

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 *hūš hepi 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-dílim-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 ì « 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',

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

² See J. G. Westenholz and M. Sigrist, forthcoming.

³ The only extant Akkadian translation of ugu-NI is given in the Larsa Bilingual 1: [ugu]-NI¹-gig = [xx?/ mu-uh?]? [qá-qá-dí¹-[ia?]].

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); na₄ gal-gal-lá a-gin₇ mu-un-dig¹ dig-ge-dè¹ « 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'), *raṭbu* « moist » (both adjectival formation and derived stem, Aa II/1 ii 9', 10').⁵ Antagal also offers the equation dig NI = *narābu* « 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 = *narbu* « to become moist, soft » (preceded by IA-a).⁶

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 *šibīṭ qaqqadi* « the sagittal fontanelle » (see CAD s.v. *šibītu* « suture, seam ») was known.⁷ 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 SAG.NI occurs in other lexical lists.⁸

In Ebla SAGxNI appears in one monolingual list MEE 3 68 i 5, in several monolingual « *éš-bar-kin_x* » 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 *muhhu* of the head ». Proceeding from the verb *mahāhu* « to soak, to soften », (see below for discussion of this etymology), we arrive at a translation of *muhhu* « 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), SAGxNI.BU = *gi-si-du* SAG (VE 266b, MEE 4 228), SAGxNI.SÜ = *mu-ḥu-um* (VE 266a, MEE 4 228). The entries SAGxNI+ME = *gi-si-tum* (VE 266a, MEE 4 228) and SAGxNI.BU = *gi-si-du* SAG (VE 266b, MEE 4 228) have been related to the Akkadian expression *qištu qaqqadi* (Civil, 1984: 88). The Akkadian dictionaries have treated the latter in various ways: CAD Q 275 s.v. *qištu* B lex.* (a part of the head or the body); AHW 923 s.v. *qištu(m)* « Wald » mng. 5: « als Bez. des behaarten Kopfes (dazu?) »; CDA (2000) 289 s.v. *qištu* « 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., *qištu qaqqadi* is equated with quite different Sumerian logograms; the first being uzu.sag-du-É.ĪB. This Sumerian lemma also occurs in the Larsa Bilingual version of Ugu-mu line 6: [sa]g-du-É (sic).ĪB.*mu(wr. GIG) = *qí-eš-ti qá-qá-dí-ia* which is an exact parallel to Hh XV 6. Likewise, in Nabnitu XVII (= J) 154a-159 (MSL XVI 158) *qištum ša qaqqadi* is equated with nearly identical Sumerian words among which this Sumerian lemma possibly occurs⁹ and others are offered. Another Sumerian equivalent given in Hh. XV 8a for Akkadian *qištu 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 azad_x. However, PSD collapses the two logograms in Ebla: (1) SAGxNI = *mu-ḥu* SAG and (2) SAGxNI+ME(or BU) = *qištum (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 = *qišti qaqqadi* Hh. XV line 8a, (3) uzu.a-za-ad = *bibēnu* Hh. XV line 9. In his discussion, Sjöberg evaluates the Sumerian equivalents for *qišti qaqqadi* and concludes that « an interpretation

⁵ Anomalous exceptions include: *rimūtu* « numbness, paralysis » Aa II/1 ii 5', *dešū* « 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 *bunnū* Aa II/1 ii 13'), *puššudu* « 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), *kabru* « fattened, plump, large » (Aa II/1 ii 2' which according to Ea II 19 has the reading mu for NI). The last entries *ša[†]GIŠ.NI[†] pušikkku* and *napāšu 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.

⁶ Mayer, 2005: 160 ll. 46-47.

⁷ Cf. also [UG]U *qaqqadišu* // *ši-bit qaqqadišu* CT 51 136:13 (comm. on Labat TDP 32:8).

⁸ 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 ugu₂. « Whether the grapheme 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-gū, cannot be established definitely. However, the lexical entry ú-gu = 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).

⁹ kuš.ĪB (or <E>.ĪB) 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-tum is some backward loan formation from an Akkadian *kiš-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 *qá-sa-tum* (Sjöberg, 1999: 526-7).¹⁰ 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-SU = *mu-ḫu-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^a 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 SAGxDÜ with reading *mu-úḫ-ḫu-um* in Proto-Ea 297.¹¹ The sign DÜ may be an incorrectly read NI.¹² On the other hand, the cognate lemma ugu-dù does occur in Ugu-mu, but with the meaning « tuft of hair ». ¹³ The confusion between these two terms is also found in S^b I 245-7 where the list is sag-du = *qaqqadu* « head », dilib = *urubḫu* « hair », followed by SAGxDÜ = *mubḫu*.

In these references, the connotation of *mubḫu(m)* as « brain » could be brought to bear. Note that it has been suggested that the basic meaning of **mubḫ* 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 *mubḫum* 'brain', 'marrow' in Akkadian has been proposed by Marten Stol.¹⁴ It is apparent that the one Akkadian word *mubḫu* apparently collapsed the Sumerian distinction between ugu « cranium » and ugu-dig (NI) « brain ». Further, this noun *mubḫu(m)* probably has the same root as the well-attested verb *mahāḫu* « to soak, to soften ». ¹⁵ The verb is known from OB onwards, from which the nominal formations *mibḫatu* and *mibḫu*, types of beer, are said to be derived. The nominal formation *mubḫu* would thus be a purs pattern (GAG § 55d 3a) from the root *mahāḫu*, a strong *mediae geminatae* verb.

Predictably, *mubḫu* is a primary noun found in all the Semitic languages (Militarev and Kogan, 2000: 169f. no. 187 **mubḫ*). The noun pattern **mubḫ* 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.¹⁶ The Proto-Semitic reconstruction of **mubḫ* presents a triradical noun pattern with a geminate root.¹⁷ 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 *mahāḫu* in Akkadian is not unexpected. Similarly, Mishnaic Hebrew has a *nif* formation *nimmo:(a)ḥ* from *mwh* with the meaning « be softened » (with a doubling of the first radical!, reference courtesy Shlomo Izre'el).

Further Akkadian attestations of *mubḫu* with the meaning « brain » can be discerned. For instance, in the simile: « if the intestinal coils look like the *mubḫu* [*kīma* 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 *mubḫu* collapsed the Sumerian distinction between ugu « cranium » and ugu-dig (NI) « brain », the question arises as to the specific identification of *mubḫu* in medical contexts. One

¹⁰ See, on the other hand, Civil, 1987: 50.

¹¹ The Sumerian equivalents of *mubḫu* 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-dù, such as *patāqu* « to build » and derivatives, obviously related to dù 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-ḫa-am ša kursinātim* « they ate the marrow of the feet » (see below). As pointed out by Worthington (2003: 2 note 1), the lemma *mubḫu* 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 *mubḫu*. The verb could derive from the noun, much like *nawārum* has been derived from *nūrum* "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* > *qótel* and replacement of geminate root with single consonant and compensatory lengthening of the vowel, see Fox, 2003: 153f.

point of contention is the translation of the series *šumma amēlu muḥḥašu 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 *muḥḥu* 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 *muḥḥu*. 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 *muḥḥu* (UGU) and *qaqqadu* (SAG.DU). The terms alternate in UGU 1: *muḥḥu* is the subject of the medical condition in lls. 1-140', 190'-197' while *qaqqadu* occurs in lls. 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 *muḥḥu* indicates the bony cranium but not the cutaneous layer surrounding it. Further, there is a series regarding the condition of *mē ukāl* « holding water, being watery ». First, it is the *muḥḥu* (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 *muḥḥu* 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 *līm šāqīū'a <ša> ūmēšama mu-ḥa-am ša kursinātīm adi šabā'im ēkulūni*

One thousand are my cup bearers who were daily eating the marrow of the shank until satiation

Kt. j/k 97:26f. (Old Assyrian Sargon legend), published by Günbatti, 1997: 134: 26f. (transliteration), 152 (copy), see treatment by van de Mieroop, 2000: 146-159.

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 *muḥḥu*, *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):

DIŠ NA UGU-šú A [*ukāl*] na ŠU.SI-ka GAL-ti ašar A.MEŠ *ukallu* TAG.TAG-at *šumma* UZU.GIŠ-šú

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.

be-e'-š[at' A? gulg]ullišu ittardu BAD-ma gulgullašu teserrem A ša gulgullišu [ušellamma? TÚG? SIG? A? L]UḪ-si Í.GIŠ SUD ana UGU GIG GAR-an

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; *r[emove]* the fluid of his skull [...]; [w]ash [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 (*3js*).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 *3js* 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 *geštú* « ear » was the seat of intelligence (Karahashi, 2000: 84).²⁶ As god of

²⁰ « If the crown of a man's head is watery, palpate the watery spot with your thumb. If his ear smells bad (and) his skull's [*fluids*] have descended, open (i.e. make an incision) and rub his skull; *r[emove]* all the fluid of his skull [...]; [w]ash [a thin bandage] in water, sprinkle (it) with oil, place (it) on the wound » (Worthington, 2005: 21). « If a man's skull holds water, you touch with your big finger the spot that holds the water. If his ... [and water (?)] descends from his skull, you open and you scrape(?) his skull; the water of his skull [you siphon off ...]; you wash, you sprinkle oil, you put (this) on the wound. » (Stol, 2004: 75-76).

²¹ See discussion by Worthington 2005: 31. Further evidence that UZU.GIŠ denotes the ear is found in the lexical series: [gi-iš] GIŠ = [uz]-nu Idu II 178; giš.be = *pi-ti uz-ni* Arnaud Emar 6/4 603:122(=Silbenvokabular A57). On the other hand, CT 12 29b ii 15, cited by AHW 1447b, does not preserve this equation.

²² We prefer to read *teserrem* from *sarāmu* « to cut, to make an incision » as cited by CAD S 172a rather than the alternative *sēru* « to rub » also cited by CAD S 229a. Worthington offers an innovative reading of LAGAB.A as *hammu* « the "swamp" (of his skull) » argued on the basis of the existence of such a disease, which could be related to the head having water.

²³ Krafeld-Daugherty, 2002: 252f.

²⁴ Edwin Smith Papyrus, see Breasted, 1930: 164-174; Allen, 2005: 75. The form of the language and its mistakes indicate that it is not an original composition but a copy of a document some two to three hundred years older (Allen, 2005: 70). Thus, this papyrus is contemporary with the Ugu-mu traditions.

²⁵ The word *3js* has also been understood to mean « viscera » and therefore « viscera of the skull » would be the brain, see discussion by Nunn, 1996: 50-51.

²⁶ Sometimes preconceptions affect the translations of *ša* in Sumerian cf. *šag₄ dab* « to think, conceive an idea; to take seriously » given in ePSD. In her dissertation, Fumi Karahashi demonstrated that « the nouns *ša* "heart" and *ní* "self," and to a lesser extent *bar* "outer body", *su* "flesh, body", and *ur₅* "liver" occur in compound verbs which convey meanings having to do with mental/emotional states/processes...They are *Verbs of Emotion*. » (2000: 144).

wisdom, Enki possesses geštú and bestows geštú on kings:

en-me-er-kár-ra ^den-ki-ke₄ geštú mu-na-^{an}-súm

« Enki now gave Enmerkar wisdom »

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

Likewise, this phrase occurs as a royal epithet: geštú sum-ma ^den-ki-ka/ke₄ « 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 geštú describe mental/brain activities, « to pay attention, » « to plan », « to think » « to forget » (Karahashi, 2000: 84).

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

é-me-eš sag-ki níg-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

šeš-gal šeš-bàn-da hi-li-a-bi na-an-na-ni-ib-gi₄-gi₄

sag-ki gal-gal-la um-ma-te inim-zu ba-dugud-dè-en

« 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 (E-dub-ba-a C, ETCSL 5.1.3) lines 19-20

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

sag-du nu-tuku nam ši-ib-tar-re

« The unwise decide the fate »

The Instructions of Šuruppak, see Alster, 2005: 76 line 115²⁷

In Akkadian, *uznu* « ear » is also used to express « mind, intelligence, wisdom ». It is a quality of the gods: *uznam nēmeqim ḥasīsam eršet* « she (Ištar) is wise in the perception of wisdom and understanding » RA 22 173:35 (OB hymn to Ištar); *Marduk mūdū gimir uzni* (var. -*nu*) « who knows all wisdom » En. el. II 116. The gods bestow this quality on human beings: GEŠTÚ ^uwatt[*r*]ašsum « they (the gods) made (his) intelligence surpassing » BE 1/1 12 i 4⁵, see Frayne, RIME 2 p. 311 E2.0.0.1003 (Oakk.); *ina uzun IGI.GÁL-im ša ilum iddinušum* « 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: may the god Ea *uznam u nēmeqam lišeršuma* « deprive him of understanding and wisdom » CH 1 2; *lišanni řemkunu ša rabū uzna* « may he whose wisdom is great confuse their reason » AfO 12 143:17 (edin.na.dib.bi.da-rit.).

The place where řemu « reason » is found must be the seat of cognition and it is located in the *muḥḥu* « brain » according to the following passages:²⁸ DN ... *muḥḥašu limḥašma řemšu lišanni* « May Ninšubura smite his *muḥḥu* and disturb his reason » ZA 68 116:89-91 (royal inscription, Takil-iliššu of Malgium, Frayne RIME 4.11.2.2); *amahḥaš muḥḥaki ušanni řenki* « I shall smite your *muḥḥu* and drive you mad » Maqlu III 148 and similar examples. Results of trauma to the head are noted in divination: *muḥḥašu maḥiṣ kīma muḥḥišuma řemšu ibašši* « (if a man squints with both his eyes), his *muḥḥu* has been hit, his mind will be like

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-ḥasīs), man is created from the flesh and blood of a slaughtered god who has řemu. It has been argued that *damu* « blood » inherited from the slain god is the source of the řemu in human beings, their blood, intelligence, personality, and soul; see discussion by Abusch, 1998: 368-372. However, all occurrences of the word řemu locate it in the *muḥḥu*, see CAD Ṭ s.v. řemu 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 1 43, written by scribe Rīmūt-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 (*libbu*), belly (*karšu*³⁰), lungs (*ḥašū*) and kidneys (*kalātu*), see latest edition by Geller, 2001/2002: 60-62. Worthington explains the unexpected source of *muṣ 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 ḫēmi* and *miqit ḫēmi* brings a change of mood, madness.³² This condition is described in the Diagnostic Handbook Tablet 22: [*šumma ḫēm*]šū *šani* DU₁₁.DU₁₁-šú KÚR.KÚR *mimmū iqabbū imaššu* « 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 Heeβel, 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 *dīm-ma* // *umuš* « 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:

níg-ga uru^{ki}-ta è-da-ni
a-ga-dè^{ki} **dīm-ma**-bi ba-ra-è
^{giš}má-e kar íb-kúr umuš a-ga-dè^{ki} ba-kúr
u₄-te-eš-du₁₁-ga kalam téš-a gar-ra
a-ma-ru zi-ga gaba-šu-gar nu-tuk

« With the possessions being taken away from the city,
good sense (**dīm-ma**) left Agade,

As the ships moved away from the docks, Agade's intelligence (**umuš**) 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 ETSCS 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 ḫēmi*, see CAD Š/1 406 s.v. *šanū* B v. mng. 2c « to become deranged, insane ». Nevertheless, CAD Š/3 46f. s.v. *šinīt ḫēmi* offers (mng. uncert.), see Stol, 2000: 629 identification *šinīt ḫēmi* 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. scholium); « When a divinity would work evil to a man, first he deprives him of his senses » (Unknown Greek author cited by Athenogoras, *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:

dím-ma-bi šu bal a-ba-a bí-in-ak umuš-bi a-[ba]-[a bí-in]-[kúr]
« Who distorted Unug's good sense and deranged its good counsel? »
Uruk Lament (ETCSL 2.2.5) A 22

These paired Sumerian synonymous nouns *dím-ma* // *umuš* have their Akkadian counterparts *hubūru* // *ṭēmu*. Naturally, the correspondence between *dím-ma* and *ṭēmu* « 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:

x x x ša ^dAdad issû eli mā[ti]m]
hubūrša iktabas *ṭēmša* ispuḥ
alāni tīlāni u parakkī ispun
« The of Adad roared over the land.
Having trampled its activity (*hubūrša*), it confused its mind (*ṭēmša*).
It leveled cities, tells and temples. »
Naram-Sin and the Enemy Hordes, Old Babylonian version I iv 4'-6'

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 *mubḥu* « 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 *ṭēmu* « 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.

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- 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

³⁵ See further the discussion in J.G. Westenholz, 1996: 198-200.

³⁶ See e.g. the discussion by Asher-Greve and Asher, 1998: 39-40.

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