

**FEEDING THE PEOPLE: THE SOCIAL AND ECONOMIC ROLE OF THE
GRANARY IN UR III UMMU**

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Abstract

The late third millennium BCE saw the unification of Mesopotamia's independent city-states under a dynasty of kings known as the Third Dynasty of Ur, and the centralisation of the means of production and redistribution of foodstuffs and other produce. The quantity of texts left by the complex administrative network offers a wealth of data unparalleled in the ancient Near East. One aspect of the redistributive system that remains mostly unstudied is the granary, *guru₇*, and the extent of its control over barley, the principal foodstuff and method of payment for workers during the period. Using quantitative analysis techniques on >1000 cuneiform texts, and focusing on one province, Umma, this thesis takes a broad view of the functioning of the granary within the Ur III society and economy, proving that the granary was an administrative unit, rather than a central warehouse as has been previously suggested, controlling a network of storage facilities in various locations in the province.

The quantitative methodology has led to some striking conclusions, including my original observations on the nature of the *guru₇* institution; firstly, that it was primarily a state institution, operating to provision state livestock and the main cult of the province, that of the god Šara, but not called upon to provision the general population directly. Secondly, the findings have demonstrated the differences between the storage facilities in use at Umma, and have shown the extent of authority of the *ka-guru₇*, the head of the *guru₇* institution, over them. Finally, this thesis also highlights various changes in *guru₇* and in wider administrative practice that occurred over time, proving that a broad-spectrum quantitative methodology is an efficacious one for studying administrative textual data. Though the results may seem specific to the province and institution studied, they contribute to a broader understanding of the Ur III economy and administration. Some assumptions about grain storage and the administration thereof have been revised, and it has contributed to our understanding of the character of provincial administration in the Ur III state.

Glossary of terms and conventions

Capacity measurements

There were four main capacity measures used in the calculation of grain quantities, listed in order of volume from high to low:

gur – equal to 300 sila

barig – equal to 60 sila

ban – equal to 10 sila

sila - roughly the equivalent of a litre

Grain quantities are written out in the following format:

1.2.3 5

1 gur + 2 barig + 3 ban + 5 sila

Throughout this dissertation I will refer to the quantities in sila only (in this case the total = 455 sila), which, as the Ur III sila is almost equal to a litre, is a helpful measure for modern comprehension.

Dates

Dates are given at the end of the text in the format of month, then year. The years are named rather than numbered in the original Sumerian, but there is an accepted method among Ur III scholars of numbering them by king and year of reign. Thus “mu Ša-su-ru-um ba-hul” (the year that Šasurum was destroyed) becomes SH42 – the 42nd year of the reign of Šulgi.

A summary of the kings of the Ur III dynasty, their abbreviations and the lengths of their reigns is below:

Šulgi (SH) – 48 years

Amar-Suen (AS) – 9 years

Šu-Sin (SS) – 8 years

Ibbi-Sin (IS) – 24 years

Months are likewise referred to by number, rather than name.

An important thing to be aware of is the intercalary month 13. This month occurred approximately every three years to balance up the effect of the Sumerian year being based on the lunar, not the solar calendar. As Englund explains, the 12 months of the lunar year each lasted for almost exactly 29.53 days, giving a year of 354 1/3 days – 11 days short of a full tropical year (one based upon the movement of the earth round the sun).¹ This imbalance between the two calendars led to a shifting of the seasons throughout the year as it was being recorded on tablets and affected the cultic festivals, and therefore to balance the year an extra month was inserted. It was not a regular three-yearly occurrence, but happened fairly regularly. This month was called

¹ R. K. Englund, "Administrative Timekeeping in Ancient Mesopotamia," *Journal of the Economic and Social History of the Orient* 31, no. 2 (1988): 121-185.

the iti diri (“extra month”, also known as the “diri month”). It is not possible to determine precisely how regularly and how far the months slipped out of alignment; there is no state-wide standardisation of calendar adaptation, since each city would introduce an intercalary month according to its own scheme.

The agricultural year

Table 1 – Agricultural activities by month

Month	Approx. equivalent	Activity
1	April	Harvest
2	May	Threshing
3	June	Transportation to storage
4	July	Ploughing / harrowing
5	August	
6	September	
7	October	Sowing
8	November	
9	December	Irrigation / weeding
10	January	
11	February	
12	March	

This outline will be useful in Chapter 5 in particular.

Sumerian terminology

In this thesis, Sumerian terms are generally presented with the Sumerian term in the main body of the text and the English translation in brackets; for example, guru₇ (granary). This is in order that, firstly, readers with limited experience of Sumerian can keep track of the terms without having to refer back repeatedly to translations in earlier parts of the chapter and, secondly, to maintain the correct nuances of the Sumerian term, which often differ slightly from the English translation – guru₇, for instance, has more depth of meaning than the standard translation of “granary/grain store” in English does. Some terms such as barley, granary keeper and temple, where the nuance is less important, are almost always used in translation only.

Chapter 1 - Introduction

1.1 – A brief history of the Ur III state

The Ur III state emerged at the very end of the third millennium BCE, unifying the main southern city states of Mesopotamia and various peripheral provinces under a centralised government based at Ur. The state endured for approximately a century, but in that time it generated tens of thousands of texts – a significant proportion of the extant cuneiform record – making it a period of history that is well-resourced for close investigation.

The state encompassed all of the city-states of the traditional heartlands of Mesopotamia - Girsu-Lagaš, Umma, Nippur, Uruk and Ur were all highly important provinces – and also incorporated many peripheral cities and regions which were not necessarily under the direct control of the central government at Ur, but which acknowledged a connection with the state and paid tribute, taxes or other forms of obligation to the king.

There were five kings of the Ur III dynasty (listed below), the most significant of whom was Šulgi, who was king for 48 years – almost half of the period of the Ur III state's existence. Under him, the quantity of cuneiform documents produced by the state is believed to have increased very significantly, owing to a more comprehensive centralisation of government in the hands of the king, and a concomitant increase in both inter- and intra-state documentation.

The five kings of the dynasty are listed below, with dates after Kuhrt.²

Table 2 – Chronologies of the Ur III Period

Name	Dates
Ur-Nammu	2112-c.2095
Šulgi	2094-2047
Amar-Suen	2046-2038
Šu-Sin	2037-2027
Ibbi-Sin	2026-c.2004

The state disintegrated during the reign of Ibbi-Sin, and probably quite early during his reign. Texts from the outlying provinces stopped in the second year

² Amélie Kuhrt, *The Ancient Near East, c. 3000-330 BC*, Taylor & Francis US, (1995)

of his 24 year reign, and from the heartlands of Lagaš, Umma and Nippur in the fifth to seventh years. By the time that the Elamites invaded the region in the last year of Ibši-Sin's reign, the state had probably shrunk to no more than the city of Ur and its hinterland. Crop failure and famine are certainly indicated as factors in the state's collapse, but there may have been underlying political pressures; the paucity of textual evidence after about the fifth year of Ibši-Sin's reign makes it impossible to determine a clear cause for the wholesale disintegration of a once highly productive, centralised state.

1.1.1 – Sources for the Ur III state

While the city of Ur was the centre of government and therefore an obvious target for research, there has been no central governmental archive found dating to the Ur III period, despite extensive excavations on the site. The main sources for the understanding of the Ur III state are, therefore, the provincial sites which have yielded far greater quantities of administrative documentation; principally Girsu, in the southeast of Mesopotamia, and Umma, a little to the northwest of Girsu. Other substantial archives exist from Nippur, in central Mesopotamia, from Puzriš-Dagan, which was similarly centrally located, and from Garšana (a royal town of unknown location) and Irisagrig.³ These are just four of the 23 provinces that made up the core of the Ur III state, according to Steinkeller.⁴ Each of these provinces consisted of a principal city and a number of towns, villages and hamlets, along with the agricultural land that surrounded them. This thesis specifically concerns the province of Umma, a province which has yielded somewhere in the region of 30,000 tablets from this period alone.

³ See Manuel Molina, "Archives and Bookkeeping in Southern Mesopotamia during the Ur III period. Archéologie de la comptabilité. Culture matérielle des pratiques comptables au Proche-Orient ancien," *Comptabilités.Revue d'histoire des comptabilités*, No. 8 (2016) for details of other archives

⁴ Piotr Steinkeller, "The administrative and economic organization of the Ur III state: The core and the periphery," *The organization of power: Aspects of bureaucracy in the Ancient Near East* (1987a): 19-41., p. 22

1.2 – The political and economic structure of the Ur III state

The king was the head of state and a great deal of power was concentrated in the palace of Ur, though some of it was in the hands of the *sukkal-mah* (“chancellor”), while regional power was often diverted through the city governors of the core provinces of the state. The nature of government in the Ur III state is a matter of profound debate, which is not aided by the absence of a central governmental archive.

1.2.1 – *The temple-household hypothesis*

Central to questions concerning any Ur III institution is the enduring debate as to how centralised the Ur III state was – whether individual institutions, provinces or individuals held any autonomous authority, or whether all aspects of the economy (and by extension the society) were micromanaged by the king or his *sukkal-mah*. This debate originates in an article written in 1931 by Deimel, in which he stated that in the mid-third millennium (the Early Dynastic III), the various temples of the cities in south Mesopotamia owned and controlled all the agricultural land in southern Mesopotamia - and therefore the entire economy – and that, though this temple-dominated order disintegrated in the last quarter of the third millennium, it was replaced in the Akkad and Ur III periods by a secular, state-led organisation that controlled the economy just as the temples had done.⁵ Falkenstein concurred with this theory, being convinced that the rise of civilisation was linked with the development of the temples. He too was of the opinion that during the Ur III period the original temple-managed economy morphed into an economy designed along the same lines, but now firmly controlled by palace officials.⁶ There have been arguments set against this by a number of scholars, beginning with Diakonoff and Gelb and continuing to this day.⁷ Most of the original assumptions have been challenged or debunked, but it was so pervasive and

⁵ see Anton Deimel, *Šumerische tempelwirtschaft: zur zeit Urukaginas und seiner vorgänger*, Pontificio istituto biblico, (1931)

⁶ see Adam Falkenstein et al., *The Sumerian temple city*, Udena Publications, (1974)

⁷ see I. M. Diakonoff, "O ploščadi i sostave naselenija šumerskogo 'goroda-gosudarstva' in *Vestnik Drevnej Istorii*, 1952, No. 2, pp. 77-93; pp. 137-154.

enduring an idea that it still influences interpretations of the Ur III period and, as Dahl says, “any student working on Ur III matters is bound by tradition to take a stand on the ongoing debate”.⁸ After all, the way one conceptualises the Ur III economy has a direct impact on how one views the role of the state’s institutions and also the function, treatment and compensation of its labour forces.

1.2.2 – Centralisation and the Ur III state – current scholarship

The aforementioned article by Deimel popularised the notion of a socio-economic system based around patrimonial “households” – the palace and temples acting as large-scale versions of the ordinary familial household. This is also known as the *oikos*; a system by which the majority of workers were tied into a temple-household, receiving their food, clothing, housing, and all other basic needs from the temple authorities. One implication is that there was next to no economy outside of the “household” economy, and that everyone was tied into some degree of dependent relationship with one or other of the temples or other great institutions. Deimel originally suggested this as having occurred during the Pre-Sargonic period, but the reach of the *oikos* has been extended to include the Ur III period.

This idea of the *oikos*-style temple-state as conceived by Deimel has given way to a modified version, which conceptualises the Ur III economy as a redistributive one, in which the *guru₇* is held to have played a significant role (in its capacity as a storage facility). Grégoire’s article on the grain-grinding households of southern Mesopotamia gives an excellent example of this fashion of conceptualising the Ur III economy. Under the title of, “Patrimonial Economic System,” he describes the Ur III economy thus:

The production of large estates as economic units, contributions, and tributes were gathered in large collecting centres—*central granaries* (*guru₇*) and *storehouses* (*ga₂-nun*)—managed by central administration. Once gathered, the goods were partly redistributed in the form of

⁸ Jacob Dahl, “Land Allotments During the Third Dynasty of Ur,” *Altorientalische Forschungen* 29, no. 2 (2002): 330-338, p. 331

rations, gratifications, or gifts. Products circulated according to a highly complex system of collecting, storing and redistributing.⁹

Dahl takes a similarly stringent view on the centralised, redistributive nature of the Ur III state, describing Ur III society as, “a state-run enterprise of immense proportions which only lasted briefly and which paralleled the other despotic regimes so frequent in the evolution of human society that they seem the rule rather than the exception.”¹⁰

One of the major problems of working on Ur III history is that the source material is almost universally institutional, deriving from the state archives or, more commonly, from the many temples of the different provinces (which, as substantial economic powers, which generated a huge textual output during the ~100 years of the Ur III period). When combined with the nature of the institutional economy, this institutional bent of the textual record makes it very difficult to determine if any part of the economy was not centralised or controlled by large organisational powers. Previous scholars have used particular aspects of the economy (pottery gangs, fishers, foresters) in an attempt to improve our understanding of the whole through the prism of a small-scale aspect. This thesis follows this well-trodden path; but it is naturally very difficult to apply the understandings or interpretations gleaned through such focused investigations to the wider scale Ur III economy, and any such attempts shall be made with caution.

That said, recent work has presented quite a strong challenge to the harsh, centralised-state perspective described above. Not only is it clear that there were some forms of private economy in the provincial cities of Ur III Mesopotamia, it is also thought that the temples and palace did not extend their influence to every area of a labourer’s life, and that there was never quite as tightly controlled a bureaucracy as was long supposed. Garfinkle is one scholar who argues for a more nuanced view of the Ur III state, observing that

⁹ Jean-Pierre Gregoire, "Major units for the transformation of grain: The grain-grinding households of southern Mesopotamia at the end of the third millennium BCE," *Prehistory of agriculture: New experimental and ethnographic approaches. Monograph* 40 (1992), p. 224

¹⁰ Dahl, *Land Allotments During the Third Dynasty of Ur*, 330-338, p. 331

however much the royal house may have wanted a fully centralised state run directly from the palace and supported by a fully bureaucratic administrative system, it never actually achieved it, and that a good deal of the Ur III kings' success lay in their ability to adopt and adjust local systems to their own benefit.¹¹

It could be argued that Grégoire's, "highly complex system of collecting, storing and redistributing," is, perhaps, an unnecessarily mystical way of describing a perfectly normal and, to us, familiar methods of food distribution. On the surface, the *guru*₇ appears (from its textual record) to be much in line with the patrimonial pattern of other institutions. Whether it is possible, by closer examination or attempting to look beneath the surface of such texts, to find more complexity in the management and administration of the *guru*₇ as an institution, and in its functions day-to-day in Umma society, is one of the prime objectives of this thesis. It is certainly worth exploration, as an understanding of the economy of a province enhances understanding of the social structure, since economy and society are intimately entwined. An understanding of the provincial economy is therefore a necessity, for the sake of examining this provincial *guru*₇ in a proper socio-economic context. Hopefully this thesis, by shining a spotlight on one aspect of the economic system, will help elucidate others in the process.

1.2.3 – The provincial redistributive duties

However one categorises the redistributive nature of the Ur III economy, it is certain that the different provinces had redistributive obligations, supplying one another with varying amounts of staple produce, those provinces with a strong agricultural economy supporting towns and provinces which had a more cultic than economic significance (as observed by Steinkeller, among

¹¹ Steven J. Garfinkle, "Was the Ur III state bureaucratic?" *The Growth of an Early State in Mesopotamia: Studies in Ur III Administration: Proceedings of the First and Second Ur III Workshops at the 49th and 51st Rencontre Assyriologique Internationale, London July 10, 2003 and Chicago July 19, 2005* 5 (2008): p. 55.

others).¹² These obligations were generally fulfilled in the form of taxes, of produce, livestock, and also labour forces, for municipal projects and the like. The Ur III state had several kinds of taxation, none of which has been unequivocally interpreted. These include the mašdaria, the gun₂-ma-da, the mu-kux(DU), and the bala, as well as certain labour obligations which seem to have had a redistributive element.

Of these, the bala is the most studied and it seems to have been a form of provincial redistributive taxation which was concentrated upon a relatively restricted selection of goods, and certainly not on the entire range of produce of a province. The system by which the bala operated is still disputed among scholars, as the evidence is by no means complete or incontrovertible.

The main scholars to have written on the bala are Hallo, Steinkeller, Maeda and Sharlach, though others have expressed opinions. Hallo was the first scholar really to tackle the system, and he believed that the bala was a means of supplying the temples of the main cultic centre of Nippur with provisions, and with livestock in particular.¹³ This idea has been challenged since it was put forward in 1960, though Zettler, who has made a study of the Inanna temple at Nippur, agrees that the supply of livestock to Nippur's temples was one of the functions of the bala.¹⁴

Steinkeller tackled the subject in 1987, using fresh evidence from Lagaš and Umma, and he argues that, contrary to Hallo's suggestions, that the bala was a "central redistributive system" and, moreover, functioned as a fund into which provinces paid their bala produce, which was usually something either agricultural or natural in which the province specialised, and the value of these contributions went into their "bala fund", which entitled them (once their bala payments were complete) to certain goods and services they needed, which could be withdrawn from their bala fund. He underscores his argument by

¹² Steinkeller, *The administrative and economic organization of the Ur III state: The core and the periphery*, pp. 19-41.

¹³ William W. Hallo, "A Sumerian amphictyony," *Journal of Cuneiform Studies* 14, No. 3 (1960): 88-114, pp. 88-114

¹⁴ Richard L. Zettler, *The Ur III Temple of Inanna at Nippur: The Operation and Organisation of Urban Religious Institutions in Mesopotamia in the Late Third Millennium BC*, Reimer (1992), pp. 22-3

stating that there is no evidence of livestock being delivered as part of a province's bala contributions, but only of them being withdrawn from redistribution centres and delivered to provinces.¹⁵

Maeda's major contribution to the debate was to discuss the meaning of certain phrases which appear in bala texts; his work has been built upon by Sharlach, who has recently written a book on the subject, a revised version of her PhD thesis, which was supervised by Steinkeller.¹⁶ Sharlach considers that there were probably different systems for different cities, but she does state some general principles which have arisen from her work. The bala was the main form of provincial taxation, and was generally paid out by the *ensi₂* of the province, though sometimes by the *šabra* (chief administrator) or the *sanga* (chief priest) of the main temple in the capital city of the province. She also observes that bala taxation was limited to certain goods and services, and goes contrary to Steinkeller in stating that there is no evidence for provinces focussing their bala contributions on produce in which the province specialised. She also contradicts him by observing that, of the principal commodities of the state, it was only livestock and, significantly for this thesis, cereal (usually in the form of barley) that was taxed as part of the bala. Other commodities are missing or simply less commonly referenced in the available textual material, though labour was also an important bala commodity/service, and the role of the bala in both barley and labour transactions will be examined in the course of this thesis.

1.3 The social, economic and administrative structure of the provinces

1.3.1 – Governorship of the provinces

Though questions of how much control the king retained over the Ur III state remain open to debate, it is certain that authority for the economic and social governance of the provinces of the state was delegated, at least to some extent, to local officials. Most of the provinces were formed from what had

¹⁵ Steinkeller, *The administrative and economic organization of the Ur III state: The core and the periphery*, 19-41, p. 29

¹⁶ Tonia M. Sharlach, *Provincial taxation and the Ur III state*, Brill (2004)

originally been independent city states in the periods before the Akkad and Ur III dynasties, and they retained an element of autonomy in the form of provincial governments under the ensi₂ "city governor". Each province consisted of a principal city and a number of towns, villages and hamlets, along with the agricultural land that surrounded them.¹⁷

It is likely that the ensi₂ came from a local family, possibly a family that was part of the elite before the Ur III period.¹⁸ It certainly seems to be the case that they were related to other senior officials in their city/province, as Dahl has shown to be the case in the city of Umma.¹⁹ His prosopography also suggests that the position became hereditary within a family; Hallo demonstrates similar in his article concerning the family of Ur-Meme in Nippur.²⁰ Hallo shows, however, that the inheritance of the role could be interrupted, and also that power could be handed over to another family, as happened in the year Šu-Sin 5, when the house of Ur-Meme was not restored to the governorship of Nippur.²¹

This procedure allowed the central government to take over local administrative procedures and incorporate them into the new system, and Garfinkle cites this co-opting of such structures rather than attempting to replace them as one of the causes of the success of the Ur III kings.²² It was sometimes possible, however, for the king to appoint someone from outside the area in the position of ensi₂, as in Nippur, cited above.²³ It was also the

¹⁷Steinkeller, *The administrative and economic organization of the Ur III state: The core and the periphery*, 19-41, p. 22

¹⁸Walther Sallaberger and Aage Westenholz, *Akkade-Zeit und Ur III-Zeit*, Saint-Paul (1999), p. 191; Steinkeller, *The administrative and economic organization of the Ur III state: The core and the periphery*, 19-41, p. 24; Wu Yuhong, "'High-ranking" Scribes" and Intellectual Governors during the Akkadian and Ur III Periods," *JAC* 10 (1995): 123.

¹⁹Jacob L. Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*, (Leiden: Nederlands Instituut voor het Nabije Oosten, (2007), p. 45

²⁰William W. Hallo, "The House of Ur-Meme," *Journal of Near Eastern Studies* 31, No. 2 (1972): 87-95. p. 89

²¹ibid.p. 94

²²Steinkeller, *The administrative and economic organization of the Ur III state: The core and the periphery*, 19-41, p. 24; Garfinkle, *Was the Ur III state bureaucratic?*, 55, p. 59

²³Hallo, *The House of Ur-Meme*, 87-95, p. 94

case with Babati, an uncle of Šu-Sin, who was ensi₂ of Abal, and Wu has cited cases of high ranking scribes being promoted to the role of ensi₂, suggesting that the civilian governors could be “intellectuals”.²⁴ This seems, however, to have been a rare occurrence.²⁵

The role of the ensi₂ was to head the civilian administration of his province, overseeing such tasks as the building of canals and irrigation systems, managing raw materials for the various industries and collecting offerings on behalf of the various temples.²⁶ Seal inscriptions indicate the significance of the role of the ensi₂ within his province, with senior officials often stating their allegiance to him rather than to the king.

The hereditary nature of the role could, however, prove a threat to royal dominion within a province. Steinkeller suggests that the role of ensi₂ was counterbalanced by the appointment of a šagina, “general,” who usually came from the royal family or another elite family of the city of Ur. He likens this to Persian satrapies, where a secretary and a military general worked to check each other’s power.²⁷ Both governors reported directly to the chancellor (sukkal-mah), who in turn reported to the king. Sallaberger does note that it was possible to have more than one šagina in a province, and also observes that, unlike the ensi₂, the šagina did not represent the province (except in the border territories), nor did he intervene in its administration; he was mainly responsible for the military troops under his command.²⁸ Most of the šaginas came from the royal family, or were connected to it by marriage, and this fact fostered a certain loyalty amongst the military which diffused any danger to the state that was created by having a standing army.²⁹

²⁴ Yuhong, “High-ranking” Scribes and Intellectual Governors during the Akkadian and Ur III Periods, 123, p. 127

²⁵ Sallaberger and Westenholz, *Akkade-Zeit und Ur III-Zeit*, p. 191

²⁶ *ibid.* p. 191

²⁷ Steinkeller, *The administrative and economic organization of the Ur III state: The core and the periphery*, 19-41, p. 25

²⁸ *ibid.* p. 20; Sallaberger and Westenholz, *Akkade-Zeit und Ur III-Zeit*, p. 194

²⁹ *ibid.* p. 194

1.3.2 – *The provincial economy: the temples and other institutions/households*

Wherever one stands on the nature of the Ur III economy, it is clear that a great many people were tied with varying degrees of dependence to the many institutions of the state, and principal among these were the temples. These were not merely places of worship but vast economy institutions in command of substantial resources. The Inanna temple at Nippur was a relatively small temple, but it commanded between 53-75 bur₃ of land (337-477ha) for the production of cereals, as well as gardens and orchards containing palm groves, date and apple trees, and many other kinds of fruit and vegetable produce. Other temples commanded much greater land holdings.³⁰ Temples held herds of cattle and extensive flocks of sheep and goats which supplied meat, milk, and also wool for the weaving establishments that were frequently attached to temples and constituted another major economic asset. Alongside the real estate, the temples generally commanded a treasury of metals, precious, and semi-precious stones.

Naturally, the extent of their operations meant that temples required the labour forces necessary to exploit these assets. They therefore required not only religious personnel, but also administrative staff to direct the labour forces at work on temple business. Principal among the administrative staff was the chief administrator. Three Sumerian words can be translated “chief administrator of the temple”: šabra, ugula e₂, and sanga. The differences between these three titles are not entirely clear. Hallo does not distinguish between šabra and ugula e₂, observing that the use of different terms, sometimes for the same person, suggests orthographic differences between scribes according perhaps to their place of training or personal preference.³¹ Since “šabra” is written PA.AL and “ugula e₂” is written PA.E₂, it is clear that the two words were closely related. Zettler seems to agree with this, observing that in the Inanna temple at Nippur at least, the chief administrator was styled

³⁰ Kazuya Maekawa, "The 'Temples' and the 'Temple Personnel' of Ur III Girsu-Lagash," *Priests and Officials in the Ancient Near East* (1999): 61-102.

³¹ Hallo, *The House of Ur-Meme*, 87-95, p. 91

“ugula e₂ (šabra) dInanna”.³² This directly contradicts De Maaijer’s assertion that the sanga was referred to in texts as “sanga of [name of deity]” or simply as “sanga”, while the šabra was described by his name and title, or sometimes simply by his name, but never as “šabra of [name of deity]”.³³ Sallaberger observes that either title could be used, but that the title “šabra” was used for the administrator of a secular household as well, whereas “sanga” was only used for temple administrators.³⁴ The cultic role of the sanga remains obscure. According to Zettler, who worked with the texts from the Inanna temple at Nippur, management of the temple’s property and assets, such as animals, were in the power of the chief administrator entirely. He was the “public face” of the temple, received goods, and “acted on behalf of the temple in concluding purchase and sale contracts”.³⁵ Zettler observes that the chief administrator had certain cultic and public roles in addition to his administrative ones, and goes on to point out that, as was the case with the role of ensi₂ or civilian administrator of a province, the role of chief administrator of the Inanna temple seems to have been hereditary, and furthermore that it was held by members of the same family, the house of Ur-Meme, as were the hereditary holders of the position of ensi₂ in Nippur.³⁶ In Girsu, the chief administrator was responsible for the division of lands, the organisation of agricultural labour, the administration of grain, and the organisation of personnel.³⁷

³² Richard L. Zettler, "Administration of the temple of Inanna at Nippur under the Third Dynasty of Ur: Archaeological and documentary evidence," *The Organization of Power: Aspects of Bureaucracy in the Ancient Near East* (1987): 117-131, p. 123

³³ R. De Maaijer, "Land Tenure in Ur III Lagaš," *Landless and Hungry: Access to Land in Early and Traditional Societies* (1998): 50-73, pp. 53-4

³⁴ Sallaberger and Westenholz, *Akkade-Zeit und Ur III-Zeit*, p. 194

³⁵ Zettler, *Administration of the temple of Inanna at Nippur under the Third Dynasty of Ur: Archaeological and documentary evidence*, 117-131, p. 123

³⁶ *ibid.* p. 123

³⁷ Sallaberger and Westenholz, *Akkade-Zeit und Ur III-Zeit*, p. 195

1.4 – Land and the economy

1.4.1 – Sustenance lands – *gan₂ šuku*

As mentioned above, it was in the power of both the state and the temples to allot parcels of land to individual workers for their sustenance while they worked for the institution in question. The line between workers who were given rations and those who were given land is not clear, although it appears that those who received land allotments were generally of a higher status (or, as Waezoldt puts it, those in “higher pay scales”) than those who received rations.³⁸ Supervisors, scribes, boatmen, farm managers, and shepherds were the kind of people allotted land; manual workers would have been given rations.³⁹

Waezoldt has a comprehensive list of the divisions of land allotments in Lagaš, and observes that land allotments in Lagaš could be as small as 2.5 iku (1 iku = ca. 3600 m²) for the lowest “pay scales”, and as large as 108 iku for the sanga “priest”.⁴⁰ Widell gives a more concise summary. He observes that in one text, BM 105334, which comes from Umma, the smallest plots of land were allotted to workers classified as “ox drivers”, who received approximately 3 iku of land. Plots of 6 iku, or 1 eše₃, went to “cultivars”, while “inspectors of plough oxen” received 3 eše₃ or 1 bur₃, and the “overseer in charge of 10 domain parcels” received 9 eše₃, or 3 bur₃.⁴¹ Waezoldt records that the amount of land allotted varied not only according to profession, but within the profession as well.⁴² Though it has been suggested by some scholars that those receiving land allotments were of a higher social status, according to Dahl the value of land allotments was not significant and had little impact upon the social mobility of the recipient of the land in question. Dahl states that in many cases dependent workers who received rations and semi-free workers who received land

³⁸ Hartmut Waezoldt, "Compensation of craft workers and officials in the Ur III period," *Labor in the Ancient Near East* 119 (1987): 12, p. 128

³⁹ *ibid.* p. 128

⁴⁰ *ibid.* p. 129

⁴¹ Magnus Widell, "Sumerian Agriculture and Land Management," *The Sumerian World* (2013): 55.

⁴² Waezoldt, *Compensation of craft workers and officials in the Ur III period*, p. 129

allotments were restricted to a low social level.⁴³ He calculates that a land allotment, which he estimates to be approximately 6 iku (2.16 ha), would produce a yield of at most 5 ½ sila of barley per day.⁴⁴ However it is quite likely that the yield would have been lower, and therefore he observes that the land allotments would only yield a little more barley than the average ration payment, and so would not have vastly altered the economic position of the person allotted the land, assuming of course that they had a small allotment.⁴⁵ Those who were in possession of large plots of land, such as the 108 iku of land received by the “sanga-priest” as recorded by Waezoldt, were of higher social status anyway, and Dahl believes these to be of more interest, and suggests that these plots of land be viewed as “yet another method by which the state could maximise production”.⁴⁶ The implication of this remark is perhaps that the state did not have the resources to cultivate all of their land, and thus passed portions of it on to their dependents to cultivate themselves, thus putting more land under cultivation and also saving an allotment of rations which would otherwise have been expended upon the person in question. The question of how those workers who were given sustenance lands would have managed to cultivate them is still rather open, however. Most individuals in receipt of these lands worked full-time in other areas, and yet the small size of the parcels of land lent them to being cultivated by a family, rather than by a significant labour force. It has been suggested that individuals who possessed sustenance lands would benefit from access to the state’s agricultural equipment and resources, and would thus reduce expenditure for their cultivation.⁴⁷

As regards private ownership of land and the non-institutional economy in general, our knowledge is scanty. There were professions that must have had a private element, such as the mercantile professions and the nomadic

⁴³ Dahl, *Land Allotments During the Third Dynasty of Ur*, 330-338, p. 333

⁴⁴ Others have calculated the size of land allotments as anywhere between 4 ½ and 9 iku, but both Steinkeller and Dahl suggest 6 iku as an average.

⁴⁵ *ibid.* bp. 334

⁴⁶ Waezoldt, *Compensation of craft workers and officials in the Ur III period*, p. 129; Dahl, *Land Allotments During the Third Dynasty of Ur*, 330-338, p. 335

⁴⁷ Widell, *Sumerian Agriculture and Land Management*, 55.

pastoralists who may have grazed many of the institutional herds. However, because they are invisible in the records and often in the archaeology, what we know of them is mostly speculation: for instance, Dahl suggests that the “hireling” of Gelb’s ration system, the lu_2 hun-ga₂, may have had other means of production aside from working for wages, such as privately owned land “not visible in the extant sources”.⁴⁸ Unfortunately we cannot get much closer than this sort of speculation with the present textual evidence.

1.4.2 – Agricultural land

Agricultural land in south Mesopotamia was probably not greatly restricted; it is likely that there was considerably more potential farmland than people to deal with it, and that access to water and labour were the limiting factors on agricultural production, although, it should be noted that to bring new land into cultivation did require a good deal of effort.⁴⁹

The question of land ownership is somewhat vexed. The problem lies in the sources, which are unilaterally institutional and thus give no hint about life outside of the state or temple organisations. This immense bias led historically to a picture of a state which dominated all areas and which left no room for life outside its limits; and while that has been subsequently revised, it is practically impossible to illuminate those areas beyond the range of the institutional documents which are our only source. It is therefore worth tackling the case of institutional land first, before examining what evidence there is for alternative land ownership.

Aside from the GAN₂-šuku sustenance lands, described above, there were several other designations of agricultural land. Principal among these was GAN₂-gu₄, the domain lands, which were under the direct control of the *ensi*₂ of a province. Maekawa describes GAN₂-gu₄ as land which belonged to the *en* of the temple and cultivated by the temple itself. Van Driel mentions a category of land which was directly exploited with plough teams and men

⁴⁸ Dahl, *Land Allotments During the Third Dynasty of Ur*, 330-338, p. 334

⁴⁹ Govert van Driel, "Land in Ancient Mesopotamia: 'That What Remains Undocumented Does not Exist'," *Landless and Hungry* (1998): 19-49, p. 20; Dahl, *Land Allotments During the Third Dynasty of Ur*, 330-338, p. 331

belonging to the institution itself, though he does not give the Sumerian term; one assumes, given the similarity, that the categories of land Maekawa and Van Driel are referring to are one and the same.

Land that was not directly exploited by the state/temples nor given as sustenance lands could be leased out; these were termed *gan₂ apin-la₂*, or *gan₂ nig₂-gal₂-la₂*". Tenants could come from both inside and outside the institution, according to Van Driel, and paid rent for the fields, usually in a mixture of silver and a portion of the harvest, which was determined before harvest-time but payable afterwards.

De Maaijer defines a further category, not listed by Van Driel or Maekawa, called "*gan₂ zi-ga lugal*", land that was reserved for the king.

There was, of course, a portion of land that was not allotted at all - that is the land that was left fallow in the long term, so that the salt that inevitably built up through the process of irrigation and evaporation might leach out of it and allow it to become productive once more. This would have profound implications for land tenure and the concept of land "ownership", for if land could only be used for a short period of time before becoming unproductive for many years, then this land could not be handed down through generations of farmers in the same way as land could be passed on in Europe, for instance. This would cause a lack of continuity, and a flexibility in the concept of "land ownership" - as Van Driel says, "ownership expresses itself...through practical use, it disappears if that use ends".⁵⁰ De Maaijer identifies fallow land as *buru₁₄ bala*.⁵¹

⁵⁰ van Driel, *Land in Ancient Mesopotamia: 'That What Remains Undocumented Does not Exist'*, 19-49, p. 30

⁵¹ De Maaijer, *Land Tenure in Ur III Lagaš*, 50-73, pp. 55-6; Kazuya Maekawa, "The Agricultural Texts of Ur III Lagaš of the British Museum (XII)," *Zinbun. Memoire of the Research Institute for Humanistic Studies* 34 (2000): 145-166, pp. 91-157; van Driel, *Land in Ancient Mesopotamia: 'That What Remains Undocumented Does not Exist'*, 19-49.

There are various theories as to how regularly fields were left fallow. Kilian Butz suggests that fields were left fallow for two years out of five, but there is no real evidence for this suggestion; a biennial fallow system was used in Lagaš in the Pre-Sargonic period and it is quite possible that the same system was used in Ur III times. Killian Butz, "Ur in altbabylonischer Zeit als Wirtschaftsfaktor," in *State and temple economy in the ancient Near East: proceedings of the International Conference*, ed.

The quantities of land that were designated for any of the above purposes varied between provinces, and a further discussion of agricultural land specific to the province of Umma will follow in Chapter 2.

1.5 – The organisation and administration of labour

Just as there is an enduring debate over the nature of the state and the economy, there has also been a lot of discussion over the status of the unskilled labour force, which is intimately connected with the arguments over the nature of the redistributive economy. The debate hinges on whether labourers should be considered serfs (with a certain amount of freedom from their institutional employer) or effectively “state slaves” with little or no external freedoms.

Struve came up with the idea of state slaves, by which he meant labourers who worked all year for the state with little or no time of their own and who were dependent upon the state for their rations.⁵² This is both hard to prove or disprove; certainly some workers could be tied to and work for the same institution for prolonged periods of time. Struve’s ideas were taken up by Diakonoff, who felt that impairments on personal freedom were the norm for most labourers, though he also considered true chattel slavery to be relatively rare. Dahl, in his article on Babylonian potters, reflects that the life of labourers – even accomplished craftsmen – was doubtless very harsh, and concurs that full time employment under institutional or state authority was limiting in terms of individual liberty. Garfinkle and Gelb take a slightly more optimistic view of the Ur III state, with Gelb arguing that the majority of unskilled labourers had a degree of personal autonomy and were not tied permanently into their state-dependent jobs. Diakonoff, whilst on the side of

Edward Lipiński. (Leuven: Peeters Publishers, 1979), 257-409.. If one assumes this to be correct, then it is clear that the amount of land appearing in the texts must be doubled to calculate the full amount of institutional land, as fallow land is almost never recorded in the texts (Widell, *Sumerian Agriculture and Land Management*, 55.).

⁵² See Jacob L. Dahl, "A Babylonian Gang of Potters," *Reconstructing the Social Organization of Crafts Production in the Late Third Millennium BC Southern Mesopotamia: RAI* 53, No. 2 (2010): 69.

“serfdom”, nonetheless argued that unskilled labourers had very little independence from the state or institution they served. As Steinkeller puts it in his article on Ur III forestry, the question of the extent of the dependence of workers is now a matter of personal interpretation, until further information comes to light.⁵³

There were five kinds of so-called unskilled labourer:

guruš = “worker/grown man”

geme₂ = “female worker”

eren₂ = “person performing obligatory labour”

UN-il₃ = a different class of labourer from the guruš and the eren₂

lu₂ hun-ga₂ = “hireling”

dumu-gi₇ = this has various definitions, but is possibly an equivalent of eren₂, at least in Umma⁵⁴

Except for the fact that one of the terms refers to female workers, the precise differences between the four kinds of worker are not clear. Such knowledge as we have is summarised below:

The guruš is the most common and therefore the standard designation of worker, and is often translated as “unskilled labourer”, as stated above. These workers could be found performing any number of tasks, including hoeing, harvesting, moving grain about the countryside (usually via the canal system), as well as other tasks such as standing guard in fields, or even smearing clay to fix walls.

The difference between the guruš and the geme₂ was not as pronounced as might have been expected. Though there were some tasks that were exclusively given to the guruš, the geme₂ could perform many of the same sort of tasks as the guruš if required; for example, in times of high labour intensity on the fields, they could be found doing heavy tasks such as the moving of

⁵³ Piotr Steinkeller, *The foresters of Umma: towards a definition of Ur III labor*, American Oriental Society (1987b)

⁵⁴ John Nicholas Reid, “Runaways and Fugitive-Catchers during the Third Dynasty of Ur,” *Journal of the Economic and Social History of the Orient* 58, No. 4 (2015): 576-605; Natalia Koslova, “Bezeichnungen der Arbeitskräfte in Umma der Ur III-Zeit,” *The Growth of an Early State in Mesopotamia: Studies in Ur III Administration* (2008): 149-206.

cereal crops and loading boats alongside their male counterparts. In ordinary times, however, they tended to be restricted to weaving and milling.

The erin₂ were the *corvée* labourers, who performed a service of work in return for land allotments. The differences between the erin₂ and the UN-ga₆ (or UN-il₃) are, however, not exactly clear. In his study on the subject of the UN-il₃, Sigrist found that they performed roughly similar work to the erin₂, and presumed therefore that they received land allotments as well as rations in recompense.⁵⁵ Whether this is true is difficult to say without a complete study of the UN-il₃ class.

Whatever kind of labourer a person was listed as, the work procedure was roughly the same. Labourers of all kinds were organised into work teams, which were headed by a foreman "ugula", and usually overseen by a responsible official. The role of the ugula could be quite flexible, and he could be drafted back into the work team at any point that proved convenient to his superiors. Furthermore, the responsibility for production was placed upon the shoulders of the ugula, and he was liable for any debits on his work team's account. This could prove difficult if the debits were called in, as sometimes happened. It seems very likely that the standardised methods for calculating expected performance resulted in estimates that continually exceeded the performance capabilities of the average work team. Given that the ugula was required to cover any debits from his own estate, this could have unfortunate results for him and for his family; his household, chattel slaves and all his wealth could become the property of the state, and his children could end up as part of a team similar to the one he had once overseen.⁵⁶ He could also face jail if he failed to settle his deficit.⁵⁷

The responsible officials took no active role in the production as the ugula did, but they took responsibility for the produce, whatever it may have been.

⁵⁵ R. Marcel Sigrist, "ERÍN-UN-ÍL (suite)," *Revue d'Assyriologie et d'archéologie orientale* (1980): 11-28.

⁵⁶ Robert K. Englund, "Hard work-where will it get you? Labor management in Ur III Mesopotamia," *Journal of Near Eastern Studies* 50, No. 4 (1991): 255-280.

⁵⁷ Dahl, *A Babylonian Gang of Potters*, 69.

It has been suggested that craftspeople did not suffer the same indignities of dependent labour and low payment (in the form of rations) as did the so-called “unskilled labourers”, but Dahl suggests that at least some craftspeople could be tied into the state in the same way; and that, despite their higher level of skill, the rations they received might not have been all that much higher than those for unskilled labourer.⁵⁸

1.6 – Conclusion

This chapter has outlined some of the broader themes and current hypotheses that lie beneath any study of the Ur III state, and that particularly affect this thesis. With this outline in place, Chapter 2 will consist of the background details that pertain specifically to the questions of this thesis, beginning with an introduction to the archive of one of the granary keepers of Umma, Arad₂-mu dumu Ur-Nigar^{gar}.

⁵⁸ *ibid.*

Chapter 2 – Grain storage in the ancient Near East

The nature of the Ur III state is so distinctive, and the textual evidence so prolific in quantity and yet so narrow in scope, that more evidence must be presented in this introduction before sense can be made of the textual and archaeological data that is to be discussed in this thesis. Before tackling the subject of Ur III bureaucracy, however, it is sensible to look more closely at the specific province which is the subject of this thesis; the former city-state of Umma.

2.1 – Arad₂-mu ka-guru₇

Arad₂-mu, or as the texts most often named him, Arad₂⁵⁹, was a member of the “ruling family” of Umma and the granary keeper for a substantial part of the Ur III period. As this thesis concerns the workings of the granary at Umma, he is of prime importance, and it is worth considering previous discussions about him before proceeding.

There are only two substantial discussions about Arad the granary keeper; one from 1962 by Snyder and Jones, and the other from Jacob Dahl’s 2007 book on the Ruling Family of Umma.⁶⁰

Arad was a son of Ur-Nigar and brother to Ur-Lisi and Ayakala⁶¹, both of whom became ensi₂. Dahl postulates that he was preceded in the role of granary keeper by his brother Ur-Lisi, succeeding to the position when Ur-Lisi became ensi₂. He was in turn probably succeeded by his son, Šara-izu, the only named member of his immediate family (his wife was mentioned in the textual record, but only as “dam Arad₂ ka-guru₇”, and never named). Šara-izu is never actually

⁵⁹ Arad₂-mu/Arad₂ shall be known henceforth in this thesis simply as “Arad”.

⁶⁰ Tom Bard Jones and John W. Snyder, *Sumerian Economic Texts from the Third Ur Dynasty: A Catalogue and Discussion of Documents from Various Collection*, University of Minnesota Press (1961); Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*, 180.

⁶¹ The debate as to whether all men who described themselves as “son of” someone were actually related, or adopted into a “scribal family” is discussed in chapter 1, but it seems very likely that Ur-Lisi, Ayakala and Arad were related, as both Ayakala and Arad referred to themselves as “šeš ensi₂” when Ur-Lisi was in office.

referred to by the title “ka-guru₇”, but contextually it seems that he succeeded his father to the post. Dahl states that:

Umma references to the name of the chief of the granary were relatively rare, whereas the title was mentioned alone very frequently. I assume that by this he means that the name of the granary keeper does not appear often in conjunction with the job title (as in, “Arad₂ ka-guru₇”). The name Arad₂ certainly does appear a great deal in the textual record. Snyder and Jones confined their observations to the role of the granary keeper, identifying ten regular “destinations” for expenditures involving Arad⁶²:

1. the mill
2. the e₂-šutum
3. various fields
4. the “mouth of the canal”
5. various threshing floors
6. the Gu₂-eden-na area
7. KI.AN^{ki}
8. U₆
9. the guru₇ storehouse
10. various houses or buildings (presumably this category includes the temples of Umma, and such places as the e₂-nig-lagar and the palace)⁶³

They argue, therefore, and quite reasonably, that the ka-guru₇ was in charge of a portion of the expenditures of grain in the city of Umma.

Dahl observes that the ka-guru₇ supplied the following:

- institutions (with fodder and rations)
- the kurušda (animal fatteners) (with fodder)
- the ugula kikken₂ (the overseer of the mill) (with rations)
- foremen of work crews, workshops, and “factories” (with rations)
- the temples (with offerings)
- fodder for donkeys and plough oxen
- wages for the lu₂-hun-ga₂

Both Dahl, and Snyder and Jones, list a number of other aspects of the business of the ka-guru₇. According to Snyder and Jones, the ka-guru₇ acted as a conveyor or comptroller for a regular delivery of leather; as a conveyor of

⁶² Snyder and Jones refer to Arad as “Urdu” – a difference in transcription of the sign “ir₁₁” which comprises his name.

⁶³ Jones and Snyder, *Sumerian Economic Texts from the Third Ur Dynasty: A Catalogue and Discussion of Documents from Various Collection*

cereals for some guruš workers in the field for Šara, as a source of barley shipped to Nippur from the guru₇, and that Arad's name was also mentioned in reference to a labour account. They also describe texts which have him disbursing wages for ploughmen at the ki-su₇ a-ša₃ la-mah, acting as gir₃ (responsible official) for workers at the reservoir and at the guru₇, and as providing wages for hired labourers (a₂ lu₂-hun-ga₂). They note that he is engaged in transactions involving labour, and that he "enjoys a responsible capacity".

Dahl, by contrast, simply observes that, besides his duties in disbursing barley to the aforementioned destinations, Arad could sometimes be involved in agricultural administration, that sometimes he acted as a provincial administrator, and that on occasion he sealed receipts for dead animals, particularly on behalf of his nephew Lu-kala. Dahl's tentative definition of a provincial administrator is a supervisor of large units of agricultural land, larger than those supervised by the nu-banda₃ gu₄ (the "captain of plough oxen", a lower level administrative role) or the dub-sar gu₄ 1(u) (the "scribe of ten oxen", another lower administrative role), and he notes that the officials whom it is thought held the role all made use of the kišib nam-šatam, the "nam-šatam seal".⁶⁴

Finally, before I move on to discuss the types of text in which Arad is concerned, it would be useful to discuss Snyder and Jones's closing remarks.

They describe the role of the ka-guru₇ as that of:

an important official in charge of a major depot to and from which large amounts of grain came, and the administration of which occasionally at least involved the employment of considerable numbers of labourers...among the transactions are the regular deliveries of cereals for gods, festivals and going to buildings etc. Other expenditures not designated as regularly occurring events went as fodder for animals, as supplies for festivals, as wages and provisions for workers, and as the purchase price of animals, in addition to other disbursements not so easy to identify. When seen in the light of many other types of expenditures appearing on Third Dynasty tablets, it seems possible that these were perhaps limited to certain administrative needs of the community at Umma; they do not compare

⁶⁴ For more detail on this postulated official role, see Dahl, 2007, p. 65

with the quantities going as salaries for workers or as the sums involved in the balanced accounts of some of the agencies and individuals active in Ur III affairs.⁶⁵

This last section is crucial to the hypothesis of this thesis, which includes the idea that the *guru₇*, for all that it was a significant administrative unit in the city of Umma, was by no means the sole supplier of grain to the city, nor the sole locus of grain storage. This shall be expanded upon in Chapter 6.

Snyder and Jones also go on to say the following:

If not a large depot compound, the *gur₇* must have been an administrative or accounting agency whose function it was to supervise certain types of expenditures...however, as its name suggests, there must also have been storage facilities as well as supervisory offices at the *gur₇* proper.⁶⁶

This is another idea which will be discussed in detail in Chapter 6.

Somewhere around the middle years of Amar-Suen's reign, Arad retired from the office of *ka-guru₇*, which was then taken over by his son Šara-izu.

2.2 – The province of Umma

The province of Umma was visited by archaeologists but never properly excavated. It has long been associated with Tell Jokha, though this is not an undisputed identification. The majority of texts that have come to us (approximately 30,000 from Umma alone) are the result of extensive looting, which began in the late 19th century and continued through the 20th. This means not only that the textual evidence presented in this thesis has no context, but also that it must of necessity take priority in studies of the province until such a time as excavations can resume in southern Iraq. Nonetheless, archaeological discussions have taken place alongside text-based studies of the region, and below is a brief survey of the city, which owes much to Adams' thorough and detailed paper of 2008.⁶⁷

⁶⁵ *ibid.* p. 317

⁶⁶ *ibid.*, p. 318

⁶⁷ Robert McC Adams, "An interdisciplinary overview of a Mesopotamian city and its hinterlands," *Cuneiform Digital Library Journal* 1 (2008): 1-23.

2.2.1 – Geography of the province

The approximate area of the province of Umma, given by Adams, is 2000km². It straddled a minor branch of the Tigris, the Idigna, and another canalised river named Iturungal. The latter connected with the Euphrates below Uruk, and dates originally either to the ED I or to the Jemdet Nasr period, suggesting longstanding ties between Uruk and some of its more northerly neighbours. These two major waterways gave way to a network of smaller canals throughout the province, serving both as irrigation and a very convenient and easy means of both communication and transport.

The city of Umma was situated in the south-east of the Ur III state, to the west of and close to the Tigris river. The city god was Šara, a minor agricultural deity, but the city also had shrines to several other gods, particularly to Ninura, the wife of Šara, and to Inanna, Šara's mother. Using textual sources, Adams and others have roughly estimated of the population of the city of Umma as somewhere between 15,000 and 20,000 people. Satellite imagery shows there was a central open space, near to the public buildings, and also a substantial kar "harbour" of about 14ha in area.

A province consisted of the principal city and a hinterland of smaller settlements, fields and canal networks. The city of Umma was the capital of the province; other important towns include Apisal, Zabala and KI.AN^{ki}, all of which feature in the Arad texts. Apisal seems to have been of significant economic importance, and the number of texts in the archives relating to the town might, it has been suggested, indicate that the city of Umma had a high degree of control over Apisal's economic affairs. By contrast, Zabala and KI.AN^{ki} seem to have been of greater cultic than economic significance.⁶⁸ The main shrine at Zabala was to Inanna, and it was a place of frequent visits from the royal family. It is likely that the city of Garšana was also in the Umma

⁶⁸ Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*, pp. 40-43

province; the archive of Garšana is substantial and is being used at present to further our understanding of various aspects of Ur III society and economy.⁶⁹ There were three “agricultural territories” as Dahl terms them, listed in order of economic importance as follows: Da-Umma, Apisal and Guedenna & Mušbiana.⁷⁰ The location of the satellite towns is not precisely known, but Adams suggests that Da-Umma was the territory that surrounded the city of Umma itself, that the town and agricultural territory of Apisal were to the northeast of Umma, and Guedenna & Mušbiana to the southeast and southwest. The latter agricultural territory was most likely sparsely populated⁷¹, possibly because the southern part of the Umma province was covered with a heavy belt of dunes, reported by Adams to be often impassable.⁷² The canal network also disappears, suggesting a less agriculture-based subsistence pattern in that part of the province. Nonetheless, it appears in the Arad texts, as does Apisal.

The fields were often named in the texts, and there are a number that recur regularly in the Umma texts. As Stępień points out, “fields” is not the most accurate translation of the Sumerian word a-ša₃, as each “field” constituted rather more than a simple unit of arable land. They were, in fact, substantial units of land and settlement, with not only barley furrows but also pasture and reedbeds, and also included housing for work teams, a threshing floor and often a storage unit of some variety. Rather more substantial than the fields recognised in the West, the a-ša₃ will nonetheless be translated as “field” in this thesis as it is the conventional terminology; the definition given above must be borne in mind.⁷³

⁶⁹ Adams, *An interdisciplinary overview of a Mesopotamian city and its hinterlands*, 1-23.; Robert McC Adams, "Slavery and freedom in the third dynasty of Ur: Implications of the Garšana Archives," *Cuneiform Digital Library Journal* 2 (2010); Robert K. Englund, "The Smell of the Cage," *Cuneiform Digital Library Journal* 4 (2009): 1-27.

⁷⁰ Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*.

⁷¹ *ibid.* pp. 34-35

⁷² Adams, *An interdisciplinary overview of a Mesopotamian city and its hinterlands*, 1-23.

⁷³ Marek Stępień, "The Economic Status of Governors in Ur III Times: An Example of the Governor of Umma," *Journal of Cuneiform Studies* 64 (2012): 17-30.

The discussion of fields leads naturally to the consideration of land and land-ownership (or authority) during the Ur III period in Umma.

2.2.2 – Domain lands

The area of land listed as domain land (GAN₂-gu₄) and restricted for the cultivation of barley by the house of the governor was 785 bur₃, or 4984 ha. Assuming that an almost identical area lay fallow each year, the total area of domain land is double that estimate. In addition, the lands set aside as land allotments for workers (GAN₂-šuku) totalled about 680 bur₃ (4318ha), giving a total of approximately 127km² of arable land in the Umma province and making Umma a quarter the size of Lagaš, in terms of cereal cultivation.⁷⁴ The text AAICAB, 1912-1143 provides an expected yield of 15,000 gur of barley from the domain lands of Umma.⁷⁵

As Adams notes, in a province of approximately 2000km², this means that only 7% of the available land was in cultivation, including fallow land. This area of cultivated land remained fairly constant throughout the Ur III period, leading to questions as to what use the rest of the land was put to. It is possible that parcels of land were used for what Adams called “informal cultivation”, in areas like the tail-end of canals where the cultivation was more difficult and therefore the yields more unpredictable, and therefore less likely to be recorded by administrative officials. He also suggests that such informal cultivation, unrecorded in the official documentation of the province, might have been a way to avoid imposition of the bala tax levies, and may have happened with the full collusion of the inspecting officials. Whichever was the case, the area of domain land remained much the same for the entire period.⁷⁶ On the more official level, the governor maintained some quite substantial holdings as GAN₂-šuku prebend land, as reported by Stępień; these were either

⁷⁴ Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*, 180.; Adams, *An interdisciplinary overview of a Mesopotamian city and its hinterlands*, 1-23.

⁷⁵ Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*, 180.

⁷⁶ Adams, *An interdisciplinary overview of a Mesopotamian city and its hinterlands*, 1-23.

managed by work teams under the command of either the household of the ensi₂, or of the temples. Alternatively, the ensi₂ could apportion his fields to “private users” who would manage their own cultivation and pay the ensi₂ with a portion of their yield.⁷⁷ These were presumably just one portion of the lands held by the state, which must have been considerable. The palace and the temples between them were the major landholders in this and every province of the Ur III state.

2.2.3 – Administration of the province of Umma

Dahl’s extensive study of the “ruling family” of Umma, the family of Ur-Nigar, has identified many of the most important administrative officials in the province, and this section draws heavily on his work.⁷⁸ As previously mentioned, Arad was a member of this family.

As described in Chapter 1, ultimate administrative responsibility for the province of Umma rested with the ensi, the city governor. Dahl identifies three governors throughout the Ur III period: Ur-Lisi, A(ya)kalla, and Dadaga. These men were all brothers, sons of Ur-Nigar the kuš, or livestock administrator. The position of kuš was another important administrative role, which Ur-Nigar passed on to another of his sons, Ur-E’e, who subsequently passed it to his own son, Lu-Haya.

Prior to their accession to the governorship, A(ya)kalla and Dadaga held the position of šabra e₂, which Dahl translates as “chief administrator of the house of the governor”, another senior role in the administration. They were succeeded in this position by Lu-kala, son Ur-E’e, and by Dadaga’s son Gududu. Arad, another son of Ur-Nigar, also occasionally styled himself as “šeš ensi₂”, brother of the ensi.⁷⁹ It is possible that Arad was preceded in the role of granary keeper by his brother Ur-Lisi, before the latter became ensi.

⁷⁷ Stępień, *The Economic Status of Governors in Ur III Times: An Example of the Governor of Umma*, 17-30.

⁷⁸ Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*, 180.

⁷⁹ *ibid.*

Other significant administrative posts include that of the ša₁₀-dub-ba (chief accountant), and those in charge of the temple of Šara, as the senior members in the cult of the principal deity of the city, who stood in some regard. They appear in the Arad texts as receiving officials and do not seem to have hailed from the ruling family.

2.2.4 – The role of officials in the Ur III state

The sheer volume of written documentation from this period demonstrates just how essential literacy was to almost all administrative roles in the Ur III state and, as Hallo says in his 1972 article, the use of the term dub-sar did not in fact denote the profession of “scribe” so much as it indicated a graduate of scribal school.⁸⁰ Training at the scribal school, “e₂-dub-ba,” was the basic requirement for becoming a bureaucrat/administrator in the Ur III state, and therefore the title of dub-sar is no indicator of rank; officials high and low in the hierarchy described themselves as “dub-sar” on their seals, and job titles were rarely detailed in a seal inscription, which were generally limited to paternal relationship or, occasionally, a declaration of allegiance to the ensi or the king.⁸¹

Sometimes the paternal relationship upon a seal could be misleading; it has been mooted that some scribal families were composed not purely of blood relatives, but of sons “adopted” into an administrative family. It seems possible that this took place in the so-called “ruling family” of Umma.

The majority of administrative roles were passed down within families, though Ur III succession did not take the form of patrilineal primogeniture, a form familiar to Europeans. Instead it has been demonstrated that a form of fratrilineal succession often took place within administrative families.

Steinkeller has shown this in forester work crews, and it has been demonstrated further by Widell in his study of the animal fatteners of the god

⁸⁰ Hallo, *The House of Ur-Meme*, 87-95.

⁸¹ Piotr Michalowski, “Charisma and control: On continuity and change in early Mesopotamian bureaucratic systems,” *The organization of power: aspects of bureaucracy in the ancient Near East* (1987): 55-68.p. 62

Šara.⁸² It seems that patrilineal succession only occurred in the youngest sons, rather than the oldest as is customary in Western society.

Steinkeller has remarked upon the nature and function of written documentation – and therefore of officials – and his observations are useful when analysing the organisations that produced large amounts of texts. His comments on the subject begin with the observation that written records were compiled, not in the field, but separately, after the physical transactions had taken place. Using Arad as an example, he observes that texts that read “ki Arad₂-ta” (“from Arad”) are not suggesting that Arad, the head of the guru₇, was literally supervising the transfer of grain from the storehouse to a recipient. Instead, he describes a pattern of 1) authorisation of the transfer by the head of the granary, presumably in a letter-order to the storage facility; 2) collection of the item(s) from the official in charge of storage facility by the recipient of the item(s) or his representative; 3) the recipient or his representative appearing at the granary in Umma, and the head of the granary or his representative signing off on the transaction, using the seal of the ka-guru₇.

Steinkeller also makes some suggestions as to the purpose of written documentation; he reports Van De Mieroop’s suggestion that documents were intended to justify the work of the administrators in charge of the institutions or organisations, to be presented for audit by a senior supervisor, while Steinkeller himself posits that they were intended to present a summary of activity to senior supervisors to enable appropriate planning for the future, a significant aspect of the Ur III economy. Both of these seem likely uses for written documentation of this period.

2.3 – Social hierarchy in the Ur III period

The following is a summary of a list of “sectors of society” as suggested by Wilkinson et al.⁸³

⁸² Steinkeller, *The foresters of Umma: towards a definition of Ur III labor*; Magnus Widell, “Two Ur III Texts from Umma: Observations on Archival Practices and Household Management,” *Cuneiform Digital Library Journal* 6 (2009b)

- 1) The palace: the king, his household and their economic holdings
- 2) The temple households and their economic holdings
- 3) Large estates: these were not part of either the temple or palace economies but held significant lands and material wealth
- 4) Craft specialists: both dependent and independent; the former were likely attached to the palace or temple households
- 5) 'Urban commoners': these probably also included craft specialists
- 6) Semi-free individuals: these include the *guruš* and *geme₂* workers, who were "indentured by the great institutions"
- 7) Slaves: true chattel slaves were, as observed by Adams/Englund, actually quite rare in the Ur III state; the kind of indentured service of the semi-free labourers, above, was more common
- 8) Villagers: invisible in the textual record, but must have existed because archaeological surveys have revealed large numbers of village-type settlements in the landscape
- 9) Nomads: also almost invisible in the texts

Of these sectors of the social hierarchy, the temple households, large households (e.g. that of the *ensi₂*) and the villagers and semi-free labourers are the most relevant to this thesis, but it is helpful to consider all the above categories when considering any large collection of data, especially one which concerns an organisation that had such a significant impact as one so closely involved the storage, processing and supply of grain within a province as the *guru₇*.

2.3.1 – Compensation of labour

The state was the biggest employer in south Mesopotamia, and the temples had large numbers of workers on their lists. Money did not exist, in the way that we know it now, and thus workers were paid for their services in a variety of ways: in the form of rations, with barley used as the standard of value in

⁸³ Tony J. Wilkinson, M. Gibson, and Magnus Widell, *Models of Mesopotamian landscapes: how small-scale processes contributed to the growth of early civilizations*. Archaeopress, (2013)

calculating wages, or with parcels of land known as sustenance lands. Studies of the ration system of Mesopotamia have often proven contradictory to each other, but below is an attempt at a summary of the generally accepted knowledge.

Rations

It is widely accepted that there were different kinds of workers with varying levels of dependency, and that they were paid according to their status and level. In his seminal study on the Mesopotamian ration system, Gelb distinguishes between *rations* (še-ba “barley ration”, although in this thesis it will generally be translated simply as “rations”, and sig₂-ba “wool ration”), and *wages*, “a₂”, and relates this difference in forms of payment to the difference between workers that were free, and received *wages*, and those that were semi-free, or dependent, and received *rations*. There were not many recipients of wages in the Ur III period; by far the most common form of recompense at this time was with rations, associated with dependent workers attached to temples or other institutions.⁸⁴

The different classes of workers were, as previously stated, the guruš, geme₂, eren₂, UN-il₃ and lu₂ hun-ga₂. The lu₂ hun-ga₂ became more numerous in the textual record later on in the Ur III period, but did not become established as a significant class of workers until the Old Babylonian period. They seem to have received a relatively high wage, however; whether this was because of their precarious position as hirelings, or for some other reason, is not clear.⁸⁵

More of interest to this particular thesis are the guruš, the geme₂ and the eren₂. The most frequently occurring class of worker in the textual record were the guruš and the geme₂, male and female labourers often dependent upon the state or an institution, and accordingly paid in rations. Dahl describes the guruš as, “a state dependent worker of the lowest social level”, and they do seem to have held a lowly status; their position was, however, rather better than that of the geme₂. Gelb has stated that the standard wage for an ordinary

⁸⁴ Ignace J. Gelb, “The ancient Mesopotamian ration system,” *Journal of Near Eastern Studies* 24, no. 3 (1965): 230-243.p. 230

⁸⁵ Dahl, *Land Allotments During the Third Dynasty of Ur*, 330-338., p. 333

male worker (guruš) was 60 sila (approximately 60 litres) of barley, and for a female worker, 30 sila. There were also young children in work, who received between 20 and 30 sila of barley, and the infants of working parents were also given rations, generally 10 sila per infant.⁸⁶

Waezoldt has expanded this to demonstrate that male and female workers were compensated very differently indeed; women, even the highest skilled women, were given a standard ration of 30-40 sila of barley per month, rising to 50-60 sila if their work was particularly highly prized. Male workers, however, could be compensated with quite large quantities of barley depending upon the position they held. Though it is unlikely that men were able to move freely up and down the social/work scale, it is clear that, within some limits, there was the possibility of earning a significant increase in the barley ration.

Those male roles that could earn a greater barley ration are listed below:

engar and nu-banda₃ gu₄: 150-1200 sila
ma₂-lah₄: 60-510 sila
craftsmen: 60, 120 or 300 sila
scribes: 60, 120 or 300 sila, with a top pay level of 5000 sila for scribes who became the sabra ("prefect" or "chief administrator") of a temple⁸⁷

Waetzoldt describes the eren₂ as the class of workers who performed obligatory labour.⁸⁸ He states further that the receipt of rations was not necessarily an indication of status, for še-ba and sig₂-ba rations were given to all personnel who worked for the state or temples, regardless of whether the recipient was free, semi-free or a slave.⁸⁹ There was, however, a status element to the giving of land allotments; it seems likely that only higher status dependent employees were granted land as well as or instead of rations.⁹⁰

⁸⁶ Gelb, *The ancient Mesopotamian ration system*, 230-243., p. 232; Waetzoldt, *Compensation of craft workers and officials in the Ur III period*, 12., p. 134

⁸⁷ *ibid.* pp. 135-37

⁸⁸ Gelb, *The ancient Mesopotamian ration system*, 230-243.; Waetzoldt, *Compensation of craft workers and officials in the Ur III period*, 12.p. 120

⁸⁹ *ibid.* p. 119

⁹⁰ *ibid.* p.128

Dahl cites evidence in the textual record of 65,000 “ration” bowls, which were the annual production of the local potters in one text.⁹¹ The dependence on rations may, therefore, have had a significant upon the wider Ur III economy.

2.4 – Cereal storage

Many people have done studies in which grain storage during the third millennium played a role, but until recently there has been no substantial study of either texts or archaeology. Recently, though, Tate Paulette of the University of Chicago produced a doctoral thesis on the archaeological remains of storage in the third millennium, and this thesis hopes to help fill the gap as regards the textual record and the administration of storage (though it is important to remain aware that evidence from one city does not necessarily speak for all the cities in the Ur III state).

Direct evidence for storage in the Ur III period (for the whole of the third millennium, in fact) is very limited. The focus of Mesopotamian archaeology on monumental architecture, which yield the highest value finds and are frequently the location of tablet caches, has led to large areas of city architecture being missed or misrepresented, and while we are well-informed about temple architecture across the millennia, there is an absence of large-scale storage from the archaeological record that limits our discussion of the subject. Tate Paulette’s doctoral thesis on the subject of the archaeological evidence for grain storage in the third millennium is a vital source of information, and I will be aligning my work on textual evidence with it, to help clarify the picture he has drawn.⁹²

Besides the archaeological evidence, there are several Sumerian words that indicate storage, which appear quite regularly in documents from the Ur III period. These include such words as *guru*, usually translated as “granary”, and *i₃-dub*, which is another kind of grain storage facility. There has been no

⁹¹ Dahl, *A Babylonian Gang of Potters*, 69.

⁹² Tate Sewell Paulette, *Grain Storage and the Moral Economy in Mesopotamia (3000-2000 BC)*. University of Chicago, Division of the Humanities, Department of Near Eastern Languages and Civilizations, (2015)

comprehensive study done on the terminology of storage facilities, and this is something this thesis aims to rectify.

It is certain that the large city populations would have needed a substantial quantity of grain to be brought in from the surrounding fields; a likely corollary is that there would be a large, centrally-managed storage facility (or several facilities) for this staple food product. Tina Breckwoldt relates that one Old Babylonian text she examined, YOS 5 176 (RS 7), described 1,582,866l of grain being disbursed by one institution in Larsa in one year, and that another text lists a further 622,094l being brought into the city from elsewhere, which means a minimum storage capacity of 1600m³.⁹³ Excavations, however, have yielded little in the way of dedicated, large-scale storage units. Whether this is a result of the locations selected for excavation or a true reflection of the south Mesopotamian city layout remains to be seen; a considerable amount of further excavation will be required to determine this with any certainty.

2.4.1 – Ideal conditions for the storage of cereals

According to Norman Kent in his *Technology of Cereals*, damage to stored cereals comes predominantly through:

- “ - excessive moisture content;
- excessive temperature;
- microbial infestation;
- insect and arachnid infestation;
- rodent predation;
- bird predation;
- biochemical deterioration;
- mechanical damage through handling”⁹⁴

Currid adds to these bio-security measures the additional consideration of security against theft, and observes that grain storage facilities should be centrally located to deter thieves. He also remarks that collection, distribution and/or transportation needs must be met in the siting of silos.⁹⁵

⁹³ Tina Breckwoldt, "Management of grain storage in Old Babylonian Larsa," *Archiv für Orientforschung* (1995): 64-88.p. 64

⁹⁴ Norman Leslie Kent, *Kent's Technology of Cereals: An introduction for students of food science and agriculture*, Elsevier, 1994)

⁹⁵ John D. Currid and Avi Navon, "Iron age pits and the Lahav (Tell Halif) Grain Storage Project," *Bulletin of the American Schools of Oriental Research* (1989): 67-78.

Taking these principal hazards and considerations into account, we can formulate an ideal situation in which grain should be stored. The space should be dry, to avoid germination whilst in storage and also to discourage microbial growth and subsequent damage; similarly it should be protected from the sun to avoid the excesses of temperature that will also lead to germination and other damage; sealed so as to be inaccessible to rodents and birds; and only accessed on an infrequent basis to avoid handling damage. Kent goes on to add that, “variation [of temperatures] should be reduced to a minimum as this can lead to local accumulation of moisture” which can cause damage from mould.⁹⁶

The ideal structure of a grain storage facility should therefore reflect the requirements described above. Practically, in the ancient world this has been achieved in a variety of ways. Silos are one significant method of ensuring the security of long term cereal stores, and Yosef Garfinkel, David Ben-Shlomo and Tali Kuperman have listed several ‘universal principles’ in their article on silos at Tel Tsaf, which they say have guided the design of silos worldwide, both ancient and modern. These run as follows:

- “1. A cylindrical shape, which better withstands the pressure of the grain, distributed evenly onto the sides of the silo and does not create stress on the base or corners of a rectilinear shape. A rounded wall requires less building material than rectilinear walls confining an equal space.
2. A number of silos are built in close proximity. It is easier to handle storage in a number of smaller silos than in one large installation, making it possible to store grain of different years, or different crops, separately. In the case of spoilage...not all the stored material will be affected.

96 Kent, *Kent's Technology of Cereals: An introduction for students of food science and agriculture*, p. 112

3. Organisation in rows, adjacent to each other."⁹⁷

2.4.2 – Large-scale storage

There is a reasonable amount of evidence from the Middle East for this kind of silo storage, with archaeological features demonstrating a circular or elliptical base found at various sites in Palestine, and also at Šurruk in northern Iraq – the latter dating to the Early Dynastic period, in the early third millennium.⁹⁸

Further, there are a number of images from Egyptian and Greek art which show the storage of grain in beehive granary structures, as well as a seal impression from Susa, depicting similar grain storage structures, and ethnographic evidence for the continued use of similar structures, constructed out of clay, in Africa and other places today.⁹⁹ Currid discusses the effectiveness of the Palestinian beehive structures he has examined and asserts that they meet the criteria for long term grain storage: they are effective against exposing grain to too much moisture, they maintain temperatures at a stable level, when hermetically sealed they are effective against microorganisms and animal predation or infestation.¹⁰⁰

Unfortunately, there is very little evidence for such structures in Mesopotamia itself, besides the aforementioned silos at Šurruk (modern Fara), which boasts 32 silos dating from the Early Dynastic period (ED III). These were cylindrical or oval shaped structures, across the site although principally concentrated in the northern third. They were large-scale structures - Harriet Martin has measured a capacity of 100 cubic metres on average for each of the

⁹⁷ Yosef Garfinkel, David Ben-Shlomo, and Tali Kuperman, "Large-scale storage of grain surplus in the sixth millennium BC: the silos of Tel Tsaf," *Antiquity* 83, no. 320 (2009): 309-325.

⁹⁸ Harriet P. Martin, *Fara: A Reconstruction of the ancient Mesopotamian city of Shurruk*, C. Martin, 1988)

⁹⁹ Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88.; Currid and Navon, *Iron age pits and the Lahav (Tell Halif) Grain Storage Project*, 67-78.; EN Nukenine, "Stored product protection in Africa: Past, present and future," *Julius-Kühn-Archiv*, no. 425 (2010): 26.

¹⁰⁰ It should be noted, however, that "long term" is unlikely to indicate several years, since, however well cereals are kept free of moisture, pests and temperature fluctuations, they do not last well for long periods of time, even in silo storage (Halstead)

structures, which works out as 125,000 sila of grain¹⁰¹ (and Giuseppe Visicato has made a population estimate for the city based on this measurement in his 1993 article).¹⁰² Other scholars have made different estimates, as has been discussed recently by Tate Paulette in his doctoral thesis; there can be no certainty with this kind of calculation and, as I am intending to focus on the administrative side of grain storage, I shall not be considering this question in this thesis.

It should be noted that no in situ evidence remains to demonstrate the use to which these silos were put, but it has been generally assumed that they were grain silos.¹⁰³ Whether they were all used for grain storage at the same time, or whether some were used for barley and others for storing other produce, is likewise difficult to determine. Their height is another vexed question, but in terms of their location, they fit the ideal storage criteria, for they were collected together in small groups at various locations in the settlement.

The cylindrical or beehive clay structures discussed above are one means of effecting long term grain storage; they fulfil the criteria presented above and there is evidence for their existence in the broader Middle East. They are not, however, the only kind of storage for which there is archaeological evidence; evidence from a variety of sites in both the Levant and the Khabur regions indicate that medium and city-sized settlements employed a variety of storage practices.

The sites of Tell `Atij, Raqa`i, Kerma, Kneidij and Bderi all have buildings with “doorless, often vaulted rooms”, identified as grain stores in part because of the existence of burned grain stores in such a room at Kerma.¹⁰⁴ The Tell `Atij rooms consisted of six semi-vaulted silos, plastered inside and set out “in two

¹⁰¹ An Early Dynastic sila measure was a little smaller than the measure used in the Ur III: 1 sila = 0.8 litres in the ED, while 1 sila = approx. 1 litre in the Ur III – therefore the calculations by Martin are correct for the ED, but would indicate a smaller barley capacity in the Ur III period.

¹⁰² Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88.p. 64

¹⁰³ Paulette, *Grain Storage and the Moral Economy in Mesopotamia (3000-2000 BC)*.p. 130

¹⁰⁴ Frank Hole, "Economic Implications of Possible Storage Structures at Tell Ziyadeh NE Syria," *Journal of Field Archaeology* 26, no. 3 (1999): 267-283., p. 274

parallel rows as part of a granary made entirely of mud brick” - the proximity reflecting the ‘universal principles’ of Garfinkel et al. above.¹⁰⁵ The other sites have similar doorless rooms of a size to lead excavators to suspect a non-domestic use. At Tell Atij, Raqa’i, Rad Shaqra and Kerma these were gathered inside heavy walls, a defensive pattern that is seen in modern ethnographic examples of grain storage facilities.¹⁰⁶ At Tell Ziyadeh there is a “Grill Building”, which has five parallel walls, 50cm wide and 6m long, with two openings that were too small for easy human passage. The walls stood too high for them realistically to be identified as for ventilation purposes, and they had no internal divisions or plastering, which makes the building unlikely to have been a grain store, though it was probably used for storage of other materials. The “Central Building” consisted of five narrow rooms with no obvious doorways, and have been interpreted as another storage facility. A platform ran alongside it, leading Reimer (part of the original investigation team) to describe it as a food storage facility, probably for grain.¹⁰⁷ The scale of the buildings is not noted, though Frank Hole does observe in his article that the scale of storage “might argue for the accumulation of surplus” - presumably this refers to storage above and beyond what was needed for the year following harvest, which is known as the “carryover” or the “normal surplus”.¹⁰⁸

As can be seen particularly from the example of Tell Ziyadeh, buildings are identified or dismissed as grain storage facilities on the basis of various bits of evidence, but one major factor is the presence of impermeable wall and floor coatings - usually plaster, as bitumen was a valuable substance. Plastered grain

¹⁰⁵ *ibid.* p. 274

¹⁰⁶ Peter Pfälzner, "Modes of storage and the development of economic systems in the Early Jezireh period," *Of Pots and Plans: Papers on the Archaeology and History of Mesopotamia and Syria Presented to David Oates in Honour of his 75th Birthday*, *Nabu*, London (2002): 259-286.

¹⁰⁷ Hole, *Economic Implications of Possible Storage Structures at Tell Ziyadeh NE Syria*, 267-283.pp. 269-272

¹⁰⁸ *ibid.* p. 274; Donald N. McCloskey and John Nash, "Corn at interest: the extent and cost of grain storage in medieval England," *The American Economic Review* 74, no. 1 (1984): 174-187., p. 175, Paul Halstead, "The economy has a normal surplus: economic stability and social change among early farming communities of Thessaly, Greece," *Bad year economics: cultural responses to risk and uncertainty* (1989): 68-80.

bins have indeed been found at Hacilar in Anatolia, dating to the prehistoric period, and the evidence of plastering at Tell `Atij helped to confirm the identification of the silos as grain storage facilities.¹⁰⁹ Another element is the absence of doors from the chambers, which implies firstly that there was no domestic function to the rooms in question, and secondly that grain or other items for storage were deposited from the top into the spaces for storage and that they were sealed from the top. Some of these spaces seem, therefore, to have filled the same function as silos, in that they are likely to have been sealed off for relatively long term storage in a manner that fits the criteria for cereals detailed above – the lack of obvious doors and the presence of plaster fits with this suggestion.

Plastered bins are, as previously mentioned, attested in Anatolia, and Breckwoldt cites the existence of very large ceramic vessels for the storage of cereals¹¹⁰; all of these types of storage are certainly possible, and though the potential preservation of cereals stored in this fashion must have been of much shorter duration than in plastered clay-built silos, there may well have been advantages in terms of accessibility of the grain stored in this manner. An example of non-silo storage in Mesopotamia comes from Ur. The excavations at Ur did not reveal any silos such as at Fara, but there are some structures that show clear signs of having been used to storage, all of which are located on the temenos area of the site. One of these was a part of the Temple of Nanna and comprised a courtyard complex surrounded by large chambers, which Leonard Woolley interpreted as a, “‘great store-house’ where offerings, rents, and tithes were brought before the god”; whether this was used for grain storage or for the storage of other goods is not clear,

¹⁰⁹ Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88., p. 64

¹¹⁰ These jars could be very large; Breckwoldt cites an inscription on one Ur III jar which said its capacity was 176 % sila of grain, though the jar itself is broken and cannot be accurately measured. Storage jars are in evidence as having been used in temples and other large building complexes. An Old Babylonian sila was roughly equal to an Ur III sila, so the considerations associated with the ED sila above are not as relevant here.

however.¹¹¹ Three other monumental constructions contain evidence of storage: the Enunmah, the Giparu and the Ehursag. Whether Woolley's reconstruction of the way in which goods were brought into storage is correct or not, this kind of structure within a temple complex makes excellent sense, for the storage of produce from their own lands as well as any offerings made by individuals or, more likely, other state-run institutions of each province. Nevertheless, there is a distinct shortage of evidence for large-scale central "granary" style storage facilities in core Mesopotamian cities from any time in the third millennium. The lack of obvious granaries could even beg the question of whether they were habitually built within cities at all, or whether the silos at Fara were an anomaly; whether there were other forms of storage used within cities, or other locations outside the city in which granaries were situated. The existence of storage spaces within the institutional complexes of palace and temple is a likely possibility, but as stated earlier in this section on storage, the amount of grain required for a city, let alone a province, is immense; the practicalities of storing large amounts of grain in institutional storage units mean that it is unlikely that there was no form of large scale silo storage in use. Their invisibility in the archaeological record of Mesopotamia is therefore either a consequence of the manner of selecting excavation sites, or else an indication that such large scale storage facilities were not built within the centre of cities at all, but in the countryside nearer to the fields from which their contents came. This latter suggestion does not mean that these facilities are not in line with the conditions suggested by Currid, that silos should be centrally located for security against thieves; rather, I suggest that they may have been located in smaller settlements outside of the main city area, doubtless on a canal for ease of grain transport, and would therefore have been within a settlement area and thus protected by local inhabitants.¹¹²

¹¹¹ Paulette, *Grain Storage and the Moral Economy in Mesopotamia (3000-2000 BC)*.p. 154

¹¹² M. Widell, "Schiff und Boot (ship and boat). A. In sumerischen Quellen," *Reallexikon der Assyriologie und Vorderasiatischen Archäologie* 12, no. 1/2 (2009a): 158-160.

Whether there was a security detail assigned for the protection of granary contents is a question for the texts; one which will be examined in Chapter 5.

2.4.3 – Domestic storage

A final form of storage, less of relevance to this thesis but nonetheless worth considering, is storage on the domestic level. As regards domestic or small-scale local storage, Kent recommends underground storage as particularly advantageous for dry climates like south Mesopotamia, for the following reasons:

- 1) the temperature does not fluctuate greatly, which as mentioned above helps to prevent germination and infestation;
- 2) the stores can be completely filled and closed tightly, which almost hermetically seals them against fungi, insects and rodents.¹¹³

It is clear that this sort of pit storage was practiced in various parts of the Near East, even until as recently as 1983 in the Levant.¹¹⁴ Experiments have shown how successfully grain can be stored in pits; the Lahav Grain Storage Project demonstrated that when pits were fumigated (by lighting a fire in the base and allowing it to burn out before putting in the grain, as was done until very recently in Cypriot storage pits) the percentage of fungal and insect infestation was reduced significantly, as the fire had the effect of destroying pests and microbes in the walls of the pit before they could get into the grain and cause infestations. Sealing with clay and stones proved an effective barrier against heat, rain water and robbery of the grain by animals; the temperature and moisture content in all the pits barely fluctuated and only one was broken into by an animal.¹¹⁵ It is also the case that when in storage, the outer layer of the grain will spoil and give off carbon dioxide, which then protects the rest of the grain.¹¹⁶ What implications this has for the size and scale of pit storage will be examined in the course of this thesis. It is quite probable that pit storage was

113 Kent, 1994, p. 110

114 John D. Currid and Avi Navon, "Iron Age Pits and the Lahav (Tell Halif) Grain Storage Project" in *Bulletin of the American Schools of Oriental Research*, vol. 273 (1989), p. 68

115 Currid and Navon, 1989, pp. 72-76

116 Halstead, 1989, p. 75

used in Mesopotamia; Hodjasch cites storage pits from Erebuni, and Widell has interpreted certain Sumerian phrases as referring to pit storage.¹¹⁷

2.4.4 – Ideas about storage in the Ur III period

Grégoire presents a suggestion of the Ur III granary, and its relationship with the grain processing unit the e₂-HAR (grinding house), in his 1999 article, which characterises both Ur III society in general and grain storage in particular as highly centralised and redistributive. He suggests that the central granary gathered together the grain products of “large estates and economic units” and redistributed them in various ways, rather in the manner of an oikos system. He states that the central administration, who were responsible for the large quantities of barley moving about within the province, had to manage both the storage of very large quantities of grain, and also the “units of grain transformation”; namely the e₂-HAR facilities of the province. He describes the guru₇ as:

an architectural complex where grain...was stored. The granary, or silo, also served as a storehouse for central administration, which drew from it the necessary grain for rations...for feeding cattle...[and] for different forms of exchange.¹¹⁸

A somewhat different perspective of grain storage systems comes from Old Babylonian Larsa, as described by Breckwoldt. She envisages a network of granaries, which may have been attached to threshing floors and would have been close to waterways for ease of transport. Like Currid, she draws attention to the need for theft prevention, and suggests that a quick turnover of grain might have been employed to limit opportunities for unauthorised removal. She observes that old grain was often designated for animal fodder, and that expenditure texts describe grain being used as payments, as kurum₆ (subsistence allocations), or as še-ba (rations). She also intimates that storehouses could have been used as a kind of bank, from which withdrawals

¹¹⁷ Svetlana Hodjasch, “Speisekammern in Erebuni. Nach Angaben der Ausgrabungen des Staatlichen Puschkin-Museums der Bildenden Künste”, in H. Klengel and J. Renger, eds., *Landwirtschaft im alten Orient*. Berlin, 1999, pp. 225-228; Widell, 2002, p. 397.

¹¹⁸ Gregoire, *Major units for the transformation of grain: The grain-grinding households of southern Mesopotamia at the end of the third millennium BCE*, p. 225

could be made by individuals and which could offer interest-free loans as a measure to reduce the risk of spoilage of grain stores.¹¹⁹

One final model is offered by Widell, which I have summarised as follows:

- 1) Barley was grown in fields (settlements of the kind as described by Stępień, above), harvested, threshed and transported to a central granary within the nearest settlement (village or city); this process would have been supervised by an official from the granary.
- 2) The central granary would return some of this grain to the farming households as subsistence or rations, again supervised by an official from the granary.
- 3) Minor granaries supplied the temples and other households of the province.
- 4) Storage of grain “appears to have been very centralised”, with local farms storing very little of their own harvests.
- 5) The central granary supplied many other economic units, such as orchards, dairy farms and workshops.
- 6) The central granary also supplied temples and other urban households, which would then have supplied their own workforces with this grain. They would also have received provisions via the bala redistributive system.¹²⁰

Given that there is very little archaeological evidence for the kinds of storage used in the Ur III state, the only option is to use the imagination to suggest possible solutions to this question. The archaeological evidence presents a number of possibilities, and chances are that structures similar to all of those described were employed to store enough grain for the subsistence of a city or province. References in the texts to *guru₇ im ur₃-ra*, translated by Huber as meaning the smearing of clay on granaries, possibly to seal them closed, are reminiscent of the plastering of silos described by Garfinkel et al, suggesting silos of the kind described at the beginning of this section, either cylindrical or beehive, and intended for longer term storage.¹²¹ Fig. 1 demonstrates what

¹¹⁹ Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88.

¹²⁰ Wilkinson, Gibson, and Widell, *Models of Mesopotamian landscapes: how small-scale processes contributed to the growth of early civilizations*.

¹²¹ Christian Huber, “*guru₇ im ùr-ra* Revisited,” *Studi sul Vicino Oriente antico dedicati alla memoria di Luigi Cagni*, ed. S. Graziani. Naples: Istituto universitario (2000): 463-495.; Garfinkel, Ben-Shlomo, and Kuperman, *Large-scale storage of grain surplus in the sixth millennium BC: the silos of Tel Tsaf*, 309-325.

such a structure might have looked like. On the other hand, the term *i₃-dub* contains the verb *dub*, meaning “to pile up”, and could indicate a heap or pile of grain – though as the word is translated in various places as “granary” or “storage” it is hard to be certain. It may even have indicated a temporary structure, perhaps constructed out of reeds or other impermanent material, as can be seen today in ethnographic studies of grain storage, and which has ancient witness in .¹²² Fig. 2 gives an impression of what such a temporary reed structure may have looked like.

In summary, this thesis will endeavour, by comparing the available archaeological evidence with both the terminology and the historical context of the texts being examined, to determine as much as possible the physical, as well as the administrative, nature of the storage in use at Umma, and to establish to what extent the above models of grain storage can be considered accurate ideas of the processes of grain storage in Ur III Umma.

Fig. 1 – Clay silos (C. Johnson)

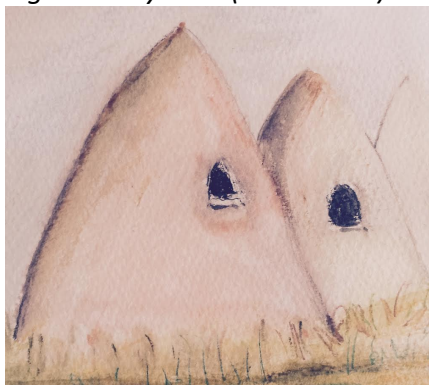


Fig. 2 – Reed granary (C. Johnson)



¹²² Nukenine, *Stored product protection in Africa: Past, present and future*, 26.

Chapter 3 – Methodology

3.1 – Background to the questions

3.1.1 – Assyriology as a field

As an academic discipline, Assyriology often finds itself on the margins, for various reasons. One major problem for the discipline is that the amount of archaeological fieldwork has been limited for more than 20 years, due to the various conflicts and other problems in the region, which limits its potential in archaeological terms and restricts scholarship to philological research into textual sources – a perfectly valid enterprise but limited in comparison with studies that unite archaeological and textual sources, and which can thus use material culture to validate deductions made about textual data, and vice versa.¹²³ Fortunately, with the advent of archaeological survey techniques such as those used by the Land of Carchemish project, progress is being made in this area, but it would still be a great benefit to be able to carry out further and more detailed fieldwork in the relevant locations.¹²⁴

It is therefore vital to perform high quality scholarly investigations into the evidence available to us, both textual and material. It would also be ideal to carry out truly interdisciplinary studies, collaborations involving, for instance, economic historians, engineers, land economists, agronomists, veterinary scientists, or experts in various other disciplines, to enhance our understanding of the complex ideas and systems conveyed in the texts from various different periods of Mesopotamian history. Unfortunately the relatively poor standard of publication of primary sources has hindered this sort of collaborative effort. Publishing lists of texts with no system of formal classification and with no translations of the texts renders it very difficult for

¹²³ Examples of this approach include Zettler, *The Ur III Temple of Inanna at Nippur: The Operation and Organisation of Urban Religious Institutions in Mesopotamia in the Late Third Millennium BC*, examining the Inanna Temple at Nippur with a combination of archaeology and administrative records.

¹²⁴ Projects such as Wilkinson, Gibson, and Widell, *Models of Mesopotamian landscapes: how small-scale processes contributed to the growth of early civilizations*, are a good example of landscape archaeology in practice in the Middle East.

those with specialist knowledge in other relevant fields but with no Sumerian or Akkadian language knowledge to make any contribution to the field unless in collaboration with an Assyriologist; and given how scarce Assyriologists are, such collaborations do occur but are not as common as could be wished. Add to this the fact that there is a minimum requirement of English, French and German in order to deal with the secondary sources, and the consequent small number of interdisciplinary collaborations with non-Assyriologist scholars becomes unsurprising.

Sadly, there is also a scarcity of scholars within the discipline to perform or arrange these collaborations, and they are swamped in the huge amount of textual material available from the region and period of Mesopotamian history. There is, therefore, a distinct problem within the field. There is a mass of data, particularly for some periods of Mesopotamian history, but not enough scholars. Very few universities offer full-time positions in Mesopotamian history, and experts from other fields are not able to offer their expertise due to the nature of the publication of primary material. Add to this the sheer quantity of data (there are 87,241 texts in the Database of Neo-Sumerian Texts, all of which date from the Ur III period¹²⁵) and it is easy to see why analysis is somewhat patchy.

Finally, there is very little discussion of theoretical positions on text analysis among the philologists and Mesopotamian historians (archaeologists have more experience in the use and application of theory). There is no consensus on theoretical ideas and no agreed best approach – the standard theoretical position appears to involve attempting to “make sense” of the texts. This approach will be discussed slightly later in this chapter.

3.1.2 – Issues with primary material

There are also a variety of issues concerning the primary material from the Ur III period – the cuneiform documents themselves. Some of these issues have

¹²⁵ Manuel Molina, "The corpus of neo-sumerian tablets: An overview," *The Growth of an Early State in Mesopotamia: Studies in Ur III Administration* (2008): 19-53.

been alluded to briefly elsewhere, but it is useful to summarise them in one place.

Firstly, the texts are entirely administrative and economic texts, which are generally very brief and lacking in detailed information about the transactions. Individuals mentioned in the texts are frequently not identified by patronymic or job title, and certain names were very common and oft repeated. It is down to the modern interpreter of the text to fill in some of the gaps, and fortunately there is a kind of standardised format for these texts that, once it has been identified, can provide a useful template for other texts in similar vein.¹²⁶

Besides interpretative problems, the textual record also presents provenance issues. Firstly, many of these texts have no archaeological provenance, being the product of looting and subsequent sale on the antiquities market.

Secondly, as mentioned in the introductory chapters, the majority of Ur III texts originated in the provinces, rather than the capital city, and despite extensive excavations at Ur under Leonard Woolley, no central governmental, state or royal archive has been located. This renders insecure any generalisation of observations and deductions in the provincial textual record, which is of substantial quantity. It cannot be assumed that institutional, economic or individual behaviour in one province is representative of all the rest. Thus scholars are restricted, to some degree, to describing and analysing very specific aspects of society and economy with only tentative attempts at linking their work with studies made on other provinces.

The quantity of texts presents another problem, which is that sifting through such a vast quantity of written material takes a great deal of time and can present difficulties in finding information or in processing data – a needle in a haystack effect. I will discuss this further in the explanation of my strategy and method for this thesis. Lastly, there is some difficulty when it comes to translating Sumerian texts. There is relatively limited consensus on the

¹²⁶ This need for a “template” for interpreting Ur III texts lies behind Chapter 4 of this thesis, a typology of all the texts in which Arad the granary-keeper appears in an active role.

translation of certain key terms and expressions, and given that there is no official dictionary, it can sometimes be a little difficult to know what precise meaning certain texts intend to convey.

3.2 – Research aims

The aim of this thesis is to examine the social and economic role of the granary as an institution in Umma during the Ur III period. To do this, I will be examining as many texts associated with the granary, the granary keeper, or with grain storage, as I have been able to translate – somewhere over one thousand administrative texts.

The question can be divided into two separate strands.

3.2.1 – The economic role of the granary

This aspect of the research aims to examine how the granary fitted into the Ur III provincial economy. It is plain that an organisation which dealt with large quantities of harvested cereals, which was run by a member of the so-called ruling family of the city of Umma, and which generated a substantial administrative record, must have had a significant economic impact on the city and province which it served. The objectives of this thesis are:

1. to identify in which sectors the *guru₇* had an economic impact
2. to define more clearly the reach of the granary as an institution
3. to clarify the role of the granary keeper in the Ur III economy

3.2.2 – The social role of the granary

The social role of any institution is difficult to examine when one's primary material is entirely composed of brief administrative texts which make almost no reference to individuals, official or labourer, great or small. Nonetheless, in a society where the majority of the population was under the direction of one or other of the great institutions of Ur III Mesopotamia, these institutions must be considered to have had a social as well as an economic impact. Investigating and identifying that impact is therefore a significant objective of this thesis, and the methodology must be designed to accommodate this objective as well

as the (on the surface) simpler objective of establishing the granary's role in the economy of the province.

3.2.3 – Specific questions

The specific questions which I will attempt to answer in this thesis are directed more towards the economic than the social angle, principally because these are the questions that best suit the administrative nature of the data. These questions are as follows:

1. What kind of transactions take place involving the *guru₇* or Arad as an individual?
2. What kinds of commodities do these transactions involve?
3. Which households or other storage facilities were involved in these transactions, and how were they involved?
4. Who were the personnel connected with these transactions? (This question will not be answered with a full prosopography, but will nonetheless be examined in a little detail)
5. What were the sources of cereal products, and what was their relationship with the *guru₇*?
6. What are the patterns of the economic activity listed above?
7. Is it possible to define and categorise the different types of storage facility available to the authorities in Ur III Umma, and is it possible to comment upon the nature of these facilities?
8. What can be determined of the role of the granary keeper in an Ur III province?

These questions take into account both the aim of the thesis, to determine the extent of the economic and social role of the *guru₇* in Ur III Umma, and the nature of the texts that provide the data used in this thesis. Having thus carefully considered the questions that can be asked of the available data, it is important to develop a strategy for analysis that is similarly well suited to the nature of the source materials.

3.3 – Possible strategies

I had originally intended that this thesis would examine grain storage across the whole of the Ur III state, but an initial assessment of the quantity of data available showed that this was certainly beyond the scope of a PhD thesis. This being so, I have chosen to restrict my focus to one particularly well-documented province, that of Umma, where the data concerning both grain storage and administration is particularly rich. This site also has the advantage of an easily identifiable named official in charge of the granary, which has facilitated the search for data on the administration of grain storage – the aforementioned Arad, brother to three governors and member of the ruling family of Umma.

The options for strategic approaches towards Ur III text corpuses can be categorised under the following headings:

3.3.1 – *Alternative 1*

Qualitative analysis based on philological analysis of Ur III texts, adopting no particular theoretical position.

3.3.2 – *Alternative 2*

Quantitative analysis, incorporating “intuitive observations” – in the Assyriological world this has been pioneered as a method for studying literature as well as numerical data, with studies such as that of Jon Taylor in *Analysing Literary Sumerian*, and Jeremy Black’s pioneering book *Reading Sumerian Poetry*, in which he analyses aspects of poetry by quantifying and tabulating the different kinds of imagery in the poem of Lugalbanda to draw conclusions as to the purpose of its use in poetry.¹²⁷

3.3.3 – *Alternative 3*

Ethnographic study, comparing present-day or historic evidence from “similar” societies and civilisations with the (usually) archaeological evidence found. Examples of this approach include Ochsenschlager’s studies at Al-Hiba, and

¹²⁷ Jeremy Black, *Reading Sumerian Poetry*, A&C Black, 1998); Jon Taylor, “A quantitative analysis of the Sumerian proverb collections,” *Analysing Literary Sumerian: Corpus-based Approaches* (2007): 273.

Louise Sweet's book on Tell Toqaan.¹²⁸ Other works, such as GC Hillman's study on traditional husbandry of cereals in the *Bulletin on Sumerian Agriculture*, are written from a similar standpoint.¹²⁹

3.3.4 – *Alternative 4*

Qualitative analysis of texts, taking a specifically-stated theoretical position as the starting point for analysis. A well-known example of this approach is David Schloen's *The House of the Father as Fact and Symbol*, which uses hermeneutics and Weberian interpretivism to discuss the nature of patrimonialism in the Ancient Near East (specifically Ugarit, but with broader implications for the whole of the Near East), and is noted as a landmark, if contested and much-discussed, work in Assyriological history writing.¹³⁰

3.4 – Choice of strategy

The approach I have chosen to take is a mixed strategy, combining a principally quantitative approach to the data with a qualitative view of specific sources. This method seems to me to address the problem of how to draw both broad-scale pattern-based deductions from this difficult data whilst allowing deeper, more qualitative analysis of the most interesting points thrown up by the quantitative analytical methods. The data analysis is based more upon inductive reasoning than deductive, principally because the field is sufficiently under-researched that the formulation of hypotheses in advance, as required by deductive analysis, is tricky. Inductive reasoning methods sit comfortably alongside the broad-spectrum quantitative approach taken in this thesis (and detailed below, section 3.4.2), as they are based upon the accumulation of

¹²⁸ Edward L. Ochsenschlager, *Iraq's Marsh Arabs in the Garden of Eden*, University of Pennsylvania Press, 2014); Louise Elizabeth Sweet, *Tell Toqaan: A Syrian Village*, University of Michigan, 1960)

¹²⁹ Gordon C. Hillman, "Traditional husbandry and processing of archaic cereals in modern times: Part I, the glume wheats," *Bulletin on Sumerian Agriculture* 1 (1984): 114-152.; GC Hillman, "Traditional husbandry and processing of archaic cereals in modern times. Part II, the free-threshing cereals," *Bulletin on Sumerian Agriculture* 2 (1985): 1-31.

¹³⁰ J. David Schloen, *The House of the Father as fact and symbol: Patrimonialism in Ugarit and the Ancient Near East*. Winona Lake. Eisenbrauns (2001)

facts and subsequent detection of patterns or trends, and the formulation of hypotheses and theories built upon the evidence base.

3.4.1 – Description of strategy

I used online databases of cuneiform tablets to identify texts relevant to this thesis. Having identified a large number of relevant texts, I designed a spreadsheet and populated it with all the data that could be gleaned from these texts, using the following categories: date; type of commodities listed; use to which commodity is put; quantity and quantity-measure; place names mentioned in connection with transaction; personal names mentioned in connection with transaction; institutions mentioned in connection with transaction; Arad's role in the transaction (recipient, witness, sealed or unsealed document). The data spreadsheet is attached as Appendix 1.

The quantitative analysis style taken in this thesis involves comparing two or three variables from the spreadsheet database, such as commodity deliveries/month/responsible official, or the use to which commodity is put/responsible official/institution or administrative office of said official. Setting related data variables alongside one another in tables and charts allows for the examination of trends, the observation of patterns, and the development of prosopographies, as well as the observation of oddities or irregularities in the data which can lead to further areas of fruitful investigation. Quantitative analysis also allows for the application of simple statistical tests, which help to indicate the significance of some of the findings of this study. It is also useful in indicating which areas would benefit from more qualitative forms of analysis.

Each section of each chapter begins with the presentation of the quantitative data, which is then developed qualitatively. There is a wealth of academic discussion on the subject of the administration of the Ur III state, as summarised in Chapters 1 and 2, and I have found this useful in informing any qualitative analysis of the quantitative data. Likewise, discussions concerning the archaeological evidence of storage in the third millennium, and some ethnographic insights into storage practices and grain use, will provide further

material for qualitative analysis. A discussion combining the qualitative and quantitative data takes place at the end of each chapter and the final chapter collates and evaluates both data and discussions to firmly establish deductions and hypotheses.

3.4.2 – The tools for data collection and analysis

Not all texts have been digitised: Manuel Molina calculates that there are probably 120,000 Ur III texts in total across the world, in both museum and private collections, and somewhere around 30,000 of these are both unpublished and not yet digitised.¹³¹ The 87,241 available on the Cuneiform Digital Library Initiative database (CDLI), which is the principal online source for cuneiform documents, would seem sufficient to provide a representative sample, however, and I am confident that the results I have drawn in the quantitative sections of this thesis are reliable. I used the CDLI as my principal online search tool, along with the Database of Neo-Sumerian Texts (BDTNS); this database is connected with the CDLI, but has a different user interface. From these two sources I identified over 1000 tablets which could be of use. I searched not only for terms referring directly to the granary (such as *guru₇* (granary) and *ka-guru₇* (granary keeper)) but also for other associated terms that I felt might provide me with further information about grain storage. Primary among these terms was *arad₂*, which has the literal meaning of “slave”, but which was also the main component of the name of the head of the granary – for while his full name was *Arad₂-mu*, this was consistently shortened in the texts to *Arad₂*. Naturally, this search term led to a lot of texts being returned which were irrelevant to my enquiries, but with discretion these were rejected quite easily.

Other terms which I chose to investigate referred to other known forms of storage or were related to storage by other means. These include *i₃-dub* (granary/grain heap), *e₂-šutum* (generally translated as “storehouse”), *ga₂-nun* (another kind of storage facility), *ki-su₇* (threshing floor) and *e₂-HAR* (grinding

¹³¹ Molina, *The corpus of Neo-Sumerian tablets: An overview*, 19-53.

house). Of these, ga₂-nun proved unrelated to grain storage, as will be briefly discussed in Chapter 6.

At various points during analysis I also had cause to investigate certain individuals or other search terms such as, for instance, “geme₂”, but these will be left for discussion within the chapters themselves and not listed here.

3.5 – Justification of the methodological approach

3.5.1 – Advantages of the method

There are several advantages to analysis using a spreadsheet database containing all of the information gleaned from over a thousand texts. Firstly, and most importantly, it is an ideal method for collating information from a huge number of texts, thus avoiding the problem mentioned in section 3.1.2 of the enormous quantity of texts available for study making it difficult to isolate any relevant information. Secondly, such a system simplifies the searching and cross-referencing of specific data points, such as deliveries of fodder with the month of delivery, or the supply of rations to work teams with the official responsible for the transfer. It allows for an efficient categorisation of data and for a swift collation of all texts relevant to a particular question, as well as presenting the ideal format for the development of an overview of how the granary functioned month-by-month and year-by-year, what duties it had, when in the year deliveries were concentrated, and so on. Furthermore, and significantly, a data spreadsheet of this sort also reveals very clearly the uses to which the granary or its stored contents were not put, which is as interesting to investigate as the opposite.

The mixed analysis strategy plays to the strengths of both quantitative and qualitative research methods. Besides the points mentioned in the previous paragraph, quantitative analysis also allows for statistical verifiability and the identification of patterns of behaviour in particular months or years.

Qualitative analysis allows for a contextual analysis both of the results of quantitative analysis, and of specific texts that highlight particularly interesting aspects of administrative or economic practice.

This mixed method is an accepted, tried and tested method in the field (the book *Analysing Sumerian Literature* contains several examples¹³²), but the main improvement I have made in my thesis is the database I have created to collate and process my data, which is attached as Appendix 1. It is one of the prime achievements of this thesis, and is worth discussing even though its development was tangential to the planned questions and conclusions. This database was planned after studying the kinds of texts in which Arad was attested, and was modified and improved as more texts were translated. It is now an extremely versatile and useful tool, which contains data from over 1000 tablets and can be used, by means of filters, for swift and easy comparisons of multiple strands of data at once. It has simplified the collation and juxtaposition of data strands and allowed for some very fruitful examinations of association between these strands. These associations have formed the basis for Chapters 5 and 6, and would not have been as easily or readily obtained without my database.

One final advantage of the method comes with the selection of Umma as the focus, as it is in many ways the most suitable province for an in-depth study of this nature. This is in part because it is the source of a great deal of the available textual material, but more importantly it has been the subject of a significant amount of study and scholarly investigation over the last ten to twenty years. People like Robert Englund, Jacob Dahl, Piotr Steinkeller, Robert McC. Adams, Xiaoli Ouyang, Stephen Garfinkle and Magnus Widell have all contributed in recent years to our knowledge and understanding of the administration of the city, across a wide variety of studies, and there have been a number of recent PhD dissertations which have focused on the city, showing that it is a great subject for current study. With this combination of exceptional availability of primary sources and the quality and quantity of secondary material with which to compare and contrast my own findings, Umma is certainly the best Ur III province to be investigating at the moment.

¹³² Jarle Ebeling and Graham Cunningham, *Analysing literary Sumerian: corpus-based approaches*, Equinox Publishing (UK), 2007)

3.5.2 – Difficulties and disadvantages of the method

There were some difficulties with the search term, “arad₂”, given its meaning and the frequency of the word “slave” in the textual record. Fortunately, it was relatively easy to determine from the context whether the word referred either to the status of slave, or to the personal name of the granary keeper at Umma.

A more significant problem was in determining whether the personal name of Arad in question was the granary keeper Arad₂-mu or some other individual of the same name. Context was again useful, but in some cases it remains uncertain. This should not cause any major problems with the data analysis, however, as any confusing texts have been omitted from my analysis and, given the quantity of data at my disposal, I believe their absence cannot materially affect the quantitative side of the research. Any qualitative analysis has taken place on texts that are known to refer to the affairs of the granary. While the database I have created has been a very successful tool and one of the significant achievements of this thesis, not all of the texts fitted into the spreadsheet design or categories, most commonly because they were not in the standard receipt formats (as detailed in the Typology, Chapter 4). This had several beneficial effects, however. Firstly, it encouraged me to continue developing the database until it had the flexibility to deal with almost any text. Secondly, when texts still did not fit into the categories offered by the amended spreadsheet, I was compelled to give closer attention to those texts to avoid the risk of missing vital information. Many were insignificant in terms of data on granary function; those that were more noteworthy have generally been dealt with separately in the text of the thesis.

3.5.3 – Justification of strategy

Despite the disadvantages described above, the method I have used makes sense and is valid for this kind of study, largely because a mixed strategy means that the best of both worlds is achieved, with quantitative methods allowing for breadth of investigation while the qualitative methods permit depth of study.

This mixed strategy is an accepted method in the field of Ur III studies and in Assyriology more broadly.¹³³ It is also a method to which I am personally well-accustomed, having used it in both my undergraduate dissertation (on Old Babylonian literary Sumerian) and in coursework and dissertation for my masters degree (on poor relief, religion and the perceptions of old age in early modern English historical writings), and it has yielded interesting and well-received results in a wide variety of subject areas and primary materials. It has proven a useful method for putting structure into text corpuses and has yielded some exciting results in this thesis.

Quantitative analysis takes advantage of the huge pool of data to attempt to draw patterns on a broad scale and over long time periods. It is extremely useful for the analysis of trends of data and for the easy cross-referencing of several strands of information at once. It is helpful to identify trends over time, or patterns of activity with certain individuals, and can be used to tie patterns of behaviour into other patterns known from external sources, such as making connections between grain deliveries and the agricultural year. The precision permitted by the employment of quantitative analysis ensures that conclusions can be considered sound, supported as they are by specific and extensive data.

Quantitative methods can also usefully point up specific areas of interest to researchers, where concentrated and detailed study may prove revealing about distinct aspects of society or economy. Since it is important to temper figures, tables and graphs with broader forms of analysis, this kind of combination of quantitative methods with qualitative analysis ensures that human interactions and processes are not reduced to units of data, but instead that patterns of behaviour can be examined using information gleaned from other secondary literature. This is exactly what I have done in this research, and the mixed methodology described above has proven very fruitful indeed in both broad discussion and narrowly focused investigation.

¹³³ Analysing Literary Sumerian has many examples of this kind of methodology.

Interestingly, one useful side-result of this study has been to show that, despite smaller sample sizes in earlier work into the field, researchers could nonetheless be disconcertingly accurate in their deductions when compared with larger-scale studies. Snyder and Jones's observations on the role of Arad the granary keeper are strikingly similar to my own, and their brief remarks on the nature of the granary are proven, by this study, to be startling in their accuracy, considering the much smaller quantity of texts available to their study. My broader study into the same and similar material joins in happy consensus with their suggestions, but I am pleased to say that I can go beyond their summarising remarks and contributes entirely new deductions in our understanding of the complex behaviours and practices around the storage and distribution of grain supplies in the Umma province.

3.6 – Evaluation of methodology

3.6.1 – Reliability

I have consistently applied the same criteria to all of the texts in this study, and I have set and maintained clearly stated exclusion categories. The method I have used and described above can be reproduced, especially with the use of the database I have designed and built, but given that the interpretation of Sumerian texts can be a matter for individual approaches and that the interpretation of the data in this thesis has not been performed with regard to any particular historiographical theory, but has instead built upon the works of other scholars in the manner of traditional history, it is possible that other scholars may not come to identical conclusions.

3.6.2 - Validity

The above notwithstanding, the results of this thesis are valid. The method takes advantage of my own skills and experience in conducting mixed quantitative and qualitative research, and makes the best sense of the data that one single study can, by combining broad-scale pattern-building investigations and deeper study of certain points within the data). While scientific methods alone are insufficient for historical and broader humanities

research, they can shed a new light on our kind of data when used in intelligent combination with more established historical methods, as has been practised in this thesis.

If I were to investigate this material further, after submitting this thesis, I would be inclined to attempt more ethnographic comparisons and contrasts, preferably in collaboration with ethnographic and ethnoarchaeological experts, but as I am not trained in these aspects of history and social sciences myself, it would have been inappropriate to use them more extensively in this thesis. Nonetheless, while it would have been interesting to critique the data more intensely with detailed ethnographic evidence, my methods are still sound for the reasons stated above, and also resists the occasional traps inherent in ethnographic research of assuming that societies are more similar than they truly were. In summary, this thesis has successfully measured and analysed what I set out to study, and the conclusions are valid. Whether someone chooses to question the interpretation of the data in a future investigation, the methods used to collect and analyse the data are not in doubt.

3.6.3 – Generalisation

While I consider the findings of this research to have implications for both the history of the Ur III period and beyond, it is vital to have a clear picture of how much these results can be generalised. Firstly, it cannot be assumed that data on the workings of an institution in one city apply to similar institutions in another city. Despite the significant centralisation of the unified Ur III state, it is credible that the provincial capitals retained enough individuality from their days as independent city-states to operate slightly differently from one another; in any case, it would be foolish to take results from one city and to declare that this was the way all cities ran their granaries.

Secondly, the nature of the source materials in the Ur III period means that it is very difficult to obtain corroborating (or contradictory) data about all the other provinces of the Ur III state. The narrow scope of the textual record means that detailed investigations can only truly be made in three or four of the

provinces, and therefore even if one were to attempt a comparative analysis of, for instance, the granary at Girsu, it is still almost impossible to state with any certainty that the operation of the granary as defined in two studies indicates a universal state-wide approach to grain storage and distribution. In the field of Assyriology particularly, where it is tempting to apply knowledge gleaned from one study to other places and time periods, generalisations are insecure at best and inaccurate at worst, and are best avoided.

That said, this research has a great deal to offer the field, both in terms of the expansion of knowledge and information, and in the methodology used, which forms a useful basis for further synchronic and also diachronic analysis, not only into the granary but into other institutions that controlled access to resources and commanded large labour forces. Broad quantitative studies can highlight where further and deeper investigation may prove fruitful, and though they are well suited to the data of the Ur III period, there is no reason why they should not be useful in earlier and later periods of Mesopotamian history.

Chapter 4 - Typology

4.1 – The types of text in which Arad appears

Sumerian administrative documents tend to come in very standardised text types and there is a fondness among Assyriologists for classifying the types of text in any one group into different categories. Below I attempt both to describe and explain the various categories of administrative text connected with the granary and with Arad, with examples for each category. As shall be seen, the texts referring to Arad come in many varieties, not all concerning grain.

Key:

n = quantity

PN = personal name

šu ba-ti = received

-ta = ablative suffix - “from”

gir₃ = responsible official

šu-nigin = total

ša₃-gal = fodder

4.2 – Type 1 – Disbursements from the granary

Type 1 is the basic type of transaction of commodities from the granary keeper to another individual or (more commonly) another institution. and can be divided into three subtypes.

Subtype 1a:

n-grain, PN₁/INSTITUTION/LOCATION-ta, ARAD₂-ta, PN₂ šu ba-ti, DATE

The basic disbursement transaction out of the granary keeper’s authority, detailing the amount of grain being delivered from the granary keeper, the origin of that grain (whether it was originally delivered by a specific individual, an institution or from a particular location outside of Umma), the name of the official receiving it (often on behalf of another institution) and Arad’s name as the official transferring control of the grain.

Example: SAT 2 0081

obverse

1. 2(asz) 3(barig) sze gur lugal

2. e2-szu-tum-ta

3. ki ARAD₂-ta

4. giri₃-ni

reverse

1. szu ba-ti
2. iti sig4-{gesz}i3-szub-ba-{ga2}gar
3. mu us2-sa a-ra2 3(disz)-kam si-mu-ru-um{ki} ba-hul

- 1 2 gur 3 barig (780 sila) barley, (measured out with) the royal measure
- 2 from the e₂-šutum storehouse
- 3 from Arad
- 4 Girini
- r. 5 received it
- 6 month 2
- 7 the year after Simurru was destroyed for the third time (SH33)

Subtype 1b

n-grain, PURPOSE, PN/INSTITUTION/LOCATION-ta, ARAD₂-ta, PN₂ šu ba-ti,

DATE

This type adds information about the use to which the grain will be put - whether it is to be used as regular deliveries to one of the temples, fodder for animals, payment to workers, or for some other purpose.

Example: SAT 2 0075

obverse

1. 2(asz) 2(barig) 3(ban2) sze gur lugal
2. sza3-gal {ansze}kunga2
3. ki ARAD2-ta
4. ur-{d}lamma
5. szu ba-ti

reverse

1. iti pa4-u2-e
2. mu us2-sa a-ra2 3(disz)-kam

- 1 2 gur, 2 barig, 2 ban (740 sila) barley, (measured out with) the royal measure
- 2 fodder for the mules
- 3 from Arad
- 4 Ur-Lamma
- 5 received it.
- r. 6 month 11
- 7 the year after Simurru was destroyed for the third time (SH33)

4.3 – Type 2 – Receipts into the granary

Type 2 comprises texts which record receipts of commodities into the granary keeper's authority. Receipts are a lot less numerous than disbursements in the current textual record; this is probably due to the fact that when grain was delivered into the granary keeper's authority from outlying fields and towns and a receipt written, the receipt was taken by the delivering official back to whichever town or institution the grain had come from, and as the texts I am examining in this thesis come from the city of Umma and excavations have not yielded many archives from the outlying towns of the province, many of these receipts are lost to us.

Type 2 can be divided into four subtypes.

Subtype 2a:

n-grain, PN/LOCATION/INSTITUTION-ta, ARAD₂ šu ba-ti, DATE

This is the basic grain transaction into the granary keeper's authority. Both a location/institution and an official's personal name are listed, and it is always Arad who receives these quantities of grain.

Example: OrSP 47-49 156

obverse

1. 1(gezš'u) 8(gezš) 1(u) 5(asz) 4(barig) 1(ban₂) 8(disz) 1/3(disz) sila₃ sze gur lugal
2. gu₂-edin-na-ta
3. ki ur-{d}li₉-si₄-ta

reverse

1. ARAD₂ szu ba-ti
2. iti dal
3. mu a-ra₂ 2(disz)-kam kar₂-har{ki} ba-hul

- 1 1095 gur, 4 barig 1 ban 8 1/3 sila (328758 1/3 sila) barley, (measured out with) the royal measure
- 4 from the "Mouth of Edin"
- 5 from Ur-Lisi
- r. 7 Arad received it
- 8 month 5
- 9 The year that Kara-HAR was destroyed for the second time (SH31)

Subtype 2b

n-grain, PN/LOCATION/INSTITUTION-ta, PURPOSE, PN-ta, gir₃ PN, ARAD₂ šu ba-ti, LOCATION, DATE

Not all of the elements of subtype 2b are always present, but nonetheless it differs from subtype 2a in giving more information about the basic transaction - more names of the officials involved, whether they are supplying or in some sense responsible for the grain (the latter indicated by the Sumerian word *gir₃*), the places from which the grain came.

Example: ASJ 09 233 03

obverse

1. 1(barig) sze gibil gur
2. e2-kikken-gibil-ta
3. 3(gesz2) sze gur
4. ka i7-da-ta
5. sze-bi bala-a

reverse

1. kiszib3 bi2-du11-ga
2. ARAD2 szu ba-ti
3. giri3 lugal-nig2-lagar-e
4. iti pa4-u2-e mu en-unu6-gal {d}inanna ba-hun

- | | |
|------|---|
| 1 | 1 barig (10 sila) new barley |
| 2 | from the new grinding house |
| 3 | 180 gur (54000 sila) barley |
| 4 | from the mouth of the river |
| 5 | its barley of bala |
| r. 6 | seal of Biduga |
| 7 | Arad received it |
| 8 | The responsible official was Lugal-nig-lagar-e |
| 9 | month 11 of the year Enunugal was installed as the en-priest of Inanna (AS05) |

Subtype 2c

n-grain, PURPOSE, GURU7-še₃, PN-ta, ARAD₂ šu ba-ti, DATE

These texts contain most of the same elements but add the extra piece of information that the grain was delivered into the granary. Why this was specified is not entirely clear; it may have been a scribal peculiarity, but it may instead indicate that unlike in the other Type 2 transactions, in subtype 2c the grain was actually physically moved into the granary.

Example: MVN 03 159

obverse

1. 8(asz) 1(barig) 2(ban2) [x] sze# [gur] lugal
2. sa2-du11# [{d}pa]-bil3#-sag-ka

3. guru7 [x]-x-sze3
4. ki ur-sa6-sa6-ta
5. ARAD2 szu ba-ti

reverse

1. mu us2-sa bad3 ba-du3

- 1 8 gur, 1 barig 2 ban (2480 sila) barley (measured out with) the royal measure
- 2 regular delivery for Pa-bil-sag
- 3 into the granary
- 4 from Ur-Sasa
- 5 Arad received it
- r. 6 the year after the wall was built (SH38)

Subtype 2d

n-COMMODITY OTHER THAN GRAIN, PN-ta, ARAD₂ šu ba-ti, DATE, SEAL

Arad was not only the recipient/disburser of grain or grain products; he was also responsible for receiving reeds, sheep and goats (dead or alive), animal skins, felled trees, bitumen, and metals, including silver, and not always listed as being part of the bala redistribution. Many of these could have been used in the granary itself - for instance, Breckwoldt has suggested that grain was stored in standardised packages of 60 sila (she suggests the existence of other standardised sack sizes), and it is possible that animal hides were used for this purpose.¹³⁴ Felled trees and bitumen might have been useful in maintenance of the granary buildings, while the dead animals delivered were almost certainly eaten.

Example: MCS 8 89 BM105406

1. [x] tug2# nig2-lam2 4(disz)-kam# [us2]
2. ki#-la2-bi 4(disz) 2/3(disz) ma-na 5(disz) gin2
3. 2(disz) tug2 nig2-lam2 du
4. ki-la2-bi 2(disz) 5/6(disz) ma-na 5(disz) gin2
5. 1(disz) tug2 guz-za 4(disz)-kam us2
6. ki-la2-bi 4(disz) 2/3(disz) ma-na 5(disz) gin2
7. 5(disz) tug2 guz-za du
8. ki-la2-bi 2(u) 1/3(disz) ma-na 5(disz) gin2
9. 1(disz) tug2 sag usz-bar
10. 2(disz) tug2 usz-bar
11. ki-la2-bi 1(u) 1(disz) ma-na 5(disz) gin2

¹³⁴ Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88.

reverse

1. siki-kur-ra szu-pesz5#-a
13. 1(disz) tug2 u2 muru13
3. ki-la2-bi 3(disz) ma-na
4. 2(disz) tug2 mug muru13
5. ki-la2-bi 4(disz) 2/3(disz) ma-na 5(disz) gin2
6. tug2 ki-la2 tag-ga
7. ki szesz-saga-ta
8. ARAD2 szu ba-ti
9. ur-e11-e in-la2
21. iti e2-<iti>-6(disz)
11. mu {d}amar-{d}suen lugal-e ur-bi2-lum{ki} mu-[hul]

- 1 [1] nigram garment of lower quality
- 2 its weight is 4 2/3 mana and 5 gin
- 3 2 nigram garments
- 4 their weight 2 5/6 mana and 5 gin
- 5 1 guzza textile of lower quality
- 6 its weight is 4 2/3 mana
- 7 5 guzza textiles
- 8 their weight is 20 1/3 mana and 5 gin
- 9 1 woven textile
- 10 2 woven textiles
- 11 their weight 11 mana and 5 gin
- r. 1 thick mountain wool
- 2 1 u2-muru13
- 3 its weight is 3 mana
- 4 2 mug garments
- 5 its weight 4 2/3 mana and 5 gin
- 6 the cloth weight is confirmed
- 7 from Šeš-sig
- 8 Arad received it
- 9 Ur-E₁₁-e weighed it out
- 10 Month 8
- 11 The year that Amar-Suen the king destroyed Urbilum (AS03)

Subtype 2e

(n-grain, INSTITUTION) x n₂, šu-nigin n₃-grain, PURPOSE, PN-ta, ARAD₂ šu ba-ti,
DATE

This type consists of a very specific set of tablets detailing grain transactions for the temples. There is only a handful of texts of this sort, covering a period

between Šulgi 33 and 41, listing quantities of grain destined for rations to temple workers.

Example: Ontario 2 302

1. 5(asz) 4(barig) gur sze-ba geme2 dumu iti 1(u) 2(disz)-kam
2. {d}nin-sun2
3. 1(u) 5(asz) 2(barig) 6(disz) sila3 gur sa2-du11
4. 8(asz) 2(barig) 3(ban2) gur sze-ba geme2 dumu iti 1(u) 2(disz)-kam
5. {d}nin-eb-gal
6. 1(u) 1(barig) 1(ban2) 7(disz) sila3 sa2-du11 iti 1(u) 2(disz)-sze3
7. {d}nansze umma{ki}
8. 1(u) gur sa2-du11 iti 1(u) 2(disz)-kam
9. 1(u) 3(barig)? sze-ba geme2 dumu iti 1(u) 2(disz)-sze3
10. {d}nin-e11-e
11. 5(asz) 5(ban2) 1(disz) 1/2(disz) sila3 gur sa2-du11
12. 7(asz) 2(barig) gur sa2-du11 geme2 dumu iti 1(u) 2(disz)-sze3
13. {d}en-ki u3 {d}USZ-ka-limmu2
14. 1(u) 2(asz) 4(barig) [...] gur sa2-du11
15. 1(asz) gur sze-ba geme2 dumu iti 1(u) 2(disz)-kam
16. {d}nun-gal
17. 3(u) 2(asz) 7(disz) sila3 gur#
18. 3(asz) 3(barig) gur sze-ba geme2 dumu iti 1(u) 2(disz)-kam
19. {d}nin-da lagasz{ki}
20. 7(asz) 1(barig) gur ninda nig2-gal2-la bara2 gesz{ki}
21. ugu2 ur-zu-ka ba-a-gar

reverse

1. szunigin 2(gesz2) 2(u) 3(asz) 8(disz) sila3 sze-ba
2. sze-ba sze ninda nig2-gal2-la
3. ki ur-{d}szara2 sza13-dub-ba-ta
4. ARAD2 ka-guru7-ke4 szu ba-ti
5. mu an-sza-an{ki} ba-hul

- | | |
|----|---|
| 1 | 5.4.0 gur barley rations for women & children for 12 months |
| 2 | Ninsun |
| 3 | 15.2.0 6 sila regular delivery |
| 4 | 8.2.3 barley rations for women & children for 12 months |
| 5 | Nin-ib-gal |
| 6 | 10.1.1 7 sila regular delivery for 12 months |
| 7 | Nanše of Umma |
| 8 | 10 gur regular delivery for 12 months |
| 9 | 10.3.0 barley rations for women & children |
| 10 | Nin-E ₁₁ -e |
| 11 | 9.0.5 1 ½ sila regular delivery |
| 12 | 7.2.0 gur regular delivery for women & children for 12 months |
| 13 | Enki & Uškalimmu |

- 14 21.4.[1 6 ½ sila] regular delivery
- 15 1.1.0 gur of barley rations for women & children for 12 months
- 16 Nungal
- 17 32.0.0 7 sila [regular delivery]
- 18 3.3.0 gur barley rations for women & children for 12 months
- 19 Nin-Da Lagaš
- 20 7.1.0 gur bread [things, possessions] Girgiš
- 21 it was placed on the account of Ur-zu
- 22 Total: 143.0.0 8 sila barley rations
- 23 Barley rations are barley, bread, possessions
- 24 From Ur-Šara the chief accountant
- 25 Arad the granary keeper received it
- 26 The year Anšan was destroyed (SH34)

4.4 – Type 3

Texts categorised Type 3 all contain some of the terminology of taxation of Ur III Mesopotamia. Given how fraught the discussion of taxation of any time period can become, the subject will not be revisited to any great extent in this thesis, but I shall give brief descriptions of the “taxation-terminology” texts below.

Subtype 3a:

n-grain, PURPOSE, ARAD₂-ta, PN šu ba-ti, ša bala, DATE

The bala was a redistributive process by which grain, animals and other produce were moved about the Ur III state. Relevant treatments of the bala include those by Sharlach and Steinkeller, which were cited in Chapter 1.¹³⁵ In this type, the granary keeper is disbursing grain products as part of the bala.

Example: SAT 2 0027

obverse

1. [...] sze gur lugal
2. ki ARAD₂-ta
3. kun-ur₃
4. szu ba-ti

reverse

1. sza₃ bala-a
2. iti {d}li₉-si₄
3. mu dumu-munus lugal

¹³⁵ Sharlach, *Provincial taxation and the Ur III state*; Steinkeller, *The administrative and economic organization of the Ur III state: The core and the periphery*, 19-41.

- 1 [...] barley, (measured out with) the royal measure
- 2 from Arad
- 3 Kun-ur
- 4 received it
- r. 5 within the bala/part of the bala
- 6 month 9
- 7 The year of the king's daughter (SH 30)

Subtype 3b

n-COMMODITY, PURPOSE, PN-ta, ARAD₂ šu ba-ti, ša bala, DATE

These texts are the reverse of subtype 3a, being receipts of arrivals rather than receipts of outgoings. The main difference between these and the outgoings is that, while the outgoings for which Arad was responsible are all of grain, he received a variety of commodities as part of the bala.

Example: Princeton 1 244

obverse

1. 1(disz) {gesz}u3-suh5
2. ki szesz-a-ni-ta
3. ARAD2 szu ba-ti
4. sza3 bala-a
5. iti min-esz3
6. mu an-sza-an{ki} ba-hul

- 1 1 conifer (pine or fir tree)
- 2 from Šeš-ani
- 3 Arad received it
- 4 Within the bala/as part of the bala
- 5 month 7
- 6 the year Anšan was destroyed (SH34)

Seal: Arad-mu, scribe, son of Ur-Nigar the livestock administrator

Subtype 3c:

n-grain, PURPOSE, PN/LOCATION/INSTITUTION-ta, mu-kux(DU), ARAD₂ šu ba-ti, DATE

The mu-kux(DU) was a type of compulsory transaction, discussed by Gomi.¹³⁶

Example: Ontario 2 088

obverse

1. 4(asz) sze gur lugal

¹³⁶ Tohru Gomi, "Über MU. TÛ. LUGAL: 'Eingebrachtes für den König' in den neusumerischen Viehverwaltungsurkunden aus Drehim," *Orient* 11 (1975): 1-14.

2. sze gu4 1(gesz2) 2(disz) szid
3. a-sza3 {d}szara2-ta
4. mu-kux(DU)
5. ki lugal-e2-mah-e-ta
6. ARAD2 szu ba-ti

reverse

1. mu {d}nanna kar-zi-da a-<ra2> 2(disz)-kam
2. e2-a-na ba-an-ku4?

- 1 4 gur barley, (measured according to) the royal measure
- 2 barley for oxen
- 3 from the "Field of Šara"
- 4 part of the mu-kux(DU) payment
- 5 from Lugal-E-Mah
- 6 Arad received it
- 7 Year that Nanna of Karzida was for the second time brought into his temple (SH 36)

4.5 – Type 4

n-workers, n-days, PURPOSE, ugula/gir₃ ARAD₂, DATE, SEAL

Texts of this type show Arad in charge of groups of workers, both male and female, performing various tasks which are mostly associated with grain or the granary. Types of tasks include disbursing grain, towing boats loaded with grain along canals and guarding the granary or the grain heaps in the fields. The existence of such texts could indicate that the granary took control of the grain even while it was a long way from Umma.

Example: AnOr 07 272

obverse

1. 8(disz) gurusz
2. u4 2(disz)-sze3
3. a-sza3 {d}szara2-ta
4. gig ziz2 zi-ga
5. giri3 ARAD2 ka-guru7

reverse

1. iti x- [...]
2. mu us2-sa a-ra2 3(disz)-kam si-mu-ru-um ba-hul

seal 1

1. ARAD2-[mu]
2. dub-[sar]
3. dumu ur-nigar[{gar}]

- 1 8 male workers
- 2 for two days (= 16 workdays)
- 3-4 levying wheat and emmer wheat from the field of Šara
- 5 the responsible official was Arad
- r. 6 month 4 (or 6)
- 7-8 year after Simurru was destroyed for the third time (SH 33)

Seal: Arad-mu, scribe, son of Ur-Nigar

4.6 – Summary

I have defined four main types of text in the corpus that I am investigating. Of these, Types 1 and 3 are disbursement documents, Type 2 are receipt documents, and Type 4 are texts concerning the administration of work teams. The sub types of Type 1 differ principally in the quantity of information they contain, with Subtype 1b containing more information than Subtype 1a. The subtypes of Type 2 differ in both the quantity and the kind of information contained within them. Subtypes 2b and 2c contain more information than Subtype 2a, while Subtype 2d describes receipts of commodities that were not cereals. Subtype 2e comprises a very distinctive set of transactions involving the temples of the Umma province, which are quite unlike any other texts from this collection and are to be examined separately in this thesis. The subtypes of Type 3 differ only in the kind of taxation described in the texts. There are no subtypes of Type 4.

In general, Type 3 is of limited significance in this text corpus, as there is relatively little reference to cereals as a product useful in the various forms of taxation and redistribution of the Ur III period. By contrast, Type 1 is the most numerous attested type in the Arad texts and is therefore of great significance in terms of the provision of information and also applicability to my method. Also relatively numerous were Type 4, which are also very useful for quantitative analysis purposes. There are numerically rather few of Type 2 in this body of texts, but the nature of their information renders them still of significance to this thesis.

Arad does appear in other transaction texts in other guises. It could be speculated that some of these show him acting as a private individual rather

than as the keeper of the granary, but such texts are difficult to interpret satisfactorily and, further, it is not always possible to determine whether the Arad mentioned in such texts is the granary keeper or another man of the same name. Of the other common types of text in Ur III text corpuses, the Arad texts are conspicuously lacking in nig2-kaš texts (running accounts), and while there are some, they are always for other organisations; there is none for the guru7 itself. It would have been of great usefulness to see a running account for this body of texts; it would have simplified the process of determining the extent and nature of its administrative powers. The method detailed in Chapter 3, however, has proven useful in analysing the texts of types 1, 2 and 4 in some detail, and it is safe to say that the texts classified above are the most important out of those that were available for a discussion of the written evidence for grain storage practices.

In summary, while the purpose of a typology is usually to create a hierarchy of whatever is being classified, this typology is far more straightforward on account of the nature of what is being classified – namely, short administrative texts which contain mainly transactional data. There may be other ways in which to classify texts of these kinds but on considered reflection this seemed the most appropriate approach to this particular text corpus, considering the method I have adopted for their analysis.

Chapter 5 – Transactions from the guru₇

5.1 – Date range of the Arad texts

The date range of the texts considered in this thesis is Šulgi 27 to Šu-Sin 4. It is known that Arad's tenure as granary keeper did not continue for the whole of this period, and therefore later references are almost certainly to his son, Šara-izu, although he is seldom named specifically in the texts. The table below shows the distribution of texts between the reigns of the three kings of this time period.

Table 3 – No. of texts associated with Arad or the guru₇ by reign

Reign	No. of texts
Šulgi	663
Amar-Suen	441
Šu-Sin	109

It is not surprising that the reign of Šulgi resulted in more texts than those of the other kings, given the number of years he was in power, but the quantity from the reign of Amar-Suen, a mere nine years, does not lag far behind, suggesting an increase (or perhaps merely a change) in activity within the guru₇ organisation over the course of the Ur III period. The chart below gives the distribution of the texts by year, which will clarify the reason for this large quantity of texts.

Fig. 3: Percentage of texts per year from the Arad corpus

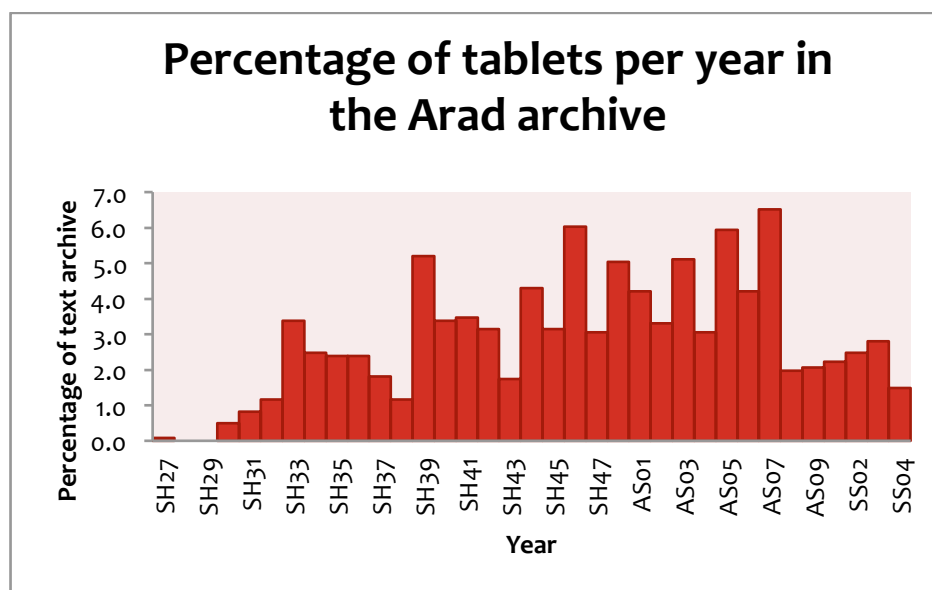
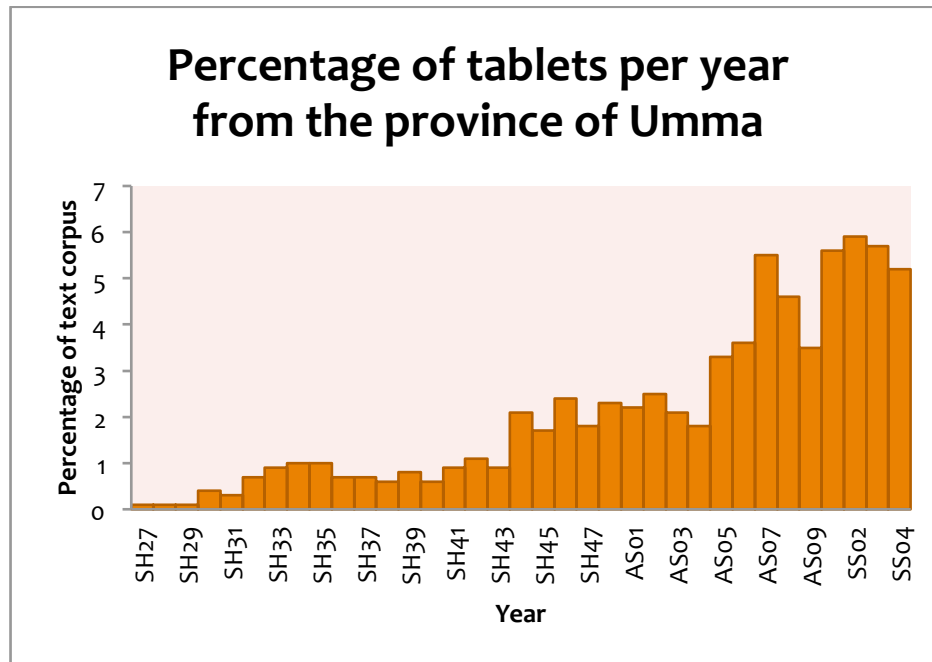


Fig. 4: Percentage of texts per year in the entire Umma text corpus



The peak comes in the year Amar-Suen 7, which matches a general peak in text numbers in that year at Umma (according to BDTNS data – see the two charts above). The texts from the reign of Šulgi, however, do not conform to the pattern of texts from Umma in general. The years SH39 and SH46 are particular peaks; there is no particular pattern to texts from SH39, while in SH46 there is a concentration of fodder texts, particularly involving the e_2 -HAR, though not a suspiciously significant one. The fall away in texts into the latter stages of Amar-Suen’s reign and the beginning of Šu-Sin’s occur at the same time as the assumption of ka-guru₇ duties by Šara-izu.

While it may be a coincidence that, when Šara-izu took over the ka-guru₇ duties, the number of texts being produced by the guru₇ decreased, this decrease represents part of a pattern of other alterations in the written documentation coming from guru₇ officials which I have observed as occurring at roughly the same time – that is, during the transition between Arad’s tenure and that of Šara-izu. These changes (which I refer to in this thesis as ‘changes in guru₇ accounting practices’) and their implications shall be discussed in more detail in Chapter 7.

5.2 – Commodities in the Arad texts

Table 4 – Types of commodity in the Arad texts

Commodity	Frequency of occurrence	Percentage of total texts
cereals	864	76.3
worker texts	152	13.4
animals	53	4.7
metals	18	1.6
reeds	14	1.2
other	32	2.8

It is no surprise that the commodities occurring most frequently in connection with the granary are barley and other grains, with 76.3% of the total texts consisting of grain transactions. Whilst not a commodity in the same way as grains, animals and other products, texts concerning workers labouring on behalf of the granary or on behalf of Arad were the next most frequently occurring kind of text, comprising 13.4% of the total texts.

More unusual are the remainder, which concern animals, reeds, metals and other products, and which altogether comprise 10.3% of the total texts. There are too few texts for it to be possible to analyse Arad's role in the transactions concerning reeds and metals with any confidence, while those described as "other" are far too infrequently attested to be useful in a quantitative study. The three biggest categories of texts, those concerning cereals, workers and animals, are by contrast ideal for the methodology described in Chapter 3, and they shall be the principal focus of this chapter. I begin with the largest category of all: cereals.

5.3 – The cereal transactions

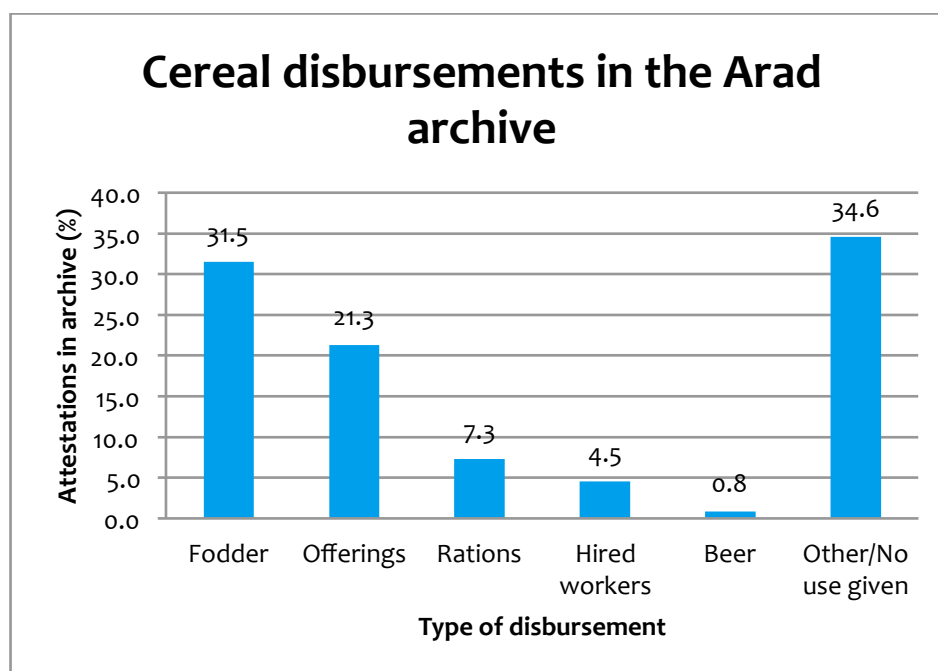
There are 864 texts detailing cereal transactions in the Arad texts, an unsurprising reflection of the principal reason for the existence of the *guru*₇, the storage and handling of barley and, to a lesser extent, other cereal products. This section sets out the most significant and frequently attested forms of disbursement of barley, and then discusses the four principal forms of transaction out of the *guru*₇ in further detail.

Below are a table and chart detailing the various types of cereal disbursement in the *guru*₇ texts.

Table 5 – Cereal disbursements in the Arad texts

Cereal disbursements	Frequency of attestation	Percentage of total
Fodder	272	31.5
Regular deliveries to temples	184	21.3
Rations	63	7.3
Hired workers	39	4.5
Beer	7	0.8
Other/No use given	299	34.6
Total	864	100

Fig. 5: Cereal disbursements in the Arad texts



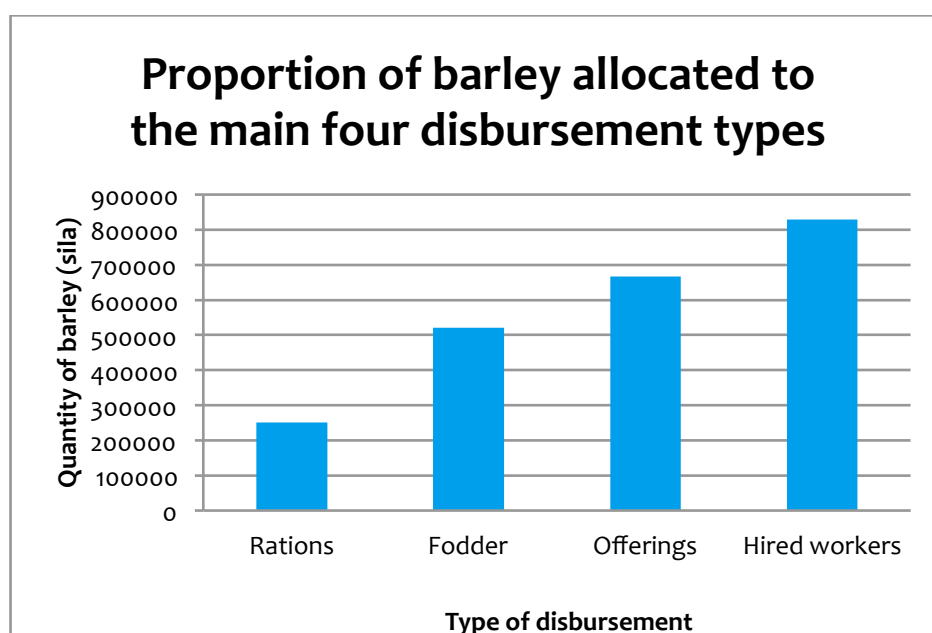
The four most common and significant types of disbursement are those for fodder, regular deliveries to temples, rations and hired workers. Those under the bracket of “other” are diverse disbursements whose purpose is not always clear, but as they either do not recur, or recur in very small numbers, they are not suitable for quantitative analysis.

5.3.1 – The four main types of cereal transaction

Table 6 – Total quantity of barley in the four main types of cereal transactions

Cereal disbursements	Total grain in sila	Percentage of total
Rations	250370	10.5
Fodder	519932	21.9
Regular deliveries	665827	28.0
Hired workers	828662	39.6
Total	2376955	100.0

Fig. 6: Total quantity of barley in the four main cereal transactions



When examined in terms of the total quantity of barley rather than the total number of attestations, the pattern of the previous graph is almost completely reversed. While rations are the second least frequently occurring type of disbursement in terms of text numbers and have the lowest quantity of barley disbursed, the pattern of the barley quantities devoted to the other three types of disbursement is the opposite of the quantity of texts in the collection. 519932 sila of barley across 272 texts was allocated to fodder across the Arad text corpus, while 665827 sila of barley was received in regular deliveries over 184 texts, which demonstrates that fodder was paid out in frequent small amounts from the guru₇, while regular deliveries were less frequently paid but

in larger quantities. Most striking is the quantity of barley devoted to the payment of hired labourers, $a_2 lu_2-hun_2-ga$. These hired labourers were unusual in the Ur III period, becoming more common in the Old Babylonian period, but they were remunerated above the usual payment level for $guru_š$ and other, more common kinds of Ur III labourer.¹³⁷ The amount of barley paid out to them in the texts of the Arad corpus would seem, at first glance, to agree with this, but this will be discussed in further detail later in the chapter.

5.4 – The fodder texts

Fodder texts account for 31.5% of the total texts concerning barley, and for 519932 sila of barley disbursed by the $guru_7$, 10.7% of the total barley disbursed. There are 272 attestations of this type of text in the Arad text corpus and they concern four distinct types of animal: equids, cattle, sheep, and pigs. The animal fodder texts are all of type 1b from the granary text typology. Below I will discuss the texts – their distribution, the quantities of grain going out for the purpose of feeding livestock, and the uses to which the animals listed in the texts might have been put for them to require extra fodder in the form of cereals – before considering these texts in the context of the people and institutions involved in the transactions, and what the various outgoings from the $guru_7$ can tell us about the institution as a whole. Fodder delivery texts can be identified by the phrase $ša_3-gal$, “fodder”, as the intended use of the grain. Fodder was supplied, as already mentioned, to four types of animal: oxen/cows (gu_4 or $gu_4 niga$), sheep ($udu-niga$), equids ($anše$ or $anše kunga_2$), and fattened pigs ($šah-niga$).

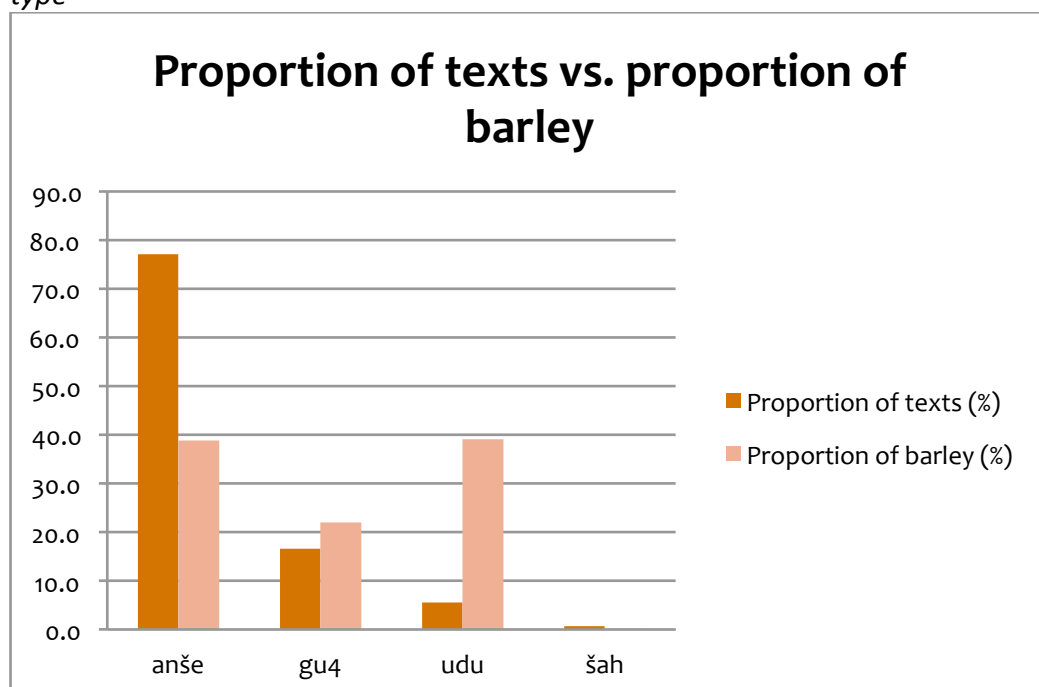
Table 7 – The number of attestations of the different types of animal

Type of animal	No. of attestations	Percentage share
equids	204	75
cattle	42	15.4
sheep	15	5.5
pigs	2	0.7
other	9	3.3
Total	272	100

¹³⁷ Waetzoldt, *Compensation of craft workers and officials in the Ur III period*, 12.

Of the barley fodder disbursed from the *guru*₇, the most common animal recipient were donkeys and mules, whose share comprised 75% of the total fodder texts. The remaining 25% of fodder texts detail fodder provided for oxen, usually specially barley-fed oxen (*gu*₄ *niga*), to fattened sheep (*udu niga*), both of which were most likely used for sacrifices, and to fattened pigs and for other purposes. Arad (or his successor, in some of the later texts) was responsible for providing this barley, which made up 31% of outgoings from the *guru*₇. The uses to which this substantial proportion of the *guru*₇ output was put will be discussed in greater detail later in this thesis.

Fig. 7 – Proportion of total texts vs. proportion of total barley for each animal type



As is quite clear from the above graph, while the number of texts referring to fodder for equids far exceeds that of those referring to cattle, sheep and pigs, the actual proportion of barley going to equids is roughly equal with the quantity going to barley-fed sheep, and lower than the quantity going to cultic animals in total. The distribution of these fodder disbursements will be examined in the next section of this chapter, but at first sight it seems that, despite the high volume of barley going out to the cultic animals, the total number of disbursements does not suggest a regular year-round delivery

system to the cultic animal fatteners from the guru₇. Meanwhile, donkeys and mules were work animals, used on all agricultural land, and would be more likely candidates for a grain-based diet all year round but especially at peak agricultural times, to keep their calorific intake high when their work level was intensive – and the number of disbursements suggests that this may indeed have been the case.

Fodder texts most often take the following format:

n-še gur, ša₃-gal ANIMAL, PN/INSTITUTION/LOCATION-ta, ki-ARAD₂-ta, PN₂ šu ba-ti, DATE

Example text: Ontario 2 064

SH34, month 10

obverse

1. 2(asz) sze gur lugal
2. sza₃-gal {ansze}kunga₂
3. ki ARAD₂-ta
4. ur-dingir-ra szusz₃
5. szu ba-ti

reverse

1. iti ezem-{d}szul-gi
2. mu an-sza-an{ki} ba-hul

- | | |
|------|------------------------------------|
| 1 | 2 gur (by the royal measure) |
| 2 | fodder for mules |
| 3 | from Arad |
| 4 | Ur-Dingira the animal fattener |
| 5 | received it |
| r. 1 | the month of the festival of Šulgi |
| 2 | the year Anšan was destroyed |

There are certain recurring receiving officials in these texts, with certain job titles appearing regularly in the lists, as noted by *Stępień* in his large-scale study of animal husbandry in Ur III Umma. This study will borrow from *Stępień*'s, both to avoid too much replication and as a useful source to compare and contrast findings and conclusions.¹³⁸

¹³⁸ Marek *Stępień*, *Animal husbandry in the ancient Near East: A prosopographic study of third-millennium Umma*, Capital Decisions Limited, 1996)

The animals recorded in the fodder texts are sometimes listed by species alone (donkey, ox etc.), and are sometimes given specific descriptors, the principal of which are detailed below.

Table 8 – The variety of animals listed in the fodder texts

Category	Specific descriptions	Translation	Number of attestations
Equids	anše	donkey	39
	anše kunga ₂	mule	133
	anše zi-gu ₅ -um	‘messenger’ donkey	14
	anše kunga ₂ zi-gu ₅ -um	‘messenger’ mule	8
	anše KI.AN ^{ki}	donkeys of the town of KI.AN	4
	anše kunga ₂ KI.AN ^{ki}	mules of the town of KI.AN	6
	anše amar amar	donkey foals	2
	anše kunga ₂ amar amar	mule foals	3
Cattle	gu ₄	oxen	5
	gu ₄ -niga	fattened oxen	36
	amar	calves	4
Sheep	udu-niga	fattened sheep	15
Pigs	šah-niga	fattened pigs	2

Equids are by far the most commonly occurring animal type in the fodder texts, and mules (anše kunga₂) vastly outnumber donkeys (anše), at a total of 150 attestations of mules to 59 attestations of donkeys. Both mules and donkeys are given more specific designations, the principal among which are the designation of zi-gu₅-um¹³⁹ and KI.AN^{ki}, though there are also mules designated as belonging to the ensi₂, or to the god Šara. There are also instances of both donkey and mule foals, anše amar or anše kunga₂ amar, but these are very scantily attested in the fodder texts.

There are 45 attestations of cattle in the fodder texts. These cattle are all gu₄ (oxen); there is no mention of cows (ab₂), though there are four attestations of amar (calves). The oxen attested in the texts are predominantly identified as gu₄-niga (barley-fed oxen), which indicates that they were reserved either for

¹³⁹ For the translation of this as “messenger”, see fn. 144

cultic purposes, most likely as sacrificial animals, or else for agricultural purposes; in times of high work load, such as ploughing, oxen would not have been able to graze sufficiently for their energy needs and would likely have been supplied with barley. Despite this fact, however, there is actually a complete absence of reference in the *guru*₇ fodder texts to *gu*₄ *apin* (plough oxen), though it seems likely that some of the calves mentioned were destined for such work.

Like the oxen, the sheep attested in the texts were also reserved for cultic purposes and consumption, being designated as *udu-niga* (barley-fed sheep), with some sheep described as *udu-niga sig*₅ (best quality barley-fed sheep). Both of these would have been sacrificial animals in the same manner as the oxen mentioned above, though the *udu-niga sig*₅ were of higher quality. There are 15 attestations of sheep in the fodder texts.

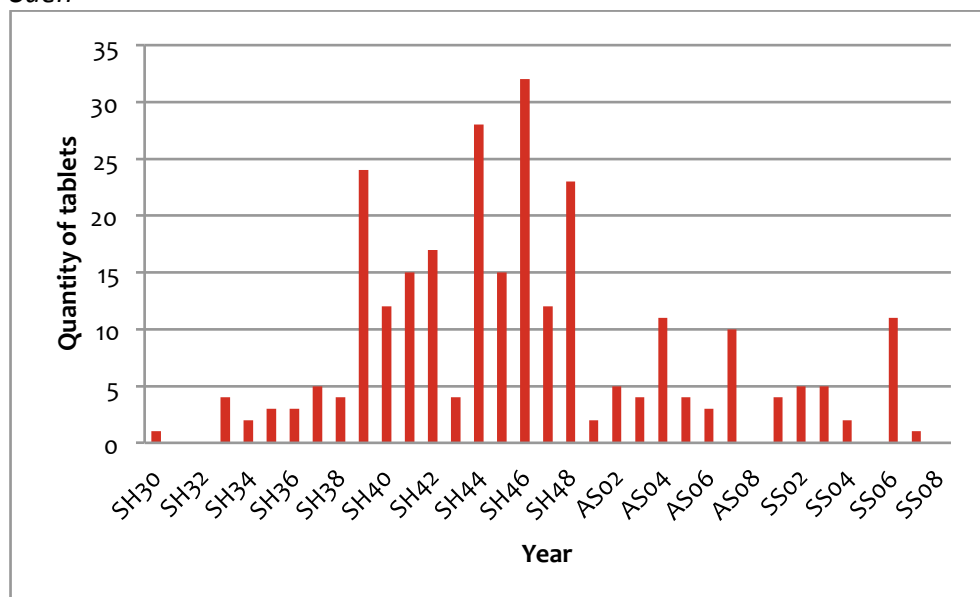
The two attestations of pigs in the fodder texts also describe *šah-niga* (barley-fed pigs), which were presumably likewise destined for a sacrificial purpose. The attestations of pigs being so scant, it is difficult to say very much more about them in this discussion of the fodder texts.¹⁴⁰

¹⁴⁰ Jacob Dahl, "Early swine herding," in *De la domestication au tabou: Le cas des suidés dans le Proche-Orient ancien*, eds. Brigitte Lion and Cécile Michel. De Boccard, 2006), 31-38. discusses swine herding in more detail.

5.4.1 – The distribution of fodder texts across the Ur III period

The chart below shows the distribution of texts across the reigns of Šulgi, Amar-Suen and Šu-Sin.

Fig. 8 – The distribution of fodder texts across the reigns of Šulgi and Amar-Suen



The later years of Šulgi's reign show a marked increase in the number of texts concerning fodder transactions from the guru₇. This increase towards the end of his reign fits in with the generally observed increase in texts towards the very end of his 48 year reign throughout the Ur III text corpus.

The number of fodder texts decreases substantially during the reigns of Amar-Suen and Šu-Sin, which goes against the general trend of increasing quantities of texts in general from Umma during this period. This is also the point of transition of the role of ka-guru₇ from Arad to his son Šara-izu, and therefore constitutes another of those changes in guru₇ accounting practices during that particular transitional period, as previously mentioned in section 5.1.

5.4.2 – The distribution of barley across the different months of the year

The total quantity of grain disbursed per month as animal fodder is listed in the table below.

Table 9 – Quantity of grain in fodder deliveries per month

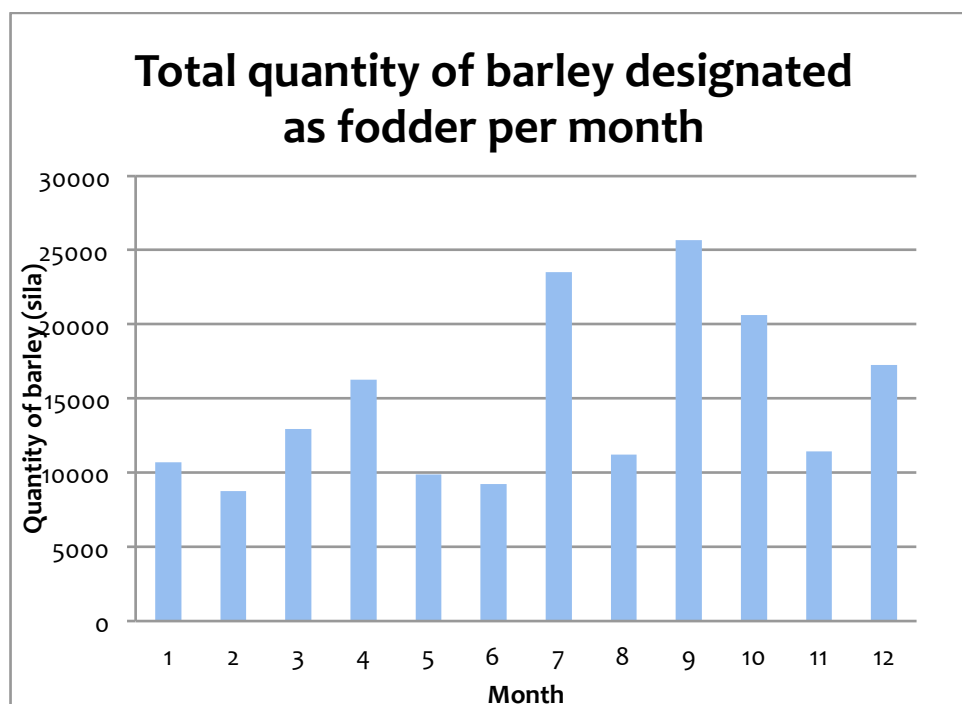
Month	Total quantity of barley (sila)
1	10713
2	8760
3	12930
4	16270
5	9865.7
6	9240
7	23510
8	11214.5
9	25650
10	20602
11	11441
12	64047 (17247) ¹⁴¹

While the figures quoted in table above are as accurate as possible, it is important to keep in mind the intercalary month, that peculiar feature of the Sumerian year described in the Glossary of useful terms. Given that the Sumerian months were based on the lunar cycle of roughly 354 days while the agricultural year was aligned with the solar cycle of 365 days, the Sumerian lunar calendar slipped out of alignment with the solar year by 11 days each year, meaning that every two or three years, the 13th month would be added to the calendar, in order to rebalance the Sumerian calendar with the agricultural year. Despite this rebalancing process, perfect correlation between the calendar and the agricultural year is impossible, and thus ploughing, sowing, harvesting and so forth can end up taking place in different months

¹⁴¹ The significant increase in month 12 (64047 sila) is due almost entirely to one tablet, SAT 2 0072, which lists a large quantity of grain, 46800 sila, which was disbursed for mule fodder in the course of a full year. Among the fodder texts there are actually very few of the tablets that would ordinarily be found dated to the twelfth month, comprising end of year accounts which sum up all the transactions with one particular individual or institution over the course of the previous year. This study of fodder texts has revealed only two: SAT 2 0072 is one example, dating to the twelfth month of SH33, and the other is MVN 13 819, which dates to SH43 and has no month recorded. These two texts are of particular interest, and are so distinct from the other fodder texts that I will deal with them separately later in this chapter - and given that they are distorting the general picture of monthly grain transactions, I am excluding these texts from the analyses of monthly fodder supply that follows immediately on from this (the number in brackets in month 12 in Table 1.2 shows the total remaining when SAT 2 0072 is excluded).

from usual. It is also not possible to determine precisely how regularly and how far the months slipped out of alignment, as each city would introduce an intercalary month according to its own scheme. Given these facts, and given also the fact that there is no one individual year in which there is an animal fodder text available for each month, the composite year which I have created for this chapter should be treated with appropriate caution.

Fig. 9 – The total grain disbursed each month for animal fodder



The chart above shows a small peak during months 3-4 and another in month 12, with two higher peaks in month 7 and again at around months 9-10. The peak during month 7 is caused almost entirely by animals which were destined for the cult, and this will be examined in more detail later in the chapter. The peaks in Months 3-4 and 9-10 show a correlation with points of the agricultural year in which draught animals are likely to have been employed, and this will be considered in more detail when the fodder disbursements for equids are examined in isolation. Month 12's peak could perhaps also be explained by the agricultural year, but is more likely to have been affected by the general increase in texts around month 12, due to the scribal practice of writing up accounts in the last month of the year which has led to a universal spike in the number of texts dated to month 12.

The number of texts concerning equids are substantial enough for a separate analysis, which will follow below – and while the numbers of tablets referring to cattle and sheep are not sufficient to make a truly reliable estimate of fodder supplies by month, they are still worth examining in the light of knowledge on cultic festivals in Umma. This will be investigated later in the chapter.

5.4.4 – Fodder for the equids

As described above, there are various different sorts of equid. The first variety is the plain anše, which is fairly certainly identified with the Latin *equus asinus*, or the domestic donkey (sometimes, though not in these texts, divided into male jacks, and female jennets). The anše is recorded in 59 texts. Far more commonly occurring are the anše kunga₂, identified by Postgate as a variety of onager-donkey crossbreed (though Maekawa differs)¹⁴²; in Sumerian, as in English, there was a distinction made between hinnies (stallion/jennet) and mules (jack/mare). The anše kunga₂ appears in 150 texts. The total quantity of barley disbursed to equids was 195808 sila, and the date range of these texts is SH30-SS07.

There is also the separate category of anše zi-gu₅-um, possibly to be translated as “messenger donkeys”¹⁴³. There were 14 messenger donkeys mentioned in the Arad texts; there were also anše-kunga₂ zi-gu₅-um, messenger mules, 8 of which were mentioned in the Arad texts. Interestingly, this is the only group of equids in which the donkey variety is more common than the mule. While

¹⁴² Wolfgang Heimpel, "Plow animal inspection records from Ur III Girsu and Umma," *Bulletin on Sumerian Agriculture* 8, no. 71 (1995): 171.

¹⁴³ This translation is currently rather tentative and needs confirmation through further research. The Sumerian phrase is anše zi-gu₅-um, the latter word of which does not appear in any of the glossaries at my disposal. However, the ePSD lists zi-kum as a “messenger hostel”, which suggests some connection between the word zi-gu₅-um/zi-kum and the translation “messenger”. Furthermore, Heimpel suggests the existence of donkeys pulling messenger carts in his 1995 article - “The term siKKum stallion designated...a mule or donkey that was used to pull the coaches of royal messengers” (Heimpel, 1995, p. 88). Further research involving the Akkadisches Handwörterbuch and the Chicago Assyrian Dictionary to trace the origins of these terms, and a more thorough search of the CDLI archives for the context of the phrase, both of which together should hopefully lead to a more sound translation.

mules are bigger and generally swifter than donkeys, and therefore might seem more suitable as messenger animals, it is possible that donkeys were more suited in terms of resilience, as they are generally less fussy than mules with food and water.

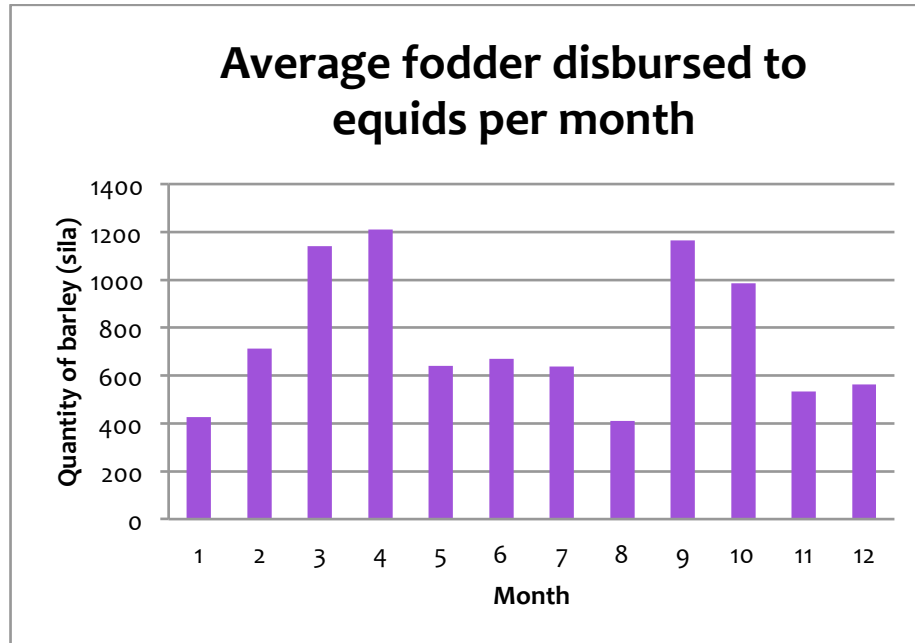
The texts concerning grain transactions give quite a clear indication of the pattern of feeding. Below is a table and accompanying graph showing monthly fodder transactions for donkeys and mules across the composite year.

Table 10 – Total and average quantities of grain supplied to equids per month

Month	Quantity of barley (sila)	Number of texts	Average quantity per month
1	5550	13	426.9
2	8550	12	712.5
3	12540	11	1140.0
4	15730	13	1210.0
5	9600	15	640.0
6	8700	13	669.2
7	8915	14	636.8
8	8215	20	410.7
9	25650	22	1165.9
10	21676	22	985.3
11	8011	15	534.1
12	58644	21	2792.6

The figure in brackets in month 12 is the total figure including the unusually high quantity which was taken from tablet SAT 2 0072 (mentioned above in fn. 142). Since it is believed to be an anomalous figure, I intend to exclude it from the following analysis and discussion.

Fig. 10 – Average barley supplied to equids per month



This chart shows a small peak at month 4, and a much more significant increase in months 9 and 10, a pattern of distribution which maps quite neatly onto the agricultural cycle.

The Mesopotamian year began in March or April, just before harvest, which generally began in Umma around month 1, *iti še-KIN-ku₅* “month of the barley cutting”. By months 3 and 4, the barley harvest was being brought into storage, and this process coincides with the first peak in fodder disbursements. I would suggest two possible reasons for this correlation; firstly, it is possible that some animals were being used as traction for the gathering in of grain, and therefore required barley as a high energy supplement to their diet. Alternatively, this increase in barley supplies at the time when grain was being brought into storage might possible be connected with a suggestion made by Breckwoldt based on her findings from Larsa, firstly that old grain and new grain were never mixed, and secondly that old grain was often fed to animals as a dietary supplement.¹⁴⁴ It is possible that a similar thing occurred in Umma; there may have been a need to empty clay silos of their old grain, and therefore a small surplus in old barley available, which may partly have been

¹⁴⁴ Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88.

used for feeding livestock. One final point is that in the summer, fodder may have been limited, making supplement feeding essential.

The second peak around months 9 to 10 is more difficult to explain. The peak indicates that barley was being given supplementary to the usual rations to equids, which in turn suggests that extra work was required of the equids at this time of year, but this was not noted as a time of high intensity agricultural labour (being the time of the growth of the barley crop, along with weeding and other maintenance tasks), unlike harvest (as described above) or ploughing (which generally involved oxen, rather than equids). Two alternative possibilities present themselves, the first of which is that this peak in barley rations might have been associated with the donkey/mule breeding cycle. Equine gestation varies according to species, with donkeys having a gestation period of between 12 and 13 months, and mares carrying mule foals having a gestation of between 11 and 12 months.¹⁴⁵ Late pregnancy and early lactation would have been a period where mares in foal would have benefitted from extra nutrition; but it is unusual for a horse to come into season in the mid-late winter, which mitigates against this suggested explanation. The second possibility is that this peak in feeding corresponded with seasonal military activity. Postgate notes that equids were particularly useful as military beasts of burden, and also that certain times of year, notably those of lower agricultural intensity (such as months 9 and 10), were more suitable for military campaigns.¹⁴⁶ It is possible that fodder in the form of energy-rich barley increased at this time in response to a need for high-calorific food for campaigning animals. Neither of these can be confirmed, but they present appealing possibilities for the increase in barley fodder supplies to the state equid herds.

It is interesting to note that Postgate's suggestion that mules (that is, the donkey-onager hybrids) were used for military purposes, leaving donkeys as

¹⁴⁵ Cynthia Attar, *The Mule Companion: A Guide to Understanding the Mule*, CCB Publishing, 2009), p. 42

¹⁴⁶ J. Nicholas Postgate, *Early Mesopotamia: Society and Economy at the Dawn of History*, New York, 1992), 92-95, p. 166 & p. 250

the main beast of burden in the agricultural context, does not correlate well with the evidence from Umma. On the contrary, the pattern of feeding of mules fits so beautifully with the agricultural cycle that it seems to contradict entirely Postgate's suggestion, at least in the context of Ur III Umma. That said, it is hard to identify patterns of military activity from the textual record that we have left to us; but in view of the data in these animal fodder texts, it seems very likely that both mules and donkeys were used in agricultural work.

5.4.5 – *The uses of equids*

In agricultural terms, donkeys and mules were most often used for draught, in place of or alongside oxen; for pulling the plough, for pulling carts used for other agricultural purposes, as pack animals, or for riding, possibly with assorted paraphernalia - at Tell Brak, donkeys have been found dating to approximately 2200 BCE with evidence of bits having been used, and bridles may well have been in existence in the south of Mesopotamia at the same time.¹⁴⁷ Evidence from South Africa suggests that donkeys and mules are considered by contemporary farming families as somewhat more tractable than oxen and therefore easier to work with, particularly in smaller fields where they are easier to manoeuvre than a team of oxen; though obviously they are less strong than draught cattle.¹⁴⁸ Stępień notes that donkeys were used as plough animals as well as for other forms of traction, and as beasts of burden.¹⁴⁹ Heimpel also suggests that donkeys were used to pull chariots for royal messengers, which ties in nicely with the idea of messenger donkeys.¹⁵⁰ Draught donkeys could also be used for military purposes, pulling chariots in much the same way as the agricultural draft animals described above. There is representational evidence for ridden equids dating from the Akkadian and Ur

¹⁴⁷ Juliet Clutton-Brock and Sophie Davies, "More Donkeys from Tell Brak," *Iraq* 55 (1993): 209-221.

¹⁴⁸ D. Taylor, J. Kneale, and A. Pearson, "The use of donkeys, horses and mules on smallholder farms in Eastern Cape Province," *The Management and Feeding of Animals for Work* (1999): 39-60.

¹⁴⁹ Stępień, *Animal husbandry in the ancient Near East: A prosopographic study of third-millennium Umma*,

¹⁵⁰ W. Heimpel, "Towards an understanding of the term SIKKUM," *Revue d'Assyriologie et d'archéologie orientale* 88, no. 1 (1994): 5-31.

III periods and for a variety of wheeled vehicles, though some of these were probably drawn by oxen and not equids.¹⁵¹ However, it is certain that equids did pull battle carts, for they are depicted as doing so on the Royal Standard of Ur. Postgate states that it was the onager-donkey crossbreed, the *anše kunga*,² that was the military beast, while the plain *anše* was used more often as a beast of burden, in both agricultural and trade work.¹⁵²

The use of equids as draught animals for pulling boats is well-documented across history – examples include the horses that pulled canal boats in the 18th and 19th centuries in Britain – but interestingly, Englund observes that there is no written evidence for animals drawing boats in the Ur III period.¹⁵³ He gives no explanation for why this should be the case, however, and though it is possible that there were not sufficient draught animals to be seconded to pulling boats, it should be noted that the fact that equids were not recorded as pulling boats does not necessarily confirm that they did not perform this task. Englund argues that there are records detailing workmen who were towing boats which contained donkeys or oxen, “presumably perfectly capable” of towing the boats themselves, but the website of The Horseboating Society, based in Britain, does note that not only crew, but also horses, need to be trained to pull boats; it is quite possible that the animals being transported on the boats were not in fact possessed of the skills needed for pulling boats.¹⁵⁴

5.4.6 – Fodder for the cultic animals

There are 60 texts in the Arad text corpus which record disbursements going to animals destined for cultic purposes; 45 of these texts refer to oxen, and 15 to fattened sheep. The date range of these texts is very similar for both kinds

¹⁵¹ Mary Aiken Littauer, Joost H. Crouwel, and JH Crouwel, *Wheeled vehicles and ridden animals in the ancient Near East*, EJ Brill Leiden, 1979)

¹⁵² Postgate, *Early Mesopotamia: Society and Economy at the Dawn of History*, 92-95.

¹⁵³ Robert K. Englund, "BU!" in *Why should someone who knows something conceal it? Cuneiform Studies in Honor of David I. Owen on His 70th Birthday*, eds. A. Kleinerman and J. Sasson. Bethesda, MD: CDLI Press, 2010), 95-114.

¹⁵⁴ The Horseboating Society can be found at <http://www.horseboating.org.uk/about.htm>; the website was accessed on 30/06/13; *ibid.*, p. 106

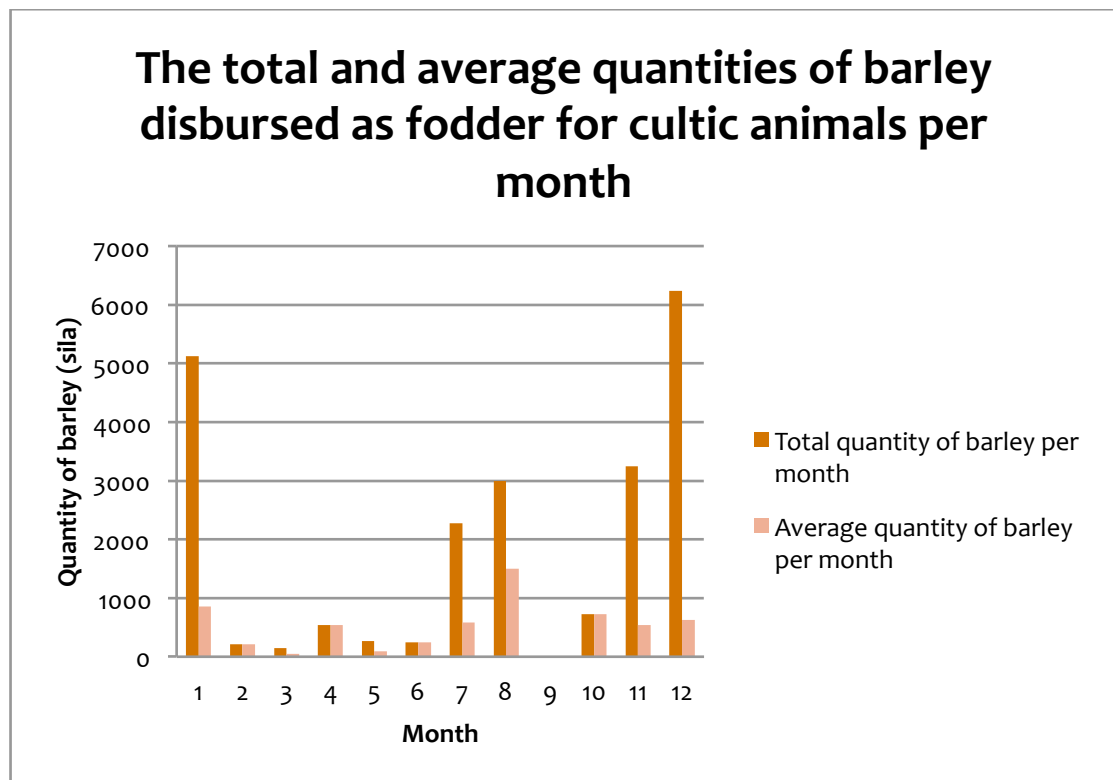
of animal; those referring to oxen date from SH40 to AS07, while those referring to sheep date from SH39-SS06.

The fodder quantities have been detailed above, but bear repeating; the total quantity of fodder barley disbursed to oxen was 110834 sila, while that disbursed to sheep amounted to 197586, a substantial quantity which exceeds that disbursed to equids across the entire period. The total quantity of barley given out from the guru, as fodder for fattening animals for the cult was 308420 sila, compared with the 195808 sila disbursed to equids.

The vast amount of barley disbursed for fattening animals is partly the result of several texts which have particularly large outgoings, in particular MVN 13 819. These large tablets are worth examining separately, but they do not affect any conclusions that can be drawn as regards the monthly disbursements, as they all occur in texts with no month given, and as such possibly represent a year's worth of fodder (though this is merely speculation as they do not specify that the fodder was iti 12-kam (fodder for 12 months) as is generally the case in such texts).

Below is a chart detailing the fodder for fattened cultic animals over the composite year as per the equids. This chart should be considered in the light of not only with the same caveats as described earlier in the chapter, but also the fact that the limited number of texts makes this data less reliable – for instance, there were no texts dating to month 9 .

Fig. 11 – The barley disbursements to cultic animals



Both the total and average disbursements of barley as fodder show a pattern as follows: a peak in the first month of the year, a smaller peak in the fourth month, a significant peak in months 7-8, and finally a general increase in months 10, 11 and 12.

There are two main considerations when analysing trends of disbursement like these. On the one hand, as these animals were destined for sacrifice in the temples of Umma, the pattern in disbursements can be viewed in terms of the cultic year – and if one does this, it is clear that the peaks in fodder disbursements reflect the significant festivals in the cultic calendar of Umma. The peak in month 1 reflects the new year festival, the smaller peak in month 4 coincides with the nisag festival, that in month 8 matches with the e_2 -iti-aš₃ festival, which was specific to Šara, and those in 10, 11 and 12 also coincide with several festivals (or else could perhaps be a product of the ordinary end-of-year increase in textual output). On the other hand, and considering the festival pattern detailed above, one has to ask what was the purpose of barley fodder for fattened cultic animals. If it was to fatten them before the slaughter, a pattern of year round regular barley deliveries makes more sense

than the peaks and troughs described in the chart, above. There is, however, an advantage in feeding sacrificial animals on rich foods like barley for a short time before they are sacrificed, raising the possibility that the barley fodder was a donation as part of the last minute preparations for sacrifice, and also the consideration that the guru₇ cannot have been the sole provider of fodder barley for the fattened cultic animals (the quantities and regularity of deliveries are not significant enough, even if one considers the fact that even the pure and sacrificial animals would not have been fed on an exclusively barley diet). It is possible that the fodder deliveries from the guru₇ were timed to increase in quantity alongside the major festivals, and that the fattened cultic animals were otherwise fed by other organisations or institutions.

5.4.7 – Personnel

Stępień has already performed a prosopographical analysis of all the personnel involved in animal husbandry, so all I will do here is note the principal personnel involved in the transactions with the guru₇.¹⁵⁵

There is a delightful consistency to receiving officials collecting fodder for animals generally, with 15 individuals attested three or more times across 272 texts. As well as these 15 officials, there are 56 texts whose receiving officials are attested only once or twice – a situation of remarkable regularity of official, then, quite unlike the situation for other kinds of grain transactions, which are far less consistent in their receiving officials.

Of these 15 regularly recurring officials, 10 have an animal or agricultural title or are dumu (son) to someone who does.

Table 11 – Titles belonging to receiving officials of fodder deliveries

Title	Translation	Attestations
kuš	livestock administrator	3
kurušda	animal fattener	1
kir ₄ -dab ₅	“nose-rope holder”	3
mu ₆ -sub ₃	shepherd	2
sipa	shepherd	1

¹⁵⁵ Stępień, *Animal husbandry in the ancient Near East: A prosopographic study of third-millennium Umma*,

Stępień has no detail as to what the titles kir₄-dab₅ and mu₆-sub₃ mean in practice, but he describes the situations of kuš (livestock administrator) and kurušda (animal fattener) clearly. The kurušda was the keeper of animals and had the duty of fattening them and distributing them to various destinations.¹⁵⁶ There were a number of kurušda officials in Umma, and as Widell has observed the position was hereditary, usually in a fratrilineal direction rather than patrilineal.¹⁵⁷

The position of kuš was a very senior administrative position, subordinate to the ensi₂ but whose official duties are hard to define clearly.¹⁵⁸ Ur-nigar^{gar}, the father of Arad, and of most of the members of the ruling family, held the position of kuš. Dahl has performed the clearest analysis of the role of the kuš, concentrating upon Ur-E₁₁-e, Arad's brother and chief livestock administrator for Umma for a considerable period.¹⁵⁹

Of the 15 repeatedly recurring officials, the distinction between those who received fodder for equids and those who received it for cultic animals is clear cut; not a single official receives fodder for both types of fodder and, furthermore, no official who receives barley for barley-fed oxen receives it likewise for barley-fed sheep, and vice versa. Stępień noted in his text that there was a close organisational tie between cowherds and donkey herders and suggests that cattle and donkeys were kept in the same herds.¹⁶⁰

Presumably, however, this did not extend to cultic cattle, who were clearly kept and fed separately from both cultic sheep and working equids.

Ur-Šara the ša₁₃-dub-ba (chief accountant) is another official who turns up in a handful of texts. Three of these concern cultic animals and give his name and patronym, while two concerning equids (though these latter probably refer to

¹⁵⁶ *ibid.*

¹⁵⁷ Widell, *Two Ur III Texts from Umma: Observations on Archival Practices and Household Management*,

¹⁵⁸ Stępień, *Animal husbandry in the ancient Near East: A prosopographic study of third-millennium Umma*,

¹⁵⁹ Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*, 180.

¹⁶⁰ Stępień, *Animal husbandry in the ancient Near East: A prosopographic study of third-millennium Umma*,

a sipa anše (donkey herder) called Ur-Šara, attested elsewhere (e.g. BIN 5 336) and not to the chief accountant). In the text concerning sheep fodder, his connection is probably through the Šara temple, as this text also mentions sa₂-du₁₁ (regular deliveries) to the Šara temple along with the barley-fed sheep.

The equids

The most commonly occurring receiving officials attested in donkey fodder texts are listed below.

Table 12 – The receiving officials of equid fodder

Name	Attestations
Ur-dingir-ra	39
Lu ₂ - ^d Nin-šubur	37
Lu ₂ -banda ₃ ^{da}	32
Igi- ^d Šara ₂ -še ₃	16
Lugal-he ₂ -gal ₂	13
Lugal-e ₂ -mah-e	12
Ur- ^u ₂ ninni ₅	8
U ₂ -li	7
Ad-da-kal-la	6
^d Šara ₂ -kam	6
Puzur ₄ -i ₃ -li ₂	4
Lu ₂ -du ₁₀ -ga	3

All of these individuals are cited by Stępień in his work on animal husbandry, and they are all well-attested in the animal fattening business. They will have been in receipt of barley on behalf of the fattening houses in which they were employed.

The cultic animals

There were many recurring receiving officials associated with the provisioning of cultic animals – as with the equids, the consistency of these officials is a contrast with the other kinds of transaction the guru₇ was involved with. That said, given that there were fewer texts concerning cultic animals overall, the recurring officials are less frequently attested than those linked with equid fodder transactions. Nigarkidu is the most frequently attested cattle man and Inim-Šara the official taking charge of the majority of sheep fodder deliveries. Both of these individuals are discussed in Stępień's study, and both are

frequently attested in the records of animal fattening within the Umma province.¹⁶¹

Table 13 – The receiving officials of cattle and sheep fodder

Name	Attestations
Cattle	
A-tu	3
Lugal-e ₂ -mah-e	2
Nigar _x ^{gar} -ki-du ₁₀	4
Ur- ^d Šara ₂	2
Ur- ^{giš} gigir	4
Irregular officials	30
Sheep	
Inim- ^d Šara ₂	9
Irregular officials	6

5.4.8 – Arad’s role and the role of the guru₇ in the fodder transactions.

Arad (and therefore the guru₇) are acting as the supplier of barley (ki Arad₂-ta) in all but two of the fodder transactions in the Arad texts. Given that fodder texts account for over 30% of all transactions out of the guru₇, it was plainly a substantial aspect of the business of the guru₇.

The two texts in which Arad was not the supplier were SAT 2 0743 and BPOA 6 0055. In these two texts he seals the documents, in the former on behalf of Lu₂-^dnam₂-nun-ka, who is described as the receiving official, and in the latter to transfer this quantity of barley to the account of Lu₂-gi-na.

The quantity of texts recording outgoings suggests that Arad was either supplying fodder to a state-owned herd of donkeys, or that the guru₇ owned its own donkeys and was supplying them itself. Stępień suggests that the guru₇ owned herds of cattle, as he refers to “records of “private” individuals who availed themselves of Nigarkidu’s services for fattening their animals, including...a storage supervisor (ka-guru₇)”.¹⁶² Although Nigarkidu is a noted cattle fattener, Stępień also suggests a link between donkey herding and cattle herding and therefore this could be taken to imply that Arad had herds of both to be fattened. Personally I consider this unlikely, and think it much more likely

¹⁶¹ *ibid.*, pp. 39, 54 & 198

¹⁶² *ibid.*, p. 198

that Arad was acting as an intermediary on behalf of the state to supply its donkey herds throughout the year.

This supposition correlates with the fact that the pattern of equid feeding definitely maps onto the agricultural year, confirming what Stępień says when he talks of the uses of equids as being predominantly agricultural. The regularity of the deliveries, their occurrence in every month and in every year, the relatively small quantities of grain being delivered (in comparison with the disbursements to cultic animal fattening), and the fact that there are peaks in barley supply at just the times when there would have been peaks in equid use, all help to suggest that Arad was the regular and probably the principal or perhaps the only supplier of the donkey herds used for agricultural purposes by the state.

The more irregular fodder supplies to the cultic animals suggests that they must have been getting supplies from elsewhere. This is presumably detailed in an archive that hasn't been discovered, however, as Stępień has noted that there was no other supplier of fodder for cattle and sheep that was quite as significant (in both quantity and frequency) as Arad – the rest were suppliers only on two or three occasions, whereas he supplied barley to the specially fattened animals regularly from SH33 to AS05.

The quantity of fodder supplied by Arad was substantial enough, and equal in total quantity to that disbursed as fodder for equids over the same time period, but the regularity is nothing like that of the equid fodder. If he was the main supplier of barley-fed oxen and sheep for cult use, they must have eaten a good deal of alternative (non-barley) fodder supplied from elsewhere, with barley added to their regular diet at festival times (as the peaks in fodder deliveries suggest). Despite the evidence given by Stępień, the cultic animals cannot have been supplied principally by barley from the guru₇.

5.4.9 – Summary

In summary, this discussion of the fodder texts suggests that the focus of the output of the guru₇, as regards fodder, was on state agriculture, with regular barley disbursements to working equids to provide high calorific nutrition at

times of peak effort and energy use, such as at sowing and at harvest. The input reduced during times of lower physical effort, and barley would never have made up the entire of an equid's diet, as this would have caused health problems such as laminitis.¹⁶³

It seems likely that support for the temples (in the case of the cultic animals) was offered at peak festival times but was less regular than the deliveries to equids. *gu*₄-*niga* and *udu-niga* would not have had a solid barley diet for the same health reasons as equids, and therefore must have received the majority of their fodder from other sources.

5.5 – *sa*₂-*du*₁₁ regular deliveries

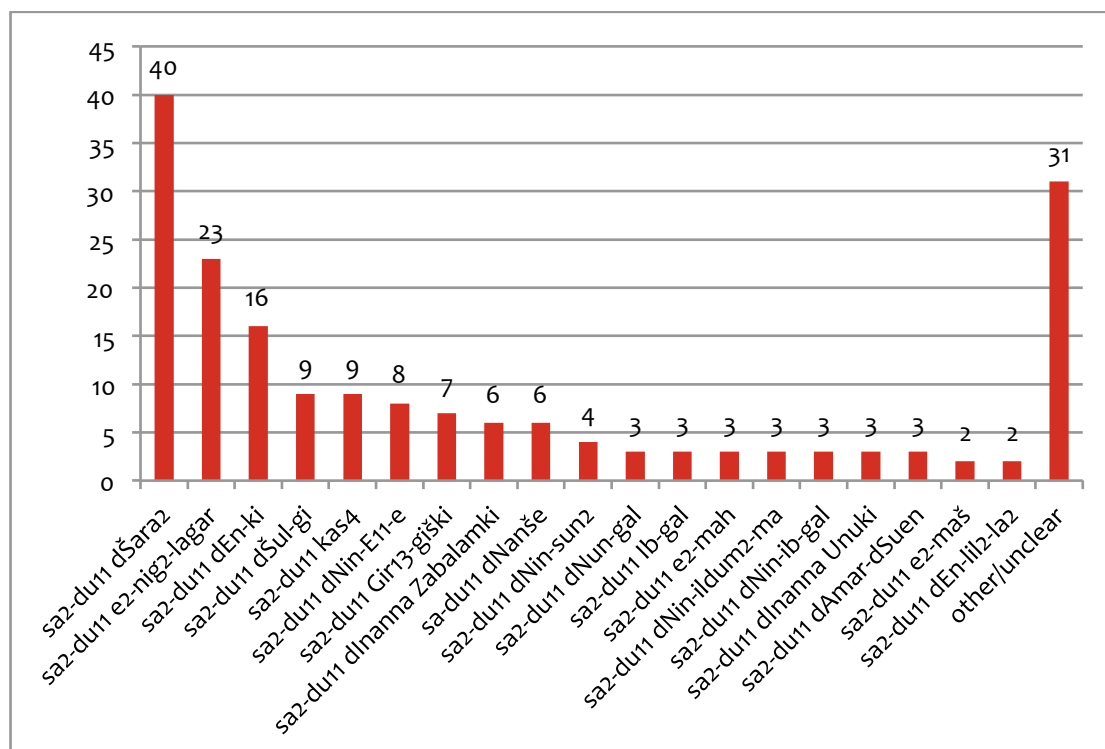
The second most frequently attested type of cereal transaction were those designated as *sa*₂-*du*₁₁ deliveries, which were frequently (though not exclusively) made to temples in the Umma province. *sa*₂-*du*₁₁ deliveries comprise 21.3% of the total texts concerning barley. The total amount of barley disbursed in regular deliveries across the Arad texts was 672685 sila, 13.7% of the total disbursements. All *sa*₂-*du*₁₁ texts accord with Type 1 from the Typology, with approximately 75% being of Type 1b.

Possible translations of *sa*₂-*du*₁₁ are “said regularly” or “done regularly”, hence the translation as “regular deliveries” as opposed to another interpretation, “regular offerings”. These deliveries were not offerings of a votive nature, or made privately, but donations of barley from a state organisation (the *guru*₇) to the principal temple(s) of the province and, therefore, must be considered as regular deliveries of offerings, which were due to the temple as part of their upkeep.

Regular deliveries went to temples, certain types of building and occasionally to individuals. Below is a chart giving details of the regular deliveries from the *guru*₇ and their destinations.

¹⁶³ Magnus Widell, "Some observations on the administration, agriculture and animals management of Tell Beydar," *Ugarit-Forschungen*, no. 35 (2003): 717-734.

Fig. 12 – Frequency of attestation of regular deliveries to temples and other households



It is no surprise that the temple to the province's patron god, Šara, was the destination for the majority of regular deliveries. The Enki temple was the next most frequently attested, and between the two is the e₂-nig₂-lagar, which I have translated as the household of the lagar priest.

There are twelve discreet temples named in the texts associated with Arad and the guru₇. The names of these temples are listed below.

Table 14 – The names and frequency of attestation of the temples in Umma

Name	Attestations
dŠara ₂	40
dEnki and dUš-ka-limmu ₂	16
dNin-E ₁₁ -e	8
dNanše	6
dInanna Zabalam ^{ki}	6
dNin-sun ₂	4
dNin-ildum ₃ -ma	3
dIb-gal	3
dNin-ib-gal	3
dNun-gal	3
dInanna Unu ^{ki}	3
dEnlil ₂	2

Šara was, of course, the city god of Umma. It seems that there was also a fairly substantial temple to Enki and his wife Uškalimmu; it is not always the case that they are both named on the texts attested above, but they are grouped together as their temples were doubtless in the same complex. There are also four different names for Inanna attested in the list (Inanna of Zabalam, Inanna of Uruk, ^dlbgal and ^dNinibgal) but as these four are distinct temples, I have grouped them separately.

The relatively low frequency of the appearance of temples in texts associated with the granary is suggestive; it appears unlikely that the temple authorities could have been storing their grain supplies in the storage facilities administered by Arad if disbursements to the temples were so infrequent. This is supported by the fact that, in the texts of disbursements to the temples, the grain was described as *sa₂-du₁₁*, “offerings”, instead of *še-ba*, “rations”.

Below are two charts detailing the total and average quantities of barley designated as *sa₂-du₁₁* per year.

*Fig. 13 – Total *sa₂-du₁₁* deliveries of barley per year in the Arad texts*

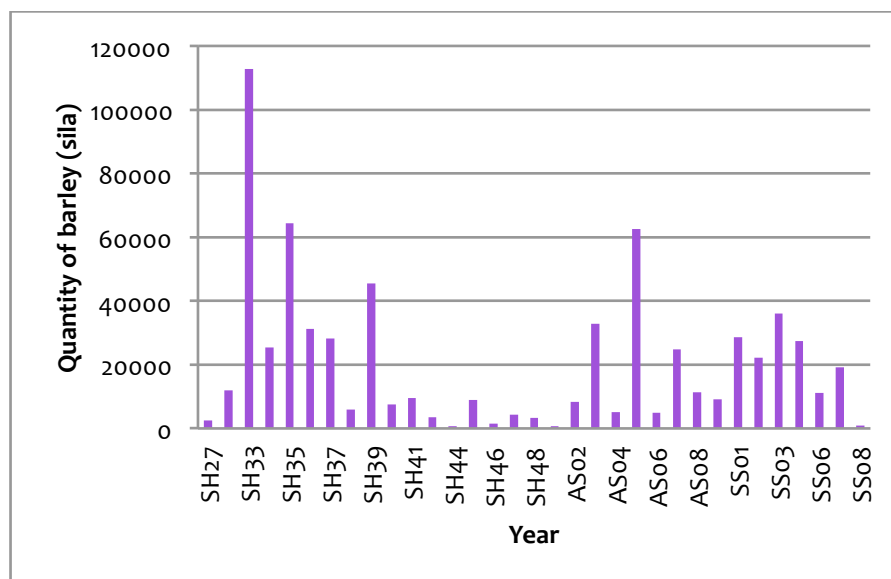
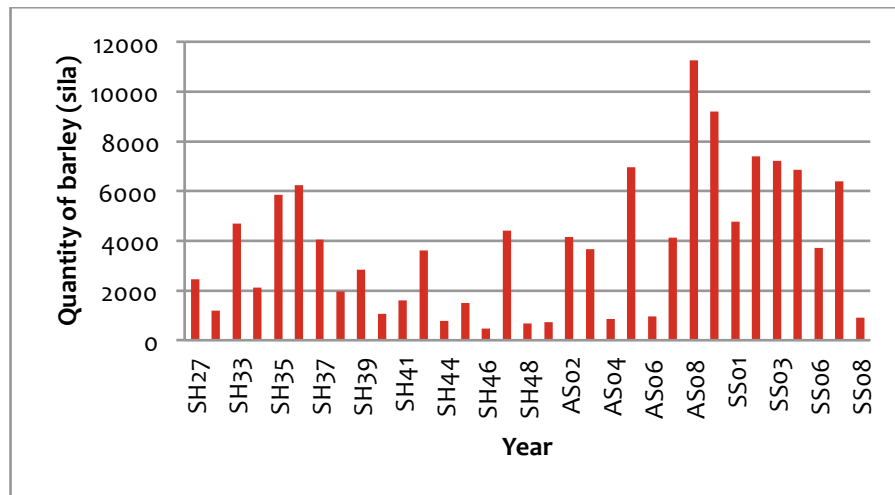


Fig. 14 – Average sa_2-du_{11} deliveries of barley per year in the Arad texts



The first of these two charts shows a spike in regular deliveries during the middle-late years of Šulgi's reign, with another spike towards the end of Amar-Suen's reign and a general tailing off throughout Šu-Sin's reign. In contrast, the average sa_2-du_{11} deliveries chart shows that, in spite of the total quantity of barley devoted to sa_2-du_{11} deliveries going down, the average disbursement went up in volume. It may be that the smaller number of texts dating to Šu-Sin's reign has inflated the average disbursement figures, but both the charts show that regular deliveries, predominantly to temples, remained an important part of the duties of the $guru_7$ throughout the Ur III period.

The majority of the temples in Table 5.11 are sadly not well attested in the Arad texts, making it impossible to perform any meaningful quantitative analysis upon them. The only temples which would yield reliable patterns or trends are the Šara and Enki temples, and these two temples, along with the e_2 nig_2 -lagar, will form the basis for the analysis of the sa_2-du_{11} deliveries.

5.5.1 – The Šara and Enki temples in Umma

Deliveries to the Šara temple stayed fairly consistent across the whole period, as the charts below demonstrate.

Fig. 15 – Total sa_2-du_{11} deliveries of barley to the Šara temple in the Arad texts

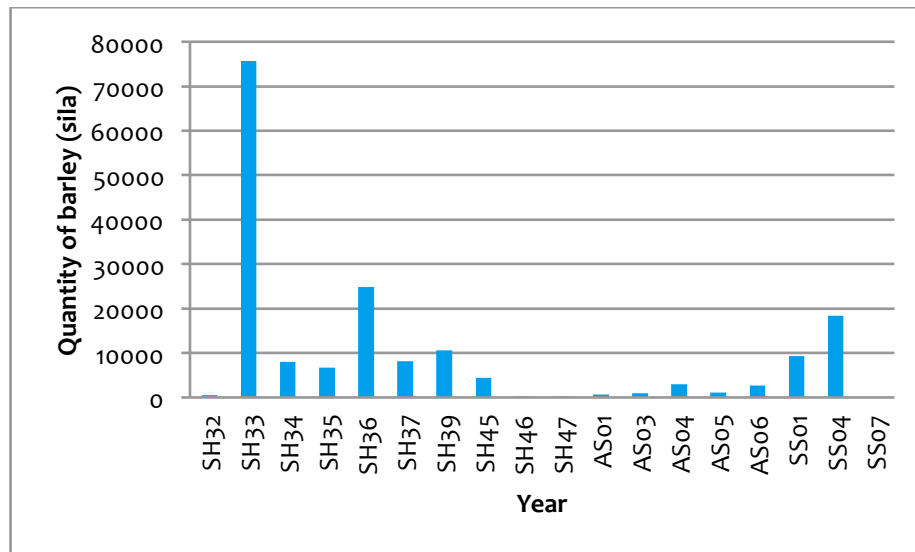
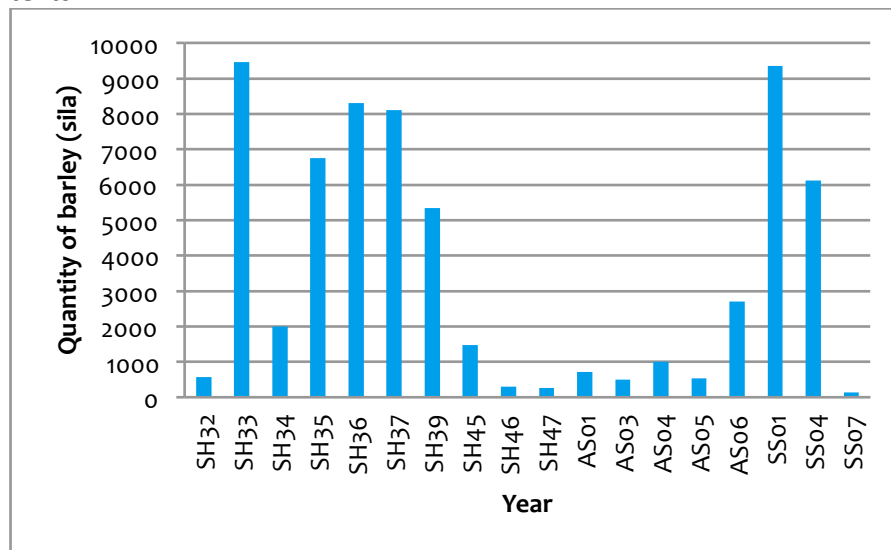


Fig 16 – Average sa_2-du_{11} deliveries of barley to the Šara temple in the Arad texts



The spike in SH33 persists in both charts, as does the peak in SH36 and in the early part of the reign of Šu-Sin. This pattern matches very well that in the charts depicting all offering disbursements over the Ur III period – unsurprising, as the Šara temple was the main focus for regular deliveries from the $guru_7$ – and demonstrates that the duty of providing barley deliveries to the temple of the main city god was one imposed upon the $guru_7$ for the whole of the period.

Fig. 17 – Total sa_2-du_{11} deliveries of barley to the Enki temple in the Arad texts

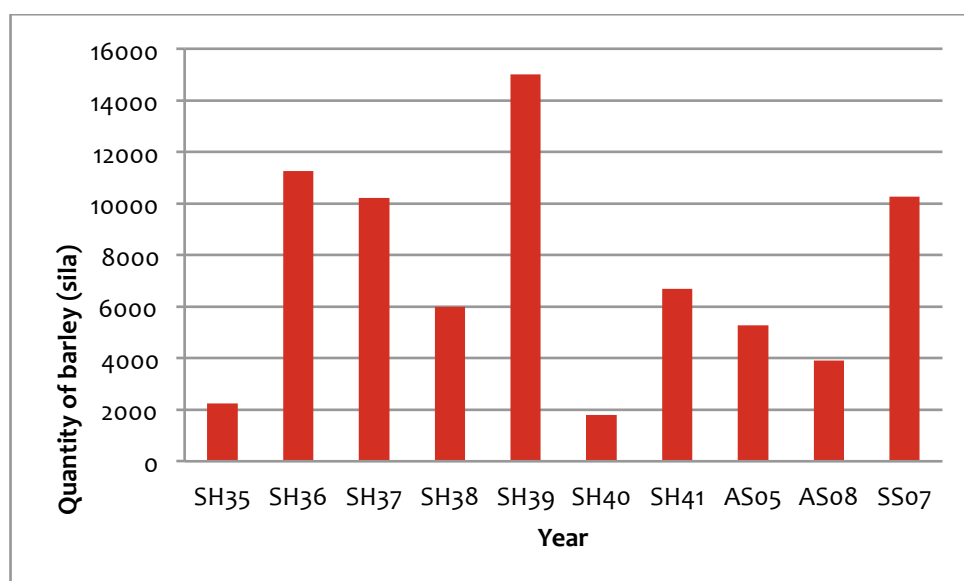
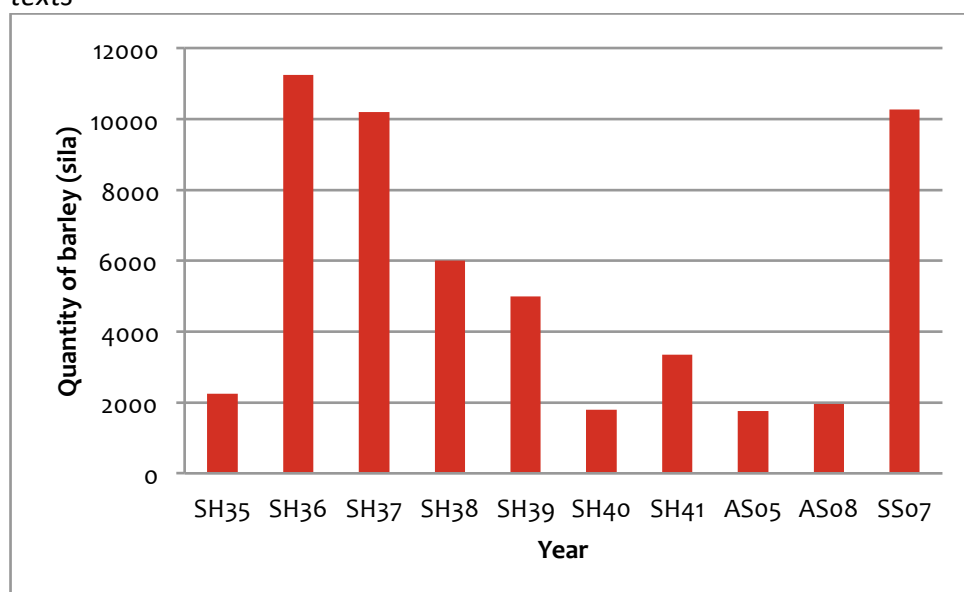
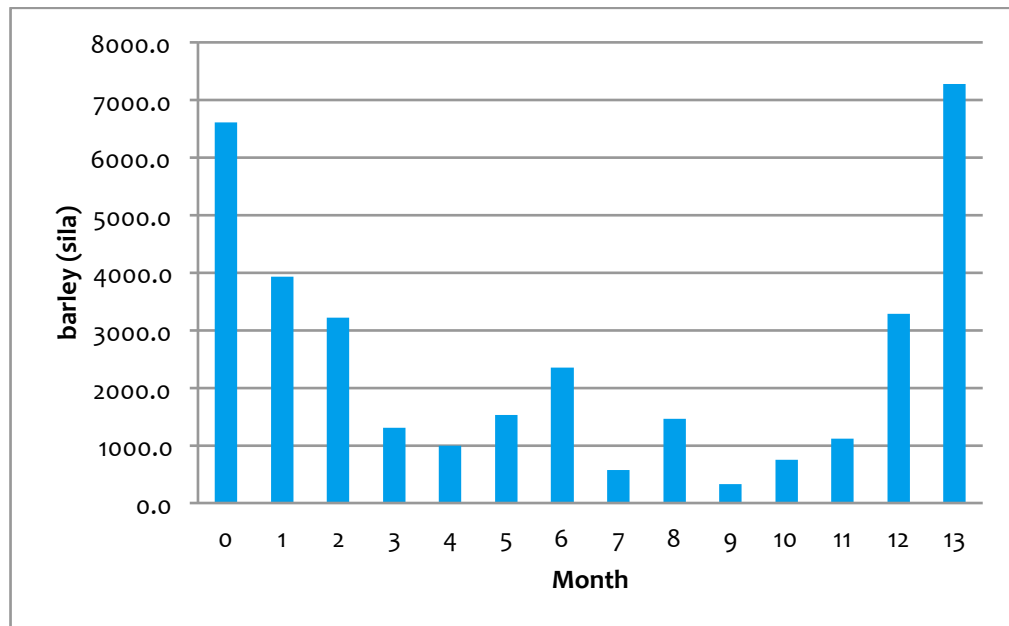


Fig. 18 – Average sa_2-du_{11} deliveries of barley to the Enki temple in the Arad texts



The patterns of distribution are less reliable here, due to the smaller number of texts available, and the graphs do not map well onto one another, possibly as a consequence of the limited amount of data available.

Fig. 19 – Average quantity of barley disbursed as regular deliveries per month

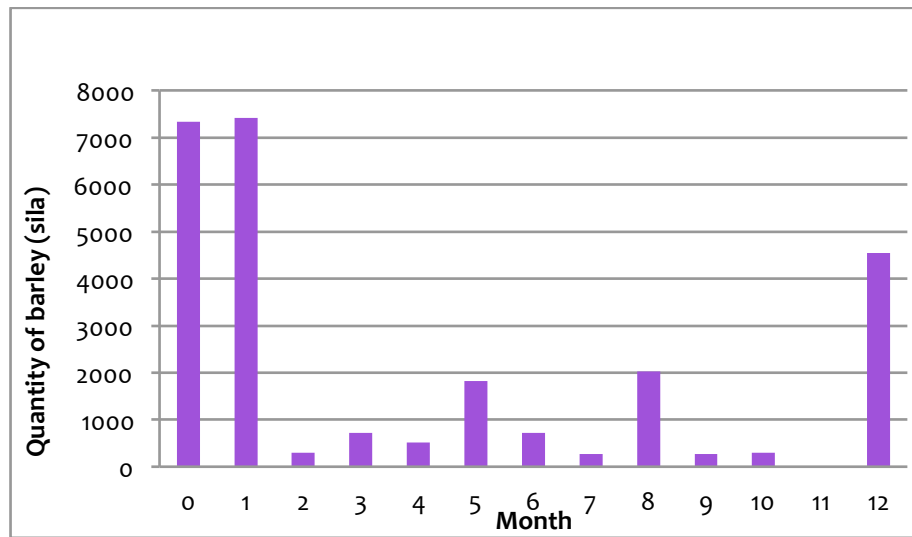


The evidence for month 13 is exceedingly limited, comprising one single text. As there is no possibility of taking an average, it can be discounted from this discussion as unrepresentative and unsound data.

The pattern shows that there was the usual higher number of transactions in month 12, when accounting documents were generally collated, and which is therefore significant only in confirming the anticipated pattern. This higher quantity of barley being disbursed continues through to month 2 of the year, with a peak in month 1. There is another pattern of increase and decrease between months 4 and 9, with a peak in month 6 of just over half the quantity of the peak in month 1.

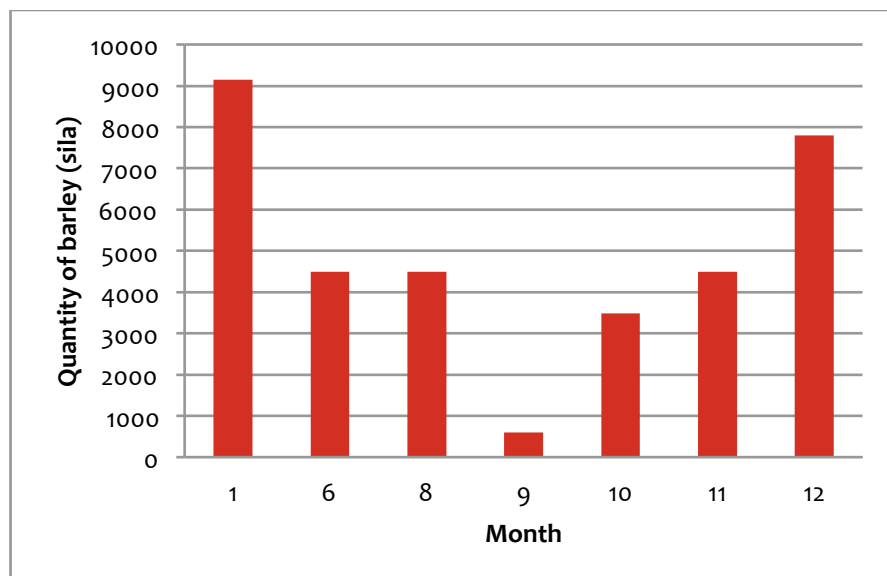
To determine the distribution of this pattern among the temples in Umma, the monthly outgoings to some of these temples are given below.

Fig. 20 – Average monthly deliveries to the Šara temple



While deliveries to the temple of Šara are concentrated in months 12 and 1 with minor peaks in the middle months of the year, and thus fit the general pattern of deliveries depicted in Fig. 18 above, it is difficult to discern such a precise pattern in the deliveries to other temples, partly because some are so scantily represented that it is difficult to determine any pattern in guru₇ disbursements across the year. The temple of Enki and Uškalimmu is the only temple which yielded enough texts in the Arad collection to stand up to closer scrutiny. The monthly pattern of deliveries is depicted in the chart below.

Fig. 21 – Quantity of barley disbursed to the Enki temple per month



It is difficult to be sure of patterns given the limited number of texts (16) and therefore the above chart is not statistically reliable. There are some similarities in shape with both the average disbursements of regular deliveries generally and the Šara chart above, with the fairly even disbursements in the middle of the year with a slight peak in months 12 and 1.

The peak in months 12, 1 & 2 is more easily explained by the fact that, as mentioned above, month 1 in the Umma calendar is the month of the barley harvest, and therefore a likely time for regular deliveries to the temples to increase for both symbolic and practical reasons (the latter being an increased quantity of barley available). Given the previously mentioned situation with the lunar months not mapping onto the solar years, as well as the fact that barley will ripen at earlier or later times according to different factors, it is likely that harvest could also have begun, from time to time, in months 12 or 2, and it would also have lasted for two or maybe even three months, both of which explains the breadth of this peak in deliveries.¹⁶⁴ The 12th month was also a significant month in the Umma cultic calendar in its own right, as it was the month of the festival of Dumuzi.¹⁶⁵

Similarly the first month, as well as being the month in which the barley harvest took place, also held a festival to celebrate the harvest, and so altogether the significant increase in barley deliveries during these two months makes good sense; a combination of increased quantities of barley available, and two substantial cultic festivals at which to give barley offerings, even in the sense of regular deliveries.

The 6th month marked the ezem šu-numun, the festival of sowing the fields with new barley seed, (though the actual sowing would have taken place later in the year, somewhere between months 7 and 9).¹⁶⁶ The increase detailed in

¹⁶⁴ Wilkinson, Gibson, and Widell, *Models of Mesopotamian landscapes: how small-scale processes contributed to the growth of early civilizations*.

¹⁶⁵ Walther Sallaberger, *Der kultische Kalender der Ur III-Zeit*, Walter de Gruyter, 1993)

¹⁶⁶ Miguel Civil, "The Farmer's Instructions," *A Sumerian Agricultural Manual* (1994): 44.; Wilkinson, Gibson, and Widell, *Models of Mesopotamian landscapes: how small-scale processes contributed to the growth of early civilizations*.

the charts above is not substantial, and in the Šara temple chart it is month 5 that has the increase, which is slightly less explicable – either the previously mentioned shifting of the pattern of months in relation to the agricultural year has affected the pattern of month 5 and month 6 deliveries to the Šara temple, or possibly this peak in deliveries is explained by the existence of another festival, ezem-ri, in month 5. Whichever is the case, the šu-numun festival is a possible explanation for this peak in deliveries in the general regular deliveries chart.

The peak during month 8 in both the general and Šara temple charts occurs alongside another festival, a significant festival of the god Šara – and therefore the fact that this peak is found on both charts is doubtless due to the fact that the Šara temple is considerably more frequently attested in the regular deliveries records than any other temple or household.

The only other important festival in the Umma cultic calendar occurred in month 4, the ezem nisag, but this month does not coincide with any peak in barley deliveries. Cohen notes that barley to this festival have been observed in some texts, but it seems likely that the extent of these deliveries was neither as substantial as those made to the other festivals, or as significant as other forms of offering (such as purified fattened livestock, which are also attested).¹⁶⁷

In all but two of the regular deliveries texts, the sa₂-du₁₁ are listed as ki Arad₂-ta, meaning that the disbursements of barley were credited to him – or, more precisely, to the guru₇.

The remaining two texts are BPOA 1 0976 and MVN 03 159. The former describes regular deliveries for the festivals of Šulgi and Amar-Suen coming into the granary from a man named Ur-Sul-pa-e₃ (and as this text dates to the reign of Šu-Sin, it would have been Arad's son Šara-izu who received the barley; the text reads "ka-guru₇ šu ba-ti"). The latter text is from SH38 and describes 8.1.2 gur of barley coming into a guru₇ (the text itself reads "guru₇ x-x-še₃," which suggests that there was an adjective designating which guru₇

¹⁶⁷ Mark E. Cohen, *The cultic calendars of the ancient Near East*, Capital Decisions Limited, 1993)

facility the barley was delivered to, making it distinct from the guru₇ as an institution) and being received by Arad (“Arad₂ šu ba-ti”). The barley is for regular deliveries to Pa-bil₃-sag, a god whose cult is attested in Umma, but most likely only on a small scale.¹⁶⁸

sa₂-du₁₁ deliveries were, like fodder, clearly a significant aspect of the transactional output of the guru₇, both in terms of frequency of attestation and in terms of quantity of barley disbursed for this purpose. Having discussed them in some depth, it is now appropriate to turn to the two final significant transaction types described in section 5.3.1, which are respectively the smallest and the largest in terms of quantity of barley disbursed: rations, and wages for the lu₂ hun-ga₂ (hired workers). The small quantities of texts referring to rations and hired workers limit the extent to which the quantitative analysis techniques can be applied and thus the amount of discussion possible, but the results can be considered both reliable and interesting.

5.5.2 -- The ‘other’ households

Aside from the temples, there are two other households associated with regular deliveries.

Table 15 – Attestations of the e₂ nig₂-lagar and e₂ lukur-gal

Household name	Attestations in the Arad texts
e ₂ nig ₂ -lagar	20
e ₂ lukur-gal	8

The e₂ nig₂-lagar

There are twenty attestations of the e₂ nig₂-lagar (the household of the lagar priest) in the Arad texts, dating from between SH32 and AS05. The texts involve mainly barley, with some emmer wheat also attested, and they all concern sa₂-du₁₁ deliveries made to the e₂ nig₂-lagar from the guru₇, sometimes involving other storage facilities. In total there are 74 attestations

¹⁶⁸ M. Krebernik, "Pabilsag (a)," *Reallexikon der Assyriologie* 2004 (2003): 160-167.

of the e_2 -nig₂-lagar in the CDLI database, almost every one of which details grains, mostly barley, and other products being sent as regular deliveries to the e_2 -nig₂-lagar.

Because there are only 20 texts concerning the e_2 nig₂-lagar in the Arad texts, it is difficult to observe any reliable patterns in these regular deliveries from the guru₇. The year with the most texts attesting the e_2 nig₂-lagar is SH33, which details regular deliveries in months 1, 4 and 6, as well as another with no month attested. While these are all months of significant festivals, it is doubtful whether anything should be read into that fact; across the 20 texts there are several deliveries attested for each month in the year apart from months 7 and 9, so it seems unlikely that there was any particular pattern to the regular deliveries in the manner of those made to the Šara temple.

It appears that the e_2 nig₂-lagar fits into the same pattern as some of the smaller temples, and therefore that it obtained its main provisioning from some other source than the guru₇, with occasional deliveries coming, at various times probably not significantly associated with the cult, from the guru₇. Interestingly, these texts are only associated with Arad, using the phrase ki Arad₂-ta, and they terminate at around the time Arad is thought to have retired from the office of ka-guru₇. There is no obvious reason why these regular deliveries do terminate, especially as the e_2 nig₂-lagar is attested as late as IS03 in the Umma text corpus. It is possible that this is connected with the general change in practice during the latter part of Amar-Suen's reign, observed across this collection of texts.

The source of barley is most frequently Arad himself (in other words, the guru₇), with a few attestations of the familiar e_2 -HAR and e_2 šutum. More unusual are the field names associated with the e_2 nig₂-lagar, which are not those that most commonly appear in the Arad texts but are field names attested only once each, and which are attested as the source of the barley being presented as sa₂-du₁₁ deliveries. There are also two threshing floors that are not commonly attested in the more "standard" areas of the Arad texts. The names of these are as follows:

a-ša₃ kiri₃-gu₄-GU-sag-ga₂
a-ša₃ u₂
ki-su₇ GAN₂ Ur-gu
ki-su₇ l₇-sal₄-la

I believe that these uncommon locations reinforce my suggestion that the e₂ nig₂-lagar received the bulk of its provisions from places other than the guru₇. It is possible that these names that are rarely-attested in the Arad texts constitute the lands belonging to the e₂ nig₂-lagar, but certainly the lack of more common field names suggests that the e₂ nig₂-lagar is not part of the standard destinations for regular deliveries made from the guru₇; these were reserved for more significant cultic households like the Šara temple. There are three recurring receiving officials in this small collection of texts concerning the e₂ nig₂-lagar: Giri₃-ne₂, his son Abuda, and an unrelated individual named Ur-^{giš}gigir dumu Lugal-iti-da. Another son of Giri₃-ne₂, Lugal-^{giš}gigir-re, makes one appearance in these texts. All three are attested elsewhere in the Umma text corpus.

The e₂ lukur-gal

In contrast with all of the other households, the e₂ lukur-gal (the household of the lukur priestess) was primarily a supplier of grain, rather than a recipient. There are just 9 texts referring to the e₂ lukur-gal, all of which date from SH32 and SH33, almost entirely to the first month (one, SAT 2 0069, dates to month 12 and one, SAT 2 0048, to month 2). The grain was supplied from the e₂ lukur-gal was always designated as sa₂-du₁₁ deliveries. Four texts (OrSP 47-49 161, JCS 23 110 05, JCS 46 019 03 and SAT 2 0069) designate their regular deliveries as to the god Šara, but it seems likely that at least two others (CHEU 016 and SAT 2 0045) refer to the temple of Šara as well, as the deliveries are specifically designated as for the first month festival.

Why the e₂ lukur-gal was briefly a supplier of barley via Arad to the Šara temple is not immediately clear. There are only 10 texts in the Umma text corpus concerning the e₂ lukur-gal – the 9 described above, and one further text dating from SS06 (SAT 3 1680) which refers to zi₃ flours of different types being giri₃ e₂-lukur-gal (under the responsibility of the e₂ lukur-gal). The fact

that its existence continued into the reign of Šu-Sin implies that there may have been an archive for the e₂ lukur-gal, which is now lost. Arad's involvement in the early texts might imply a connection between the storage facilities of the e₂ lukur-gal and the guru₇; perhaps the guru₇ was initially responsible for barley storage for the e₂ lukur-gal, a responsibility that was later rendered obsolete by a change in storage practice on the part of the e₂ lukur-gal.

5.6 – Rations

Ration texts account for 7.3% of texts concerning barley in the Arad texts, and for 250370 sila of barley, 5.2% of the total disbursements. They have a date range of SH30-SS07, with the earlier texts authorised by Arad himself ("ki Arad₂-ta"), while the later texts (late AS + all SS) contain the phrase "ki ka-guru₇-ta" = authorised by the granary keeper, in this case Arad's son Šara-izu. All rations texts are of Type 1, with approximately half being of Type 1a and half of Type 1b.

9 of these texts date from the reign of Šulgi, concentrated towards the end of his reign. 24 date from Amar-Suen's reign, with several in each year and a spike in attestations during AS02. 29 texts date from the reign of Šu-Sin, with several texts attested each year. This suggests a trend towards more ration disbursements coming from the guru₇ over the Ur III period; the reasons for this trend are, however, unclear.

The receiving officials are a mixed collection; several appear more than once, but mostly not more than twice (the exceptions being ^dŠara₂-a-mu dumu ^dŠara₂-šeš, who appears 5 times, and Ur-^{giš}gigir dumu Ba-sa₆, who is attested three times). There were 22 receiving officials during the reign of Šu-Sin alone. The majority of the disbursements are simply described as še-ba, sometimes with a named recipient of the rations. In 13 texts the disbursements are described as either še-ba za₃-mu or še-ba za₃-mu [PN]. The ezem za₃-mu was the new year festival, celebrated in most provinces around the vernal equinox but thought by Cohen to have been celebrated in month 4 in the Umma cultic

calendar.¹⁶⁹ That said, all of these ration texts are dated to months 6, 7, 8 or 9, with one dated to the first month of the year, and these dates do not correspond very well either to a new year celebration which took place either in month 1 or month 4. The reason for this is unclear.

Table 16 – Names of the recipients of še-ba rations

Names of recipients of rations
Lu-^dSuen ma₂-lah₅
A-ba-al-la (& children)
^dNin-ur₄-da
Gur₈-za-an simug (& children)
Ma₂-da-ga
Me-e₂-gal-ta
Ša₃-ad-da (& children)
Ur-lu₂-lal₃
DUB-mu(?)
Nin-zi
Kur-ba
^dŠara₂-a-mu
Nam-<tar>-ib₂-gu-ul

Each of these names appears only once; none of the recipients is repeated in the texts. Those that have the addition of “children” (u₃ dumu-ni) may have been receiving rations for their actual sons, or for apprentices in the same line of work.

In these texts there are a great many suppliers and receiving officials – and those that are listed as the recipients of rations are never mentioned as part of the exchange process, only as the intended eventual recipient of rations. These texts are therefore at least one step before the handing over of rations to those labourers (who had either earned them already or were imminently to do so), detailing the transaction out of the granary (most of the texts are “ki Arad₂-ta”) into the hands of the official who was to make the payment to the labourers.

¹⁶⁹ Cohen, *The cultic calendars of the ancient Near East*,

Another interesting factor is that these texts occur relatively infrequently and do not constitute a significant portion of the administrative output of the guru₇. This is something that shall be discussed further in Chapter 6.

5.7 – Hired Workers

Wages paid to hired workers (a₂ lu₂ hun-ga₂) comprise 4.5% of total texts concerning cereals but account for a total volume of 828662 sila of barley, 17.1% of the total barley disbursed, in a combination of disbursements and receipts. The texts have a broad date range, between SH30 and SS06, and there are spikes in text volume in SH39 and AS03. These texts are almost always of Type 1a.

Most of these texts refer simply to a₂ lu₂ hun-ga₂ without detailing the work performed by these labourers. There are 5 mentions of work around canals, probably involving digging irrigation ditches (i₇ ba-al-la), and a number of texts refer to fieldwork – 7 texts refer to field work, with the a-ša₃ la₂-mah, the a-ša₃ la₂-tur, the a-ša₃ Uku₂-nu-ti kin ak and the a-ša₃ En-gaba-ri₆ mentioned specifically. There is also mention of work done in the threshing floors (ki-su₇) of the a-ša₃ ^{giš}Ma-nu and the a-ša₃ muru₁₃, as well as four references to sahar (either “earth” or more broadly “sand dunes/plain”). Several of these groups of hired labourers are mentioned in connection with an allocation of barley as seed grains; possibly they were employed to seed the fields with this še numun.

There are 24 different receiving officials, though two men make six appearances each, receiving barley to pay hired labourers. These are Lugal-e-ba-an-sa₆ dumu Ur-^dlšaran, who is given no job title and appears as “dub-sar” on his seal, and Ur-Šara dumu Lugal-ušur₄, who was employed as GA₂-dub-ba or ša₁₃-dub-ba, “chief accountant”. The latter is a noteworthy character, and the grain he sealed for in these texts is generally placed onto someone else’s account; presumably the man in charge of the work teams. Ur-Šara will reappear in discussion in Chapter 6, as will these texts in comparison with various others.

As well as the lu₂ hun-ga₂, the figures above include six references to a₂ ma₂ hun-ga₂ (hired boats), one to guruš hun-ga₂, and one to nagar hun-ga₂ (hired carpenters); these are included because the nature of employment (hun-ga₂) is the same.

It is in fact the guruš hun-ga₂ text that accounts for a large proportion of the total barley disbursed as “hun-ga₂” payments, and it is an interesting text. The text is Ontario 2 236, and it reads as follows:

obverse

1. 2(gezš'u) 3(gezš2) 1(u) 8(asz) 3(barig) sze gur lugal
2. 6(disz) gur gig
3. 2(disz) <gur> a2 gurusz hun-ga2
4. ki lugal-inim-gi-na-ta
5. ARAD2-mu
6. szu ba-ti

reverse

1. zi-ga uri5{ki}-ma
2. iti {d}li9-si4
3. mu dumu-munus lugal ensi2 an-sza-na-ke4 ba-tuku-a

Translation:

1. 419430 sila of barley (using the royal measure)
2. 1800 sila of wheat
3. 600 sila for the hired workers
4. from Lugal-inim-ge-na
5. Arad
6. received it
7. the levy was from Ur
8. the ninth month
9. the year that the governor of Anšan married the daughter of the king

In this text, Arad received a substantial amount of barley from Lugal-inim-gina, a man who appears in just two tablets in the entire collection of texts connected with Arad. The text seems to indicate that only 2 gur (600 sila) of barley was designated as wages for hired workers, which leaves the reason for the remainder of this substantial delivery unclear. It is also not clear whether Arad was receiving this barley in his capacity as overseer of work teams, as will

be described in the next section, or as granary keeper. This latter possibility will be discussed further in Chapter 6.

To conclude this section, the number of tablets referring to hired workers may be small, but it remains fairly consistent despite that. The texts and the work they describe is spread evenly across the years, and across the tenure of both the granary keepers there is no particular spike in one distinct kind of work. Receiving officials are likewise not concentrated into any one particular year or month (except SH39 which has 5 texts for similar work from months 10 and 11 – the digging of the new irrigation ditch in the area of En-gaba-ri₆).

With the exception of Ontario 2 236, in which he is the receiving official, Arad's role in these hired worker texts was to be supplier of barley to the various receiving officials, transferring authority for this portion of grain from the guru₇ institution to these officials, to be used for paying their hired labourers. Having now considered cereals in detail, it is appropriate to turn to the second biggest category of texts in the Arad text corpus – those concerning workers. There are considerably fewer of these texts, but they yield some interesting points for discussion and analysis.

5.8 – Workers in the Arad texts

There are 137 texts concerning workers in which Arad has a supervisory role. Though Arad himself seals relatively few of these texts, it is highly likely that he is the man named as ugula (overseer) of the rest of the texts; a man of high enough status to be an ugula would have had a seal of his own, and there are no other contemporary seals in Umma belonging to a man called Arad. Worker texts belong to Type 4 from the Typology.

Of the 137 texts, there are 24 texts referring to teams of geme₂ (female workers), 89 are entirely composed of guruš, 8 are composed entirely of UN-ga₆, and 16 of these texts refer to groups of combined forces of guruš and UN-ga₆. The teams of female workers were mostly involved with loading and moving barley, sometimes into storage, or onto boats, and sometimes they were involved in levying grain in certain fields. There is a small spike in texts dating to SH48; most of these refer to female workers transferring barley from

various places (KI.AN, the fields la₂-tur, ^{giš}Manu & la₂-mah) into Umma. The total number of geme₂ workdays in the Arad texts is 2644 workdays. In these texts, Arad either seals the document or is listed as gir₃ (conveyer).

There are very few references to geme₂ working in the e₂-HAR (grinding house); intriguing, as milling cereals was one work task predominantly assigned to women. Since Arad is in various ways responsible for these women, and yet their principle duties with him are to move grain from one location to another rather than the more typical duties for female workers, it seems that Arad, and therefore that the guru₇ staff, had little to do with the internal management of the grinding house, despite the obvious connection between the two institutions.

The teams of gurus and UN-ga₆/IL₃ performed a slightly wider variety of tasks than the geme₂ teams, including hoeing fields, smearing clay (for repairs or for sealing, as described by Huber) and towing boats presumably laden with grain, given Arad was an overseer as well as sealing documents or acting as gir₃.

The table below shows where the workers under Arad's management were working – in fields, on canals, or inside buildings or institutions – and how frequently these locations turn up in the texts concerning workers.

Table 17 – Locations where workers were active

Location	guruš	geme ₂	UN-ga ₆	Total
a-ša ₃	38	2	14	54
i ₇	8	2	3	13
e ₂ -amar	4	0	0	4
e ₂ -šidim	2	0	0	2
ga ₂ -nun	2	0	0	2
e ₂ - ^d Lamma	2	0	0	2
e ₂ -šu-tum	1	3	0	4
guru ₇	1	1	1	3
e ₂ -HAR	1	3	0	4
ki-su ₇	1	0	0	1
e ₂ -udu	0	2	0	2
e ₂ -Nin-ur-ra	0	1	0	1
e ₂ -HI.AŠ	0	1	0	1

It is no surprise to find that the most common locations for workers under Arad's management to be stationed were various fields, with 54 occurrences in the texts, with the majority of field labourers listed as guruš, though a substantial minority were UN-ga₆. The fields in question were as follows.

Table 18 – Fields in which labourers under Arad's management were working

Field names	Attestations
a-ša ₃ GAN ₂ -mah	3
a-ša ₃ la ₂ -mah	3
a-ša ₃ gibil	2
a-ša ₃ ^{giš} Ma-nu	2
a-ša ₃ la ₂ -tur	2
a-ša ₃ na-ka ₃ -ab-tum	2
a-ša ₃ nin ₁₀ -nu-du ₃	2
a-ša ₃ ^d Nin-ur ₄ -ra-du ₆ -na	1
a-ša ₃ GAN ₂ -anše	1
a-ša ₃ amar ^{giš} GIR ₂ gunu	1
a-ša ₃ APIN-ba-zi	1
a-ša ₃ ^d Nin-ur ₄ -ra-du ₆ -na	1
a-ša ₃ ^d Šara ₂	1
a-ša ₃ ^d Šul-pa-e ₃	1
a-ša ₃ Du ₆ -ku ₃ -sig ₁₇	1
a-ša ₃ Gu ₂ -eden-na	1
a-ša ₃ gu ₄ -šuhub ₂	1
a-ša ₃ igi-e ₂ -mah-še ₃	1
a-ša ₃ išib-e-ne	1
a-ša ₃ Muš-bi-an-na	1
a-ša ₃ nun-na	1

Three of the fields in this list are the three most commonly occurring in the Arad texts: the a-ša₃ la₂-mah, the a-ša₃ la₂-tur and the a-ša₃ ^{giš}Ma-nu, and each of these occurs more than once. Their frequency of appearance here and elsewhere suggests a significance within the province. There are, however, 21 fields in which Arad's teams of workers were deployed, some of which (the a-ša₃ ^dŠara₂ or the a-ša₃ ^dŠul-pa-e₃) are frequently attested in the Umma text corpus, others of which make rarer appearances.

The second table in this section shows Arad's precise role in the management of his teams of workers.

Table 19 – Arad's role in the administration of labour

Arad's role	ugula	gir ₃	kišib	other
geme ₂	1	5	16	2
guruš	74	7	14	10
UN-ga ₆	24	0	0	0

ugula is most frequently translated as “overseer”, but as Steinkeller has pointed out, it is unlikely that any man designated as ugula of a work team would have done any physical labour himself. Both Steinkeller and Dahl have noted that those who were appointed ugula were generally graduates of the scribal school (dub-sar) and sealed documents concerning their work teams, or had them sealed by a brother or other high level official, but when it came to organising and supervising the labour forces, Steinkeller observes that it was likely that a substitute took their place in the actual labour team.¹⁷⁰ In short, then, an ugula took responsibility for a team in the documentation, but did very little practical administration of the workers in the field (or equivalent). Arad was ugula for the vast majority of the texts concerning male work teams, and the vast majority of these teams were working in fields performing duties such as standing guard, carrying and transporting grain and loading it for storage, as well as other field tasks such as hoeing.

gir₃ is a term that is slightly more difficult to define precisely. It is often translated “conveyor”, indicating some connection with the physical transport of goods or commodities. Breckwoldt, writing from a second millennium perspective, suggests that the official designated as gir₃ was ‘the carrier who transported the animals or good from the disbursing agency to their final destination’, but in the context both of Arad, a leading member of the ruling family of Umma, and of work teams, which are not quite the equivalent of commodities of the sort she describes, this does not make ideal sense.¹⁷¹ By way of contrast, Tsouparapoulou suggests that the official described as gir₃ was the one that was present when a transaction was being documented, and presumably therefore the one under whose eye matters were being

¹⁷⁰ Dahl, *A Babylonian Gang of Potters*, 69.; Steinkeller, *The foresters of Umma: towards a definition of Ur III labor*,

¹⁷¹ Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88.

transacted.¹⁷² This is a better fit for the sort of duties Arad was performing, and therefore it seems likely that when he was listed as gir₃, this indicated that he was responsible for the transaction that was taking place, signing his responsibility for the work team that was going out to perform its duties. In this way it is similar to and yet subtly different from the role of the ugula, though both terms indicate a role that was almost purely documentary. The word “kišib” indicates that Arad sealed the document in question. In commodity transactions, the one that sealed a document was normally the recipient of the commodity/commodities, or their representative; in documents concerning workers, the official who sealed was mostly likely the highest responsible official, whether or not they were described as ugula, gir₃ or any other title in the text itself.

In summary, Arad acted as the most senior official in authority over his work teams, though his specific duties in relation to them would have differed slightly depending on which role he took on. In all cases, it is probable that another official would have overseen the practical work done by all of the teams, while Arad maintained overall authority.

Below is a table detailing the tasks carried out by the workers under Arad’s supervision, listed according to the relevant verb.

¹⁷² Christina Tsouparopoulou, "A Reconstruction of the Puzriš-Dagan Central Livestock Agency1," *Cuneiform Digital Library Journal* 2 (2013)

Table 20 – Tasks assigned to workers under Arad’s supervision

Task	guruš	geme ₂	UN-ga ₆	Total texts
gub (to stand)	30	15	7	52
zig₃ (to raise, levy)	10	8	0	18
ga₆/il₂ (to carry)	13	0	2	15
ku₅ (to cut down)	7	0	8	15
gid₂ (to draw (a boat))	12	0	1	13
sig (to load)	7	1	1	9
bala (to transfer (a boat over a weir))	7	0	0	7
al ak (to hoe)	6	0	0	6
im ur₃ (to smear clay)	2	0	1	3
gar (to put, place)	3	0	0	3
ku₄ (to enter, bring in)	0	2	0	2
du₃ (to build)	2	0	0	2
other	9	0	1	10
TOTAL	108	26	21	155

The five principal tasks which employed the workers under Arad’s supervision can be bracketed under the verbs gub (to stand), zig₃ (to raise/levy), ga₆/il₂ (to lift/carry), ku₅ (to cut down), and gid₂ (to draw a boat). The details of these texts is briefly summarised below, with text examples given in brackets.

gub: This mostly occurs in the context of the phrase a-da gub-ba, meaning to perform water duty (e.g. BPOA 7 2068). Very occasionally it also occurs in the context of a building or household (MVN 21 213, for instance, which describes guruš workers as e₂-šidim gub-ba e₂-šu-tum gub-ba). This is unusual, though, and water duty is far more commonly cited. All kinds of worker perform this task.

zig₃: This is attested in the context of raising or levying še, gig and ziz₂ in various fields (UTI 3 2294, BPOA 1 1270). There are also infrequent attestations of cereals being raised or levied from fields and taken to Umma (BPOA 7 2885). Both guruš and geme₂ are attested as performing this duty.

ga₆/il₂: Cereals are carried from, into or between such locations as fields, the e₂-šutum (BPOA 7 1832), the e₂-HAR (MVN 18 514), granaries (CDLI P387638),

and other far less frequently attested locations such as the e₂ udu-niga (BPOA 6 1516). In the Arad texts, this is a task reserved almost entirely for guruš workers, though elsewhere geme₂ are also attested as carrying grain.

ku₅: Camelthorn (UTI 4 1873) and reeds (BPOA 2 2219) are both frequently attested as plants required to be cut down by work teams. This task is reserved, in the Arad texts at least, for male-only work teams.

gid₂: Another male-only task, the towing/drawing of boats frequently appears in connection with the verbs sig “to load” and bala “to transfer a boat over a weir” (UTI 4 2327). This appears, from the listings of all three verbs above, to have been another task reserved almost exclusively for guruš workers.

5.9 – The animal transactions

While there were many texts concerning fodder for animals, the principal commodity of these transactions was the grain for fodder; they are therefore included with the grain receipts in the table above and are not considered in this section, which is concerned specifically with animal receipts.

Arad’s involvement in animal transactions is very likely connected with his relationship with Lu-kala, his nephew who acted as sabra e₂ ensi₂ (chief household administrator of the governor) for the province in the latter years of Amar-Suen and into the reign of Šu-Sin. Dahl has already remarked on Arad receiving livestock on Lu-kala’s behalf, and it is likely that some of the texts collected here record such transactions.¹⁷³ The date range of these texts is SH37 – AS07. These texts belong to Type 2d.

Table 21 – Receipts concerning livestock

Animal type	Occurrences
sheep and goats	44
cattle	7
donkeys	1
pigs	1
Total	53

¹⁷³ Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*, 180.

Sheep were by far the most frequently occurring animal to appear as livestock receipts in the Arad texts, and most often udu or u₈ “ba-ug₇” – dead sheep and ewes. If these sheep were given a designation, it was either that they were part of the bala redistributive tax “ša₃ bala” or that they were “ri-ri-ga-am₃” (dead).¹⁷⁴ The ša bala animals all appear in texts dating to the 10th month of the latter years of Amar-Suen’s reign, particularly AS05, while the ri-ri-ga-am₃ animals are all in texts from the 11th month of AS05.

In 7 of the texts concerning sheep or sheep and goats, Arad was the supplier (“ki Arad₂-ta”, though some of these texts indicate that he may have been responsible for supplying a barley equivalence), and he supplied one ox in BPOA 6 1016, for reasons not given in the text. In 32 of the texts concerning sheep or sheep and goats, he is the receiving official (“Arad₂ šu ba-ti” or “kišib Arad₂”), receiving livestock either “ša₃ bala” or “ri-ri-ga-am₃”. These texts are all in accord with Dahl’s observations, cited above, on Arad’s receipts of livestock on behalf of his nephew Lu-kala, particularly in the latter months of AS05.

The large number of texts in which Arad acted as receiving official is affected by a sudden peak in quantity of texts preserved from the year AS05. These texts all date to the 10 and 11th months of the year, in which Arad sealed documents for small numbers of u₈ “ewes” and very occasionally for udu or udu-nita “sheep/rams”. 20 of the 30 texts date from these two months of AS05, accounting for almost all of those texts designated as ša₃ bala or ri-ri-ga-am₃.

In 15 of the 32 texts in which Arad acts as receiving official, he is receiving livestock from Ur-RU, and in 6 cases he is receiving it from Nig₂-du₁₀-ga-mu. In 5 out of the 6 transactions with Nig₂-du₁₀-ga-mu as supplier, A-kal-la is the responsible official (gir₃). Another regularly recurring responsible official (gir₃) was Ur-Suen, appearing in 9 of the sheep transactions, and most commonly in those in which Ur-RU is credited with supplying the sheep. Ur-RU and A-kal-la

¹⁷⁴ Stępień, *Animal husbandry in the ancient Near East: A prosopographic study of third-millennium Umma*,

appear in the same text once, as well, suggesting a connection between Ur-RU and Nig₂-du₁₀-ga-mu.

In summary, it is reasonable to assume that receipts of animals, alive or dead, by Arad were not part of his work as ka-guru₇, but related to his position in the ruling family of Umma, and that therefore the animal transactions described above do not involve the guru₇. This is reinforced by the fact that no texts involving the receipt of animals appear when Arad's son Šara-izu takes over the running of the guru₇ in the latter half of Amar-Suen's reign – either his relationship with the cousin who had taken over the role of livestock administrator, or chief household administrator, did not run on the same lines as Arad's with his nephew Lu-kala, or else the two offices had been made more distinct and separate under the latter kings of the Ur III dynasty.

When sheep and goats were listed together, they were often designated “še-ta sa₁₀”, with a quantity of barley added beneath the total number of sheep and goats and Arad listed as the supplier. In these case, it is probable that Arad was setting or supplying a barley amount equivalent to the value of the sheep and goats – in other words, a sale price in barley. In this case, Arad is clearly working on behalf of the guru₇, setting barley equivalences, albeit on a very small scale.

5.10 – Summary of chapter

In this chapter I have shown that Arad and the guru₇ were responsible for some specific areas of cereal provision, with fodder disbursements (ša₃-gal) being the most well attested area of guru₇ activity, along with making regular deliveries (sa₂-du₁₁) to temples, particularly the Šara temple, and with a small but significant set of texts disbursing cereals as rations (še-ba) and wages (a₂ lu₂-hun-ga₂) to various groups. As an administrator of work teams, he was responsible for various kinds of work, most commonly grain-related, carried out in particular fields – the la₂-mah, la₂-tur and ^{giš}Manu fields, all three of which will be discussed further in Chapter 6. Arad was also responsible for receiving various animals, usually on behalf of other members of his family, and particularly his nephew Lu-Haia.

On the basis of the evidence presented in this chapter, I suggest that the guru⁷ had a narrower focus of activity than might have been anticipated from an organisation called “the granary”, and that, given the scope of its outgoings, it is unlikely to have been responsible for provisioning the entire province. It seems likely that it was an organisation primarily dedicated to state business, supplying state herds and the principal temple of the cult, but not generally acting on behalf of that nor of any other temple household in the province.

Chapter 6 – The connections between Arad and the facilities that supplied the guru₇

The previous chapter dealt with the transactions involving the guru₇, and the small number of transactions involving Arad as a member of the ruling family separate from his duties as ka-guru₇. In those transactions, there are indications that Arad and the guru₇ had connections with various locations, institutional households, and storage or grain processing facilities, some of which it supplied (as discussed in Chapter 5) and some with which the connections are more oblique.

This chapter sets out to examine these links between the guru₇ and various households or facilities, as well as touching upon some with which Arad and the guru₇ had minimal association – which makes for as interesting a point of discussion as those households/facilities with which Arad *was* connected. The chapter also takes account of the fact that, as Tate Paulette has discussed in his thesis on the archaeological evidence for grain storage, the discussion on the terminology of grain storage in the Ur III period has been limited at best, and therefore I attempt to fill this gap by providing a comprehensive survey of the grain storage terminology in use at Umma and clarifying the uses and connections of the different types of storage facility described in the Umma text corpus.¹⁷⁵

6.1 – The households and facilities associated with the guru₇

The table below details the different types of institutional household or storage facility which appear in the guru₇ texts.

¹⁷⁵ Paulette, *Grain Storage and the Moral Economy in Mesopotamia (3000-2000 BC)*.

Table 22 – Frequency of attestation of different households or facilities in the Arad texts

Household/Facility	No. of attestations
e ₂ -HAR (grinding house)	176
a-ša ₃ (fields)	174
temples	107
ki-su ₇ (threshing floor)	93
e ₂ -šutum (“storehouse”)	46
guru ₇ (granary)	32
e ₂ nig ₂ -lagar (the household of the lagar priest)	20
i ₃ -dub (“granary” or “grain heap”)	8
e ₂ lukur-gal (the household of the lukur priestess)	8
ga ₂ -nun (“storehouse”)	4

The households or facilities listed above are either primarily suppliers or primarily recipients of cereals, labour or occasionally other products. Those that were primarily recipients (the temples and the e₂ nig₂-lagar) were discussed in detail in Chapter 5, and will not be discussed further here.

Likewise the e₂ lukur-gal, though primarily a supplier of cereals, was discussed in the section on sa₂-du₁₁ deliveries in Chapter 5 and, given the small number of texts concerning this household, there is not a great deal more that can be said about it.

The discussion in this chapter will, therefore, consider the most frequently attested suppliers of cereals – the e₂-HAR, which is the most commonly attested household with 176 attestations, the e₂-šutum, which despite its rather smaller number of attestations was still a significant cereal supplier, and the various attested guru₇ facilities, as well as storage facilities which appear very infrequently in the Arad texts, such as the i₃-dub and the ga₂-nun. The inclusion of fields and threshing floors takes account of the fact that more than 200 texts indicate fields or threshing floors as the location from which the cereals being transacted were obtained, which in conjunction with various other factors indicates a storage aspect to both of these locations.

First, I shall discuss those households and facilities that were primarily involved in cereal transactions, as opposed to the worker texts, in a comprehensive survey of the storage terminology in use in Ur III Umma.

6.2 – Storage terminology

This section will attempt to rectify the lack of a full discussion of storage terminology in the Ur III period, by examining various storage facilities associated with the *guru₇* at Umma and attempting to define the nature of storage facilities that have occasionally been lumped together without sufficient distinction between them.

This discussion will begin with an examination of the *guru₇* storage facilities, and then of the two households which are regularly attested in the Arad texts, the *e₂-HAR* (grinding house) and the *e₂-šutum* (storehouse). Discussion will then consider storage facilities which are attested in the Umma text corpus but with which Arad has little recorded connection: the *i₃-dub* and the *ga₂-nun*.

6.2.1 – *guru₇*

Of the many terms concerned with storage, particularly of grain, the term *guru₇* is the one that is usually translated as granary, or sometimes as silo. The implication of the term has always been large-scale storage, with an assumption that it was probably centralized and based within the main city or cities of a province in the manner of the silos of Šurruapak, which were discussed in Chapter 2. This assumption is further strengthened by the existence of the term, “*ka-guru₇*”, often translated as granary keeper. Arad was, of course, ranked as *ka-guru₇* and, given his connection with the ruling family of the city of Umma, it is clear that it was a role which enjoyed high status and privilege.

This section considers the *guru₇* as a storage unit as opposed to the *guru₇* as an organisation concerned with the distribution of cereals. It seems that not all storage units in the province identified as *guru₇* were under the authority of the *ka-guru₇*, despite the relatively high status of the role.

Below is a table listing all the attestations of a storage unit identified as *guru₇* in the texts concerning Arad and the office of the *ka-guru₇*.

Table 23 – The frequency of attestation of individual descriptors of a guru₇ storage facility

Name	No. of attestation
guru ₇	9
guru ₇ i ₃ -sum	5
guru ₇ A-pi ₄ -sal ₄ ^{ki}	2
guru ₇ ^d Šul-pa-e ₃	2
guru ₇ l ₇ -sal ₄ -la	2
guru ₇ sag-du ₃	2
guru ₇ us ₂ -sa e ₂ ^d Nin-ur ₄ -ra	2
guru ₇ a-ša ₃ ^{gi} šMa-nu	1
guru ₇ a-ša ₃ la ₂ -mah	1
guru ₇ du ₆ -na	1
guru ₇ gu-<la>	1
guru ₇ igi-e ₂ -a	1
guru ₇ Ki-sur-ra	1
guru ₇ Kl.AN ^{ki}	1
guru ₇ Ur- ^d Šul-pa-e ₃	1

There are no frequently recurring descriptors in the Arad texts, though the number of named guru₇ units increases during the reigns of Amar-Suen and Šu-Sin; in fact, all the attestations of the guru₇ i₃-sum date from Šu-Sin's reign, with four attestations dated to SS03 and one to SS07.

The role of Arad (and his successor) in the vast majority of these texts was the same; authorising the supply of barley from the guru₇ in question. The exceptions include five texts concerning workers, in which Arad is listed as the overseer or otherwise responsible for the work team, and one text (Ontario 2 278) in which he received barley from two officials, Lu₂-gi-na and Ku₃-ga-ni, which derived from the ^{gi}šManu field. The worker texts include one which describes the smearing of clay upon a guru₇ unit; the others concern the delivery and depositing of cereals in a guru₇.

The destination of the barley disbursed by Arad in these texts is almost never recorded; two sa₂-du₁₁ regular deliveries to the e₂ nig₂-lagar are listed as coming from a guru₇ facility, and one sa₂-du₁₁ delivery was sent to the temple of Inanna at Zabalam.

The commodity disbursed by the guru₇ units was almost always barley; three texts record disbursements of emmer wheat, twice from an unnamed guru₇ and once from the guru₇ sag-du₃.

Descriptors of the guru₇

In Table 23 there are several guru₇ facilities that were given particular names or descriptors, which suggests that they were specific storage facilities rather than aspects of the guru₇ as an administrative organisation. There are also named guru₇ facilities that appear in the broader Umma text corpus without being attested in the Arad texts. These are referred to in this thesis as “named granaries”.

The majority of these named granaries are scantily attested in the recovered material from Umma but, for all their scarcity, they bear witness to the variety of storage facilities in use at Umma. Sadly, the majority of these are not sufficiently well attested to present useful material for analysis. There are exceptions, however, which are attested sufficiently frequently to merit closer examination, or which are worth considering by reason of their particular connection to the guru₇ or to Arad. Among these are several guru₇ facilities named after particular fields, such as the a-ša₃ la₂-mah and the a-ša₃ ^{giš}Manu, and these will be examined in a section dedicated to field storage later in the chapter. Besides the field granaries, there are two other named granaries worth examining: the guru₇ KI.AN^{ki} and the guru₇ Apisal^{ki}.

guru₇ Apisal^{ki}

Apisal was the second biggest and the most economically significant city in the province of Umma after Umma itself. It has never been excavated but its location is to the east of Umma.¹⁷⁶ It seems to have maintained some connections with the city of Umma but had authority over its own affairs.

There are 46 attestations of the guru₇ Apisal in the Umma text corpus, but only one of these includes mention of Arad. Given that Apisal had its own granary keeper (Lugal-inim-gena, attested in BPOA 6 1198), it is not surprising that

¹⁷⁶ Adams, *An interdisciplinary overview of a Mesopotamian city and its hinterlands*, 1-23.

Arad had relatively little connection with the Apisal guru₇, but though Arad was not much attested, other members of his family did have regular dealings with it, and with the town of Apisal more generally. There are 39 attestations of members of the ruling family in the 46 texts concerning the Apisal granary.¹⁷⁷

Table 24 – Members of the ruling family associated with the Apisal granary

Name	Frequency of attestation	Date range
Gududu	15	AS07-SS06
Inim-Šara	7	SH48-SS04
Ur-E ₁₁ -e	4	SH48-AS07
Inim-Šara dumu Dadaga	3	SS03-SS05
Lu ₂ -Haia	1	SS02
Lugal-hegal	8	AS01-SS01
Arad	1	AS06
Total	39	

Dahl has already noted the connections between certain members of the ruling family and Apisal and the evidence does suggest that, although the ka-guru₇ of Apisal was not a member of the ruling family, the family still maintained an interest in the operations of the Apisal guru₇, and over quite a long period of time.¹⁷⁸ The vast majority of attestations involving these family members involve them sealing documents, and indicate therefore that they were either receiving barley or overseeing work teams.

A number of these work teams were deployed in what appears to be either the maintenance of or the closing up of the granary, as shown by the use of the phrase “im ur₃-ra”. Indeed, BPOA 6 0945 gives a very nice example of the process of filling and sealing a guru₇ silo:

obverse

1. 3(geš2) 2(u) geme2 u4 1(disz)-sze3
2. ki-su7 a-sza3 gibil-ta
3. a-pi4-sa4{ki}-sze3
4. sze zi-ga
5. 4(geš2) 2(u) geme2 u4 1(disz)-sze3

¹⁷⁷ Some texts have two or more members of the ruling family attested

¹⁷⁸ Dahl, *The ruling family of Ur III Umma : a prosopographical analysis of an elite family in Southern Iraq 4000 years ago*, 180.

6. ki-su7 a-sza3 nun-na-ta

reverse

1. a-pi4-sal4{ki}-sze3

2. sze zi-ga

3. 2(u) geme2 u4 1(disz)-sze3

4. guru7 a-pi4-sal4{ki} im ur3-ra

5. ki szesz-saga-ta

6. kiszib3 lugal-he2-gal2

7. mu {d}amar-{d}suen lugal-e ur-bi2-lum{ki} <ba-hul>

seal

1. lugal-he2-gal2

2. dub-sar

3. dumu ur-nigar{gar}

1 200 female workers for one day

2-4 levying barley from the threshing floor of the “new field” to Apisal

5 260 female workers for one day

6-r. 2 levying barley from the threshing floor of the Nunna field to Apisal

r. 3 20 female workers for one day

r. 4 smearing/sealing the Apisal granary with clay

r. 5 from Šeš-sig

r. 6 sealed by Lugal-hegal

r. 7 the year that Amar-Suen, the king, destroyed Urbilum (AS02)

Here a number of (female) labourers are seen transporting barley for storage in Apisal. Once the two fields’ worth of barley has been transported to the guru₇ facilities, a smaller number of women seal up the silo(s) with clay. It should be noted that u4 1-še3 means “workdays”, and therefore though the text implies that 200 separate workers worked for just one day on the levying of barley from the threshing floor, the phrasing in fact indicates that the labour took 200 workdays in total, but was probably carried out by fewer workers over a longer period of time. Nonetheless this text does suggest that a very substantial amount of barley was being stored in the Apisal facilities.

guru₇ KI.AN^{ki}

The guru₇ KI.AN is considerably less frequently mentioned than the guru₇ Apisal, in the Arad texts or in the Umma text corpus and, of the 7 texts connected with the KI.AN granary, Arad is mentioned in two. Despite this

infrequency of attestation, however, there is a remarkable consistency in these texts, especially in the fact that certain personnel appear repeatedly: an individual named Lu₂-ge-na appears in 3 texts, and ^dŠara₂-ba-zi-ge in two. Similarly to the Apisal guru₇, there is an indication of interest from the ruling family, with Gududu mentioned in BPOA 1 1501.

It is also clear that the guru₇ at Umma was in regular contact with the KI.AN granary and with KI.AN generally, as shown by the fact that 38 texts in the Arad text corpus refer to transfers to and from the settlement of KI.AN. It is interesting to note that transactions between the guru₇ (as an organisation) and KI.AN ceased at around the time that Arad retired from his post as ka-guru₇, a fact that is consistent with my previous observations of a change in guru₇ accounting practices at this particular point in time, as previously discussed in sections 5.1 and 5.4.1.

Arad's role in the transactions concerning the named granaries

It is hard to clarify Arad's role in the transactions concerning the individual granaries listed in Table 21, because the numbers of attestations are not sufficiently large to make secure generalisations. Clearly he was responsible for some cereal transactions involving all of the named granaries listed in Table 6.1, but whether that was the entire picture for each of those granaries cannot be determined without further investigation outside of the texts covered in this thesis. The only granaries with sufficient attestations or connections to the Umma guru₇ were the guru₇ Apisal and the guru₇ KI.AN; in both of these cases, Arad's lack of connection with the transactions to and from these granaries indicates that they were both under other jurisdiction and only tangentially connected to the main guru₇ institution.

The results suggest, therefore, that while Arad had some possible connection with the guru₇ facilities listed in his texts, he was almost certainly not responsible for transactions from the granaries in other towns and districts. That said, the interests of his family members in the granaries of Apisal and KI.AN suggest that these two facilities were far from independent of state scrutiny.

6.2.2 – the e₂-HAR and the e₂-šutum

The e₂-HAR is widely attested in the Umma text corpus, with 541 attestations in 520 texts. Of these, 176 texts occur as part of the texts concerning Arad, 33% of the total attestations of the e₂-HAR. The meaning of the term e₂-HAR is widely accepted as “grinding house” or “mill”, and it was staffed by teams generally of female workers who would grind various cereals into different types and grades of flour.

The amount of authority which Arad had over this household is unclear. He is frequently attested as having authority to move unmilled cereals for the e₂-HAR to other locations, but it is reasonable to suggest that his authority did not extend to the entire facility, especially considering the fact that he is only attested in a small proportion of texts concerning the grinding house.

Descriptors of the e₂-HAR

There are e₂-HAR facilities in the Umma text corpus with a variety of descriptors. Some are locational, such as the e₂-HAR da bad₃ (the grinding house by the wall), while some indicate an institutional connection, such as the e₂-HAR d^dšara₂ (the grinding house of šara, presumably belonging to the šara temple). The only frequently occurring descriptors of the e₂-HAR in the Arad texts, however, simply indicate the age of the building; the e₂-HAR gibil (New Grinding House) and the e₂-HAR sumun (Old Grinding House).

Table 25 – Descriptors of the e₂-HAR attested in the Arad texts

Descriptor	Frequency of attestation in the Arad texts	Frequency of attestation in the Umma texts	Date range of texts
e ₂ -HAR	139	326	SH24-SS08
e ₂ -HAR gibil	26	109	SH41-SS05
e ₂ -HAR-sumun	8	46	SS01-SS08
e ₂ -HAR da bad ₃	2	6	SH42-AS06
e ₂ -HAR bad ₃ -e us ₂ -sa DU-a	1	1	SH25

This data suggests that Arad and the guru₇ were closely associated with the main grinding house of the city of Umma. I would suggest that the simplicity of the naming of the facilities in the Arad texts indicates that they were more likely to be the main state grinding house, and it is therefore no surprise to

find that Arad is closely connected with this grinding house and not with others.

Commodities

The e_2 -HAR was primarily associated with barley, though a handful of texts concern emmer wheat. Below is a table that shows the frequency of attestation of different cereals.

Table 26 – Frequency of attestation of different cereals connected with the e_2 -HAR

Commodity	Frequency of attestation	Date range
še	152	SH27-SS08
ziz ₂	14	SH32-SS06
workers	5	SH40-SH48

Both types of cereal are attested throughout the period of study, but at 8.4% of the total attestations of cereal being disbursed from the e_2 -HAR, emmer wheat does not seem to have comprised a very significant part of the cereals over which the $guru_7$ had authority in the e_2 -HAR. This doubtless relates to the fact that the e_2 -šutum seems to have been responsible for the provisioning of emmer to the dependents of the $guru_7$, as will be discussed later in this chapter.

The destination for the cereals was varied, as the table below demonstrates.

Table 27 – Destination of cereals from the e_2 -HAR

Commodity	ša-gal	sa ₂ -du ₁₁	še-ba	a ₂ lu ₂ hun-ga ₂	other
še	82	29	11	1	31
ziz ₂	0	13	0	0	1

In common with the disbursements from the $guru_7$ organisation generally, 53% of the disbursements from the e_2 -HAR went to the animal fatteners as fodder, with 19% dedicated to regular deliveries and 7% for rations; approximately 1/3 of the disbursements from the $guru_7$ organisation which were intended as rations list the e_2 -HAR as their source.

Arad and the e₂-HAR

Arad was regularly attested in e₂-HAR transactions, usually as the official authorising the transfer of barley from the e₂-HAR to various destinations. The texts from the entire Umma corpus show clearly, however, that he was by no means in overall charge of this household, but simply had some authority over unmilled barley, and occasionally other cereals, that were stored there.

The e₂-šutum

The e₂-šutum was another storage facility used principally for grain, usually translated generically as “storehouse”. Its relationship to the guru₇ is not perfectly clear, but that it was under the same management is not in doubt, as shall be seen.

The texts concerning the e₂-šutum date from between the years SH25 to SS05. During that time there is a slight shift in both usage of the e₂-šutum and the terminology used in association with it, as shall be seen in sections 5.4.1 and 5.4.2.

Most of the texts list withdrawals from the e₂-šutum – this is almost certainly a result of the fact that the grain that was brought into the e₂-šutum came from some distance away, and therefore any receipts of incoming grain supplies would have been stored in the towns and villages whence the grain came. These settlements are unlikely to have been discovered or excavated, and thus their textual archives remain undiscovered.

Descriptors of the e₂-šutum

Unlike the i₃-dub and the ki-su₇, the e₂-šutum did not have innumerable different descriptors, and in the vast majority of texts it is referred to simply as the e₂-šutum. It is possible that there was one specific e₂-šutum storehouse, well-enough known to be identifiable in the texts without further qualification. It seems likely that, at some point, further structures known as “e₂-šutum” came into operation, as later texts do add an identifying descriptor. The table below lists these descriptors.

Table 28 – Descriptors of the *e₂-šutum*

Descriptor	Frequency of attestation	Date range
<i>e₂-šutum</i>	86	SH25 – SS03
<i>e₂-šutum Šara-ka</i>	7	SH44 – AS09
<i>e₂-šutum Ar-ha</i>	1	AS02
<i>e₂-šutum šabra</i> ¹⁷⁹	18	AS06 – SS01
<i>e₂-šutum^d Nin-ur₄-ra</i>	3	AS09 – SS01
<i>e₂-šutum Ib-gal</i>	1	SS01
<i>e₂-šutum lugal</i>	3	SS02 – SS05
<i>e₂-šutum e₂-gal-ka</i>	1	SS03
<i>e₂-šutum gibil</i>	1	SS03

It is notable that the majority of specifically identified *e₂-šutum* storehouses appeared in the reign of Amar-Suen. It is possible that the *e₂-šutum* was one single storage facility, perhaps in a specific location, during the reign of Šulgi, but by the reign of his successor the term had become a title for several different storage locations, either concurrent or successive. The later *e₂-šutum* facilities either have names belonging to gods or to people (the *šabra*, “chief priest” or the *lugal*, “king”), or to the palace. I would suggest that this indicates that the above hypothesis – that it was once a specific storage facility, hence no need to identify it in the texts by anything other than the term “*e₂-šutum*”, but became a generic term for a storage facility of some kind – is likely to be correct; the identification with gods or the *šabra* suggest that these *e₂-šutum* facilities were attached to temples, while the connection with the *lugal* or the *e₂-gal*, the king and the palace, suggest a facility attached to the provincial palace, or else a barley supply designated for royal use.

Commodities supplied from the e₂-šutum

In the earlier part of the period, from SH25-43, the *e₂-šutum* transactions list barley almost exclusively, and after SH43 there is a change in the range

¹⁷⁹ The spike in the number of references to the *e₂-šutum šabra* suggests that at some stage the archive specific to that particular *e₂-šutum* was discovered in its entirety, or at least a substantial part of it. The other facilities, less well-attested, presumably have archives which remain undiscovered.

commodities listed, which broadens to include other grains, particularly emmer.

Table 29 – Commodities associated with the e_2 -šutum in the Umma text corpus

Commodity	Frequency of occurrence
še	85
zi ₂	23
zi ₃	7
gig	3
dabin	2
ninda	1
other	6

The quantities of cereals transacted into and out of the e_2 -šutum are mostly fairly small; often the e_2 -šutum transactions form part of much larger total quantities of grain, but the cereals come from various sources.

The e_2 -šutum seems, from the evidence in the table above, to be a storehouse entirely dedicated to cereals – unlike the ga₂-nun (discussed below) which was predominantly used for reed storage. The cereals-only nature of the e_2 -šutum is not surprising, but while some storage facilities are designated specifically as barley storage, the e_2 -šutum has an unusually high number of attestations of other cereal products. This diversity of cereal products will be discussed in the conclusions section of this chapter.

Arad and the e_2 -šutum

The first text to refer to Arad as being responsible for the grain stored in the e_2 -šutum (specified in the term “ki Arad₂-ta”, exactly like the grain stored in the guru₇) was SH33, and he is mentioned in 36 out of 48 texts between SH33 and SH48. In the early years of Amar-Suen’s reign he is also listed as responsible for a lot of the e_2 -šutum transactions up until AS06. This is around the time that Arad disappears from the guru₇ records and presumably retired from the post of granary keeper. Until that point, the guru₇ clearly had authority over the barley stored in the e_2 -šutum, and it maintained a long-lasting link to the e_2 -HAR.

Once Arad disappears from the record in AS05 or AS06, it is interesting to observe that there is no transfer of authority over the e_2 -šutum to one particular individual. Notably, it does not appear to pass to his son – where the phrase, “ki Arad₂-ta” once appeared in the texts, there is no equivalent “ki ka-guru₇-ta”, as there is for most of Arad’s guru₇ responsibilities; instead, various other officials now appear, but no one scribe appears consistently enough to be considered Arad’s replacement at the e_2 -šutum, despite the fact that a facility called the e_2 -šutum was in use well into the reign of Šu-Sin.

Association between the e_2 -HAR and the e_2 -šutum

There are twenty-three texts in which the e_2 -šutum is associated with the e_2 -HAR, the grinding house. Most of these texts follow a pattern, as in the example below.

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obverse

1. 3(asz) ziz₂ gur lugal
2. e₂-szu-tum-ta
3. 2(asz) 2(ban₂) 2(disz) sila₃ sze gur
4. e₂-kikken gibil-ta
5. sa₂-du₁₁ {d}szara₂
6. ki ARAD₂-ta

reverse

1. kiszib₃ ur-{d}suen
2. iti szu-numun u₃ min-esz₃
3. mu en-unu₆-gal en {d}inanna ba-hun

seal 1

1. [ur-{d}suen]
2. dumu nig₂-[x]
3. ninda-du₈-[du₈]

- | | |
|------|--|
| o. 1 | 3 royal gur of emmer |
| 2 | from the e_2 -šutum |
| 3 | 2.0.2 2 gur of barley |
| 4 | from the grinding house |
| 5 | regular deliveries to Šara |
| 6 | from Arad |
| r.1 | sealed by Ur- ^d Suen |
| 2 | the sixth month |
| 3-4 | The year that En-unu ₆ -gal was installed as en-priest of Inanna (AS05) |

The format of these texts is always the same and, even though details about the destination of the cereals, for instance, can differ, one notable aspect is that when there is a mixture of cereal types, the e₂-HAR supplied barley while the e₂-šutum supplied emmer.

The barley and emmer being transferred from the e₂-šutum and the grinding house was used for regular deliveries, or as fodder for mules. It seems likely that there was a close connection between the two institutions and that they were both under the jurisdiction of Arad and the guru₇ to some extent.

This kind of text always lists Arad as the supplier from both facilities, suggesting he had jurisdiction over both households for these transactions. This was not the case, as previously mentioned, for all the transactions from the e₂-HAR; he was more frequently attested in connection with the e₂-šutum, which seems to have had closer ties to the guru₇ than the e₂-HAR.

Summary

It seems likely that the e₂-šutum came under the aegis of guru₇ storage facilities, along with, to some extent, the e₂-HAR. The fact that the majority of texts involve Arad demonstrates that he had authority over the barley in this storage facility. The frequent co-attestations of the e₂-šutum with the e₂-HAR in the textual record indicates a connection between the two, although the precise nature of this connection is difficult to determine.

It is also difficult to tell whether the e₂-šutum was one single storage facility, or a type of storage facility of which there were several different examples in the city of Umma. It is possible that the meaning of the term changed during the period and, having once denoted a single facility, came to mean a storage facility of a particular kind, generally attached to temples or other households. The lack of other commodities being transferred from the e₂-šutum indicates that this was a facility purely for grain, but it is clear that various different types of grain (and sometimes flours) were stored and disbursed from there, particularly emmer.

6.2.3 – the i₃-dub

There are 68 texts in the Umma text corpus that refer to a storage facility called the i₃-dub, dating from between SH28 – IS03. The context of these texts makes it clear that the i₃-dub was a form of storage facility, but it is unlikely that it carries the meaning of “granary” in the same sense as the guru₇; the scale both of the storage capacity itself (judging by the quantities of grain moving into and out of the facility) and low frequency of appearance of the term in comparison with the term guru₇ argue against it having the same significance. The evidence given below would seem to confirm this hypothesis.

5.2.1 – Descriptors given to the i₃-dub

In the aforementioned 68 texts, there is a total of 86 references to a type of facility named “i₃-dub”, of which 63 i₃-dub facilities are given individual descriptors, such as “i₃-dub a-ša₃ A-pi₄-sal₄^{ki}” or “i₃-dub ša₃ a-ša₃-ga”.¹⁸⁰ The vast majority of these descriptors are not repeated; besides the unqualified term “i₃-dub”, which occurs 20 times, there are only four descriptors that recur, as can be seen in the table below:

Table 30 – Frequency of recurrence of i₃-dub facilities with individual descriptors

Name	Frequency of occurrence	Dates of texts
i ₃ -dub a-ša ₃ A-pi ₄ -sal ₄ ^{ki}	2	AS08 & IS01
i ₃ -dub eren ₂ -na ¹⁸¹	2	IS02 & unknown
i ₃ -dub še ur ₅ -ra ¹⁸²	3	AS08 & AS09
i ₃ -dub a-ša ₃ i ₃ -sum	2	AS03 & AS05

The overwhelming lack of repeated descriptors support the hypothesis that, far from being a granary in the broader sense of the guru₇, or another form of permanent storage facility as implied by some translations of the term, the i₃-

¹⁸⁰ See Appendix 3 for a full list of i₃-dub titles.

¹⁸¹ i₃-dub eren₂-na might refer to an i₃-dub facility serving local soldiers (eren₂), although the term could also refer to local draft labourers; given the available information it is difficult to determine which of these is the correct translation.

¹⁸² še ur₅-ra is a designation of grain, discussed in Paola-Spada Paoletti, "Gabriella, Testi še-ur₅-ra da Girsu conservati al British Museum (NSAM 10)," (2005) among others.

dub was a very temporary feature of the landscape, presumably set up when and wherever it was needed for interim grain storage.

While no individual descriptor is replicated exactly in any of the 68 texts which refer to the i_3 -dub, there are nonetheless some common features of the descriptors. A handful of i_3 -dub facilities are attached to institutions such as the granary ($guru_7$), the “village” (e_2 - $duru_5$)¹⁸³ and the quay (kar), the latter of which may suggest an urban setting. The majority, though, are named after fields (a - $ša_3$) or threshing floors (ki - su_7). Below is a table detailing the frequency of association of the i_3 -dub with an institution, field or threshing floor.

Table 31 – Frequency of association of i_3 -dub with a storage facility, field or threshing floor

Name	Frequency of occurrence
i_3 -dub	20
i_3 -dub [field]	15
i_3 -dub [ki - su_7]	16
i_3 -dub [e_2 - $duru_5$]	2
i_3 -dub [$guru_7$]	6
i_3 -dub kar	2
Total	61

The connection of the i_3 -dub storage facility with fields and threshing floors lends further weight to the previously mentioned hypothesis that the i_3 -dub was a temporary facility set up for storing grain in the short term, and indicates a physical proximity of the i_3 -dub to the fields named in the text. I would suggest, given the evidence, that the i_3 -dub functioned as an interim storage facility for grain before and after it had been threshed, perhaps while it awaited transport to the larger scale permanent storage facilities closer to the urban centres of the province; Widell has noted similar practices in textile handling at Ur, and has discussed the use of the phrase “ ki - ba se - ge_4 - de_3 ” in

¹⁸³ The e_2 - $duru_5$ constituted the housing for agricultural labourers

relation to barley as perhaps denoting a temporary form of storage.¹⁸⁴ There is certainly nothing outrageous in the suggestion of temporary storage facilities in the fields and near threshing floors.

Commodities stored in the i₃-dub

The principal commodity of the texts is še (barley). Some texts also list gig (wheat), ziz₂ (emmer) and dabin (flour), but all but one text have these commodities listed along with še. One text, dating from AS08, lists three sheep in connection with the “i₃-dub til-la”, but it is an isolated example and is hard to explain without better context.

There are no texts referring to labourers in association with the i₃-dub. If it were a permanent storage facility, it is possible that there would be mention made of the maintenance required to keep it sound and secure against intrusion from thieves. Huber has discussed the phrase “im ur₃-ra” (meaning “smearing with clay”) in relation to the maintenance (or perhaps permanent sealing) of granaries (the guru₇ specifically).¹⁸⁵ The fact that the phrase includes the word “clay” indicates that it referred to buildings of a relatively permanent, or at least long-term, nature, and while the lack of references to maintenance is not proof in itself that the i₃-dub was a transient feature of the landscape, it lends weight to the hypothesis when considered alongside the other details.

Arad and the i₃-dub

It is interesting to observe that, despite the fact that, as granary keeper, Arad might be supposed to have been in authority over the vast majority of grain storage in the province of Umma, he almost never appears in texts concerning the i₃-dub, and he is never in a position of authority over the grain that is being stored or transferred. It is possible that, with the grain presumably still in or near to the fields, it had not yet been transferred into Arad’s control;

¹⁸⁴ Magnus WIDELL, "From All the Stacks to the Center of Ur," *Orient* 45 (2010): 177-182.; Magnus Widell, "A note on the Sumerian expression SI-ge 4-de 3/dam," *Sefarad* 62, no. 2 (2002): 393-400.

¹⁸⁵ Huber, *guru₇ im ùr-ra Revisited*, 463-495.

alternatively, this may have been a form of storage which bypassed the guru₇, perhaps belonging to a temple or other large household which kept its own storage facilities.

The personnel of the i₃-dub

Just as with the naming of the i₃-dub, the personnel involved in transactions concerning the i₃-dub seldom appear more than once in the texts. The receiving officials associated with the i₃-dub are all graduates of the scribal school (dub-sar), but mostly are not referred to by any particular administrative title (one of them, Lugal-šu-nir-re, is listed as *sagi lugal* “cupbearer to the king” and another, Ur-^dIštaran, is described as *ugula* “overseer”).

Summary

The implication of all the above evidence is that each individual i₃-dub was a short-term phenomenon; set up somewhere during the harvest period, perhaps, to provide short-term storage for grain that was to be transferred shortly afterwards. It is certainly the case that i₃-dub does not mean “granary”. It is clear from the lack of attestations in the textual record that Arad had little to do with the i₃-dub storage facilities and no control over the grain stored within them. This is either because the grain had yet to enter his jurisdiction – which would likely have been described on texts written in the fields themselves and stored locally, and which therefore most likely remain undiscovered – or because the i₃-dub facilities were set up by people or households with no connection to the guru₇. Of these two suggestions, I consider the former to be the more likely, as it seems unlikely that any substantial or frequently appearing storage facility which appears in the cuneiform record would not have fallen within the purview of the state institution established for that very purpose; as Widell and Breckwoldt have both noted, it is improbable that there were no kinds of informal storage utilised by villagers, farmers, and domestic households, but their very

informality argues against their appearance in the cuneiform record.¹⁸⁶ The fact that the *i₃-dub* did appear suggests that it was an officially approved form of storage, but it is unclear whether the *guru₇* eventually took on the authority of administering the grain that was stored within these *i₃-dub* facilities. This could only be established by the recovery of rural or smaller urban archives, which will hopefully provide more detailed evidence for receipts of barley into the *guru₇* to correspond with those receipts of outgoing transactions that make up the majority of the Arad texts at present, and might indicate whether the grains stored in the *i₃-dub* facilities were ever delivered into *guru₇* facilities.

6.2.4 – the *ga₂-nun*

The last storage facility I will examine, albeit only briefly, is the *ga₂-nun*, a facility that is very scantily attested in the Arad texts and which is commonly translated as “storehouse”, and textual data shows that it was indeed a storehouse, one which specialised in mixed goods but particularly in reeds. It is relatively frequently attested in the Umma texts, with 466 attestations dating from SH27 to IS02, but is attested in the Arad texts only 4 times: MVN 01 087, Princeton 1 429, Princeton 2 373 and BPOA 1 1463. The first three of these four attestations concern work teams, for whom Arad is responsible, bringing reeds and wooden items to the *ga₂-nun*, and the fourth records a delivery of reeds from the *ga₂-nun*, received by Arad. It is clear, therefore, that while the *ga₂-nun* was one of the significant storage facilities within the Umma province, it was not a facility that stored grains of any sort, and at no point did it come under the management of Arad or the *guru₇*.

6.2.5 – Discussion of the grain storage facilities

The *i₃-dub*, the *e₂-HAR*, the *e₂ šutum* and the *ga₂-nun* demonstrate some of the complexity of cereal and other storage in Ur III Umma. While places like the *e₂-HAR* were surely meant for the processing, rather than the storage, of cereals, it is plain that this facility was periodically used for supplying unprocessed barley, which is likely to have been stored there, to various recipients. It seems

¹⁸⁶ Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88.; Widell, *A note on the Sumerian expression SI-ge 4-de 3/dam*, 393-400.

evident that storage was not restricted to specialised facilities, but that different forms of storage, of lesser or greater degrees of formality or specificity, were deployed to manage the barley harvest in the province.

There is no indication of where the e₂-HAR and the e₂ šutum were located; the i₃-dub, by contrast, seems to have been a rural type of storage facility, the lack of permanence in its naming pattern indicating that it was not a permanent feature of the landscape.

I have suggested that the e₂ šutum was initially one single facility, not requiring a descriptor, but that it became a more generic term for a storehouse later in the Ur III period; while this is not certain, it is suggested in the increased variety in e₂ šutum naming practices during the reign of Amar-Suen.¹⁸⁷ The e₂-HAR, by contrast, seems to have been one facility, possibly in the city of Umma itself, though a ‘new grinding house’ (e₂-HAR gibil) was built at some point during the reign of Amar-Suen – the first secure attestation was in AS03.

6.3 – The nature of the different kinds of storage facilities

The evidence and discussion above suggest that the storage of cereals was varied in practice and not limited to the use of large silos and a lot of evidence as to the nature of the different storage facilities has already been presented. One further clue to their individual characteristics can be gleaned from the variety of commodities stored within the different facilities, and below is a table detailing the types of transactions involving the different households or facilities discussed in this chapter.

Table 32 – The variety of commodities supplied from different households/facilities to the guru₇

Institution	še	zi ₂	zi ₃	gig	workers	gi	other
e ₂ -HAR	152	8	0	0	5	4	12
a-ša ₃	145	14	2	1	37	1	6
ki-su ₇	86	5	0	0	2	0	2
e ₂ šu-tum	36	18	5	0	2	0	0
guru ₇	25	3	0	0	5	0	2

¹⁸⁷ The fact that the e₂-šutum naming practices seem to change later in the period differentiates them from the naming of the different i₃-dub facilities, which was always diverse and almost never repeated, unlike the descriptors of the e₂-šutum.

As can be seen from the table above, some storage facilities seem to have specialised in barley alone, while others took in a variety of cereal products. I would suggest that this indicates that these forms of mixed cereals storage, such as the e₂ šutum, did not consist of the traditional silos used in long term cereal storage, since when different cereal types are mixed they obviously cannot be separated again once mixed. Therefore it is plain that mixed storage must have taken the form of some sort of container storage, possibly in large ceramic jars, or alternatively in sacks, as suggested by Breckwoldt.¹⁸⁸

6.4 – Discussion of storage facility terminology

There were not many ‘named granaries’ and Arad’s connection, at least with the ones not obviously belonging to other towns, seems to have been a fairly standard supplier relationship: he authorised transfers of barley from those guru₇ facilities to another destination. In contrast with many of the other texts concerning specific storage locations, the texts concerning guru₇ storage facilities do not generally specify a destination for their barley disbursements. While Arad seems to have had a connection with some Umma based guru₇ storage facilities, he did not have close connections with granaries in other settlements. Various members of his family clearly did, however, particularly with the guru₇ at Apisal; and therefore whilst this and the guru₇ KI.AN^{ki} seem to have been outside the remit of the guru₇ organisation at Umma, they were not independent of the ruling family of Umma, and were therefore closely tied in with the state.

Evidence from Umma and from Apisal help to define the construction of the guru₇ storage facilities – Apisal shows reeds being delivered by work teams at the same time as clay was smeared on the guru₇, and the latter process of clay smearing is also attested at Umma. This leads me to suggest that a facility called “guru₇” would most likely have been a classic silo type of facility, made out of clay (possibly onto a reed frame), the barley (or other cereals) poured in, and then sealed closed with clay. This would keep out pests of all kinds and ensure the safety of cereals stored long-term.

¹⁸⁸ Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88.

One thing Arad did have clear authority over was the e_2 -šutum from which he was a regular disburser of cereals. The e_2 -šutum was clearly a mixed storehouse, as shown by the fact that disbursements of emmer comprised just under one third of its cereal disbursements, a considerably higher proportion than from any other storage facility. I suggest that the e_2 -šutum is unlikely to have consisted of clay-sealed silos like the $guru_7$, but is more likely to have provided storage for cereal products in ceramic jars or sacks, in order to keep the cereal types separate.

The e_2 -HAR was another regular source of unmilled barley which was available to the ka - $guru_7$. The degree of authority Arad had over the facility as a whole is debateable. There are plenty of “ e_2 -HAR-ta” texts which name Arad as the authority over the transfer of cereals, but almost no “ e_2 -HAR-še₃” texts indicating him as a recipient of cereals on behalf of the e_2 -HAR. He is also never cited as an overseer of work teams involved in grinding cereals, or as an administrator of anything other than the transfer of unmilled cereals out of the e_2 -HAR. I would suggest that, while Arad was not in charge of the grinding house as a whole, or indeed of any of the work teams that operated within it, he nonetheless had a high degree of authority over the cereals that were stored within it, and was at liberty to transfer them to new locations whenever this was necessary. I would also suggest that this fact of Arad’s authority over the unmilled cereals suggest that the e_2 -HAR was a significant part of the state property, or at least property of the ruling family in the city of Umma.

The ga_2 -nun was a storehouse which, being intended almost exclusively for the storage of reeds, had no connection whatever with the ka - $guru_7$. It is attested in the $guru_7$ texts only as a source of reeds, presumably (judging by the evidence from the Apisal granary texts) for the maintenance of storage facilities.

One final cereal storage facility was the i_3 -dub, which was almost certainly not under the aegis of the $guru_7$ organisation despite being specifically a grain storage facility. Exactly who had authority over the cereals stored in these locations is impossible for me to say; a further study must be made into the

personnel connected with the i₃-dub locations, though as a preliminary examination suggests that these personnel were never repeatedly attested in connection with an i₃-dub facility, I suggest there was no continuity of use of any particular i₃-dub. Indeed, the character of the storage is easier to suggest than any connection with institution or household; being closely connected with fields or threshing floors, and with the descriptors used to identify individual i₃-dub locations almost never repeated, it is reasonable to suggest that “i₃-dub” was a term for a temporary storage measure, and that “grain heap” may indicate more accurately the kind of storage it was than “granary” or “storage facility” (as it is translated in various parts of the secondary literature).

In summary, there was a wide variety of storage facility in use in Ur III Umma, of differing degrees of permanence and kinds of use. Different facilities were likely deployed by different households, and since the guru₇ organisation seems to have had authority over some of these facilities but not over others, I suggest there was a strong state connection between those facilities over which it had authority

The facilities described above were not, in spite of their variety, the only forms of cereal storage in the Umma province. It is clear from texts both in the Arad texts and more generally in the Umma text corpus that there must have been some form of field storage as well as urban storage, that probably operated separately the i₃-dub and was administered by Arad under the aegis of the guru₇. Discussion of this field storage will form the next section of this chapter

6.5 – Fields & field-based storage

In the course of this thesis it has become evident that certain field names are very frequently attested in the Arad texts, and since there are several granaries associated with field names as well, I felt it would be relevant to examine Arad’s connection with the fields named in texts from the guru₇ texts.

6.5.1 – *The fields*

Below is a table showing the frequency of attestation of various field names in connection with Arad or the guru₇.

Table 31 – Frequency of attestation of field names in the Arad texts

Name	Frequency of attestation
la ₂ -mah	73
^{giš} Ma-nu	34
la ₂ -tur	14
^d Sara ₂	9
^d Nin-ur ₄ -ra-du ₆ -na	8
Ka-ma-ri ₂ ^{ki}	6
mur ₁₃	5
amar ^{giš} GIR ₂ gunu	3
En-gaba-ri ₆	3
GAN ₂ -mah	3
nin ₁₀ -nu-du ₃	3
i ₃ -sum	3
ensi ₂	2
gibil	2
Gu ₂ -eden-na (u ₃ Muš-bi-an-na)	2
na-ka ₃ -ab-tum	2
Uku ₂ -nu-ti	2

As the table shows, there is a striking frequency of attestations within the Arad texts of just three fields, the a-ša₃ la₂-mah, the a-ša₃ ^{giš}Manu and the a-ša₃ la₂-tur, and the overwhelming majority of attestations involve the la₂-mah field. Besides these three fields there are frequent attestations of four other field names, but none to such a degree as the la₂-mah field and, to a lesser extent, the ^{giš}Manu field.

The majority of attestations of fields in the texts are as sources of grain, in the following manner:

Ontario 2 473

obverse

1. 4(asz) sze gur lugal
2. nig2-ezem-ma {d}dumu-zi
3. a-sza3 la2-mah-ta
4. ki ARAD2-ta

reverse

1. x-ma-ti
2. szu# ba-ti
3. mu us2-sa e2 puzur4-da-gan ba-du3

seal 1

1. he2-na-sa6
2. dub-sar
3. dumu ur-{d}dumu-zi

- 1 4 gur of barley (the royal measure)
- 2 things for the festival of Dumuzi
- 3 from the la₂-mah field
- 4 from Arad
- r. 1 Hamati
- 2 received it
- 3 year after the temple of Puzriš-Dagan was built

Seal

- 1 He-na-sa
- 2 scribe
- 3 son of Ur-Dumuzi

There are also texts which refer to the ki-su₇ of various fields, as follows:

SAT 2 0130

obverse

1. 4(asz) sze gur lugal
2. sa2-du11 {d}nansze
3. ki-su7 a-sza3 {gesz}ma-nu-ta
4. ki ARAD2-ta
5. kiszib3 ha-ha-sza4

reverse

1. iti e2-iti-6(disz)
2. mu us2-sa an-sza-an{ki} ba-hul

seal 1

1. lu2-{d}szara2
2. dumu lugal-si-NE-e

- 1 4.0.0 gur of barley (the royal measure)
- 2 regular deliveries to Nanše
- 3 from the threshing floor of the ^{giš}Manu field
- 4 from Arad
- 5 sealed by Ha-ha-DU
- r. 6 month
7. year after Anšan was destroyed

Seal

- 1 Lu-Šara
- 2 son of Lugal-si-NE-e

The fact that fields are listed as sources of grain indicates that the role of the ka-guru₇ here was the same as his role in texts concerning grain from more obvious storage locations – Arad (and his successor) passes the authority over grain from the fields to a receiving official, described in the texts using the customary formula of ki Arad₂-ta.

Given that Arad is transferring authority over the grain in question, this suggests that he had a certain degree of authority over administering the fields from which it originates, just as he does over some of the storage locations detailed in the texts.

The three most commonly attested fields in the Arad texts also appear in connection with a ki-su₇ (threshing floor), which I have previously mentioned as likely to have had some form of storage attached to them for the storage of both unthreshed and threshed grain. It is therefore possible that these threshing floors are the storage location from which the grain is being transferred.

Aside from being noted as sources of grain, these fields also occasionally appear in connection with workers over whom Arad had authority (the words giri₃, ugula or kišib are used to describe his relationships with teams of workers listed as working in these fields). These texts are far fewer in number than texts concerning barley deliveries, but they all refer to workers performing grain-related activities, such as standing guard in the threshing floor (BPOA 7 1875), levying grain in the fields (BPOA 6 0362) or transporting grain from the field to Umma or another location (e.g. AnOr 01 068).

I would suggest, from the evidence above and from other indications throughout the Arad texts, as well as Arad's position as a member of the ruling family of Umma, that the three most commonly attested fields in these texts are somehow part of the state's possessions, which would explain why Arad had some measure of authority over them. He is seen to authorise the transfer of grain from these fields into the hands of other officials, and to oversee work teams who are carrying out grain-related activity, and grain from all three

fields is put to a variety of uses, though there is a distinct connection with fodder deliveries from both the la₂-mah and ^{giš}Ma-nu fields.

Of the seven most frequently attested fields, the date ranges are as follows.

Table 32 – Date range of the most frequently attested fields

Field name	Date range
la ₂ -mah	SH35-SS07
^{giš} Ma-nu	SH35-SS07
la ₂ -tur	SH39-SS06
^d Šara ₂	SH30-SH36
^d Nin-ur ₄ -ra-du ₆ -na	AS05-SS07
Ka-ma-ri ₂ ^{ki}	SH27-SH36
mur ₁₃	SS04-SS06

The association with the three principal fields was clearly a long-lasting one, which I would contest fits my assertion above, that they were in some way connected with the state. The other fields, though less frequently attested, are interesting in terms of the duration of association. The field of Šara and the field of Kamari were both attested relatively frequently early on in Arad's tenure as ka-guru₇, but their connection with the guru₇ ends in SH36. By contrast, the fields of Ninurra and "mur₁₃" become connected with the ka-guru₇ much later, quite possibly after Arad had handed over the role to his son Šara-izu. It is possible that Šara-izu brought the connection with him to the role, but otherwise it is difficult to explain.

6.5.2 – the ki-su₇/threshing floors

The Sumerian term ki-su₇ is translated as "threshing floor" – the place where the threshing of newly harvested grain occurred. It is highly likely that these threshing floors were located very close to the fields in which the barley and other grains had been grown, and this is reinforced by the fact that many individual threshing floors mentioned in the texts are identified as the ki-su₇ of particular fields. It is very likely that each ki-su₇ had some form of storage connected with it; grain is much more easily threshed after it has been dried, so each threshing floor would need a place for the harvested grain to be laid

out for drying, and likewise somewhere for the threshed grain (and also the chaff, which could be used for animal fodder).

Classifications of the ki-su₇

There are so many descriptors of individual threshing floors that it would be of little value to list them all here, but there are broad categories of classification that are more useful to examine. Below is a table listing these categories of classification of the various threshing floors in the Umma province.

Table 33 – Categories of classification of the ki-su₇ storage facilities

Category of classification	Frequency of appearance	Percentage of total
ki-su ₇ a-ša ₃	382	28%
ki-su ₇ [e ₂ -duru ₅] gu-la divided into:	133	9.8%
ki-su ₇ gu-la	101	7.4%
ki-su ₇ e ₂ -duru ₅ gu-la	32	2.3%
ki-su ₇ e ₂ -duru ₅	11	0.8%
Total texts	1364	

There are distinct categories of threshing floors; as mentioned above, the word ki-su₇ occurs frequently in connection with fields, and there is also an association with the word GAN₂, another word meaning “field”. Like the i₃-dub, the ki-su₇ was a local form of storage for grain in both its unthreshed and threshed forms, and was likely located near to whichever field the grain was grown in; to transfer it long distances unthreshed would have been costly and impractical.

The most commonly attested field names in the Arad texts are as follows.

Table 34 – The frequency of attestation of the most common fields

Name	Frequency of attestation
ki-su ₇ a-ša ₃ la ₂ -mah	13
ki-su ₇ a-ša ₃ ^{giš} Ma-nu	6
ki-su ₇ a-ša ₃ ^d Nin-ur ₄ -ra	6
ki-su ₇ a-ša ₃ la ₂ tur	5
ki-su ₇ a-ša ₃ muru ₁₃	5

Here it can be seen that, as with the fields above, the familiar fields of la₂-mah, ^{giš}Manu, la₂-tur and ^dNinurra are again the most commonly attested. The five

mentions of the ki-su₇ a-ša₃ muru₁₃ account for all mentions of the a-ša₃ muru₁₃ in the Arad texts.

There is a small set of texts which link the word “ki-su₇” with the word “gu-la”, often in the phrase, “ki-su₇ e₂-duru₅ gu-la”, which is likely to be translated, “the ki-su₇ of the large village”, where the e₂-duru₅ was the location of the housing for agricultural labour; presumably the scribes would have known which e₂-duru₅ was meant by this phrase. There are quite a few more texts which use the phrase “ki-su₇ gu-la”; whether gu-la was being used as an adjective in these cases (as in, “the large ki-su₇”), or as a shorthand for the complete phrase, “ki-su₇ e₂-duru₅ gu-la” is not entirely clear, but it seems likely that the two sets of texts are connected.

There is one mention of the term sizkur in a text concerning a ki-su₇; specifically, the text concerned barley and emmer as “nig₂ sizkur₂-ra” in connection with the ki-su₇ gu-la a-ša₃ la₂-mah. This is a rare example in this texts of a sizkur offering, a kind of offering that seems to have an element of prayer attached to it (rather than a regular delivery/offering as with the term sa₂-du₁₁, which seems to have had a more dutiful character to it). These sizkur offerings are noted by Stępień as having been “sacrifices accompanying prayers in small shrines located in open fields, centers of a local “plebeian” cult which may have existed in quite large numbers in the province.”¹⁸⁹ Though they were apparently animal sacrifices, it would not have been unusual for a barley offering to be made as well. The a-ša₃ la₂-mah is the only field in the Arad texts to have a record of having sizkur offerings made, which indicates its importance and perhaps explains, in part at least, the use of the phrase “ki-su₇ gu-la” – the large ki-su₇ attached to an important field in the province.

Commodities

¹⁸⁹ Stępień, *Animal husbandry in the ancient Near East: A prosopographic study of third-millennium Umma*,

Table 35 – Commodities associated with the ki-su₇ storage facilities

Commodity	Frequency
grain	~1000
gurus/geme ₂	>350
udu	55

There were a great many texts referring to labourers in place in the ki-su₇; most often these refer to workers transporting barley to and from the ki-su₇, while a small subset describe guruš workers as ki-su₇ gub-ba “standing [on duty] at the ki-su₇”. Both of these tasks hint at the fact that the grain in the ki-su₇ is unlikely to have been kept securely at the threshing floors, and would need guarding while it was there, as well as swift transport to more secure storage locations.

As with the figures given earlier in the chapter for the types of cereal most commonly linked with the various storage locations and sources, the ki-su₇ is very rarely the source of emmer or einkorn wheat; it is almost entirely a source of barley.

Arad and the ki-su₇

Of the more than 1300 texts from Umma that refer to the ki-su₇, Arad is mentioned less than 100 times. Though he was clearly associated in some way with the operation of the ki-su₇, it is unlikely that he had any real jurisdiction over the grain that were being threshed and stored there. It seems that grain fell under the authority of the granary at some later stage in the process of harvest, transport and storage.

Summary

In summary, it seems clear that, as well as the location for the threshing of grain, the ki-su₇ also acted as a facility for storing it, albeit temporarily. These facilities were located in or near to fields, and there was a close connection between the guru₇ and the threshing floors of certain substantial fields, particularly the a-ša₃ la₂-mah and the a-ša₃ ^{giš}Manu, which recur frequently in these texts. Threshing floors could also be located in villages or hamlets, generally identified by name in the texts. Given the paucity of mentions of

Arad or the guru₇ in texts referring to a ki-su₇, it seems unlikely that the granary keeper had any great deal of jurisdiction over the grain stored in the ki-su₇ facilities in the Umma fields until the grain harvest was moved into the more permanent storage facilities he administered. A possible exception are the la₂-mah and ^{giš}Manu fields, the products of which seem to have been administered almost exclusively by the ka-guru₇.

6.5.3 – Field granaries

Alongside the named fields and the evidence for storage in or near to the threshing floors connected with those fields, there are also a number of guru₇ granaries, in both the Umma text corpus and in the Arad texts, which are named after various fields. These are identified by the formula “guru₇ a-ša₃ [name]” and will be referred to in this thesis as “field granaries”. These field granaries are listed below.

Table 36 – The frequency of attestation of the field granaries and the frequency of association with the ka-guru₇

Name	Attestations in Umma corpus	Attestations in Arad texts
guru ₇ a-ša ₃ la ₂ -mah	6	1
guru ₇ a-ša ₃ la ₂ -tur	2	0
guru ₇ a-ša ₃ ^d Nin-ur ₄ -ra	4	0
guru ₇ a-ša ₃ ^{giš} Ma-nu	2	1
guru ₇ a-ša ₃ e ₂ -HAR	1	0
guru ₇ -a kin a-ša ₃ Uku ₂ -nu-ti	1	0
guru ₇ ša ₃ a-ša ₃ -ga-ka	1	1
guru ₇ a-ša ₃ lugal-ka	1	0

As can be seen above, there are 8 separately named field granaries, of which four are attested once only. The other four appear more frequently, but are nonetheless still scantily attested. All four of the field granaries that appear more than once bear the names of fields which are regularly attested in the Arad texts, as shown in Table 36, above. Three of the four fields (the la₂-mah, la₂-tur and ^{giš}Manu fields) are attested very frequently, with the fourth (the a-ša₃ ^dNin-ur₄-ra) appearing less often.

Besides the field granaries listed above, which are directly named as granaries attached to fields, there is evidence that there may have been other field granaries not identified by the formula “guru₇ a-ša₃ [name]”. An example of this is Princeton 2 503, where there is mention of the a-ša₃ ^dŠul-pa-e₃ alongside the guru₇ ^dŠul-pa-e₃.

Princeton 2 503

obverse

1. 1(gez2) 4(u) 4(disz) ug3-IL2 sila3
2. a-da gub-ba a-sza3 ambar-tur
3. 2(u) 1(disz) ug3-IL2
4. a-sza3 gub-ba a-sza3 lugal-lal3
5. 2(u) 8(disz) ug3-IL2 sila3
6. a-sza3 gub-ba a-sza3 {d}szul-pa-e3
7. 1(gez2) 3(disz) ug3-IL2 sila3
8. guru7 {d}szul-pa-e3
9. gaba <a-sza3> apin-ba-zi
10. 3(u) ug3-IL2 sila3
11. i7-da {d}szara2-[he2]-gal2

reverse

1. 4(u) ug3-IL2 sila3
2. bar-la2 u3-dag-ga gub-ba
3. 2(u) 2(disz) ug3-IL2 sila3
4. guru7 {d}szul-pa-e3
5. 2(u) 1(disz) ug3-IL2 sila3
6. <a-sza3> apin-ba-zi-ta a-sza3 zabar-sze3
7. a ku5-ta
8. [ub?] dub-ba
9. [...] kiszib3 inim-{d}[...]
10. iti dal
11. mu {d}amar-{d}suen lugal

Seal

1. Inim-^dInanna
2. dumu Lugal-iti-da

The fact that the field and granary bear the same name indicates a link between the two; it is reasonable to assume that the storage facility guru₇ ^dŠul-pa-e₃ served the a-ša₃ ^dŠul-pa-e₃.

It seems highly likely that there was not only the means of recording in the texts the storage of specific quantities of produce from the individual fields in the main granary system of Umma, but separate storage facilities for each

specific field. The field granaries, in conjunction with the guru₇ ^dšul-pa-e₃, make it quite reasonable to suppose that certain fields would have had storage facilities either specific to that field, or else near enough to that field to be identified by its name.

While the appearance of the term guru₇ is not unique to the most frequently attested fields, the fact that these fields had the largest number of attestations of granaries is suggestive. These two facts give further evidence to a strong relationship between the fields and various individuals, including Arad, who were active upon state matters.

Appearances in conjunction with other storage facilities

The field granaries are very seldom mentioned alongside other forms of storage; twice in this set of texts there is mention of an i₃-dub facility, and once of a threshing floor. Earlier in the chapter, I discussed the i₃-dub storage facility, deducing from the frequency of i₃-dub [field name] in the record that it was a field-based storage facility, probably of a temporary nature rather than a permanent feature of the landscape. The field granaries most likely differed from the i₃-dub is in terms of permanence. and I suggest that they were clay silos of the kind described in Chapter 2, rather than short-term forms of grain storage. It seems likely that they were located either in the fields (that is, within settlements connected with the fields) or were otherwise located nearby and dedicated specifically for the storage of barley from those fields.

Management of storage

As can be seen in Table 36, Arad is seldom connected in the texts with the field granaries, though he is once attested with the a-ša₃ ^{giš}Manu as a recipient of barley (Ontario 2 278) and his successor as ka-guru₇ is attested once with the a-šaš₃ la₂-mah as a supplier of cereals (SAT 3 1290).

Summary

Alone, the evidence of the field granaries would not prove much; there are too few connections between them and Arad the granary keeper to make any definite observations of the nature of his connection with them. However,

when taken alongside the evidence given in section 6.5.1, concerning the frequency of attestation of certain fields in the Arad texts, the appearance of these granaries is suggestive of a complex hierarchy of fields and field storage.

6.6 – Discussion of field storage

Earlier in this chapter I discussed the i_3 -dub storage facility, deducing from the frequency of i_3 -dub <field name> in the record that it was a field-based storage facility. It is clear, however, that this was not the only form of storage associated with fields, as the above discussions of both field granaries and the use of the $ki-su_7$ for barley storage show. The precise differences between $guru_7$ and i_3 -dub storage are not resolved with any certainty, but several facts are suggestive.

Firstly, there is the previously mentioned fact that the designations used to describe individual i_3 -dub facilities are almost never repeated, implying a temporary nature in these facilities – perhaps they were erected for one season, according to need.

Secondly, there is the intriguing fact that there are only eight named field granaries in the Umma text corpus, and the four that occur more than once are the field granaries of the four most commonly attested fields in the Arad texts.

If we accept the suggestion that Arad had a connection with these fields, and was perhaps in charge of administering grain produced in at least three of them, then it is no great step to imagine that he might have been in charge of $guru_7$ storage facilities named after these three fields.

Arguing against this suggestion is the fact that two out of these four field granaries are not attested in the Arad texts (though the $guru_7$ a-ša Ninurra might be assumed to be connected with the $guru_7$ us_2 -sa e_2 Ninurra, which is named in the Arad texts). The field granary for the a-ša₃ la₂-tur is attested only twice in total, administered once by Adaga and once by Ayakalla, Arad's brother and later $ensi_2$ of Umma, so despite the lack of an obvious connection with Arad or the $guru_7$, there is still a link to important members of the ruling family.

Whether Arad had authority over these field granaries or not, it is certainly clear that some fields had i₃-dub facilities and some – perhaps the largest, or those administered by the state – had guru₇ facilities. The question remains as to what manner of storage the guru₇ (as a facility rather than an organisation) was. I have previously posited that, as it is mentioned almost always as disbursing barley only, and not other cereals, and also that as it is very occasionally mentioned in the worker texts as having clay smeared upon it (im ur₃-ra), that a guru₇ was a large scale silo intended for long term storage, unlike some other facilities that were probably accessible all year round. Perhaps this implies that a guru₇ named for a field may not have been located near to that field, but could perhaps have been a facility in Umma, or at least at some distance from the field in question, but designated as storage for the barley harvested from that particular field. But however it was designed and wherever it was located, I am still confident in suggesting a link with these fields to the state, or at least to the palace of the ensi, and therefore with the guru₇ as a broader institution. Considering the small number of attestations, it may be that Arad did have a connection, as ka-guru₇ rather than as a member of the ruling family, with these fields and field granaries, that is simply not immediately apparent in these texts; it could also be the case that barley disbursements purporting to come from these fields might indicate that they came from the field granary of those fields, which were significant enough or well enough known to not require “guru₇” to be added to the name – the assumption being that the scribal class would be familiar enough with it to assume that “a-ša₃ la₂-mah-ta” means “ki guru₇ a-ša₃ la₂-mah-ta” without needing it to be stated explicitly.

This could be why a great many of the regular disbursements of fodder to animal fatteners come from the e₂-HAR or the e₂ šutum; if the storage at these locations was not in the form of silos but, as posited above, ceramic storage jars or even sacks, it would be easier both to disburse comparatively small amounts (as frequently went to the equid handlers) and also would limit the risk of spoilage in any silo type storage, such as the guru₇ (storage facility)

might well have been. The more times a storage unit is opened to the air, the more risk of microbial, fungal or mammalian pests invading and spoiling the stored grain. The fact that clay was smeared on the guru₇ facilities implies that they were intended as long term storage, not to be opened up regularly but one at a time according to need.

Chapter 7 – Conclusions

7.1 – Summary of findings

The purpose of my study was to determine the extent of the economic role of the guru₇, “granary”, and also to determine the nature of some of the storage facilities identified in the texts in terms of their relationship to the guru₇. This was achieved through examining the texts concerning the guru₇ and those concerning the ka-guru₇, the head of the granary and the individual ultimately responsible for administering the cereals stored in the various facilities of the guru₇.

7.1.1 – The administration of the guru₇ organisation

This study has identified the major areas of operation of the guru₇ as an administrative unit and has helped to define Arad’s role, not only as the granary keeper but also as a member of the ruling family of the province.

These findings were as follows:

- As ka-guru₇, Arad’s role included the areas of cereal provision and of work team administration, particularly in specific fields; these two comprised the main areas of economic activity of the guru₇. In addition to his duties on behalf of the guru₇, he is known to have sealed a small number of transactions involving animals, mostly on behalf of his nephew Lu-Haia – this divergence from ordinary guru₇ duties is doubtless due to his being a member of the ruling family of the province.
- One of the principal findings of this study is that the economic activity of the guru₇ had a tighter focus than perhaps would be expected of an institution called “the granary”, with barley disbursements

concentrated in four main categories: fodder, sa₂-du₁₁ “regular deliveries”, rations and wages for lu₂ hun-ga₂ “hired workers”.

- The disbursements for fodder consisted of regular small amounts throughout the year, making the supply of fodder one of the main responsibilities of the guru₇. These fodder disbursements focused upon provisioning equids and cattle for agricultural work, and cattle and sheep for cultic and consumption purposes.
- Regular sa₂-du₁₁ deliveries were, in spite of the name, not regularly disbursed from the guru₇, and they were not supplied to all temples but were principally disbursed to the Šara temple, with the many other temples of the province either omitted or scantily provisioned.
- The latter two categories of rations and of wages for hired workers were also relatively limited in their scope; the guru₇ did not supply regular wages or rations to any destination or individual, though the quantities disbursed in wages were considerably higher than any of its other outputs. While fodder was the most commonly attested category in the Arad texts, the quantity of barley disbursed for this purpose was lower than that disbursed as regular deliveries or as wages for hired labour.

The overall picture of guru₇ administrative operations given by the above facts suggests an institution that concerned itself primarily with state business, on behalf of the king and the ensi (governor) of the province. It implies, above all, that the guru₇ was most likely not the grain store for the entire city or province, and that it did not act on behalf of the temple households of Umma. I would suggest that the temples, and any other large households within the province, looked to themselves to obtain and store grain, and provisioned their workers from their own stores, with periodic additions to their barley supply from the guru₇ made principally at festival times.

7.1.2 – The nature of the storage facilities utilised by the guru₇

The results of my investigation into the storage facilities named in the texts from Umma can be divided into three areas: accessibility to the guru₇, contents, and nature of the storage.

Access:

- The storage facilities to which the officials of the guru₇ had at least some degree of access include the e₂-HAR (the main grinding house in Umma) and the e₂-šutum (a storehouse dedicated to cereals), and various guru₇ facilities.
- The degree of access to guru₇ officials differed for each facility; the contents of some of the guru₇ structures and the e₂-šutum seem to have been entirely at the disposal of the ka-guru₇, while the e₂-HAR, though permitting guru₇ officials ready access to its unmilled barley stores, does not seem to have come under the direct management of the guru₇.
- The guru₇ organisation also had access to what I have termed “field storage”, which comprised the threshing floors and guru₇ facilities of various fields. Another storage facility, one likewise connected with fields and threshing floors but over which the guru₇ had no authority, was the i₃-dub storage facility, a storage feature of a temporary nature.
- The field storage was, like the e₂-HAR, of limited and particular accessibility; the storage facilities belonging to some fields, notably the la₂-mah, la₂-tur and ^{giš}Manu fields, were clearly connected quite closely with the guru₇, while other fields and threshing floors seem to have supplied both the guru₇, and other individuals not connected with the guru₇, with barley and other cereals

Contents:

- The majority of the storage facilities described above stored barley only (though it is highly probable that the e₂-HAR also had storage dedicated to different grades of flour; it simply did not supply the guru₇ with these products).

- The e₂-šutum is the exception, with almost one third of the cereals it supplied to the guru₇ comprising emmer wheat, to approximately two thirds barley.

Nature of storage:

One of the most significant findings of this study is that the different natures of grain storage almost certainly reflect different usages.

- The guru₇ storage facilities seem to have been used for permanent and long term storage, as shown by the fact that they are recorded in transactions concerning barley only (and not any other sort of cereals) and also the fact that workers are recorded as smearing clay upon guru₇ facilities, presumably to seal them closed for long term storage – which suggests that they must have been either the kind of clay silo described at Šurruapak (though it is not established whether they were on a similar scale), or else the kind of beehive granary visible in Egyptian and Greek art and in the archaeological evidence of Palestine, among others, intended for the long term storage of barley only.¹⁹⁰
- There is also the possibility that certain fields had specific guru₇ facilities designated for their barley produce, as evidenced by the four fields to feature most prominently in the Arad/guru₇ texts all having granaries which bore their names.
- The e₂-HAR cannot have been a permanent storage facility either, as it was used primarily for storing grain to be ground/milled, though it is clear that the guru₇ organisation and the ka-guru₇ had some degree of authority over what was stored there as it is a frequent source of unmilled barley.
- The e₂-šutum was clearly a permanent facility, appearing in texts throughout the period, and though it seems to have gone from one facility to a set of facilities all called e₂-šutum during the reign of Amar-Suen, it was a regular supplier of grain. The frequency of these

¹⁹⁰ Breckwoldt, *Management of grain storage in Old Babylonian Larsa*, 64-88.; Currid and Navon, *Iron age pits and the lahav (tell halif) Grain Storage Project*, 67-78.; Martin, *Fara: A Reconstruction of the ancient Mesopotamian city of Shuruppak*,

supplies, along with the variety of cereals stored in the e₂-šutum (a great many texts detailing supplies from the e₂-šutum list emmer wheat as well as barley) lead me to suggest that it was not a sealed silo like the guru₇, but a storehouse where different cereal products were kept, possibly in ceramic jars or possibly in leather sacks.

- At the other end of the permanency scale, the i₃-dub facilities seem from the texts to have been short term or temporary storage facilities – in 68 texts there are 4 repeated names for i₃-dub facilities, and the administrators that dealt with grain movement from these locations were similarly inconsistent. The i₃-dub facilities are also associated with field names, suggesting they may have been connected with or even located in the fields in question.
- The field storage is also suggestive of one further idea: Arad, and therefore the guru₇, were associated very heavily with certain fields, which (if one accepts the suggestion that the guru₇ was closely tied up into the state administration) could imply that these fields were some of the principal fields in the province.

The evidence described above indicates two things about the storage of cereals in Ur III Umma: firstly, that the storage of grains belonging to the guru₇ was not concentrated in one area, such as within one set of central silos, but encompassed a number of storage facilities, all under the control of the guru₇ and granary keeper; secondly, that while there may have been a central set of silos, the other storage facilities were more significant in the frequent regular transactions detailed in the texts, such as the deliveries to the animal fatteners. Indeed, it is possible that the use of some storage facilities for regular outgoings is quite natural, as it would save the contents of other facilities from the risk of spoilage (which increases the more a grain store is opened), and means that some grain could be held back for long-term surplus storage, while other storage facilities (such as those connected with the e₂-HAR and e₂-šutum, which

turn up so frequently in texts) would have saved the need for potential contamination of these long-term storage locations.

One final theme to emerge from my analysis was of a change in guru₇ accounting practices during the Ur III period, at the point where Arad's tenure as ka-guru₇ passed to his son, and thus more broadly somewhere between the later stages of Amar-Suen's reign and the beginning of the reign of Šu-Sin. In this short period, not only does the terminology within the guru₇ texts alter but the type of transaction from the guru₇ changes, as follows:

Things that become less prominent in the administration at around the time of Arad's retirement:

- 1) regular deliveries to the e₂-nig₂-lagar
- 2) the association between the ka-guru₇ and the e₂-šutum – the storehouse as an entity continues to exist, but authority does not pass to Šara-izu
- 3) the association with KI.AN
- 4) receipts of animals (on behalf of his nephew, Lu-Haia)
- 5) a substantial decrease in the quantity of fodder texts associated with the guru₇

Things that increase in importance at around the time of Arad's retirement:

- 1) the quantity of guru₇ texts increases in the reigns of Amar-Suen and Šu-Sin
- 2) texts designated as regular deliveries increase in frequency during Šu-Sin's reign (obviously, these do not include the e₂-nig₂-lagar regular deliveries, which disappear)
- 3) texts designated as rations increase significantly in frequency in the reign of Amar-Suen and continue at a high level into Šu-Sin's reign
- 4) names or descriptors for various facilities increase: named guru₇ units increase in frequency of attestation, and names/descriptors for the e₂-šutum increase in number and in attestations from AS02 onwards

- 5) after the retirement of Arad from the granary keeper role, texts stop referring to the granary keeper by name (as in the phrase ki Arad₂-ta) and instead refer to him by title (ki ka-guru₇-ta)

All of the above points to a change in guru₇, and perhaps in wider accounting practice. Some of the duties, such as receiving dead animals, are clearly factors of Arad's membership of the ruling family; although his son is also a member of the family, it seems probably from the evidence that he did not face the same broad spectrum of family duties as his father did, though why that should be is not certain. The changes in some other duties are less clear. The reduction in the frequency of fodder disbursements, for instance, is hard to explain with the available data and analysis. Similarly, the KI.AN connection and termination thereof is also difficult to explain. Could it have been handed on to another agency on Arad's retirement? It is impossible to give a certain answer without further research.

The duties of the guru₇ were not, apparently, impaired by the change in function, especially when one considers the increase in texts coming from it. The increase in regular deliveries and rations suggest that the responsibilities of the ka-guru₇ altered during Amar-Suen's reign; whether this was due to the change in official or to some other cause, such as alterations to accounting procedures throughout the provincial administration, is impossible to say. The alteration in the guru₇ texts is interesting; Šara-izu is very rarely referred to by his name in any text, and the guru₇ texts simply list him as "ka-guru₇".

Unfortunately, any further explanation of this phenomenon in this dissertation is impossible; it must become the focus of future investigation, as without further data my study can add no more.

7.2 – Relationship with previous research

Much of this study is consistent with previous research. While my findings have improved our knowledge of Arad's role and significance, particularly concerning the operations of the guru₇, they nonetheless sit comfortably alongside Dahl's study on the ruling family of Umma, and in terms of the understanding of administrative practices my study does not differ

substantially from the interpretations of such scholars as Steinkeller, Adams, Englund, Garfinkle and Widell.

I disagree with the strong emphasis on centralised redistribution given by Grégoire.¹⁹¹ My thesis has made it clear that the distribution of grain was much more complex than is characterised in Grégoire's piece, with a strong emphasis on supporting the state institutions and very little in the way of provisioning the general populous. It seems unlikely that the *guru₇* was a large-scale storage complex located in the centre of the city, dispensing grain to the public in redistributive fashion. A model with storage facilities located in rural facilities, and though I do not discount the possibility of an urban storage facility, I posit with confidence that the *guru₇* in the city was principally an administrative unit, not a physical storage site.

For this reason, I tend more towards Widell's model in *Models of Mesopotamian Landscapes*, though I suggest that my findings modify it slightly.¹⁹² Firstly, instead of storage from many fields, my findings suggest that a great deal of the grain coming into the *guru₇* originated in a small number of specific fields. It seems that the central granary/*guru₇* had authority over certain rural storage facilities, but not over others, and that redistribution went to various state institutions and offices, but not regularly to the temples as suggested in the model, with the exception of the Šara temple. Grain storage, it seems, was not as highly centralised as previously suspected; certain parts of it were strongly centralised and redistributive, but the focus of the *guru₇* operations was surprisingly narrow, and it is not clear from my findings where the remainder of the province's grain was stored.

In most cases, however, the differences between my findings and the conclusions of others are slight, and only as regards details of interpretation. For instance, my findings do not exactly modify Stepien's discussion of the prebend lands belonging to the *ensi₂*, but they may provide further

¹⁹¹ Grégoire, *Major units for the transformation of grain: The grain-grinding households of southern Mesopotamia at the end of the third millennium BCE*,

¹⁹² Wilkinson, Gibson, and Widell, *Models of Mesopotamian landscapes: how small-scale processes contributed to the growth of early civilizations*.

information with which to analyse the material he has discussed. He notes certain fields as most likely being the land holdings that belonged in some form to the office of the *ensi*₂, while my work has revealed evidence, both to support his evidence that certain fields, including the *a-ša*₃ *la*₂-*tur*, were prebend lands of the *ensi*₂, and also to suggest that other fields, particularly the *la*₂-*mah*,^{giš} *Manu* and *Ninurra* fields, may also have been closely connected with the state in some similar way, given their significance in the records of the *ka-guru*₇ and their association with other members of the ruling family.¹⁹³

My findings concerning the *guru*₇ also tally with those of Sigrist and Tsouparopoulou regarding *Drehem*; namely that the majority of livestock processed by the agency at *Puzriš-Dagan* were not physically transported through that location, but that it was most likely an administration hub, where authority over livestock was changed and recorded on tablets.¹⁹⁴ In the case of the *guru*₇, my findings concerning barley transfers indicate that the majority of gathering in and redistribution was done on tablets in *Umma*, while the barley itself remained in whichever storage location it had been placed, with nothing more than a change in authority over it. It could not, of course, keep changing hands and never be used – it was, after all, a foodstuff of prime importance – but I posit that it may well have changed hands “on clay” more than once before finally being removed from whichever storage location it was being kept in and used.

Finally, I should like to observe just how accurate Snyder and Jones were in their assessment of both the *guru*₇ and the role of the *ka-guru*₇ as described in Chapter 2 and repeated here.

On the *ka-guru*₇:

an important official in charge of a major depot to and from which large amounts of grain came, and the administration of which occasionally at least involved the employment of considerable numbers of labourers...among the transactions are the regular deliveries of cereals for gods, festivals and going to buildings etc. Other

¹⁹³ Stępień, *The Economic Status of Governors in Ur III Times: An Example of the Governor of Umma*, 17-30.

¹⁹⁴ Tsouparopoulou, *A Reconstruction of the Puzriš-Dagan Central Livestock Agency*

expenditures not designated as regularly occurring events went as fodder for animals, as supplies for festivals, as wages and provisions for workers, and as the purchase price of animals, in addition to other disbursements not so easy to identify. When seen in the light of many other types of expenditures appearing on Third Dynasty tablets, it seems possible that these were perhaps limited to certain administrative needs of the community at Umma; they do not compare with the quantities going as salaries for workers or as the sums involved in the balanced accounts of some of the agencies and individuals active in Ur III affairs.¹⁹⁵

And on the gur₇:

If not a large depot compound, the gur₇ must have been an administrative or accounting agency whose function it was to supervise certain types of expenditures...however, as its name suggests, there must also have been storage facilities as well as supervisory offices at the gur₇ proper.¹⁹⁶

Far from contesting any of these conclusions, this thesis concurs with them in almost every particular and, with the benefit of considerably more data than Snyder and Jones had access to, I have now been able to clarify just what those “certain administrative needs” and “certain types of expenditures” were, and to suggest some reasons for those limitations.

7.3 – My contribution

My study has made four significant contributions to the literature on grain storage.

Firstly, I have conducted a full survey and some detailed analysis of the economic and administrative responsibilities of the gur₇ and of the granary keeper of Umma. I have established the extent of the gur₇ as a facility for grain storage and a unit for the administration of grain transactions, as detailed above. It is an institution tied into the state, and the implication of this is that there were other means of provisioning the population besides the gur₇ administrative unit, which had a relatively limited set of functions in the province of Umma. This adds real knowledge to the current corpus of

¹⁹⁵ Jones and Snyder, *Sumerian Economic Texts from the Third Ur Dynasty: A Catalogue and Discussion of Documents from Various Collections*, p. 317

¹⁹⁶ *ibid.*, p. 318

secondary literature on Ur III Umma and will be useful far beyond the specific area of study, by supplying a means of comparative analysis with other locations and time periods.

Secondly, I have provided a full survey of grain storage terminology and suggestions and arguments as to the nature of the different storage facilities. This was noted as a major gap in the secondary literature by Tate Paulette in his University of Chicago doctoral thesis, and therefore my work constitutes a significant addition to the discussion on storage facilities in the Ur III period, and also to studies on grain storage in the Ancient Near East more generally, and can even contribute to wider discussions on the nature of storage in different parts of the world.

Thirdly, I have defined the *guru₇* both as a storage unit and as an administrative unit. I have remarked upon the similarity with other agencies that were designed for administrative rather than physical storage purposes, such as the livestock agency at Puzriš-Dagan, and have confirmed that the *guru₇* was similarly designed as an administrative rather than a storage unit. I consider it unlikely that there was a substantial physical storage facility called the *guru₇* within the city of Umma itself; the storage is most likely to have taken place in the various villages and settlements attached to the province's fields. It is also clear that the *guru₇* administrative unit, of which Arad was *ka-guru₇*, was most closely associated with four specific fields which had a strong state connection, supporting the view that the *guru₇* was a unit specifically of state storage, and most likely did not store grain on behalf of other households or institutions.

Finally, various of my findings have demonstrated the real importance of close examination and analysis of the numbers involved; for instance, while fodder is the most frequently attested type of disbursement from the *guru₇*, the amount of grain disbursed for this purpose was actually smaller than for some less well-attested uses for grain. This indicates that fodder was distributed in small but frequent disbursements, and this kind of information only becomes apparent if the numbers are examined in close detail. Similarly, the analysis of

texts over long time periods has pointed up some interesting alterations in the administrative practices and also in the role of the ka-guru₇, which may well have been missed without a rigorous quantitative method.

7.4 – Limitations of research

I should stress that my study has been primarily concerned with the province of Umma, and as such has not taken into account any data from other provinces. This was a deliberate decision made during the data gathering process, in which I faced the problem of the sheer volume of data returned from the database searches described in Chapter 3. It soon became clear that, although I had initially intended an examination of the guru₇ across the Ur III text corpus, the amount of data would have been counterproductive and the effort of processing the information from such a huge dataset would have limited the quality of the analysis and the range of findings. I therefore refined my parameters in order to obtain a better calibre of analysis, and I believe that my findings are more significant for being drawn from a smaller and more specific dataset, and one that is supported by an abundance of recent secondary literature.

My decision to focus closely upon the province of Umma does bring limitations to the applicability of this study. It has been plain from the many other studies of the Ur III period that the various provinces and cities differed from one another in terms of management and administrative practice. Our understanding of institutional administration one province is therefore not necessarily applicable to the institutional practices in another province. Concentrating my discussion of the guru₇ on the Umma facilities has therefore limited the degree to which my findings can be transferred to other provinces, such as Girsu (which has extensive archives of its own, including a large guru₇ archive), and especially the provinces whose archives are too small for proper studies to be made.

This particular limitation in sharing findings between provinces is, however, well known within the field, and if used with appropriate caution my findings can help to shed light upon aspects of institutional practice in other provinces.

Furthermore, the method I have developed in preparing this dissertation most certainly is applicable and transferrable to the study of other provinces and institutions, and certainly any limitations to the applicability of this study caused by a focus upon Umma do not lessen the significance of my findings for the province of Umma itself.

The focus of this dissertation was intentionally upon general trends within the data, as my intentions were to model the processes of administration within the *guru*₇ and to determine what patterns emerged and what significance they might have. I have concentrated upon some specific texts, but further investigation into the “outlying” texts might prove fruitful sources of information.

I chose an approach to the data that involved a strong methodological framework. In the preparation for undertaking this thesis I considered that quantitative analysis was a sound approach, especially considering that I did not enter into data analysis with any particular hypothesis but in a spirit of simply interpreting the data presented by my researches, and it was only very late in the analysis that I discovered some aspects of the data that indicated that theoretical viewpoints from within the fields of finance or business might have any bearing upon my data. I recommend that the data would benefit from further analysis using financial or business models, perhaps in conjunction with an expert in those fields, for the sake of providing further interpretations of the administrative and organisational structures in place within specific organisations of the Ur III period such as the *guru*₇.

My intention on beginning this piece of research was to provide an interpretation of the economic and social role of the *guru*₇ in Umma during the Ur III period. I believe I have achieved a sound interpretation of the economic side of the question but, unfortunately, the nature of the data does not allow me to determine any great detail concerning the social role of the *guru*₇. It is a noted problem that the majority of the population of the Ur III period is missing from the texts, and academics working in the field can only define their social status in relation to their economic status. My method, whilst

sound where it concerned the economic side of the *guru₇*, was not flexible enough to reveal insights into the social aspects of grain storage and food provision, and has only added to the understanding of the already privileged group of named graduates of the scribal school who took up official positions in the administration. An interdisciplinary approach might be a remedy for the absent populace in this case, as there are studies on, for instance, Greco-Roman food supply that could prove relevant to discussions on food supply in Mesopotamia. As a research approach, a comparative analysis of this kind seems the most likely to be fruitful.

Similar limitations in the data have prevented me from some deeper analysis with regard to the nature of the relationship between the *guru₇* and the palace at Ur – as there is no palace archive and, indeed, very little textual material concerning the palace in general, it simply has not been possible to establish a clear link between the *guru₇* and the palace, besides the obvious fact that the *guru₇* at Umma must have been closely connected with the state.

7.5 – Implications of findings and recommendations for future research

My thesis has implications, not only for our perceptions of how grain storage worked in the province of Umma specifically, but also how it functioned in the Ur III state more widely. As I discussed in Chapter 2, there has been a general assumption that there was some kind of centralised grain storage system in the various Ur III provinces and that the *guru₇* was the facility and organisation that provided this centralised storage for each province. My thesis, however, demonstrates quite clearly that the *guru₇* did not perform this particular function in Umma; the texts I have studied show that it had a very specific remit in the economy and government of this province. This raises questions as to whether the *guru₇* (as an organisation) functioned as a centralised grain storage facility in any of the other provinces, or whether it always had the same specialised and limited remit as the *guru₇* at Umma. To investigate this, there are two potential directions for future research; one of which is to determine more clearly the grain storage situation within Umma itself and to clarify whether there was a central grain storage facility there at all, and the

other of which is to examine the textual archives of other provinces, to establish whether the *guru₇* was ever a centralised, general grain storage facility supplying all the major institutions of the Ur III economy, or whether it always operated with the limited and specialised remit of the Umma *guru₇*. Further research needs therefore to be carried out into how grain storage functioned in Umma beyond the remit of the *guru₇*, to help develop a better model for the storage of grain in the province as a whole. There are many areas of potential research here, particularly concerning who or what was providing those services for which the *guru₇* at Umma seems not to have been responsible. Who provisioned brewers with barley for their beer, farmers with the seed grain they needed for planting, and where did the temple households procure the majority of their barley supplies to pay grain rations to their workers? These are valuable questions, and this investigation could be performed by means of true prosopographical analysis, possibly alongside similar quantitative analysis as that carried out in my thesis. It is possible that big institutions had their own storage locations – and as the rations supplied to the workforce seem not to have come from the *guru₇*, it would be enlightening to find out who or what was supplying the general population with the barley they needed for their daily provisions.

My thesis research also indicates that the *guru₇* had an association with a small number of specific agricultural areas of the kind referred to as *a-ša₃* “fields”, but that many fields which exist in other records were either seldom or never mentioned in connection with the *guru₇*. It would very likely help to answer the questions posed above if a study were to be carried out into what happened to the grain grown in those fields not mentioned in connection with the *guru₇*, where this grain was stored and the purpose(s) to which it was put. Investigating this may shed further light on the question of what kind of other, non-*guru₇* grain storage existed in Umma (and, more broadly, across the Ur III state), and hopefully indicate more clearly how the general population was provisioned.

As well as the investigations into the province of Umma as described above, it is clear that the “big picture” of grain storage in the Ur III state as a whole needs to be re-examined, to clarify the extent to which the meaning of the term “guru₇” and the function of that institution varied between the different provinces. This can be achieved by replicating this study using texts from other relevant provinces. I devised a methodology for my Umma study that is both sound and transferrable, and thus it will be very easy to take this methodology and apply it to the guru₇ facilities at Girsu, a province of the Ur III state with a sufficiently large text corpus to prove a valuable candidate for a parallel study. There are also valuable archives from the provinces of Nippur, Ur and Garšana to which this methodology could also be applied, and finally there is the aforementioned collection of guru₇ texts from Apisal, a town within the Umma province whose guru₇ did not fall under Arad’s remit, which would be another very useful subject of study in the same way. These studies should reveal to what degree it is possible to make generalisations between guru₇ practices in different provinces, and would help to determine whether the limited remit identified in this dissertation was specific to Umma or more widely-spread throughout the Ur III state. Without further research, my doctoral thesis will be relatively limited in its scope and usefulness to other scholars, so these studies are important for enhancing the usefulness and applicability of my conclusions as they stand currently. The method can also be adapted to other households and organisations of similar structure to the guru₇, which may have wider implications for the study of Ur III institutional households. Another area of potential research is that of broadening the study of grain storage to focus more closely on other forms of grain stored and distributed by the guru₇. I limited this study to the provisioning of barley, since it was the main foodstuff and by far the most frequently attested variety of cereal, and my analysis of other cereals was limited to a discussion of the number of attestations of the various kinds of cereal derived from different storage facilities. It might be relevant for a future investigation to explore the other

grains, their uses and value in transactions, and the destinations to which they were disbursed.

One final area of future research which may prove fruitful would be to examine the data presented in this dissertation using different theoretical perspectives; in particular, using a business or financial model, in collaboration with experts in these areas. The alternative perspective that this kind of modelling might present of some of the more complex aspects of the *guru*₇, such as its role in transferring ownership or authority over barley between accounts, would prove valuable not just for our understanding of the *guru*₇, but also in terms of its applicability to other areas of Ur III institutional behaviour, management and administration.

Methodologically, this dissertation proves the importance of two aspects of research practice: firstly the quantitative analysis of trends and patterns; and secondly the necessity of paying close attention to the analysis of all the numbers derived during a quantitative analysis process, and of examining the data from several angles. The former has proven helpful in determining the extent of the authority of a significant administrative organisation in Ur III Umma, whereas the latter is vital for identifying as much salient information as possible. Without this kind of attention to detail important facts (such as the differences between the frequency of attestation of certain destinations for grain supply and the actual quantity of grain being disbursed to these locations) would have been missed, leading to an inaccurate picture being presented of *guru*₇ activities. The database itself is also a great resource, full of information concerning storage at Umma and with considerable flexibility to make analysis of data easy.

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Appendix 1

Full list of texts concerning Arad₂-mu or the guru₇.

AAICAB 1/1, Ashm. 1911-154	Aleppo 381	BCT 2 253
AAICAB 1/1, Ashm. 1911-170	Aleppo 391	BCT 2 256
AAICAB 1/1, Ashm. 1912-1148	Aleppo 423	BCT 2 298
AAICAB 1/1, Ashm. 1912-1159	Aleppo 490	BIN 3 351
AAICAB 1/3, Bod. S 176	AnOr 01 063	BIN 3 549
AAICAB 1/3, Bod. S 223	AnOr 01 065	BIN 5 067
AAICAB 1/3, Bod. S 303	AnOr 01 068	BIN 5 109
AAICAB 1/4, Bod. S 370	AnOr 07 018	BIN 5 151
AAS 051	AnOr 07 125	BIN 5 152
AAS 081	AnOr 07 179	BIN 5 194
AAS 088	AnOr 07 189	BIN 5 211
AAS 092	AnOr 07 272	BIN 5 318
AAS 158	AnOr 07 339	BIN 5 337
Aegyptus 10, 260 4	AnOr 07 379	BJRL 64 099 05
Aegyptus 10, 261 5	AR RIM 04 08	BPOA 1 0364
Aegyptus 10, 286 65	ASJ 06 137 01	BPOA 1 0371
Akkadica 114-115 103 37	ASJ 09 233 01	BPOA 1 0401
Aleppo 065	ASJ 09 233 03	BPOA 1 0450
Aleppo 178	ASJ 09 242 19	BPOA 1 0529
Aleppo 236	ASJ 11 176-178	BPOA 1 0530
Aleppo 249	ASJ 12 037 06	BPOA 1 0537
Aleppo 255	ASJ 17 328 2	BPOA 1 0547
Aleppo 279	ASJ 18 077 10	BPOA 1 0572
Aleppo 287	ASJ 19 212 35	BPOA 1 0610
Aleppo 290	Atiqot 4 pl. 13 26	BPOA 1 0624
Aleppo 302	AUCT 1 681	BPOA 1 0655
Aleppo 304	AUCT 3 242	BPOA 1 0662
Aleppo 305	AUCT 3 279	BPOA 1 0677
Aleppo 312	AUCT 3 495	BPOA 1 0699
Aleppo 314	AuOr 08 85 15	BPOA 1 0702
Aleppo 315	Babyl. 8 Pupil 24	BPOA 1 0713
Aleppo 316	Babyl. 8 Pupil 25	BPOA 1 0749
Aleppo 318	Babyl. 8 Pupil 27	BPOA 1 0770
Aleppo 341	BAOM 2 39 116	BPOA 1 0780
Aleppo 375	BAOM 5 38 8	BPOA 1 0898
	BCT 2 165	BPOA 1 0966
	BCT 2 168	BPOA 1 0976
	BCT 2 169	BPOA 1 1013
	BCT 2 182	BPOA 1 1049
	BCT 2 183	BPOA 1 1056
	BCT 2 184	BPOA 1 1059
	BCT 2 187	BPOA 1 1099
	BCT 2 188	BPOA 1 1157
	BCT 2 189	BPOA 1 1161

BPOA 1 1172	BPOA 2 2120	BPOA 6 0481
BPOA 1 1252	BPOA 2 2121	BPOA 6 0483
BPOA 1 1255	BPOA 2 2130	BPOA 6 0497
BPOA 1 1263	BPOA 2 2165	BPOA 6 0518
BPOA 1 1270	BPOA 2 2170	BPOA 6 0543
BPOA 1 1277	BPOA 2 2189	BPOA 6 0549
BPOA 1 1287	BPOA 2 2192	BPOA 6 0593
BPOA 1 1296	BPOA 2 2219	BPOA 6 0602
BPOA 1 1335	BPOA 2 2223	BPOA 6 0612
BPOA 1 1352	BPOA 2 2253	BPOA 6 0713
BPOA 1 1354	BPOA 2 2282	BPOA 6 0714
BPOA 1 1357	BPOA 2 2288	BPOA 6 0717
BPOA 1 1381	BPOA 2 2292	BPOA 6 0760
BPOA 1 1424	BPOA 2 2300	BPOA 6 0806
BPOA 1 1462	BPOA 2 2321	BPOA 6 0841
BPOA 1 1463	BPOA 2 2324	BPOA 6 0847
BPOA 1 1466	BPOA 2 2333	BPOA 6 0913
BPOA 1 1484	BPOA 2 2352	BPOA 6 0928
BPOA 1 1508	BPOA 2 2361	BPOA 6 0934
BPOA 1 1513	BPOA 2 2362	BPOA 6 0940
BPOA 1 1518	BPOA 2 2363	BPOA 6 0978
BPOA 1 1530	BPOA 2 2369	BPOA 6 0990
BPOA 1 1533	BPOA 2 2374	BPOA 6 0991
BPOA 1 1537	BPOA 2 2377	BPOA 6 1016
BPOA 1 1588	BPOA 2 2420	BPOA 6 1017
BPOA 1 1598	BPOA 2 2425	BPOA 6 1031
BPOA 1 1603	BPOA 2 2452	BPOA 6 1151
BPOA 1 1606	BPOA 2 2461	BPOA 6 1156
BPOA 1 1612	BPOA 2 2482	BPOA 6 1202
BPOA 1 1633	BPOA 2 2505	BPOA 6 1221
BPOA 1 1635	BPOA 2 2508	BPOA 6 1281
BPOA 1 1640	BPOA 2 2521	BPOA 6 1293
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BPOA 1 1699	BPOA 2 2576	BPOA 6 1318
BPOA 1 1723	BPOA 2 2630	BPOA 6 1368
BPOA 1 1725	BPOA 6 0003	BPOA 6 1370
BPOA 1 1761	BPOA 6 0022	BPOA 6 1402
BPOA 2 2003	BPOA 6 0055	BPOA 6 1403
BPOA 2 2006	BPOA 6 0102	BPOA 6 1459
BPOA 2 2018	BPOA 6 0121	BPOA 6 1479
BPOA 2 2028	BPOA 6 0208	BPOA 6 1481
BPOA 2 2034	BPOA 6 0263	BPOA 6 1483
BPOA 2 2052	BPOA 6 0305	BPOA 6 1505
BPOA 2 2082	BPOA 6 0362	BPOA 6 1516
BPOA 2 2083	BPOA 6 0363	BPOA 6 1526
BPOA 2 2106	BPOA 6 0367	BPOA 7 1552
BPOA 2 2113	BPOA 6 0411	BPOA 7 1556

BPOA 7 1607	BRM 3 048	CTNMC 25
BPOA 7 1648	BRM 3 081	CTNMC 27
BPOA 7 1695	BRM 3 086	CTNMC 52
BPOA 7 1698	BRM 3 089	DoCu EPHE 231
BPOA 7 1704	BRM 3 096	DoCu EPHE 234
BPOA 7 1746	BRM 3 097	DoCu EPHE 236
BPOA 7 1770	BRM 3 098	DoCu EPHE 252
BPOA 7 1772	BRM 3 099	DoCu EPHE 261
BPOA 7 1803	BRM 3 107	DoCu EPHE 275
BPOA 7 1823	CDLI P218000	DoCu EPHE 618
BPOA 7 1847	CDLI P387627	Ebay
BPOA 7 1862	CDLI P387638	WWW19990816
BPOA 7 1875	CDLI P405491	Farmer's Instructions
BPOA 7 1908	CDLI P429786	7.03
BPOA 7 1926	CDLI 2009: 2 FSU 20	Farmer's Instructions
BPOA 7 1932	CDLI 2012: 1 3.02	7.04
BPOA 7 1936	CDLI 2012: 1 3.11	Frühe Schrift, Abb.
BPOA 7 1947	CHEU 004	13k, Kat. 13.13
BPOA 7 1954	CHEU 007	is this our Arad?
BPOA 7 1975	CHEU 014	is this our Arad?
BPOA 7 1985	CHEU 015	JANES 21 69 02-03
BPOA 7 2015	CHEU 016	JCS 23 110 05
BPOA 7 2038	CHEU 017	JCS 23 111 10
BPOA 7 2061	CHEU 022	JCS 24, 161 62
BPOA 7 2068	CHEU 026	JCS 24, 170 90
BPOA 7 2070	CHEU 027	JCS 24, 171 92
BPOA 7 2075	CHEU 030	JCS 28 100 100
BPOA 7 2090	CHEU 039	JCS 28 215 25
BPOA 7 2093	CHEU 043	JCS 28 216 30
BPOA 7 2111	CHEU 047	JCS 28 223 51
BPOA 7 2166	CHEU 057	JCS 28 224 55
BPOA 7 2185	CHEU 059	JCS 31 243 17
BPOA 7 2233	CHEU 066	JCS 35 201 2
BPOA 7 2241	CHEU 086	JCS 46 019 03
BPOA 7 2260	CHEU 088	JCS 52 14 63
BPOA 7 2300	CHEU 089	JCS 52 14 68
BPOA 7 2302	CHEU 093	JCS 52 15 73
BPOA 7 2352	CST 523	JEOL 34 30 3
BPOA 7 2359	CST 648	JMEOS 12 40 3482
BPOA 7 2393	CST 651	JMEOS 15 41 1
BPOA 7 2409	CST 653	JRAS 1937 471 1
BPOA 7 2410	CST 658	JRL 0713
BPOA 7 2457	CST 667	JSOR 14 48 58
BPOA 7 2496	CST 675	Kyoto 04
BPOA 7 2542	CST 692	Kyoto 06
BPOA 7 2579	CST 745	Kyoto 07
BPOA 7 2885	CST 746	Kyoto 11

LAOS 1 18	MVN 03 192	MVN 13 819
Ledgers pl. 37 21	MVN 03 193	MVN 13 858
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MCS 3 85 BM	MVN 03 195	MVN 14 0024
105447	MVN 03 210	MVN 14 0037
MCS 3 89 BM	MVN 03 216	MVN 14 0062
111774	MVN 03 218	MVN 14 0076
MCS 3 90 BM	MVN 03 226	MVN 14 0077
112984	MVN 03 249	MVN 14 0091
MCS 8 89 BM	MVN 04 007	MVN 14 0104
105406	MVN 04 041	MVN 14 0136
MVN 01 085	MVN 04 085	MVN 14 0151
MVN 01 086	MVN 04 183	MVN 14 0161
MVN 01 087	MVN 05 015	MVN 14 0177
MVN 01 192	MVN 05 036	MVN 14 0183
MVN 01 193	MVN 09 216	MVN 14 0189
MVN 01 194	MVN 13 179	MVN 14 0214
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MVN 02 319	MVN 13 181	MVN 14 0382
MVN 03 122	MVN 13 182	MVN 14 0391
MVN 03 127	MVN 13 183	MVN 15 200
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MVN 03 135	MVN 13 205	MVN 15 342
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MVN 03 155	MVN 13 659	MVN 16 1039
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MVN 03 158	MVN 13 665	MVN 16 1351
MVN 03 159	MVN 13 669	MVN 16 1469
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MVN 03 167	MVN 13 680	MVN 18 461
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MVN 03 171	MVN 13 701	MVN 18 502
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MVN 03 180	MVN 13 707	MVN 18 547
MVN 03 181	MVN 13 709	MVN 18 573
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MVN 21 044	Nisaba 09 035	Ontario 2 039
MVN 21 165	Nisaba 09 105	Ontario 2 041
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MVN 21 213	Nisaba 09 158	Ontario 2 043
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MVN 21 246	Nisaba 09 282	Ontario 2 048
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MVN 21 291	Nisaba 23 151	Ontario 2 055
MVN 21 295	Nisaba 24 13	Ontario 2 057
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NATN 025	Ontario 2 011	Ontario 2 070
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Nebraska 15	Ontario 2 013	Ontario 2 072
Nebraska 44	Ontario 2 015	Ontario 2 073
Nebraska 54	Ontario 2 016	Ontario 2 075
Nebraska 67	Ontario 2 017	Ontario 2 076
Nebraska 77	Ontario 2 018	Ontario 2 077
Nik. 2 203	Ontario 2 019	Ontario 2 078
Nik. 2 261	Ontario 2 020	Ontario 2 081
Nik. 2 264	Ontario 2 021	Ontario 2 082
Nik. 2 268	Ontario 2 022	Ontario 2 084
Nik. 2 269	Ontario 2 023	Ontario 2 085
Nik. 2 271	Ontario 2 024	Ontario 2 088
Nik. 2 403	Ontario 2 025	Ontario 2 095
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Nisaba 01 282	Ontario 2 028	Ontario 2 106
Nisaba 01 290	Ontario 2 030	Ontario 2 107
Nisaba 03-1 025	Ontario 2 031	Ontario 2 109
Nisaba 03-1 082	Ontario 2 032	Ontario 2 110
Nisaba 06 05	Ontario 2 033	Ontario 2 115
Nisaba 06 20	Ontario 2 036	Ontario 2 116
Nisaba 06 26	Ontario 2 037	Ontario 2 122

Ontario 2 127	OrSP 47-49 179	OrSP 47-49 408
Ontario 2 128	OrSP 47-49 184	OrSP 47-49 411
Ontario 2 129	OrSP 47-49 186	OrSP 47-49 414
Ontario 2 130	OrSP 47-49 187	OrSP 47-49 415
Ontario 2 131	OrSP 47-49 189	OrSP 47-49 416
Ontario 2 132	OrSP 47-49 201	OrSP 47-49 422
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Ontario 2 205	OrSP 47-49 209	(unpubl.)
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Ontario 2 238	OrSP 47-49 215	Princeton 1 244
Ontario 2 246	OrSP 47-49 218	Princeton 1 258
Ontario 2 251	OrSP 47-49 223	Princeton 1 264
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Ontario 2 269	OrSP 47-49 226	Princeton 1 268
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Ontario 2 278	OrSP 47-49 241	Princeton 1 274
Ontario 2 281	OrSP 47-49 242	Princeton 1 317
Ontario 2 296	OrSP 47-49 246	Princeton 1 334
Ontario 2 298	OrSP 47-49 247	Princeton 1 357
Ontario 2 299	OrSP 47-49 255	Princeton 1 393
Ontario 2 302	OrSP 47-49 258	Princeton 1 429
Ontario 2 312	OrSP 47-49 260	Princeton 1 493
Ontario 2 331	OrSP 47-49 263	Princeton 1 496
Ontario 2 338	OrSP 47-49 266	Princeton 1 516
Ontario 2 339	OrSP 47-49 267	Princeton 1 563
Ontario 2 473	OrSP 47-49 274	Princeton 2 124
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Orient 16 061 69	OrSP 47-49 288	Princeton 2 373
Orient 16 064 76	OrSP 47-49 295	Princeton 2 378
Orient 16 067 85	OrSP 47-49 302	Princeton 2 379
Orient 16 068 90	OrSP 47-49 304	Princeton 2 403
Orient 16 071 96	OrSP 47-49 308	Princeton 2 503
Orient 16 072 99	OrSP 47-49 309	RA 101 42 11
Orient 16 108 175	OrSP 47-49 311	RA 12 021 13
Orient 21 7	OrSP 47-49 319	RA 16 19
OrSP 47-49 151	OrSP 47-49 321	RA 49 92 30
OrSP 47-49 155	OrSP 47-49 322	RIAA 104
OrSP 47-49 156	OrSP 47-49 324	Rochester 106
OrSP 47-49 157	OrSP 47-49 337	Rochester 158
OrSP 47-49 160	OrSP 47-49 343	Rochester 199
OrSP 47-49 161	OrSP 47-49 355	Rochester 200
OrSP 47-49 164	OrSP 47-49 356	Rochester 204
OrSP 47-49 170	OrSP 47-49 358	SA 132 (Pl. 099)
OrSP 47-49 171	OrSP 47-49 359	SA 134 (Pl. 076)
OrSP 47-49 178	OrSP 47-49 391	SACT 2 088

SAKF 014	SAT 2 0136	SAT 2 0375
SAKF 019	SAT 2 0146	SAT 2 0376
SAKF 033	SAT 2 0152	SAT 2 0400
SAKF 040	SAT 2 0158	SAT 2 0403
SAKF 043	SAT 2 0168	SAT 2 0405
SAKF 051	SAT 2 0169	SAT 2 0421
SAKF 063	SAT 2 0176	SAT 2 0445
SAKF 065	SAT 2 0187	SAT 2 0454
SAKF 073	SAT 2 0189	SAT 2 0455
SAKF 075	SAT 2 0206	SAT 2 0494
SAKF 078	SAT 2 0209	SAT 2 0497
SAKF 080	SAT 2 0216	SAT 2 0498
Salesianum 4 175 03	SAT 2 0218	SAT 2 0502
Santag 6 010	SAT 2 0220	SAT 2 0503
Santag 6 015	SAT 2 0221	SAT 2 0512
Santag 6 037	SAT 2 0222	SAT 2 0514
Santag 7 015	SAT 2 0224	SAT 2 0533
Santag 7 019	SAT 2 0230	SAT 2 0535
Santag 7 181	SAT 2 0235	SAT 2 0561
SAT 2 0027	SAT 2 0236	SAT 2 0576
SAT 2 0045	SAT 2 0238	SAT 2 0581
SAT 2 0048	SAT 2 0239	SAT 2 0582
SAT 2 0052	SAT 2 0242	SAT 2 0583
SAT 2 0055	SAT 2 0248	SAT 2 0584
SAT 2 0056	SAT 2 0251	SAT 2 0587
SAT 2 0060	SAT 2 0255	SAT 2 0589
SAT 2 0063	SAT 2 0264	SAT 2 0591
SAT 2 0066	SAT 2 0271	SAT 2 0612
SAT 2 0069	SAT 2 0273	SAT 2 0647
SAT 2 0070	SAT 2 0275	SAT 2 0661
SAT 2 0072	SAT 2 0276	SAT 2 0666
SAT 2 0073	SAT 2 0282	SAT 2 0667
SAT 2 0075	SAT 2 0287	SAT 2 0694
SAT 2 0076	SAT 2 0290	SAT 2 0698
SAT 2 0078	SAT 2 0292	SAT 2 0705
SAT 2 0079	SAT 2 0293	SAT 2 0717
SAT 2 0081	SAT 2 0295	SAT 2 0728
SAT 2 0083	SAT 2 0296	SAT 2 0729
SAT 2 0084	SAT 2 0297	SAT 2 0731
SAT 2 0087	SAT 2 0298	SAT 2 0735
SAT 2 0097	SAT 2 0303	SAT 2 0743
SAT 2 0111	SAT 2 0305	SAT 2 0753
SAT 2 0112	SAT 2 0312	SAT 2 0756
SAT 2 0115	SAT 2 0355	SAT 2 0770
SAT 2 0118	SAT 2 0359	SAT 2 0787
SAT 2 0120	SAT 2 0366	SAT 2 0830
SAT 2 0130	SAT 2 0370	SAT 2 0841

SAT 2 0851	SAT 3 1373	STA 05
SAT 2 0857	SAT 3 1374	StOr 09-1 31 (pl.12)
SAT 2 0859	SAT 3 1426	STU 28
SAT 2 0860	SAT 3 1449	STU 36
SAT 2 0867	SAT 3 1487	Studies Tadmor 2
SAT 2 0870	SAT 3 1505	209-220
SAT 2 0876	SAT 3 1545	Syracuse 084
SAT 2 0877	SAT 3 1653	Syracuse 085
SAT 2 0894	SAT 3 2048	Syracuse 086
SAT 2 0905	SET 128	Syracuse 087
SAT 2 0919	SET 130	Syracuse 137
SAT 2 0921	SET 174	Syracuse 153
SAT 2 0933	SET 175	Syracuse 158
SAT 2 0935	SET 182	Syracuse 187
SAT 2 0937	SET 186	Syracuse 200
SAT 2 0951	SET 187	Syracuse 219
SAT 2 0955	SET 189	Syracuse 364
SAT 2 0958	SET 190	Syracuse 383
SAT 2 0964	SET 191	Syracuse 387
SAT 2 0988	SET 192	Syracuse 389
SAT 2 0989	SET 193	Syracuse 426
SAT 2 1013	SET 194	TCL 5 5663
SAT 2 1047	SET 195	TCL 5 5665
SAT 2 1051	SET 196	TCL 5 5668
SAT 2 1053	SET 234	TCL 5 5670
SAT 2 1092	SET 243	TCL 5 5671
SAT 2 1098	SET 256	TCL 5 5672
SAT 2 1149	SNAT 278	TCL 5 5675
SAT 2 1150	SNAT 280	TCL 5 5676
SAT 2 1152	SNAT 311	TCL 5 5680
SAT 3 1188	SNAT 319	TCL 5 6036
SAT 3 1194	SNAT 343	TCL 5 6046
SAT 3 1206	SNAT 344	TCL 5 6050
SAT 3 1212	SNAT 349	TCL 5 6052
SAT 3 1232	SNAT 361	TCS 028
SAT 3 1235	SNAT 362	TCS 1 101
SAT 3 1280	SNAT 369	TCS 1 293
SAT 3 1284	SNAT 376	TCS 1 294
SAT 3 1289	SNAT 377	Textile Terminologies
SAT 3 1290	SNAT 388	195
SAT 3 1292	SNAT 391	TIM 6 01
SAT 3 1297	SNAT 392	TJAMC IOS 02 (pl.
SAT 3 1329	SNAT 422	49)
SAT 3 1335	SNAT 434	TJAMC IOS 03 (pl.
SAT 3 1360	SNAT 443	50)
SAT 3 1361	SNAT 453	TJAMC IOS 42 (pl.
SAT 3 1372	SNSAP 094 72.45b	62)

TJAMC IOS 44 (pl. 64)	UTI 3 1863	Vicino Oriente 8/1 021
TJAMC IOS 46 (pl. 60)	UTI 3 2147	
Torino 2 446	UTI 3 2163	Vicino Oriente 8/1 079
Torino 2 448	UTI 3 2204	Wiseman Tablets W 00 = 2010-06-022-13
Torino 2 452	UTI 3 2246	www.charlesede.com 2001 07
Torino 2 456	UTI 3 2288	YOS 04 015
Torino 2 457	UTI 3 2294	YOS 04 057
Torino 2 458	UTI 4 2327	YOS 04 058
Torino 2 472	UTI 4 2333	YOS 04 097
Torino 2 540	UTI 4 2379	YOS 04 109
Torino 2 544	UTI 4 2380	YOS 04 129
Torino 2 647	UTI 4 2437	YOS 04 131
UCP 9-2-1 011	UTI 4 2520	YOS 04 197
UCP 9-2-1 012	UTI 4 2585	YOS 04 232
UCP 9-2-1 020	UTI 4 2587	YOS 04 260
UCP 9-2-1 023	UTI 4 2673	YOS 04 263
UCP 9-2-1 027	UTI 4 2680	YOS 04 264
UCP 9-2-1 041	UTI 4 2799	YOS 04 265
UCP 9-2-1 047	UTI 4 2812	YOS 04 279
UCP 9-2-1 073	UTI 4 2822	YOS 04 309
UCP 9-2-1 080	UTI 4 2873	YOS 04 319
UCP 9-2-2 018	UTI 4 2904	YOS 04 321
UCP 9-2-2 031	UTI 4 2912	YOS 18 105
UCP 9-2-2 034	UTI 4 2955	YOS 18 109
UCP 9-2-2 059	UTI 4 2961	ZVO 25 136 3
UCP 9-2-2 093	UTI 4 2977	
Umma 008	UTI 4 2993	
Umma 009	UTI 5 3044	
Umma 012	UTI 5 3101	
Umma 014	UTI 5 3383	
Umma 016	UTI 5 3496	
Umma 018	UTI 6 3534	
Umma 019	UTI 6 3580+3599	
Umma 020	UTI 6 3666	
Umma 092	UTI 6 3681	
Umma 100	UTI 6 3740	
UMTBM 3 39	UTI 6 3767	
UMTBM 3 43	Van Schaik 1	
UMTBM 3 45	Vicino Oriente 8/1 002	
UTI 3 1628	Vicino Oriente 8/1 003	
UTI 3 1691	Vicino Oriente 8/1 004	
UTI 3 1697	Vicino Oriente 8/1 016	
UTI 3 1701		
UTI 3 1752		
UTI 3 1795		

Appendix 2

List of texts concerning the i3-dub

PPAC 5 1063	
SNAT 531	BPOA 7 2381
SAT 2 0042	Nisaba 11 16
BPOA 2 2364	Nisaba 11 17
NYPL 192 / AOS 32 J 08	Nisaba 11 21
Ontario 2 310	Nisaba 09 062
Ontario 2 307 + 308	Nisaba 24 09
CTNMC 52	Nisaba 06 09
MVN 12 496	Nisaba 24 16
SET 165	Ontario 2 104
MVN 16 0728	Ontario 2 258
BPOA 7 1793	Ontario 2 449
MVN 12 482	Ontario 2 271
AAS 096	Ontario 2 092
AnOr 07 380-02	NME H94679
AUCT 1 304	AAICAB 1/3, Bod. S 143
BE 3-1 084	AAICAB 1/3, Bod. S 308
BIN 5 103	BPOA 6 1465
BIN 5 119	BPOA 6 1025
BRM 3 180	Nisaba 24 32
Bull. Buffalo SNS 11-2 117 01	Nisaba 24 37
L'uomo 48	Nisaba 23 002
MVN 12 119	PPAC 5 0770
MVN 13 223	PPAC 5 1076
MVN 13 619	PPAC 5 1158
MVN 21 334	PPAC 5 1642
Nik. 2 257	OrNS 81 280 01
Nik. 2 259	
SNAT 434	
SNAT 498	
Syracuse 452	
RIAA 186	
Torino 2 468	
YOS 04 311	
ASJ 11 182	
AAICAB 1/1, Ashm. 1911-484	
AAICAB 1/1, Ashm. 1912-1143	
SAT 2 0005	
SAT 2 0842	
SAT 2 1014	
SAT 3 1519	
SAT 3 1564	

Appendix 3

Descriptors of the i₃-dub storage facility:

i₃-dub a-ša₃ A-pi₄-sal₄^{ki}
i₃-dub a-ša₃ da-še₂
i₃-dub a-ša₃ ^dNin-/ur₄-ra
i₃-dub a-ša₃ du₆-tir
i₃-dub a-ša₃ ^{giš}Ma-nu
i₃-dub a-ša₃ i₃-sum
i₃-dub a-ša₃ pa₅-li-ir-dam
i₃-dub An-za-gar₃ i₇-Gir₂-su^{ki}-ka
i₃-dub bar-ta gal₂-^lla^l
i₃-dub da-gar-ra-ak
i₃-dub ^dNin-hur-sag-lu₂-Ku₃-nun
i₃-dub du₁₁-ga
i₃-dub e₂-duru₅ ^d[Šu]-/^dSue[n]
i₃-dub e₂-duru₅ en-na-ta
i₃-dub eren₂-na
i₃-dub gaba l₇-sal₄-la
i₃-dub GAN₂ Ur-gu
i₃-dub ^{giš}tir-gaba-gid₂-da
i₃-dub Gu₂-eden-na / u₃ Muš-bi-an-n[a]
i₃-dub guru₇ 1-kam
i₃-dub guru₇ 2-kam
i₃-dub guru₇ a-ku₄-ku₄
i₃-dub guru₇ ša₃ a-ša₃-ga
i₃-dub guru₇-gu-/la
i₃-dub guru₇-tur
i₃-dub he-gal₂
i₃-dub HI-a-bar-ra-ka
i₃-dub i₃-ba Šar-^lru^l-[x (x)]
i₃-dub igi e₂-duru₅ a-ša₃ la₂-mah
i₃-dub igi-e₂-mah-še₃
i₃-dub Ka-ma-ri₂^{ki}
i₃-dub KA-us₂
i₃-dub kar lugal
i₃-dub kar-ra giri₃ Lu₂-^dTUG₂.AN-ka
i₃-dub ki-su₇ a-ru-a U₂-da
i₃-dub ki-su₇ a-ša₃ ^dNin-ur₄-ra du₆-na

i₃-dub ki-su₇ a-ša₃ ^dŠara₂-gu₂-gal
 i₃-dub ki-su₇ a-ša₃ la₂-tur
 i₃-dub ki-su₇ a-ša₃ u₂-du-^dNin-a-ra-li
 i₃-dub ki-su₇ apin ba-an-[zi]
 i₃-dub ki-su₇ bad₃ du₃-a
 i₃-dub ki-su₇ ^dNin-hur-sag
 i₃-dub ki-su₇ gu-la / a-ša₃ la₂-mah
 i₃-dub ki-su₇ gu₄-šuhub₂
 i₃-dub ki-su₇ igi e₂-mah-še₃
 i₃-dub ki-su₇ KA-/eštub^{ku6}-sag
 i₃-dub ki-su₇ muru₁₃
 i₃-dub ki-su₇ nin₁₀-nu-du₃
 i₃-dub ki-su₇ sahar-u₂-u₂
 i₃-dub ki-su₇ uš-gid₂-da
 i₃-dub KI.AN^{ki}
 i₃-dub Me-en-kar₂
 i₃-dub Me-luh-ha-a-ta
 i₃-dub ša₃ a-ša₃-ga
 i₃-dub ša₃ i₇ Gir₂-su^{ki}-ka
 i₃-dub ša₃ ki-^Ix^I
 i₃-dub še ur₅-ra
 i₃-dub til-la
 i₃-dub ur₃-NE še-ur₅