304 - 306.

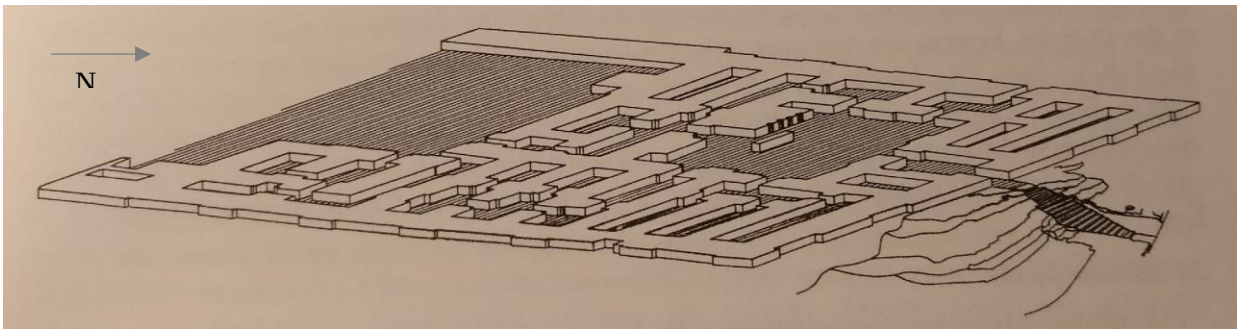


Figure 8: Lay out of the Gula temple in Isin made with CAD in Hrouda et al. 1992, 15 ,figure 1.

Before we make a comparison with other temples such as the ones in Greece and in other parts of Mesopotamia, we first have to take a closer look at the architecture of the temple in Isin.

The entrance of the temple could be reached after 19 steps (Seidel 1992, 11). The temple was rectangular and measured 70 by 50m. It was first constructed in the third millennium around 2700 B.C. The temple continued to exist for several centuries and was rebuilt a few times during the Old Babylonian, Kassite and Neo-Babylonian periods. Its main occupancy was probably during the Kassite period (Bryce 2006, 338). This can be explained by the fact that Gula was very popular during this period and was one of the higher gods that was anthropomorphically pictured (Heinrich 1982, 208).

In the first campaigns of 1973 and 1974 two courtyards were excavated. The smallest one (B) in the north and more southwards another courtyard (A). As stated above, the southern part of the temple is troublesome because of erosion and former excavations (figure 7 and 8). The more southern part of the temple was abandoned and archaeologists started focusing around the smaller courtyard which had several rooms attached to it (Heinrich 1982, 208). In the three next campaigns of ’75 until ’78 the rest of the temple was excavated (Hrouda, Haussperger, Strommenger 1981, 9-27). The question arises if this temple was any different from other temples in Mesopotamia, but this was probably not the case since its architecture is comparable to other temples in Mesopotamia (Heinrich 1982).

There is a courtyard with surrounding small rooms, it is rectangular and it is not remarkable in size or width. The architecture of this temple has similarities with other temples in other cities, such as the Gula temple in Nippur. This will be discussed in 9.4.

What is a little remarkable about the Gula temple in Isin, is the extremely large courtyard in the south. Although, due to erosion and former non-scientific excavations, we cannot be sure if this

courtyard was surrounded by smaller rooms to the side. If the courtyard was as large as we can see on the map of the temple we can ask ourselves the question if this was an open courtyard and if it had any specific functions regarding storage, schooling for physicians or a place where patients were treated.

These are all possible interpretations, but we cannot prove this. Room 24, located north-east of court B, contains a remarkable installation (Haussperger 1992, 21-24; Hrouda, Haussperger, Strommenger 1981, 16-17). This room was excavated during several campaigns. The room itself had several construction stages from which the second stage was the most important. During the Kassite period (2nd stage), the room was expanded from 2.40m x 9.50m to 3.00m x 10.00m and it included, what the German archaeologists called it, a "Sickerschacht" which can be interpreted as some kind of water reservoir.

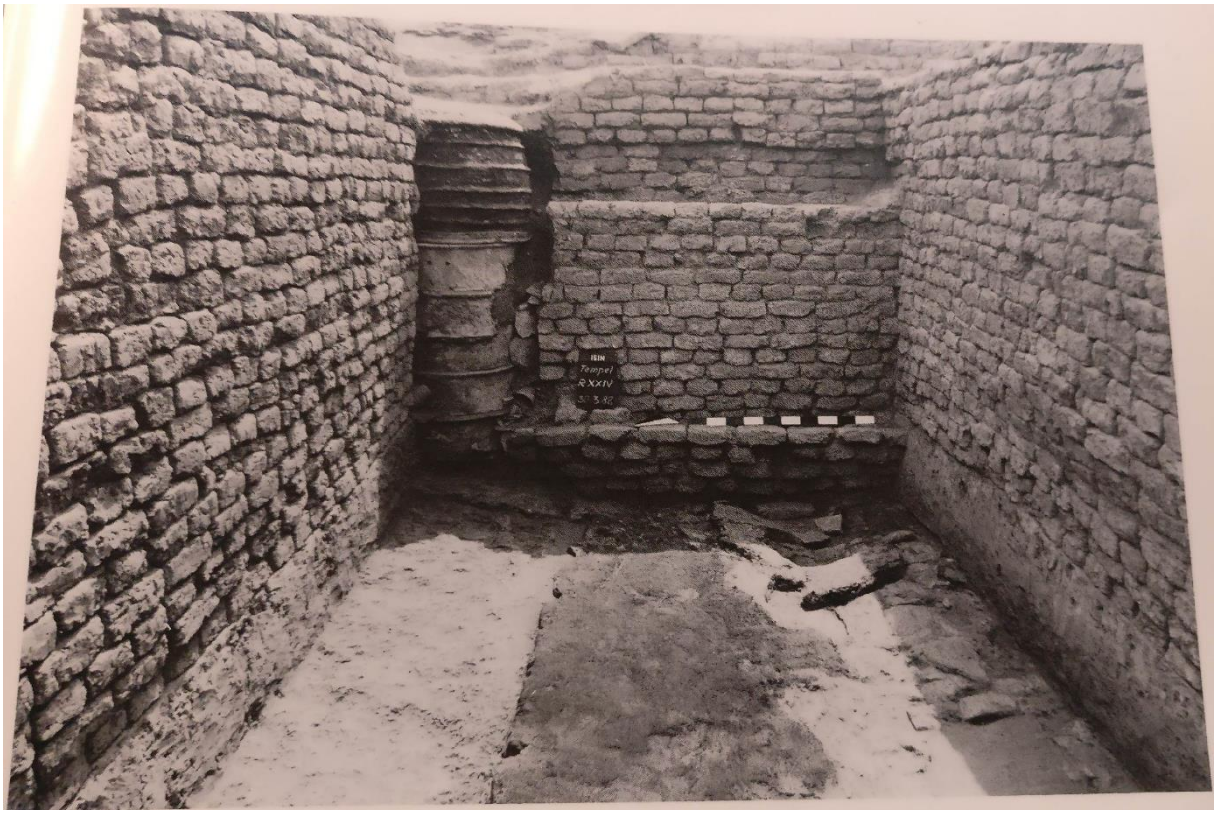


Figure 9: Sickerschacht in situ in Hrouda et al. 1992, plate 13, no. 2.

It was lined with asphalt and was situated in the eastern corner of the room (Haussperger 1992, 22). The Sickerschacht was later filled with 562 ceramic shards dating from the Isin I period until the Old-Babylonian period (2019 – 1793 B.C.). Most of these shards were fragments of bottles or top shards of vessels (Haas 1992, 95).

The structure is remarkable for several reasons. A lot of effort was needed in making this structure, since it was made waterproof using asphalt. The temple itself was situated on top of a mound where water was scarce and people had to walk a great distance access water. A well is not possible since they should have dug a pit of several tens of meters. The Sickerschacht was approximately 9m long and was made out of clay and asphalt and had probably the function for the storage of water or drainage of (contaminated) water.

Not only the Sickerschacht in this room is remarkable but also the fact that human remains have been found in the northwestern wall of the room (Hrouda, Haussperger, Strommenger 1981, 16). Unfortunately, there are no pictures of these remains or no stratigraphy on how it has been preserved in situ. The first time this room was excavated was in the campaigns from 1975 until 1978 when only the first layers were excavated until Kassite level.

Several Kassite kings are mentioned on building material, such as Adad-apla-iddina and Kurigalzu. However, dating the different phases remains difficult since there have been two kings named Kurigalzu. We are unable to determine which one has rebuilt parts of the temple. The next excavation on this room was much later in the campaigns of 1986 - 1989 (Haussperger 1992, 21-22). The human remains were situated in the oldest layer of the Kassite phase, just above the Old-Babylonian layer.

A complete description of these remains and therefore, a stratigraphy of the complete room would have been interesting. Then we could see where the Kassite layers are combined with the older ones. Unfortunately, this has not been done by the archaeologists.

Several terracotta figurines have been found in a hoard close to the burial, some of them were dog figurines which links the remains to the temple. The grave was also imbedded into the wall and this was done intentionally according to the excavators (Hrouda, Haussperger, Strommenger 1981, 16). Burials inside a temple haven not been attested. It could have been a building offer, but again, texts have not mentioned building offers of humans for temples (De Graef 12/03/2018, personal communication). There is a possibility that the person died in this temple while he was taken care of by the medical personnel of the temple. We cannot prove this with the current evidence and this remains an interpretation.

The room next to this one is equally interesting since two graves have been excavated there. An adult and child were found in this room and their remains were covered by a brick layer (Hrouda et al. 1992, 17-18). Other finds are ceramics and a special type of jar. It is described as a bulky round vessel with a rather small opening. This vessel was separated from the other ceramic finds by a small mudbrick wall consisting of three bricks. On the east side of the room the same construction was found but the vessel was missing. The vessel was eventually left in situ and pictures of this were not added to the excavation reports (Hrouda, Haussperger, Strommenger 1981, 17).

In total 74 ceramic sherds were found, 29 edges and 13 bottom fragments which brings the total on 42 individual vessels/pots that were found only in this room (Haas 1992, 95). From the description given by the archaeologists there is possibility that said vessels and pots were fumigation jars or storage jars for several medicinal oils. However, chemical analyses were not carried out, thus the contents of these jars remains uncertain.

9.4 Gula temple at Nippur

The excavations of the Gula temple in Nippur took place in the 1970's and 1980's and early nineties. In 1990, Area WA was excavated and a building of about 100m x 40m in size was found. The building dated from the Kassite Period until the Neo-Babylonian period (McGuire 13). Several artefacts in the temple were found and because of these objects the deity to whom the temple was dedicated could be identified. Dog figurines and ex-voto statues of humans in pain were found. The temple of Gula is probably part of a larger complex dedicated to her husband, Ninurta, since he was the second most important god in Nippur. The lay-out of the temple is similar to the one of Isin. Unfortunately, the excavation campaigns stopped in 1990 because of the start of the Gulf war (McGuire 1993, 15).

Figure 10: Ex-voto statue of a human in pain, a dog figurine and a part of the lay-out of the Gula temple in Nippur in McGuire 1993.

McGuire suggests that sick people went to the temple of Gula, whether before or after they visited a doctor. They could even go to the doctor in the temple. They probably did because the figurines argues that they did. Hopefully more information will be gathered when the rest of the temple will be excavated in the future (McGuire 1990, 5; McGuire 1993, 15).

9.5 Conclusion

Although none of the evidence is conclusive, the temple precinct of Gula in Isin displays several elements and features that point to medicinal practice. Fales describes the evidence in his article of 2016 as 'flimsy' (Fales 2016, 22), but he did not take the architectural features into consideration.

First there is the Sickerschacht, which was clearly used for water storage or drainage. This water could be used for rituals and to wash patients. Similar architectural features have not been found in other temples in Mesopotamia and is limited to the temple of Gula in Isin.

Second, are the the Lamaštu objects and female figurines with their hands on their stomach, which are mostly found in private contexts but not much in temple contexts. It is possible that patients were treated in the temple and thus had to be protected from Lamaštu.

Thirdly, the very large court A. Because of the erosion we cannot be certain of this but it is possible that this attached court was used as a room for patients or even as some kind of school for *asûs*.

Fourth, a lot of pottery was found in and around the temple which could mean the temple stored medical oils or medicinal herbs which were used by physicians to treat patients, not necessarily in the temple but also for people at home as we can see in several palaces such as Ebla (cfr. infra) or Assur.

Last there is the text material, such as a text made by Enlil-bani, who describes the temple of Gula as "a house of relaxation (é.ni.dub.bu) or as Frayne describes it "a house which gives rest" (Frayne 1990, 83).

The dog cemetary relates to Gula as the healing goddess, but it cannot be considered as evidence for medicinal practice.

These finds and descriptions suggests that people went to the temple and were given some kind of help to relax or heal them.

10 Health care in practice

In this chapter a general overview will be given on how health care was managed in the Mesopotamian society. A closer look will be taken at the role of the palace and on the public and personal hygiene.

As shown in the previous chapters, medical care was well integrated and highly valued in Mesopotamian society, but if we take a look at the health of the society in general, not only medical care has to be taken in to account. Public and personal hygiene and nutrition are some of the key elements to sustain a healthy life and lifestyle. This can be done by the person itself, but the people were aware of contagious diseases and how to prevent them (Scurlock, Andersen 2005, 13). This is also attested in a Mari tablet which states that nobody is to drink from a cup of a sick person, nor to sit on their seat or lay in their bed and not to mingle with them since the "illness" is contagious (Scurlock, Andersen 2005, 13; ARMT 10.129:11-20).

10.1 The palace of Ebla

The palace has to be taken into account for the administration of health care in general. The role of the palace is an interesting topic in Mesopotamian medicine. Some palaces made medicines and provided them in the first place for the court, secondly, for the physicians and in the end the people.

This can be illustrated archaeologically by an excavation in Ebla where a "special" kitchen has been found in a palace (Vacca et al. 2017, §1). It is in an odd location, at the bottom of the monumental stairway to the court of audience. The room had eight fireplaces and several cooking pots where found. Although the interpretation of a kitchen is not the case here (Vacca et al. 2017, §5, 6). No animal bones were found in this room which is remarkable if it was an actual kitchen were food was prepared. The preservation of the palace is remarkable, lots of the vessels and cooking pots were left *in situ* because the palace was destroyed around 2300 BC. So far, 4500m² of the palace has been excavated since 1964 (Vacca et al 2017, §1).

Although the location of this city is much more west and closer to the coast than Niniveh or Assur (figure 1), parallels can be made with the cities in the heartland of Mesopotamia. The palace in Ebla has just like other Early Bronze Ages palaces in Mesopotamia several rooms made for different functions. These functions include the storage and food preparation and administrative quarters. Other rooms have been found with basalt slabs and rooms which were

filled with storage jars and tableware. They have been found in their original position (Vacca et al. 2017, §3). Cuneiform tablets show that there were a lot of political and economic relations with cities in Mesopotamia (Vacca et al. 2017, §2, 3).

Figure 11: Kitchen hearths located in Palace G, room L.2890 in Vacca et al. 2017.

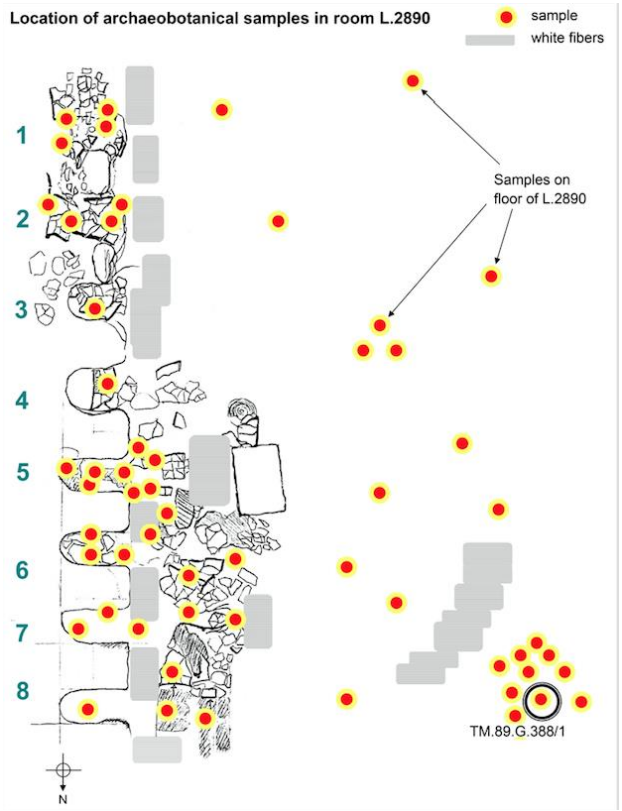


Figure 12: Location of the archaeobotanial samples in room L.2890 in Vacca et al. 2017.

Several storage jars have been found in the "special kitchen" and the contents were enough to feed the royal family and the court but also the people outside of the palace. The storage jars were analyzed and several pots contained herbs which were used for medicinal usage only. Only a few of the herbs were for consumption. The quantity was another remarkable factor. The content of these jars was probably used by the royal family and members of the court but they could have been distributed for the people (Vacca et al. 2017).

This case study proves that analyses on botanical material *in situ* are very important for the understanding of health and medicines in the ancient Near East. It provides us with another function of the palace we have not seen before in Mesopotamia and it shows that health care was an important aspect in the Mesopotamian society.

10.2 Epidemics

It is quite remarkable that the written sources rarely mention epidemics in Mesopotamia although some cities were densely crowded at some points in their history. This is probably due to several factors, one of them being the well-established health care. It begins with families that had to keep their houses clean. Several texts are made for this and are seen as some kind of rites to keep evil and sickness out (Maul 1994, 28-30). Most of these texts mention that the dust and other filth is to be swept outside on the streets. Some texts mention that the sweepings are to be collected in reed baskets and burned afterwards but the last one is rather rare (Maul 1994, 28-30, 500).

Another factor has to be taken into account which is the climate of Mesopotamia. Mesopotamia had a rather hot and dry climate during summers and colder and wetter during winters. Humidity levels were much higher in the southern areas closer to the Persian Gulf (Scurlock, Andersen 2015, 14). In the south, the average temperature in January lays around 14 °C and could go up to 43.7°C in August. Overall we can conclude that the climate was very dry and that sandstorms were relatively common in summer whereas there were storms in winter. The overall dryness in this region was beneficial to prevent the spread of microorganism since the dryness desiccated excrements and other animal residues (Scurlock, Andersen 2015, 14). Some epidemics are attested in the Mari letters. The epidemic had struck in the city of Tuttul where a lot of people got sick but only a few died. In another city, the city of Dunnum over 20 people died from the plague and a lot of its population had left the city for this reason (Durand 1988, 561 nr. 259). Another letter mentioned sickness in Zurubbân and Zapad. These cities are not in the same area which means the disease was more widespread this time. The sickness was

attested as “hand of the god” and it struck mostly farmers, workers, craftsmen. This could indicate that these people did not have the same health care or good facilities than other people living in the city (Geller 2010, 69).

Nonetheless epidemics did happen and one episode is particularly interesting for this dissertation. As mentioned before, the Gula cult peaked during the Kassite period. The Kassites started to control Babylon after the Hittites defeated Babylon around 1595 B.C. Babylon was weakened and this was in the benefit of the Kassite people which eventually gained control around 1475 B.C. (Van De Mieroop 2016, 182).

The start of a new dynasty is sometimes troublesome for its people. The new reign often comes with a (partially) destruction of the city; there will be a difference in politics, in the distribution of food rations and probably hygiene in the very beginning of the dynasty. This means that diseases could thrive more easily. The Kassites also had other elements in their religion. The combination of these things could be one of the few reasons why Gula became popular during the reign of the Kassites. They reigned until approximately 1155 B.C. (Van De Mieroop 2016, 182-183).

10.3 Surgery

When discussing the topic of surgery in the Near East, scholars must mention one of the most famous written documents: The code of Hammurabi. Thanks to these cases an interest arose by Assyriologists in surgery and medicine in general. Several instruments of the *asû* or *āšipu* are mentioned. The complete code of Hammurabi consists of a prologue, epilogue and 282 cases are mentioned, but only paragraphs 215 until 223 are important for this dissertation (Richardson 2004, 106-107).

§ 215

Šumma asûm awīlam simmam kabtam ina karzilli siparrim īpušma awīlam ubtalliṭ u lu nakkapti awīlim ina karzilli siparrim iptēma īn awīlim ubtalliṭ, 10 šiqil kaspam ileqqe.

“If a physician made a deep incision in a sore with a *karzillu*-knife on a free man and he saved the man his life or has opened the temple of the man and saved the man his sight, he shall receive five sheqel of silver.”

§ 216

Šumma mār muškēnim, 5 šiqil kaspam ileqqe.

“If it was the son of a man with civil rights, he shall receive five sheqels of silver.”

§ 217

Šumma warad awīlim, bēl wardim ana asîm 2 šiqil kaspam inaddin.

“If it was a slave of a free man, the owner of the slave shall give the physician two sheqels of silver.”

§ 218

Šumma asûm awīlam simmam kabtam ina karzilli siparrim īpušma awīlam uštamīt u lu nakkapti awīlim ina karzilli siparrim iptēma īn awīlim uḫtappid, rittašu inakkisū.

“If a physician made a deep incision with a *karzillu*-knife and kills the free man or he opened the temple of the free man and destroyed the man his sight, they shall cut off his hand.”

§ 219

Šumma asûm simmam kabtam warad muškēnim ina karzilli siparrim īpušma uštamīṭ, wardam kīma wardim iriab.

“If a physician made a deep incision with a *karzillu*-knife and kills the slave of a man with civil rights and caused his death, he shall recompense with a slave for a slave.”

§ 220

Šumma nakkaptašu ina karzilli siparrim iptēma īnšu uḫtapid kaspam mišil šīmišu išaqqal.

“If he opened his temple and destroyed his sight, he shall pay half of his value in silver.”

§ 221

Šumma asûm eṣemti awīlim šebirtam uštallim u lu šer’ānam marṣam ubtalliṭ, bēl simmim ana asîm 5 šiqil kaspam inaddin.

“If a physician has mended a broken bone of a free man or he has freed a sick joint, the patient shall give the physician five sheqels of silver.”

§ 222

Šumma mār muškēnim, 3 šiqil kaspam inaddin.

"If it was the son of a man with civil rights, he shall give three sheqels of silver."

§ 223

Šumma warad awīlim, bēl wardim ana asîm 2 šiqil kaspam inaddin.

"If it was the slave of a free man, the owner of the slave shall give the physician two sheqels of silver."

These paragraphs in the code of Hammurabi give information about different aspects of a medical/surgical procedure and the social status of the patients. The cases mention the *karzillu*-knife which was used by the *asû*. This knife is often translated as surgeon's knife, lancet or scalpel.

Most of the scholars agree that surgery was not practiced often and that the scientific side of medicine consisted of herbal treatments combined with the religious/magical side.

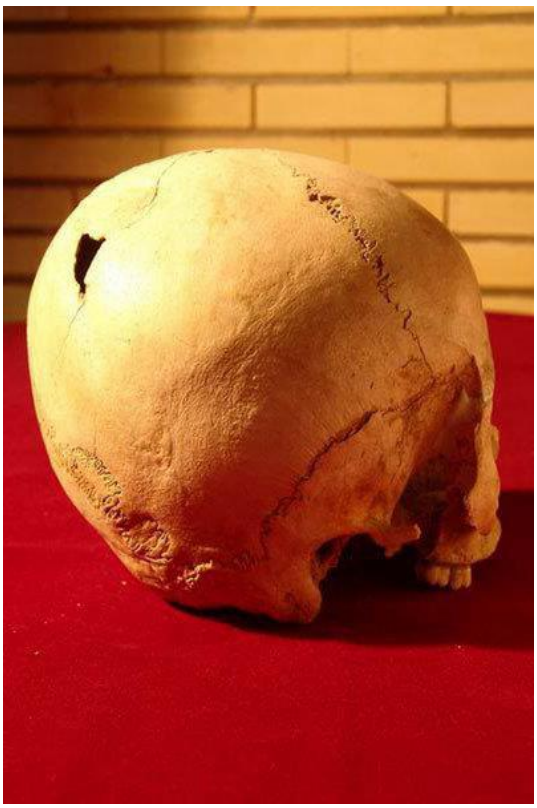
Although, we cannot be certain if the code of Hammurabi was actually used in its time but it does mention the fact that surgery did occur in Mesopotamia.

10.4 Studies on human remains

10.4.1 The skull of the Burned City

§ 218 of the Code of Hammurabi mentions how the physician "opens the temple" of the patient. There has been a lot of debate on this topic (Biggs 2005, 15). The operation mentioned in these cases are probably about bloodletting or trephination of the skull. This means that a small incision is made into the skull or a piece of skull is removed to relief pressure on the brain. The scientific term for the last procedure is called decompressive craniotomy (Naser Moghadasi 2014).

The practice is very rarely attested in the medical corpus and thus the practice must be limited (Biggs 2005, 15). The reason why it was a rare practice is because the procedure involved many risks. The risk did not only count for the patient but also for the *asû* if we assume that the code of Hammurabi was used as stated. Bloodletting was used in ancient cultures for stabilizing the blood pressure on the brain or to treat mental health issues (Geller 2004).



Figuur 13: Skull with signs of surgery in Naser Moghadasi 2014.

On the archaeological site of Shahr-e Sukhteh situated in eastern Iran or better known as “the Burnt city”, a skull of a teenage girl has been found. The skull was found in a mass grave which can be dated back 2800 B.C. The skull is now held in the Tehran Museum of Medical History (Naser Moghadasi 2014; Seyed Sajjadi 2008)

The skull showed a deep triangular incision, the rest of the skull was intact. Archaeologists and anthropologists concluded that an operation has been done on the girl to treat hydrocephalus (Seyed Sajjadi 2008).

This disease can occur at birth or later in age and has several causes such as the manifestation of a brain tumor or other brain related diseases. Fluids accumulate in the brain which causes the skull to expand. Studies on the skull determined that the person was female and approximately thirteen years old (Naser Moghadasi 2014, 249). The skull was enlarged at the back and was bigger in the center and the left. After examining the incision it is clear that she did survive the operation since the incision had healed in some extent but she did not live long after this operation but it cannot be proven that she died of complications of the surgery (Seyed Sajjadi 2008, 18).

Operations like these are often conducted as a magical intervention and have a long history in different parts of the world. But why did the practitioners wait until the girl was thirteen? When someone is born with this condition approximately 50% survives without treatment. Researchers know that the girl suffered a long time of this disease since her skull was enlarged. If the hydrocephalus resulted of a sudden stroke or tumor, the enlargement of the skull would not be so significant. Her condition was visible for other people (Naser Moghadasi 2014, 250). Other skulls with hydrocephalus have been found in the same region but without surgical marks. Maybe, the practitioners only decided to start a procedure when the patient started to show symptoms such as epilepsy or vomiting (Naser Moghadasi 2014, 251).

Similar case studies have not yet been found but that does not mean the practice did not happen as some suggest that the healing practitioners only focused on herbal/magical medicine. On some occasions, surgical procedures were certainly executed. Not everyone with the same condition was treated with surgery as the case study above proves. Some people were treated in the end with surgery if they started to show symptoms. We also have to keep in mind that only the elite had the privilege to benefit from the best health care. They were probably the only people who could afford surgery.

10.4.2 Other studies

Unfortunately, few osteological remains are found and most of them are scarce in archaeological excavations due to poor preservation (Biggs 2005, 15). There have been studies on human material to discuss leprosy and trephination (Avalos 1995, 14). It has become clear now that leprosy occurred in Palestine in the Byzantine period. It is not clear whether it already occurred in Mesopotamia (Zias 1989, 27-31).

The most extensive study on human remains has been done for the Abu Salabikh excavation. 99 graves were found but, for several reasons, most of them were in bad condition (Harriet, Moon, Postgate 1985). First of all, the bones have been preserved poorly. Secondly, grave-robbing has taken place. Moreover,, the detailed results concerning the physical anthropology have not been published until today (Harriet, Moon, Postgate 1985, 3).

From case studies like the one of the skull of the Burned City we can conclude that studies on human bone material can give us a lot more information on surgery that has been practiced in the Ancient Near East (Fales 2016, 8-9). For now we have to rely mostly on written sources if scholars want to study surgery in the Ancient Near East.

11 Conclusion

The research questions posed in the beginning of this dissertation were the following:

"Is there a scientific approach to medicine and on what scale was it practiced?

"Was there a practice of temple medicine, and is it comparable with the temple practice as we know in the Greek world?"

The conclusion is that there was a scientific approach to medicine. This scientific approach is much larger and wider spread than we would suspect in the first place. Researchers and scholars often interpreted medical texts as magical. However, the texts are not always magical, as was stated in chapter two. Procedures were often written down in a poetic way instead of a scientific way. This has to be taken into account for further scholars, they have to read beyond the poetic way of writing.

Nonetheless, magic and rituals were an important factor in society and several mysterious objects were used to heal patients. They go hand in hand with real drugs and salves. This is still the same in today's health care for some people.

A new interpretation was given in chapter four. There is some convincing evidence to assume that the *āšipu* was more than a priest who focused on rituals regarding the healing of people. He had a scientific background and some *āšipus*, such as Urad-Gula, are known to have been practicing the *asûtu*. Therefore, I believe that the social status of the family played a huge part in becoming an *āšipu* as we can see in the case of Kiṣir-Aššur. Teamwork and collaboration was certainly involved in the practice of medicine between the different practitioners.

The excavations of the Gula temple in Isin show that the temple played a role in the practice of medicine. Several objects were found, such as the dog container, amulets and ceramics. Structures, such as the Sickerschacht and the large court have been excavated, even human remains have been found in this temple. This shows that there is reason to believe that temple medicine was practiced. Attestations were made, and state that *āšipus* are known to have been visiting the temple to study cuneiform tablets.

Thus, we can say with certainty that the temple had a medical function to some privileged people. In a way we can compare temple medicine with the practice that was done in the temples of Asclepius. We know from Greek sources that the people stayed overnight but this cannot be proven for the temples of Gula.

In both cases we cannot speak of a hospital. It is more like a *Hospice*. A place where people could spend some time to be looked after by the *āšipus* and to bring offerings for the goddess of medicine for their wellbeing.

The comparison with the Asclepeia and Asclepius himself shows that the cult of Gula could be a predecessor. Therefore, there is a possibility that this kind of temple medicine evolved to the temple medicine known from the Asclepeia several hundreds and even thousands years later.

Not only the temple played a role in the general health care of people, but also the palace. The case study of the palace in Ebla shows that drugs were prepared on a large scale. The amount of cooking pits and ceramics show that the palace must have been active in the spread of these drugs in their city.

Unfortunately, we lack studies and analyses on human bone material from excavations in the Ancient Near East. Case studies, as the one of the Burned City, show that the practitioners were very skilled in their surgical procedures. The problem is poor preservation of this material, but also misinterpretation of the excavators as we saw with the medical instruments.

We have to keep in mind that people of the Ancient Near East acted in a practicalc way and that religion played an important role. They had a very high knowledge of health care. The scientific approach to medicine and healing only reached the same level in the western world at the end of the 19th century

Overall, the practical side of medicine is an interesting study and new research is necessary if we want to reconstruct as much as possible. It is really important to include the archaeological finds and compare them with the written material. Only then can we make the most accurate reconstruction.

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12.3 Figures

Figure 1: Mesopotamia around 1200 BC., which show the location of Assur and Niniveh © Ian Mladjov, accessed on https://sites.google.com/a/umich.edu/imladjov/maps.

Figure 2: Inscribed vessels © The British Museum in Walker C. B. F., 1980. Some Mesopotamian Inscribed Vessels, Iraq 52/1, 84 – 86.

Figure 3: Seal which shows the practice of healing, a fumigation jar is used in Collon D., 1987. *First Impressions, Cylinder Seals in the Ancient Near East.* London: The British Museum.

Figure 4: Sick person in a hut on an Assyrian cylinder seal after Teissier 1984, no. 231 in Ornan T., 2004. The Goddess Gula and Her Dog, *IMSA* 3, 13-30.

Figure 5: Ex voto statues of feet and legs found in the Gula temple precinct in Hrouda B., et al., 1977. *Isin - Išān Bahrīyāt I, Die Ergebnisse der Ausgrabungen 1973 - 1974*. München: Verlag Der Bayerischen Akademie der Wissenschaften, plate 8.

Figure 6: Dog figurine found in Tello © Musée Du Louvre in AO 4349 and Charpin D., 2017. *La vie méconnus des temples Mésopotamiens*. Paris: Les Belles Lettres, Collège de France.

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Figure 11: Kitchen hearths located in Palace G, room L.2890 in Vacca A., Peyronel L., Wachter-Sarkady C., 2017. *An Affair of Herbal Medicine? The "Special" Kitchen in the Royal palace of Ebla*, accessed on 10/01/2018 on http://asorblog.org/2017/11/07/affair-herbal-medicine-special-kitchen-royal-palace-ebla/?utm_content=buffer5e171&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer.

Figure 12: Location of the archaeobotanial samples in room L.2890 in Vacca A., Peyronel L., Wachter-Sarkady C., 2017. *An Affair of Herbal Medicine? The "Special" Kitchen in the Royal palace of Ebla*, accessed on 10/01/2018 on http://asorblog.org/2017/11/07/affair-herbal-medicine-special-kitchen-royal-palace-ebla/?utm_content=buffer5e171&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer.

Figure 13: Skull with signs of surgery in Naser Moghadasi A., 2014. First Skull Surgery in Iran: The Burned City and a 4800-Year-Old Skull, *Iran J Public Health* 43/2, 249 – 251.

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