The Brain, the Marrow and the Seat of Cognition in Mesopotamian Tradition*

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It has been assumed that according to the Babylonians the mind was located in the organ of the heart (Akkadian libbu, see CAD L s.v. libbu mng. 3; Geller, 2001/2002: 61) and that they had marginal understanding of the existence of the brain and its function. The heart was also considered to be the seat of will and emotions, which is the reason that mental illnesses, such as ḫuṣ ḫepi libbi « mental breakdown, neurosis », were located there (Kinnier Wilson, 1965).¹

In the anatomical lexical text Ugu-mu « My Cranium », we have identified the first five lines as:²

ugu-mu « my calvarium, cranium »
ugu-dig(NI)-mu « my brain » (lit. « my soft cranium »)
ugu-dīlim-mu « my brain pan » (the interior side of the cranium)
sag-du-mu « my head » (in general)
sag-ki-mu « my forehead », « my temples »

In this article, we would like to take the opportunity to look closer at the second line: ugu-NI-mu and to provide further support for our supposition. In addition, we will discuss the identification of the brain in Sumerian and Akkadian lexical and literary texts and the possible functions attributed to this organ in those traditions.

The documentation for the Sumerian expression ugu-NI-mu is minimal; it is unique to the anatomical list Ugu-mu and does not occur elsewhere in the Mesopotamian corpus. Yet, all Ugu-mu traditions except that of Susa preserve the line ugu-NI. Unfortunately, the bilingual manuscripts of Ugu-mu do not provide an Akkadian translation.³ Since they do not furnish a translation for us, we are forced to concentrate on the Sumerian text. Let us look at possibilities regarding the meaning of the sign NI in Sumerian.

The first plausible meaning based on the most common reading NI as i « oil » results in « my oil-anointed cranium. » Although sensible, this translation is to be discarded since it is not a description of a physical attribute of the body. Other possibilities depend on further readings of the sign NI. The reading dig is given in Proto-Ea 93 (MSL XIV 35) and NI with the reading dig is equated with narbu adj. « moist, soft » in Ea II 14 (MSL XIV 247). Likewise, Proto-Aa (MSL XIV 123 Secondary Branch No. 9:389-391 [OB Sippar]) furnishes three Akkadian equations for NI: narbum adj. « moist, soft », rabābum « to grow soft » and lubbukum « to soften, moisten ». The lemma dig is also to be found in Sumerian literary texts with the meaning « to be soft ».⁴ Further evidence might be adduced from later lexical texts, both Aa and Antagal. Aa II/1 ii 2'-17' (MSL XIV 265f.) furnishes a series of analogous Akkadian lexical equivalents for NI with the value dig with semantically similar meanings: rabābu « to grow soft » (among its other meanings, Aa II/1 ii 3'), labāku « to soften, to steep » (including derived stems and adjectival formations, Aa II/1 ii 4', 11', 11a',

¹ We would also like to take this opportunity to thank Annie Attia and Mark Geller for reading a draft of this article and for their very helpful comments. We are also grateful to Shlomo Izre’el for his input regarding the nominal pattern of muḫḫu and to Deborah Sweeney for her assistance with the Egyptian sources.

² ḫuṣ ḫepi « depression » is also the first disease associated with the libbu in a late tablet (Hunger Spātbabylonische Texte aus Uruk 1 43) which gives a list of diseases, associating them with four internal organs: heart (libbu), belly (karšu?), lungs (ḫasū) and kidneys (kalātu), see latest edition by Geller, 2001/2002: 61.

³ The only extant Akkadian translation of ugu-NI is given in the Larsa Bilingual 1: [ugu]-NI'-gig = [xx?] mu-uḫu?² ³ ² qa-qa-di-[inšu]² ².

⁴ E.g. TUG.bar-sig₉ dig-dig-e im-ma-ak-e « he softens the plaster that had been put on them » (A šir-gida to Ninisina (Ninisina A), ETSC 4 22.1, line 18); na, gal-gal-lā a-gin; mu-un-dig² dig-ge-dè « they were softening large stones like liquid » (forerunner to udug-hul IV 254, also UET 6/2 391:10 and dupl. (bilingual udug-hul), see Geller, 1985: 34 and 99 comments to line.)
12'), rāṭibu « moist » (both adjectival formation and derived stem, Aa II/1 ii 9', 10'). Antagal also offers the equation dig NI = naraṭibu « to become moist, soft » (in group with labāku and a-za-al, Antagal G 45, MSL XVII 222). Another recently published late Babylonian acrographical lexical text also offers the equation dig NI = naraṭibu « to become moist, soft » (preceded by IA-a). As a qualification of ugu « cranium », this semantic range yields « my softened cranium ». The tentative proposition of « softened » may refer to the child’s head whose skull bones are soft until they harden with age. The šibib qaqqadī (the sagittal fontanelle) (see CAD s.v. šētu šētu « suture, seam ») was known. However, most likely, « my soft cranium » refers to the soft part of the cranium that is the brain.

Support for the meaning ugu-dig « brain » can be found in other lexical sources. While ugu-NI is unique to Ugu-mu, SAGxNI or SAO.NI occurs in other lexical lists. In Ebla SAGxNI appears in one monolingual list MEE 3 68 i 5, in several monolingual « eš-bar-kin, » acrographic lists MEE 15 no. 1 vii 32f., no. 9 i 10' and in the Ebla bilingual vocabulary MEE 4 264, 266a-d, 0346 i 90. In particular, the line in Ugu-mu might be compared to SAGxNI = mu-ḥu SAG in the Ebla Vocabulary VE 264 (MEE 4 228) « the muḥu of the head ». Proceeding from the verb mahāṭu « to soak, to soften », (see below for discussion of this etymology), we arrive at a translation of muḥhu « soft part of the head » as the translation of the Eblaite SAGxNI.

The Eblaite compound sign SAGxNI further occurs with modifiers in the following lines: SAGxNI+ME = gi-si-tum (VE 266a, MEE 4 228), SAGxNIΛBU = gi-si-di SAG (VE 266b, MEE 4 228), SAGxNI-SU = mu-ḥu-um (VE 266a, MEE 4 228). The entries SAGxNI+ME = gi-si-tum (VE 266a, MEE 4 228) and SAGxNIΛBU = gi-si-di SAG (VE 266b, MEE 4 228) have been related to the Akkadian expression ḥiṣṭu qaqqadi (Civil, 1984: 88). The Akkadian dictionaries have treated the latter in various ways: CAD Q 275 s.v. ḥiṣṭu B lex.² (a part of the head or the body); AHw 923 s.v. ḥiṣṭu(m) « Wald » mng. 5: « als Bez. des behaarten Kopfes (dazu?) »; CDA (2000) 289 s.v. ḥiṣṭu « forest »: « lex. q. ša qaqqadi (desig. of hair on head) ». All the dictionaries depend on the same references for this Akkadian lemma and these references are limited to lexical texts. In Hh., ḥiṣṭu qaqqadi is equated with quite different Sumerian logograms; the first being uzu.sag-du-É.iB. This Sumerian lemma also occurs in the Larsa bilingual version of Ugu-mu line 6: [sa]g-du-É (sic).IB-*mu(wr. GIG) = qi-eš-ti qā-qā-di-ia which is an exact parallel to Hh XV 6. Likewise, in Nabnitu XVII (= J) 154a-159 (MSL XVI 158) qiṣṭum ša qaqqadi is equated with nearly identical Sumerian words among which this Sumerian lemma possibly occurs³ and others are offered. Another Sumerian equivalent given in Hh XV 8a for Akkadian ḥiṣṭu qaqqadi is uzu.a-za-ad, see PSD A/I 202 s.v. a-za-ad A « head » (also a part of the head). Consequently, PSD suggests reading SAGxNI in Ebla as azadx. However, PSD collapses the two logograms in Ebla: (1) SAGxNI = mu-ḥu SAG and (2) SAGxNI+ME(OR BU) = qiṣṭum (gi-si-tum) SAG. Further, in Hh. the entry uzu.a-za-ad appears in three positions: (1) uzu.a-za-ad = qaqqadu Hh XV line 3, (2) uzu.a-za-ad = ḥiṣṭu qaqqadi Hh. XV line 8a, (3) uzu.a-za-ad = bibênu Hh. XV line 9. In his discussion, Jörgenberg evaluates the Sumerian equivalents for ḥiṣṭu qaqqadi and concludes that « an interpretation

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² Anomalous exceptions include: rimāṭu « numbness, paralysis » Aa II/1 ii 5', dešā « to be abundant » Aa II/1 ii 6', banū « to grow, to be pleasant » (Aa II/1 ii 7' which according to Ea II 20 has possibly the reading mu for NI, also bu Nhiều II/1 ii 13'), pusṣudu « to smash, to shatter » Aa II/1 ii 7a', litiktu « true measure » (Aa II/1 ii 2' which according to Ea II 11 has the reading lid for NI), kabri « fattened, plump, large » (Aa II/1 ii 2' which according to Ea II 19 has the reading mu for NI). The last entries ša ¹GIS.NI pušikku and nāpišu ša LÚ (Aa II/1 ii 14'-15') are related to combing wool. Commentary B to Aa II/1 (MSL XIV 268-270) gives an even wider selection for NI but only lls. 12'-13' for NI with reading dig with a comparable varied group of meanings.


⁴ For the UGU qaqqadīšu » / si-bit qaqqadīšu CT 51 136:13 (comm. on Labat TDP 32:8).

⁵ Note that the UGU (= U+KA) sign was introduced in late third millennium to replace the more archaic UGU₂ (= A+KA). It became the standard Old Babylonian spelling. Of the 933 instances of ugu cited in the ePSD, 881 are written ugu. « Whether the logogram U+KA was considered by the Old Babylonian scribes themselves as a logogram, to be read ugu, or as a phonetic spelling of the same sound sequence, to be read u-qa, cannot be established definitely. However, the lexical entry u-qa = U+KA in Proto-Ea 310 (MSL II 56 [now MSL XIV 44]) seems to indicate that this complex is viewed as a pseudo-logogram, at least in the lexical texts » (Klein, 1979: 152 note 17).

⁶ kuš.IB (or <E>-IB) is the Sumerian entry in Nabnitu XVII 156 (MSL XVI 158), see notes MSL IX p. 16. It is quite unexpected since kuš.e-ib = miserru « belt, girdle ». One could speculate that kuš-turn is some backward loan formation from an Akkadian kis-tum.
"the forest of the head" for "hair" is out of the question since the Sum. equivalents ... do not support such an interpretation. He also points out that the Eblaite word for forest is gi-sa-tum (Sjöberg, 1999: 526-7). Thus, the denotation of gi-si-tum in Eblaite and its equivalent KI-EŠ-TUM / KIŠ-TUM in Akkadian is not evident. The entry SAGxNI-SÙ = mu-ù-hu-um (266c) seems to be composed of two elements: the previous lemma SAGxNI plus the suffix -sù which Krebernik explains as the Eblaite possessive suffix and notes its absence in line 264 (Krebernik, 1983: 12).

Outside of Ebla, the lemma SAG.NI occurs in the S Vocabulary found at Emar: sag-NI = [...] Arnaud, Emar VI/4 537: 334 (see Sjöberg, 1998: 261 no. 334). It is unfortunate that the Akkadian column is not preserved.

This line might be further compared to SAGxDÙ with reading mu-ù-hu-um in Proto-Ea 297. The sign DÙ may be an incorrectly read NI. On the other hand, the cognate lemma ugu-du does occur in Ugu-mu, but with the meaning « tuft of hair ». The confusion between these two terms is also found is Sb I 245-7 line 264 (Krebernik, 1983: 12). The entry SAGxNI-SÙ preserved.

In these references, the connotation of mubhu(m) as « brain » could be brought to bear. Note that it has been suggested that the basic meaning of *mubh* in Semitic is « brain », (Militarev and Kogan, 2000: 169f. no. 187) while *qa/udqa/ud* is 'skull, head' (ibid. 144f. no. 159). Such a meaning of mubhum 'brain', 'marrow' in Akkadian has been proposed by Marten Stol. It is apparent that the one Akkadian word mubhu apparently collapsed the Sumerian distinction between ugu « cranium » and ugu-dig (NI) « brain ». Further, this noun mubhu(m) probably has the same root as the well-attested verb mahāhu « to soak, to soften ». The verb is known from OB onwards, from which the nominal formations mubhatu and mubhu, types of beer, are said to be derived. The nominal formation mubhu would thus be a purs pattern (GAG § 55d 3a) from the root mahāhu, a strong mediae geminatae verb.

Predictably, mubhu is a primary noun found in all the Semitic languages (Militarev and Kogan, 2000: 169f. no. 187 *mubh*). The noun pattern *mubh* has been reconstructed for Proto-Semitic (Fox, 2003: 81, reference courtesy Shlomo Izre'el). It is commonly considered an isolated noun with no known derivation. The Proto-Semitic reconstruction of *mubh* presents a triradical noun pattern with a geminate root. However, « there are almost no truly isolated nouns in a synchronic analysis of any of the languages since the Semitic languages usually form roots even from Proto-Semitic isolated nouns » (Fox, 2003: 61). Consequently, the appearance of the cognate root mahāhu in Akkadian is not unexpected. Similarly, Mishnaic Hebrew has a nif. formation nimmav(a)h from mwh with the meaning « be softened » (with a doubling of the first radical!), reference courtesy Shlomo Izre'el).

Further Akkadian attestations of mubhu with the meaning « brain » can be discerned. For instance, in the simile: «if the intestinal coils look like the mubhu [kima UGU] » BRM 4 13:47 (SB ext., CAD M/2 173b 1), the commonality between these two entities are found in their both being coiled organs.

Since the Akkadian word mubhu collapsed the Sumerian distinction between ugu « cranium » and ugu-dig (NI) « brain », the question arises as to the specific identification of mubhu in medical contexts. One

10 See, on the other hand, Civil, 1987: 50.
11 The Sumerian equivalents of mubhu were accounted for in a broken section of Ea III 46-49 (MSL XIV 305), possibly also in III 133 (MSL XIV 309).
12 This equation differs from the more common ones of sag-du, such as pathaq « to build » and derivatives, obviously related to dû and santakku « triangle » related to sag-kak.
13 For ugu-KAK « tuft of hair » in Ugu-mu Nippur Monolingual line 37 (MSL IX 53), see Civil, 1973: 58.
14 « The primary meaning is in Semitic "brains", "marrow" » (Stol, 2000: 628). For the meaning « marrow » in Akkadian, Stol cites the OA Sargon text: mu-ha-am ša kurbnatum « they ate the marrow of the feet » (see below). As pointed out by Worthington (2003: 2 note 1), the lemma mubhu was previously translated as « brain » (« cerveau ») by Contenau (1938: 66). Another word for « brain » mm is found in Ugaritic, see Militarev and Kogan, 2000: 167, Kogan, 2004.
15 The dictionaries do not attribute any verbal stem to mubhu. The verb could derive from the noun, much like nawārum has been derived from nīrum "light".
16 An isolated noun is defined as a substantive which does not share a root with another word with a similar meaning whether verb or noun (Fox, 2003: 27, 29, 61ff) but even isolated nouns can be analyzed into pattern and root (ibid., 54).
17 Rather than a geminate form, the form may appear as medial weak in individual languages. This reflects phonological development within these languages. For the Hebrew development of qutl > qotel and replacement of geminate root with single consonant and compensatory lengthening of the vowel, see Fox, 2003: 153ff.
point of contention is the translation of the series ʾṣumma amēlī muḫḫāšu umma ukāl which has been treated in this journal; tablet one by Worthington, 2005 and tablet two by Attia and Buisson, 2003. Both translated similarly: « If the crown of a man's head is feverish » (Worthington) and « Si le crâne d'un homme contient de la chaleur » (Attia and Buisson). Geller (2001/2002: 58, 68) suggests translating: « If a man's brain contains heat (fever) » basing himself on Greek parallels and explains that « Although fever can affect many other organs of the body, the association with the brain is suggestive, since Galen associates the disease of phrenitis, a combination mostly of fever and delirium, with the brain » (Geller, 2001/2002: 58).18 His translation was criticized by Worthington (2003: 2 note 1) who assumed that he was advocating that muḫḫu was to be equated with « brain » in all medical contexts. It is interesting to note that in UGU I, the therapeutic treatment for this head malady is applied to the SAG.DU qaqqadu « head » which is shaved and not to the UGU muḫḫu. Another condition and treatment are similarly described: « If the crown (UGU) of a man's head is continually hot, mix... and fumigate his head (SAG.DU) over the embers of camelthorn » UGU 1 74-75 (Worthington, 2005: 9). Since the medical texts might be expected to use anatomical terminology with some exactitude, we should pause to reconsider their use of muḫḫu (UGU) and qaqqadu (SAG.DU). The terms alternate in UGU 1: muḫḫu is the subject of the medical condition in Ils. 1-140', 190'-197' while qaqqadu occurs in Ils. 141'-189', 206'-end. It is interesting to note that hair is said to fall out of the qaqqadu from which it could be inferred that the muḫḫu indicates the bony cranium but not the cutaneous layer surrounding it. Further, there is a series regarding the condition of mê ukāl « holding water, being watery ». First, it is the muḫḫu (190'), then the qaqqadu (206') and then the abbuttu « forelock » (207'). This medical condition might be compared to that of hydrocephalus, the accumulation of cerebrospinal fluid in the ventricles of the brain and in the subarachnoid spaces, leading to the enlargement and swelling of the head, prominence of the forehead, atrophy of the brain, mental weakness and convulsions.

The one certain reference for muḫḫu in the meaning « marrow », the soft, fatty vascular tissue in the cavities of the bones, comes from the Old Assyrian tale of the Sargon legend:

1 ʾlim šaḫuʾa ʾša ʿunnašama mu-ḫa-am ša kursinātim aši šabāʾim ʾekulūnī
One thousand are my cup bearers who were daily eating the marrow of the shank until satiation

This delicacy is similar to Osso buco, a regional dish from the Piedmont in Italy in which traditionally a veal shank is used. Thus, in Akkadian as in other Semitic languages, the brain was probably considered to be a type of marrow, the fatty tissue of the bones of the skull.

Further, there may be other Akkadian words for brain. CAD (G 5b) suggested that gabbu B (a part of the human or animal body) is possibly a term for brain which was accepted by both AHw 272b (s.v. gabbu II etwa « Gehirn (v. Tier) »?) and CDA (2000) 87 (s.v. gabbu II ～ « (animal's) brain? j/NB as meat offering »). Like muḫḫu, gabbu denotes a semi-liquid part of the human body according to the context of the vocabulary passages which refer to the human body while the gabbu of animals in the passages from Neo-Babylonian texts indicate that it was an edible unit and denoted an internal part of the animal body, although it is never mentioned among the exta. Thus, it is credible that gabbu also denotes the marrow in general and the brain in particular.

Knowledge of the existence of the brain as an organ was most likely gained through traumatic and medical procedures. There is both archaeological and textual evidence of the operation of trepanation. The archaeological evidence19 is contemporary with our Ugu-mu text and precedes the later textual evidence found in the medical therapeutic corpus. The operation is outlined in UGU I 190'-192' (Worthington, 2005: 13):


18 For a full description of phrenitis « brain fever », see also Geller, 2001/2002: 65, 68. Geller points out that phrenitis actually means « inflammation of the phrenes » which are located in the diaphragm.
19 See Wolska, 1994 for two cases of trepanation from Tell Bi'a, Old Babylonian levels, one post trauma and one possibly for medical or magical reasons. See also the overview of cases of trepanation in the ancient Near East by Krafeld-Daugherty, 2002: 253. See further references cited by Worthington, 2005: 30, note 65.
We offer our own translation, based on the previous work of Worthington and Stol.20

«If the brain21 of a man's head contains water, palpate the watery spot with your thumb. If his ear21 smells bad (and) [fluids from] his skull have descended, open (i.e. make an incision) and scrape22 his skull; [emove] the fluid of his skull [...]; [wash] [a thin bandage in water(?)], sprinkle (it) with oil, place (it) on the wound. »

Although traumatic head wounds, in particular from military engagements, are seen in skeletal remains,23 and recounted in descriptions of such armed combat, medical references to such conditions are not yet known in the Mesopotamian medical corpus. However, head wounds are described in the Egyptian medical corpus. A detailed text written in ca. 1600 B.C.E. lists varying degrees of traumatic injury. In case 6, it concerns a head wound with skull fracture exposing the brain (Jjs).24 According to the explanations given in the text, the wound is described as having penetrated to the surface of the brain and exposed the meningeal membrane and the sulci (grooves on the surface of the brain) which are compared to the slag which gathers on the surface of molten copper. In his comments regarding the word for brain (3s), Breasted (1930: 166-167) comments: «Indeed it may designate organic substances of a viscous or semi-fluid consistency like marrow; for in five out of the seven occurrences of the word in Pap. Smith it is followed by the phrase "of his skull" as if to render the word Jjs more specific. "Marrow of the skull" would thus be the earliest designation of brain. » It is interesting to note the parallel development of the lemma for brain from an original word that designated the fluid marrow.25

Thus, we can see both in Akkadian, in Ugaritic and in Egyptian, three separate words designating «marrow», the soft, fatty substance in the cavities of the bones were used to designate the «brain» the marrow of the skull.

The Seat of Cognition in Mesopotamian Tradition

Sumerians held that geštū «ear» was the seat of intelligence (Karahashi, 2000: 84).26 As god of...
wisdom, Enki possesses geštû and bestows geštû on kings:

\[ \text{Enki now gave Enmerkar wisdom} \]

Enmerkar and the Lord of Aratta (ETCSL 1.8.2.3) line 420, see also Vanstiphout, 2003: 80ff.

Likewise, this phrase occurs as a royal epithet: geštû sum-ma geštû « given wisdom by Enki ». It first appears in the inscriptions of Eannatum (see Behrens and Steible, 1983: 304 s.v. sum II 1.b). In addition to auditory activities, compound verbs composed with geštû describe mental/brain activities, « to pay attention, » « to think, » « to forget » (Karalahashi, 2000: 84).

From the ear, wisdom spread to other parts of the head, in particular, sag-ki « the forehead »:

\[ \text{é-me-eš sag-ki nīg-nam mu-un-kin zi im-ma-da-ab-gi₄} \]

« Summer pondered everything in his head (sag-ki) and calmed down »

The Debate Between Winter and Summer (ETCSL 5.3.3) line 297

\[ \text{sēš-gal sēš-bān-da hi-li-a-bi na-an-na-ni-ib-gi₄-gi₄} \]

« Do not reject the pleasurable company of a mentor or his assistant: once you have come into contact with such great brains (sag-ki gal-gal-la), you will make your own words more worthy »

The advice of a supervisor to a younger scribe (Et-dub-ba-a C, ETCSL 5.1.3) lines 19-20

If you do not have a « head », you cannot think:

\[ \text{sag-du nu-tuku nam ši-ib-tar-re} \]

The Instructions of Šuruppak, see Alster, 2005: 76 line 115

In Akkadian, uznu « ear » is also used to express « mind, intelligence, wisdom ». It is a quality of the gods: uznam nēmeqim hasīsam erēt « she (Istar) is wise in the perception of wisdom and understanding » RA 22 173:35 (OB hymn to Istar); Marduq mūdû gimûr uzni (var. -nu) « who knows all wisdom » En. el. II 116. The gods bestowed this quality on human beings: GEŠTÛ [u’watā[r]jašum « they (the gods) made (his) intelligence surpassing » BE 1/1 12 ii 4'-5', see Frayne, RIME 2 p. 311 E2.0.0.1003 (OAkk.); ina uzun IGI.GAL-im ša ilum ididinšum « with the wise understanding that the god gave to him » RA 11 92 i 8, see Frayne, RIME 4 p. 267 E4.2.13a.2 (OB, Kudur-mabuk). The gods can also deprive or withdraw wisdom from undeserving persons: the god Ea uznam u nēmeqam šēršuma « deprive him of understanding and wisdom » CH 1 2; šānānī šēmkunū ša rabā uzna « may he whose wisdom is great confuse their reason » AFO 12 143:17 (edin.na.dib.bi.da-rii).

The place where šēmu « reason » is found must be the seat of cognition and it is located in the mubhû « brain » according to the following passages:28 DN ... mubahšu limḫaṣna šēmu šēnanî « May Ninšubara smite his mubhû and disturb his reason » ZA 68 116:89-91 (royal inscription, Takil-liššu of Malgium, Frayne RIME 4.11.2.2); amahhaš mubahki ušanai šēnki « I shall smite your mubhû and drive you mad » Maqlû III 148 and similar examples. Results of trauma to the head are noted in divination: mubahšu mahīš kīna mubhiṣuma šēnu išišši « (if a man squints with both his eyes), his mubhû has been hit, his mind will be like

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27 For notes on previous translations, see Alster, 2005: 141, in particular his own earlier translation: « The idiot makes decisions » (Alster, 1974: 41 line 120).

28 According to the myth of the creation of mankind (Atra-šašš), man is created from the flesh and blood of a slaughtered god who has šēmu. It has been argued that damu « blood » inherited from the slain god is the source of the šēmu in human beings, their blood, intelligence, personality, and soul; see discussion by Abusch, 1998: 368-372. However, all occurrences of the word šēmu locate it in the mubhû, see CAD T s.v. šēmu mng. 5.
his brain, i.e. mushy » AfO 18 65 ii 30 (OB omen text). 29

The question regarding the head as the seat of reason was raised by Worthington (2003: 3f.). In his discussion, Worthington assumes that although the ancient Mesopotamians knew that a blow to the head led to impaired mental functioning, they thought that the seat of reason was located in the stomach or heart. He discusses a late text (Hunger Spätbabylonische Texte aus Uruk I 43, written by scribe Rîmfit-Anu who lived during the reign of Darius, see Geller, 2001/2: 60 note 105) which gives a list of diseases, associating them with four internal organs: heart (lībbu), belly (karšu)30, lungs (jaššu) and kidneys (kalāti), see latest edition by Geller, 2001/2002: 60-62. Worthington explains the unexpected source of muruš qaqqadi u pi « head and mouth disease » in the stomach: « This connection between what the ancients thought to be the seat of reason (the stomach/heart) and what actually constitutes it (the head) is unlikely to be coincidental, and probably stemmed from a chain of thought such as: "reason is in the stomach, but a bad head can interfere with reasoning, so a bad head must depend on the stomach". » (p. 4). Nevertheless, whether or not diseases of the head can be traced to a source in the stomach has no bearing on the question of the location of the seat of cognition.31

The loss of reason šanē / šinīt šemi and miqit šemi brings a change of mood, madness.32 This condition is described in the Diagnostic Handbook Tablet 22: [šumma šem][šu šan DU₁₁,DU₁₁,šu KUR.KUR mimmu₅ iqabbû inãšu « if his mind is altered, what he says is strange, he forgets everything he says » Labat TDP 182-49, cf. the preceding lines 47-48 and rev. 1-5, see HeeBel, 2000: 255 line 49 (transliteration), 260 (translation) and 269 (notes to lines). This condition can not only affect an individual but also a whole community or nation. It is a favorite literary trope from Sumerian to modern times: « Quem Deus perdere vult prius dementat » (Whomever God wants to destroy He first makes mad).33 The derangement of the human qualities dim-ma // umu₅ « good sense, intelligence » precede their destruction by the gods. For example, the disaster that is brought upon the city of Akkade in the Curse of Agade, from the end of the third millennium B.C.E. is described as:

nig-ga uruk₅-ta è-da-ni
a-ga-dē₅ dim-ma₆-bi ba-ra-è
si₃-ma-e kar ib-kur umu₅ a-ga-dē₅ ba-kur
u₇-te-eš-du₁₁-ga kalam teš-a gar-ra
a-ma-ru zi-ga gaba-šu-gar nu-tuk
« With the possessions being taken away from the city, good sense (dim-ma) left Agade, As the ships moved away from the docks, Agade's intelligence (umu₅) was removed. Enlil, the roaring storm that subjugates the entire land, the rising deluge that cannot be confronted, (was considering what should be destroyed in return for the wrecking of his beloved Ekur). »
Curse of Agade, 146-150, see Cooper, 1983: 56f. and ETSCL 2.1.5

29 This line appears in a section dealing with symptoms of eye movements, many related to mental confusion.
30 For the problems in the reading of the cuneiform signs, see Stol, 1993: 26f. and note 31.
31 Mark Geller (private communication) informs me that he will be publishing a new edition of this important text.
32 For šanē šemi, see CAD Š/1 406 s.v. šanē B v. mng. 2c « to become deranged, insane ». Nevertheless, CAD Š/3 46f. s.v. šinīt šemi offers (mng. uncert.), see Stol, 2000: 629 identification šinīt šeri₇ as « madness, mental insanity ».
33 This is the quotation is usually attributed to Seneca but it was a common theme among ancient Greek writers. It was already cited as a maxim then: « For in wisdom someone has revealed the famous saying, that evil seems good to him whose mind (phrenes) the god is driving towards disaster; » (Sophocles, Antigone 622-624, cf. scholiion); « When a divinity would work evil to a man, first he deprives him of his senses » (Unknown Greek author cited by Athenaeus, Legatio, chap. 26, section 2 who is identified by scholars as Euripides); « I value as utterance of an oracle these lines, composed by ancient poets and handed down to posterity: "When gods in anger seek a mortal's harm, first they deprive him of his sanity. " » (Lycurgus, Against Leocrates, Speech 1, section 92). For more modern quotations, cf. a British Poet of the 17th century: « For those whom God to ruin has design'd, He fits for fate, and first destroys their mind. » (John Dryden, The Hind and the Panther) and an American poet of the 19th century: « Whom the Gods would destroy they first make mad. » (Henry Wadsworth Longfellow, The Masque of Pandora, VI. In the Garden).
In the Lament over the destruction of the city of Uruk, the poet cries out:

\[ \text{dim-ma-bi šu bal a-ba-a bi-in-ak umuš-bi a-[ba]-[a bi-in]-[kùr]} \]

« Who distorted Unug's good sense and deranged its good counsel? »

_Uruk Lament_ (ETCSL 2.2.5) A 22

These paired Sumerian synonymous nouns _dim-ma // umuš_ have their Akkadian counterparts _hubûra // ūmu._ Naturally, the correspondence between _dim-ma_ and _ūmu_ « sense, personality, understanding » is etymological, an Akkadian loanword into Sumerian.34

This trope became a building block in the creation of literary figures and passed from the Sumerian into the Akkadian:

\[
\begin{align*}
xx x śa & d \text{ Adad issâ eli m[a[tim]} \\
\text{ hubûrša iktabas ūmèsâ ispuh} & \\
\text{ alâni tilâni u parakkt ispun} & \\
\text{ « The .... of Adad roared over the land.} \\
\text{ Having trampled its activity (hubûrša), it confused its mind (ūmèsâ).} & \\
\text{ It leveled cities, tells and temples. »} & \\
\text{Naram-Sin and the Enemy Hordes, Old Babylonian version I iv 4'-6'} & \\
\end{align*}
\]

The stanza quoted here from _Naram-Sin and the Enemy Hordes_ would thus describe the derangement of the human intelligence as the first step of the catastrophe, the cessation of all physical and mental activities as in the Sumerian descriptions. This trope becomes an essential element in the Deluge catastrophe imagery.35

In conclusion, according to our argument the Sumerians noted the existence of the brain, which they designated ugu-dig, and believed that understanding passed through the ear to the seat of the intelligence. On the other hand, the Akkadians not only collapsed the lexical distinction between the Sumerian lemmas, ugu « cranium » and ugu-dig “brain” but also equated both with the Semitic _mulḫu_ « marrow » (of bones including the cranium). The ancient physicians did not know the function of the brain as an organ and it is quite likely that they considered it a type of skull marrow. Nevertheless, the ancient metaphysical interpretations, both Sumerian and Akkadian, place understanding, reason and wisdom in the ear. Thus, despite the heart being seat of will, the head or brain, the place where _ūmu_ « reason » is found, must be the seat of cognition, whether or not the medical profession understood the functions of the brain as an organ. Such a Mesopotamian conception of the mind as we have offered here has wider theoretical implications. The absence of a distinct word for brain in Sumerian has led to a metaphysical holistic interpretation of the body in Sumerian thought.36 We should now rethink our construction of the ancient Mesopotamian awareness of human anatomy and its metaphysical associations.

References Cited

Abbreviations


ePSD  Tinney, S. et al., _The Pennsylvania Sumerian Dictionary Project, the Babylonian Section of the University of Pennsylvania Museum of Anthropology and Archaeology._ (http://psd.museum.upenn.edu/epsd/)

34 See e.g. Steiner, 2003: 634, no. 63
36 See e.g. the discussion by Asher-Greve and Asher, 1998: 39-40.

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Abusch, Tzvi.

Allen, James.

Alster, Bendt.

Asher-Greve, Julia M. and Asher, A. Lawrence.

Attia, Annie and Buisson, Gilles.

Behrens, Hermann and Steible, Horst.

Breasted, James Henry.
1930 The Edwin Smith Surgical Papyrus [OIP 3], Chicago: University of Chicago.

Civil, Miguel.

Contenau, Georges.
1938 La Médecine en Assyrie et en Babylone, Paris.

Cooper, Jerrold.
1983 The Curse of Agade, Baltimore.

Geller, Markham J.
1985 Forerunners to Udug-Hul [FAOS 12], Stuttgart.

Fox, Joshua.
2003 Semitic Noun Patterns [Harvard Semitic Studies 52], Winona Lake, Indiana.

Gümbattı, Cahit.

Heeßel, Nils P.
2000 Babylonisch-assyrische Diagnostik [AOAT 43], Münster.

Karashishi, Fumi.

Kinnier Wilson, J. V.

Klein, Jacob.

Kogan, Leonid.
2004 « Ugaritic mm’m "brain" revisited, » UF 36: 195-203.

Krafeld-Daugherty, Maria.
Krebemik, Manfred.
Mayer, Werner R.
van de Mieroop, Marc.
2000 « Sargon of Agade and His Successors in Anatolia, » Studi Micenei ed Egeo-Anatolici 42: 133-159
Militarev, Alexander and Kogan, Leonid.
Nunn, John F.
1996 Ancient Egyptian Medicine, London.
Sjöberg, Åke.
Steiner, Gerd.
Stol, Marten.
1993 Epilepsy in Babylonia [Cuneiform Monographs 2], Groningen: Styx.
Vanstiphout, Herman.
2003 Epics of Sumerian Kings, The Matter of Aratta [SBL Writings from the Ancient World 20], Atlanta.
Westenholz, Joan Goodnick.
Westenholz, Joan Goodnick and Sigrist, Marcel.
Wolska, Wanda.
Worthington, Martin.