Book Reviews

Scholars and Scholarship in Late Babylonian Uruk, Edited by Christine Proust and John M. Steel, Springer, Cham, 2019.

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In the mid-fourth millennium,[1] Uruk in southern Mesopotamia was the centre of the earliest state formation in the region (and probably the absolutely first); here, writing was invented, at first as a tool for accounting. After some centuries, the city was reduced to being a centre among several, but with ups and downs it was still an important city in the Late Babylonian period, after the fall of the Assyrian empire.

The period is conventionally subdivided according to ruling dynasties: the native Chaldaeans, whose Neo-Babylonian empire lasted from 612 to 539; the Persian Achaemenids, ruling Mesopotamia from 539 to Alexander's conquest in 331; and the Macedonian Seleucids, keeping Mesopotamia until it was taken over by the Parthian Arsacids in 141.

The present volume deals with texts from Achaemenid and Seleucid times. Some of them have been regularly (more or less well) excavated; others have been acquired by museums at the antiquities market, but a number of these (as well as of those regularly excavated) carry colophons informing about who wrote them and/or for whom they were written. Finally, a number of broken tablets without known provenience fit together with other broken tablets whose origin is better known, while still others (broken or intact) arrived at the antiquities market at a moment that informs indirectly about their provenience.

Combination of all this evidence allows the creation of a fairly well-defined corpus of scholarly texts from Uruk; the volume under review is dedicated to analysis of this corpus from a variety of perspectives. Since the volume is well argued and calls for no substantial objections (and few objections or supplementary observations regarding details), it seems most adequate to present in the following its contents chapter wise.

[1] Obviously BCE, as all historical dates in what follows.

Gaṇita Bhāratī Vol. 41, No. 1-2 (2019) pages 181-196

The Achaemenid part of the corpus postdates 484, in which year Babylon but not Uruk rebelled against Xerxes. One consequence of this rebellion was that Babylonian scribal families lost influence in Uruk, and Uruk families took their place; another was a religious reform in Uruk, where the sky-god Anu became head of the Uruk pantheon.

Part of the corpus come from the "house of the *āšipus*" – *āšipus* being priestly experts in ritual and medicine. This residential house was occupied by the Šangî-Ninurta scribal family from *ca* 445 to 385, and from *ca* 350 to 229 by the Ekur-Zākir family. Another part, in the main from the late third and early second century, comes from the Reš temple, dedicated to Anu. It appears to come from at least two different locations within the temple – perhaps two distinct scholarly archives.

This, together with detailed lists of all the texts concerned and an overview of the other articles in the volume, is related in the editors' introduction.

Chapter 2 (Uri Gabbay and Enrique Jiménez), deals with "Cultural Imports and Local Products in the Commentaries from Uruk", more precisely with scholarly commentaries to classical texts from Achaemenid as well as Seleucid Uruk which betray exchanges with Nippur (whether exchange of written material or of scholars is mostly hard to say) after the elimination of the dominance of Babylon – apparently giving rise to the emergence of "a shared tradition" (p. 57). It seems likely that this shared tradition involved not only Nippur and Uruk but also other southern cities.

Some Uruk commentaries are copies of matters known from elsewhere. Many, however, are almost certainly compilations produced locally; the "shared tradition" was a living tradition, not just a shared corpus of canonical texts with equally canonical interpretation. Its horizon was not strictly confined to the South. A few imports from Assyrian Ninive and from Babylon can indeed be identified; but they are few.

Chapter 3 (Christine Proust) discusses the "Mathematical Collection Found in the 'House of the *āšipus*'. Some of the tablets were found in disturbed contexts, but all that can be dated are of Achaemenid date. A noteworthy characteristic of the texts in question is interest in the various area metrologies in use – in particular area metrologies – and their connections. One of these was the "scholarly system", around which the sexagesimal place value system had been created in the outgoing third millennium, and together with which it had been handed down. In the first millennium it had gone out of administrative and economic use. Here, it had been replaced by "seed" and "reed-measures", the former corresponding to a standardized expectation for the amount of grain needed to seed the area and feed the plough oxen (different in Uruk and elsewhere), the latter measured in

[square] reeds, the reed being a length of 7 cubits.[2]

The presence of the scholarly system in the Uruk texts shows that it was just as much part of the "stream of tradition" as those literary, religious and ritual texts which are habitually collected under this heading; being unchanged since the outgoing third millennium it may even be claimed to be more of a true tradition that the rest of the supposed stream, even though there are indications that the Uruk scholars did not understand its purpose and function to the full, as pointed out by Proust (p. 102). The effort to connect it to the practical metrologies of the day is also evidence of actual interest in active mathematics (quite likely interest in *teaching* it); it may be seen as an attempt to reconquer ground which was known to have been lost,[3] and thereby perhaps be connected to the ideological innovative restoration dealt with in chapter 2.

Chapter 4 (John Steele), "Astronomical Activity in the 'House of the *āšipus*', obviously also touches at astrology – gone are the days where the Babylonian study of the heavenly motions could be treated as (if not believed to be) undefiled by "superstition". But just like Ptolemy, the Babylonians kept texts describing the observed or predicted heavenly phenomena apart from texts dealing with their meaning.

Even the corpus of astronomical texts (those about heavenly phenomena) falls into separate categories. At the highest level, Steele distinguishes between "practice texts" (containing the results of astronomical activity – either observation or prediction of astronomical phenomena) and "reference texts", providing necessary background information for this activity. His discussion of the single texts, however, classifies more finely. His largest group consists of observational texts, containing compilations of observations made in part a century, in part shortly before the first occupation of the "house of the *āšipus*". There is thus no evidence that any member of the families made observations, but at least one member of the Šangî-Ninurta family was apparently interested enough to compile earlier observational material.

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[2] The reed measure is actually the length of the area if laid out as a strip of width 1 reed; a "[surface-]cubit" is therefore 1 length-cubit ´ 1 length-reed, a "[surface-]finger" is 1 length-finger ´ 1 length-reed ,etc. [Powell 1984: 35]. This measurement in terms of a "broad line" (a line provided with a presupposed standard width) is widespread in pre-modern practical mensuration [Høyrup 1995]. Powell (who insisted being a "farmer boy" and eventually left scholarship for farming) goes so far as to state that this "system shows the strong orientation towards the concrete that is characteristic of all metrological systems except the metric, which is, as I am not the first to remark, rather anti-commonsense in many ways".

[3] This goes slightly beyond Proust, who instead on p. 126 points to the economic interest of the *šipus* in urban real estate and agricultural land; but for further evidence, see the discussion of some of the texts in question in [Høyrup 2014: 207*f*]. One motivation, evidently, does not exclude the other.

An "almanac" (predicted astronomical data for a given year) may indicate that even a member of the Ekur-Zākir family had such interests. Schemes for the determination of solstices and equinoxes (etc.) as well calculations of synodic phenomena for the moon and Saturn (the former according to "system A", the latter according to "system B") suggest through rather elementary blunders that the context for this interest was training, not necessarily astrological or similar use.

The latter inference is supported by the very modest overlap between the astronomical and the astrological texts found in the house. In this respect, the situation here is very similar to the picture offered by one of the two archives in the Reš temple; the other Reš archive offers evidence of genuine astronomical practice – but still much more restricted than what is found in contemporary Babylon.

Chapter 5 (Hermann Hunger), "Astrological Texts from Later Babylonian Uruk", treats of texts from the "House of the *Āšipus*" as well as others that are likely to come from the Reš temple – some 60 in total.

25 of them are celestial omina – and of these, the majority come from the series *Enūma Anu Enlil* ("When Anu and Enlil ..."), or they are commentaries to it. Comparison of an Uruk commentary owned by Iqīša,[4] a member of the Ekur-Zākir family living in the late fourth century and priest of the Reš temple, with two commentaries to the same part of the series from Babylon allows Hunger to conclude that "while the base text of *Enūma Anu Enlil* underwent a certain canonization, commentaries obviously did not". Other commentaries copied for Iqīša indicate that they are copied from a wax tablet, which might then have been written by Iqīša himself.

Other astrological texts represent new inventions of the Late Babylonian period: personal horoscopes, medical astrology, links between medical ingredients or cultic sites and locations on the zodiac or between liver parts and astral entities – several of them again "owned" by Iqīša. Two texts from *ca* 228 contain weather predictions from planetary phenomena, probably made from the assumption "that the same weather that was present at some planetary phenomenon, will take place again at the next occurrence of the same phenomenon" (p. 182); the repetitions of the occurrences are predicted from sometimes crude, sometimes better periods, the latter shared with astronomical "goal-year texts" and from weather observations recorded in astronomical diaries.

Chapter 6 (Mathieu Ossendrijver), "Scholarly Mathematics in the Reš Temple", initially

[4] Hunger more or less endorses the proposal made by Mathieu Ossendrijver that this kind of ownership indicated in colophons does not mean possession but intellectual responsibility.

(p. 188) points out that a "full-blown study of mathematical practices in the Reš would, ideally, cover all the material evidence of skills, techniques and methods for counting and computing, i.e. scholarly and administrative texts, but also material artifacts such as weights, bricks, containers, architecture and design elements", but restricts the focus of the actual discussion to "tablets with scholarly mathematics in a more conventional sense". On the other hand, it includes all tablets with a merely plausible, not necessarily certain connection to the Reš. Seven tablets satisfy these criteria, of which three are analyzed in depth, while the others receive terser discussion.

One (AO 6456) is an extensive table of regular numbers with their reciprocals. Ossendrijver bases his analysis on a method developed by Otto Neugebauer, a triaxial grid based on the factors 2, 3 and 5, and utilizes the way in which calculation errors propagate through the grid to analyze the order in which calculations were made. The outcome seems to support Neugebauer's suggestion that the table was produced from factors listed in the short standard table of reciprocals, but Ossendrijver admits that it does not quite rule out Evert Bruins' suggestion that all pairs, once they were calculated, could serve in the further process. Comparison with a similarly extensive table of reciprocals from Babylon appears to rule out that any of the two depended on the other. The Uruk table may therefore well have been produced directly by the scribe identified in the colophon. Even though a tablet written by his brother betrays intimate familiarity with the mathematics of the astronomical goal-year method, nothing in the present table suggests that it was meant, or could be useful, for mathematical astronomical computation. Ossendrijver does not discuss what can then have been its purpose – *art pour l'art*, or a pretext to train sexagesimal place-value numeracy.[5]

Another tablet (VAT 7848) is connected to Uruk by indirect and not overwhelmingly strong evidence only. It contains rather elementary geometric computations (unless two strongly damaged and badly understood problems should be less elementary than the rest, which seems unlikely); several problems involve the determination of areas in seed measure.

U 91 + W 169, composed of two fragments, is a combined multiplication table, probably a Seleucid copy of a pre-Seleucid original. Some of the principal numbers (those numbers whose products with 1, 2, 3, ..., 19, 20, 30, 40 and 50 are listed) are irregular (that is, they possess no finite sexagesimal reciprocal): 35, 55, 3.30 and 4.20. Tables of multiples of such irregular numbers represent an innovation, they are never found in the Old Babylonian

[5] When I was in the fifth form and had solved all the problems in the book, my mathematics teacher allowed me to compute diagonals in right-angled triangles. For me *art pour l'art*, for him meant to let me continue training, perhaps a way to keep me occupied.

corpus. Ossendrijver suggests them to have served as a tool for multiplication of multi-place regular numbers, where these sequences of digits often occur.

AO 6484 was "owned" by a well-known mathematical astronomer connected to the Reš. It is a collection of sundry mathematical problems, of which Ossendrijver mentions the summations, first of the powers[6] of 2 from 1 to 512 and then of the square numbers from 1 to 10. The second he finds of interest because (as pointed out in [Huber 1957: 280], which Ossendrijver refers to) the summation of squares may serve to determine the basic parameters of a planetary ephemeris. It may be added that two summations are also interesting because they form an indubitable cluster together with the summations of the first 10 natural numbers and the first 10 triangular numbers in the Demotic P. British Museum 10520 (probably of early Roman date) – see [Høyrup 2016: 85*f*]. They are thus evidence that the late Babylonian mathematical temple environment was not as closed on itself as often assumed (more evidence exists). Since the summation of the geometric series has no astronomical application, it seems doubtful that the sum of squares should have been *invented* for astronomical use (which does not exclude *use*).

AO 6555, known as the "Esagila tablet", "owned" by an Uruk scholar, states to be copied from "an old tablet from Borsippa"; it contains geometrical and metrological computations taking the measures of the Esagila temple in Babylon as pretexts. W 20030,108 is a fragment using the Reš temple in a similar way. W 20030,15 is a fragment of a copy from an already damaged original.[7] All that can be said about it is that it deals with "lengths" and "widths".

Chapter 7 (Julia Krul) deals with the "Influence of the Celestial Sciences on Temple Rituals in Hellenistic Uruk and Babylon", and further with what this tells about changing religious thought. However, first Krul looks at "several individuals who may have influenced religious development at Uruk during the Hellenistic period, and then examine[s] a few key texts that were produced or commissioned by those persons" (p. 220). These are largely the same persons as those who were mentioned in earlier chapters as writers or owners of mathematical, astronomical or astrological texts. As *āšipus* or "scribes of *Enūma Anu Enlil*" they were indeed naturally involved in rituals and the appurtenant scholarship. Referring to work by Ossendrijver Krul further points out that the four major scribal families to which they belong were involved in each other's scribal education. One figure is new, although his family was involved in the network in question: Anu-uballim alias Kephalon,

[6] Ossendrijver speaks of the summation of a linear series. The words are opaque but the numbers show that the geometric series 1+...+512 is meant.

[7] Thus according to the text in Eleanor Robson's edition on http://oracc.museum.upenn.edu/cams/gkab/P363351.

who was responsible for a renovation of the major Uruk temples in 202/201 and probably also for a reorganization of the cultic service system. As Krul observes, we "cannot prove, but certainly reasonably suppose that Kephalon engaged in dialogue with" members of the *āšipu* families "about the ritual aspects of his cultic innovations – e.g. which deities, which offerings, which festivals, and on which days".

Among the texts for which the various scholars are responsible as "owners" or copyists, a cultic calendar from c. 250 combines second-millennium cultic material with the zodiac (a fifth-century invention) and the positions of planets; in another one, from 216/215, "the stars, planets and constellations are all presented as divine entities subordinate to the god Anu, who is thereby elevated to the position of divine ruler of the entire firmament" (p. 223). Finally, an illustrated microzodiac (that it, a document in which each zodiacal sign is subdivided into 12 sections – evidently a later invention than the zodiac itself) copied in *ca* 200 connects each of these sections of 2.5° to plants, stones and types of wood with their medical properties; but further to omina, weather and harvest, personal lucky and unlucky days, and finally to elements of the cultic calendar. Even here there is thus evidence of integration of old material with recent astral thought.

This thought not only comprises that the heavenly bodies and constellations are subordinate to Anu but even that Anu and his wife Antu themselves are represented by stars – an idea apparently never found in earlier epochs nor outside Uruk. In cultic practice this led to regular food offerings being given to the heavenly bodies (which in preceding centuries had only been done on special occasions, when they were addressed as mediators that might intervene with the great gods). In this sense, as Krul says, it seems allowed to speak of an "astral religion" in Late Babylonian Uruk. Not only, however: The idea "that the priest-scholars of Uruk may have believed that the cosmic balance could and should be ritually restored around the solstices is not mere speculation, but derives from a cultic commentary from the Babylon-Borsippa area dated to 137". In Uruk as well Babylon, there is thus further evidence "for a greater 'astral' dimension to local temple rituals and the way the city's patron deities were perceived" (p. 230). As concluded, we may assume for Babylon what can only be demonstrated in Uruk, namely "that the scholars active in the celestial sciences were the same people who were responsible for the temple cults, in terms of organisation and daily ritual performance as well as the theology underlying contemporary religious practice" (p. 232).

Chapter 8 (Paul-Alain Beaulieu), on "Interactions Between Greek and Babylonian Thought in Seleucid Uruk", illustrates these interactions and the conditions on which they have to be dealt with through two examples. One is the names "Hired Man" and "Ram"

given to the same constellation in Mesopotamian respectively Greek tradition. Since the constellation also came to be understood as a sheep or ram in Seleucid and probably somewhat earlier Babylonian texts, the shift could have taken place within the Babylonian tradition, and could have been caused by homophony or similarity between cuneiform characters. On the other hand, the Elder Pliny claims that the name Aries was invented by Cleostratos of Tenedos, perhaps around 500; while this need not be true, it *could* suggest a Greek origin – in which case Babylonian glosses involving the homophony would be rationalizations of a borrowing. On the whole, this part of the article illustrates on how thin ice we often move when discussing the cultural interactions in Seleucid Babylonia.

The other point dealt with is a text listing names and epithets of Antu, known from a copy from 225. As some of the texts discussed by Krul, this one reformulates older material so as to suit the post-484 religious ideas, exalting Antu as a universal deity. The final catchline of the tablet (identifying a lost subsequent tablet by its first words) connects the sun-god Šamaš with ^{d}Duruna (^{d} is a determinative indicating that a divine entity is meant). After a discussion of the various interpretations that have been given to Duruna Beaulieu concludes that it is a mythological location, and that the name probably carried multiple meanings – among which "oven". But connecting it to Šamaš also "seems to be placing it at the centre of the primeval, unformed and idealized cosmos" (p. 248). All this leads Beaulieu to the cosmology of the Pythagorean Philolaos of Croton with its central fire identified with Zeus – an idea he supports by many details. The article ends (p. 252) with a question,

> What do we make of these resemblances? Are they purely coincidental? Is it possible that MLC 1890 bears witness to the existence of cosmological and mythological speculations at Uruk that were similar to those attributed to Philolaus and the Pythagorean school? Babylonian scholarly texts never provide explanations, only the bare elements of a system. We must supply the rest, often to the risk of misinterpreting the data

and with a suggested conclusion

> What the evidence suggests, however, is that specific elements of cosmological and mythological imagery, and perhaps certain concepts as well, travelled from one world to the other, and possibly in both directions. The depth of these interactions cannot be evaluated given the limitations of the textual evidence, but future research may be able to establish other points of contact.

It may be added that the above-mentioned link between Demotic and Seleucid series summations involves mathematics that is often supposed to be Pythagorean. But since this

supposition in itself is also doubtful we remain on thin ice.

The final Chapter 9 (Alexander Jones), "Uruk and the Greco-Roman World", discusses what (little) Greco-Roman sources know about *Orchoi* (Uruk) and its inhabitants, the *Orchenoi*. Such knowledge appears to have been restricted to specialized circles.

Orchoi is mentioned in Ptolemy's *Handy Tables* and in his *Geography*, neither too well-informed. *Orchenoi* are spoken of separately in the *Geography*, and also turn up in Ptolemy's *Tetrabiblos*. As background to this latter appearance, Jones discusses general Greek astrological geography and climate-based ethno-psychology over eight pages. This leads to an astonishing contrast (p. 265*f*): whereas the area to which Babylonia belongs is generally characterized in the *Tetrabiblos* by "sweeping stereotypes: luxuriousness, effeminate dress, but warlike and magnanimous behavior", Babylonia itself (with Mesopotamia and Assyria) are characterized solely by "an exceptional dedication to 'mathematics' and to the observation of the five planets" ('mathematics' in this context no doubt meaning mathematical astronomy). Still more striking, Chaldaea and Uruk, against habitual geography, are grouped together with Idumaea, Coele Syria, Judaea, Phoenicia, and Arabia Felix, whose inhabitants are supposed in general to be "great merchants and traders, but cowardly, treacherous, and servile". The Phoenicians, *Chaldaioi* and *Orchenoi*, however, "are more sincere and benevolent – and they are lovers of the astral sciences, φιαστρολογοι, and are the greatest worshippers of the Sun". Jones observes that "while Ptolemy associated astronomy with all three peoples, Babylonians, *Chaldaioi* and *Orchenoi*, in his eyes the Babylonians were somehow more exotic, while the *Chaldaioi* and *Orchenoi* were more 'people like us", and further that there was thus "somehow more of a sense of contact with the *Chaldaioi* and *Orchenoi*, at least in the sphere of the astral sciences".

The Elder Pliny similarly connects the three cities Babylon, Nippur and Uruk to the "doctrine of the Chaldaeans", and points to the Esagila temple in Babylon as "the inventor of the science of stars". Strabo appears to consider *Orchenoi* and *Borsippenoi* not as people from a particular place but as *sects* within the astral sciences (in the same sense as Galen speaks about the different sects of physicians). A scrap of Papyrus (*P.Oxy. astr. 4139*) discussing the periodicities of the moon confirms this. It appears to distinguish an opinion which can be identified as the Babylonian System A moon theory from that of the *Orchenoi*. Jones rounds off his essay with "a speculation, that this was the System B relation equating 269 anomalistic months with 251 synodic months, and therefore that, rightly or wrongly, Greek astronomers saw the scholars of Uruk as the advocates of System B".

Most contributions are written in a way that presupposes familiarity with Assyriological

technical matters – and, as Assyriologists themselves confess about their field with a shade of pride, Assyriology is a *Geheimwissenschaft*, an "occult science"). None the less, the non-adept reader who accepts not to grasp every detailed argument should still be able to get the gist and understand the many facets of Late Babylonian scholarship as belonging to a single jewel.

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