CHAPTER 2

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ACCOUNTING IN
PROTO-CUNEIFORM

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HISTORIANS of ancient Babylonia are confronted with a myriad of hurdles in their work. First and foremost is the fact that they deal with a long-dead civilization, so that in the absence of informants they must interpret the material remains from Near Eastern excavations as best they can, often with very limited tools.

More daunting is the task for those who want to make sense of the social system that produced the documents from the Late Uruk period. Associates of the Berlin research project *Archaische Texte aus Uruk* (Englund and Nissen 2001: 9–10; Englund 2004: 23 n. 1), to whom I owe most of my understanding of the earliest written records in Mesopotamia, are often forced to oversimplify archaeological and epigraphic data from Uruk and the other late fourth-millennium BC settlements of the Near East, and in a sense to falsify into apparent meaningfulness what remains a disturbingly unclear picture. We may apply to our data the models developed in the social, above all the ethnographic, sciences, yet we should remember that with the onset of urbanization in the mid-fourth millennium BC we are dealing with an historical, developed society in Babylonia; there is a danger of ascribing to this historically distinct period the same ahistorical nature that characterizes most general histories of Mesopotamia (Bernbeck 1999; Englund 2004: 24 n. 2).

Control of the movement of goods and services is a critical element in the economic dimension of social power (Mann 1986). As is clear from a review of the emergence of proto-cuneiform in the latter half of the fourth millennium BC, it was an ever present component of urbanization in the ancient Near East. Michael Hudson (2004) has offered a concise description of most of the salient elements of early accounting in Babylonia, elements that most Assyriologists have considered in working on their specific periods of specialization, and to a lesser degree in terms of general developments in Mesopotamia. Among these are the development of writing itself; a system of calendrical metrology; and systems of quantification and bookkeeping that led to the formation of equivalence values based on the commodity silver.

Considering the importance of precious metals in most early civilizations, it might seem surprising to learn that we have no clear evidence in the archaic texts of the use of weights, nor any evidence that silver was in any way used in early households in a manner comparable to later, third-millennium usage. We indeed are hard pressed to cite evidence for the utilization of equivalence values in the Late Uruk period, with the possible exception of ration days.

An attempt is made in the following pages to give a general impression of the little we know about the accounting methods in the archaic period, with occasionally formalistic information culled from early texts, starting with a review of the development of writing; discussing in short fashion the importance of archaic numerical and metrological systems as elements of social control; illuminating the use of writing with some examples drawn from grain administration archives; touching on the matter of labour management; and closing with a tentative discussion of the implications the labour accounts have for our understanding of archaic ideology of class.

Account-keeping and the emergence of writing

More so than other writing systems, cuneiform has been described as a script based on a long history of preliterate accounting devices. Most who have studied the matter have considered early writing to be a collateral development from the exploitation of an increasingly complex method of fixing quantitative data.

Urbanization in southern Babylonia during the Middle and Late Uruk periods resulted in the growth of the settlement of southern Mesopotamian Uruk into an expanse of 200 hectares, with a population estimated to have approached 40,000 or more. Very large numbers of this population evidently were available for the construction and maintenance of the massive public district known as Eanna, with its monumental architecture surely the clearest testimony to the extraordinary new surplus economy supporting Uruk.

Hand in hand with these urban developments (Figure 2.1) are found in the archaeological record a series of accounting devices known popularly as 'tokens' since the publications of Denise Schmandt-Besserat (1992; 1996). While the archaeologist has been faulted for over-interpreting both the systematization and the iconic differentiation of these small clay objects (Englund 2004: 26 n. 4), there can be little doubt that at least a subset consisting of many of her simple geometrical artefacts represents the precursors of writing in Mesopotamia, and therefore that cuneiform began with numerical signs.

This assertion is based on two phenomena (Figure 2.2). First, the simple tokens were gathered in discrete assemblages and encased in clay balls in the periods immediately before the emergence of proto-cuneiform *c.* 3300 BC, and these balls were then sealed with impressions from cylinder seals—the hallmark of 3000 years of Babylonian

	Period	Writing Phase	Historical Developments
3400		Clay bullae and numerical tablets	Beginning of large-scale settlement of Babylonia
3300	Late Uruk	Archaic texts from Uruk: writing Phase Uruk IV, writing Phase Uruk III	
3200			First urban centres
3100			Age of early civilization
3000	Jemdet Nasr		
2900			
2800	Early Dynastic I	Archaic texts from Ur	
2700			Formation of large irrigation networks
2600	Early Dynastic II		
2500		Texts from Fara	Rival city-states
2400	Early Dynastic III	Old Sumerian texts	

FIGURE 2.1 Overview of the chronology and historical developments of the earliest literate periods in Babylonia.

administrative history. Second, the plastic tokens were themselves impressed on the outer surfaces of some balls, leaving marks which, both physically and also in their context, conform exactly to the impressed numerical signs of the early so-called numerical tablets and the curvilinear tradition of Babylonian accounts down to the Ur III period at the end of the third millennium. We have little doubt that a statistical analysis of the overwhelming numbers of tokens still encased within clay envelopes would lead even further, to the establishment of the preliterate use of numerical sign systems with the same abstraction of unit bundling as has been shown for proto-cuneiform numerical notations. We should anticipate that we will find the two most important numerical systems in these tokens, one used to count discrete objects and one used to quantify capacity measures (Englund 2006).

It is of historical interest that the so-called Uruk expansion continued down through the use of bullae and sealed numerical tablets. Further, as Reinhard Dittmann (1986: 332–366) demonstrated, this contact continued into the earliest phase of 'ideographic' inscriptions of the Late Uruk period, those that I have called the numero-ideographic tablets (Englund 1998: 51–56). These texts from the Susa level 17Ax 'contact' (Damerow and Englund 1989: 15 n. 37; Englund 2004: 27 n. 6) correspond nicely with texts found in the area of the Red Temple at Uruk, characterized by their inclusion of seal impressions, numerical notations, and one or at most two apparent ideograms representing the basic agricultural commodities butter oil, textiles, and small cattle.

At this point there is an abrupt conclusion of interregional Uruk influence, with a continuation of development of writing in Uruk alone (Englund 2004: 28 n. 7). The
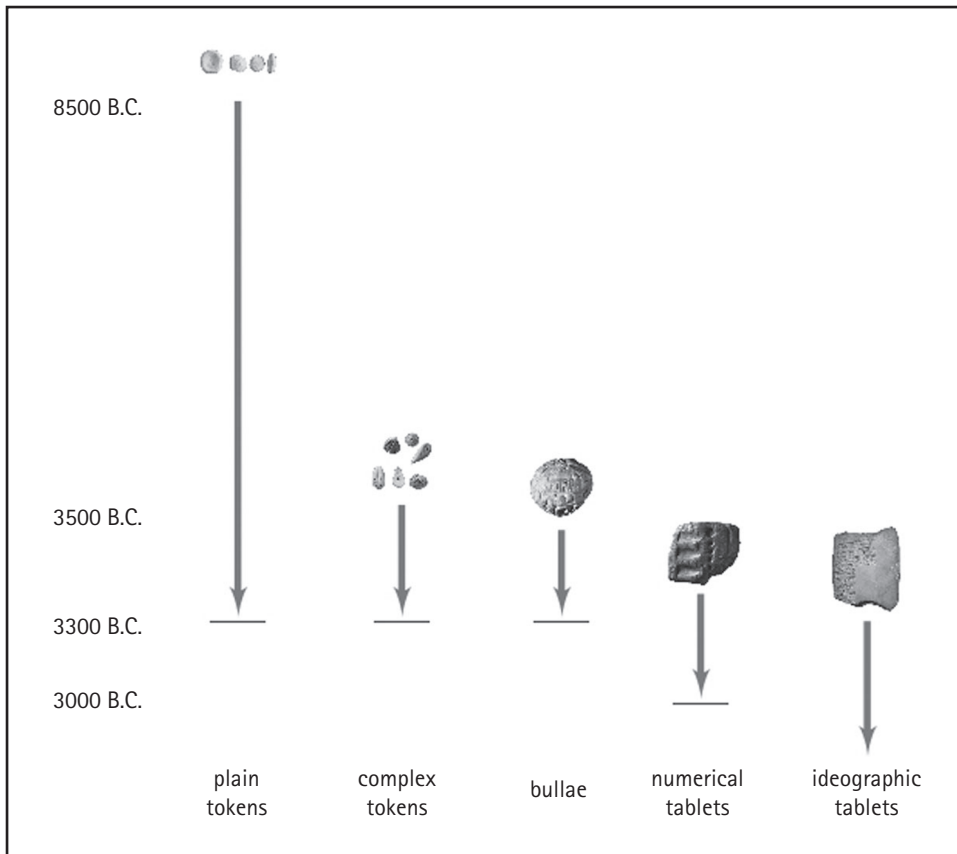
FIGURE 2.2 Denise Schmandt-Besserat's schema of the history of writing. (Based on Schmandt-Besserat 1992; 1996)

archives from Uruk consist above all of administrative documents, accompanied by a group of texts generally known as lexical lists, although there is good reason to assert that we have among these lists the earliest known example of literature (Englund and Nissen 1993: 25–29). It should be remembered that the numbers generally cited in this connection, 85% administrative and 15% lexical texts, represent averages; less than 1% of the earliest, the Uruk IV tablets, are of the lexical genre, while close to 20% of the following Uruk III tablets belong to this type of document. Whereas Uruk IV documents known to us derive without apparent exception from Uruk, those of the Uruk III (also called Jemdet Nasr) period come from a number of Babylonian sites, including Jemdet Nasr, Kiš, Uqair, Larsa, from transtigridian Tell Asmar, and, as post-Kuwait excavations streaming through London have shown, from Umma and from Adab. We should include here too the *c.* 1500 tablets and fragments of the so-called proto-Elamite phase in Susiana and regions to the east.

The categories of administrative documents

We can divide proto-cuneiform administrative documentation into the two major bookkeeping types known from later periods in Babylonia, namely into primary and secondary documents (Figure 2.3). The easiest way to recognize the former type, consisting of receipts, bills, and simple transfers, etc., is by the physical size and the spatial format of the tablets. As a rule these are quite small, perhaps up to *c.* 8 × 8 cm, and might be divided into at most several cases. At present we can anticipate only that these sorts of simple documents contain no more than the most basic elements of a transaction or inventory record, as a rule including designations of quantified objects and of one or more actors involved in a relationship of some sort with those objects, often together with an indication of the administrative positions of these actors, as well as their geographical affiliations. In less frequent cases these simple texts would appear to include predicate information in the form of transaction qualifications: for instance, the signs BA or GI, which qualify, evidently for purposes of accounting clarity, the nature of the movement or storage of goods, including parcels of agricultural land.

The more interesting but rarer secondary documents can be twice or three times as large. They contain relatively large numbers of entries, and their surfaces are often divided into a complex format. As has been stated in numerous publications, this tablet format may be presumed to fulfil the syntactical functions of the more developed language representation found in later texts, particularly those of the Fara period and thereafter.

While we should be circumspect in our judgement of the syntactical force of the archaic ideographic record, there can be little doubt that the highly formalized system of numerical notations, with its roots in the token assemblages found in clay envelopes in Persia, Babylonia, and Syria, followed a wholly conventionalized internal syntax, and represented concrete facts in the archaic record that have played an imposing role in our partial decipherment of proto-cuneiform, and of proto-Elamite.

Numerical and metrological systems

Peter Damerow of the Max Planck Institute for the History of Science in Berlin, and Jöran Friberg of the Chalmers Technical Institute in Göteborg, must be credited with having early on discovered the importance of the numerical signs in the archaic record and making progress in this decipherment. It should be obvious that accounts deal with numbers and measures; however, the treatment by Assyriologists of numerical notations in cuneiform texts has been one of the worst blemishes in a field otherwise marked by close attention to detail. Friberg was so vexed by the copies and interpretations of the
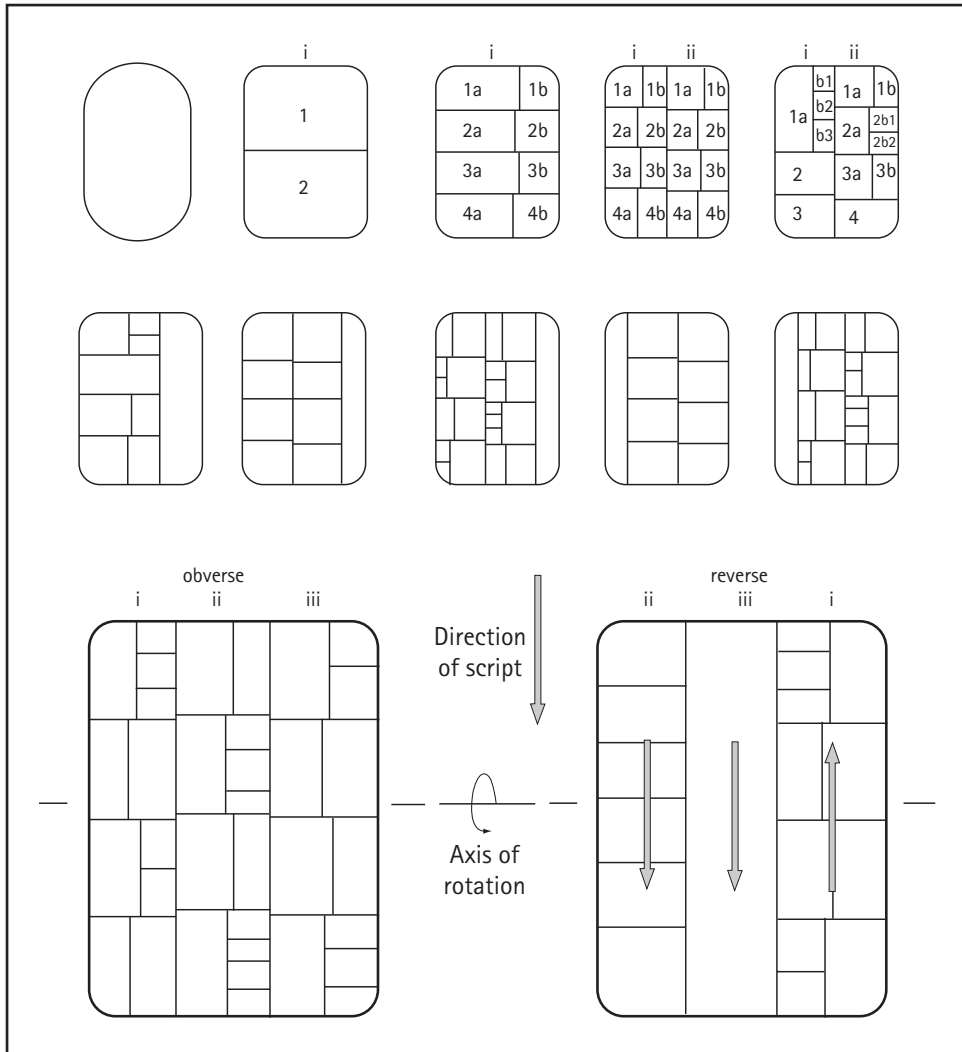
FIGURE 2.3 Formats of the proto-cuneiform texts: the two upper rows represent primary documents, the lower row a secondary document. (Drawing by Robert K. Englund)

important Jemdet Nasr texts by Stephen Langdon (1928) that, in the preparation of his groundbreaking re-edition of a number of these, together with archaic texts from other European collections (Friberg 1978–79), he made and exploited photocopies of the physical tablets in Oxford to aid in his work.

Langdon's *Pictographic Inscriptions from Jemdet Nasr* (1928) must be the worst example of cuneiform text editions on record. But a tradition of cavalierly dispensing with numerical notations in editions of administrative documents continues today in transliterated publications of primary sources with decimally interpreted sexagesimal

notations, despite the standardization proposals of the associates of the *Cuneiform Digital Library Initiative* (http://oracc. org/doc/builder/numbers) that a system of transliteration reflecting in a strict fashion the physical realities of the cuneiform inscriptions be adhered to. This should be a basic convention in text-analytical treatments of Babylonian literature.

In considering proto-cuneiform accounts, the first signs that command one's attention must be the numerical signs. These were impressed deep in the clay surface with the butt ends of two round styli of different diameters. As a rule, impressions of the larger stylus represent larger numbers or measures, those of the smaller styli numbers and measures from the lower scale of the numerical systems they represented. In most cases these numerical notations come first, followed by some designation of the objects they qualify, then by representations of persons or offices. Although within discrete notations the signs were, with some few exceptions, entirely unambiguous and therefore might, again with some few exceptions, have been inscribed in free order (Englund 2004: 31 n. 13), numerical notations conformed to a rigid syntactical sequence, from signs representing the largest to those representing the smallest order of quantity or measure.

The rigidity of these notational sequences can be explained partly by the fact that many of the signs were ambiguous across system borders. Dependent on the object quantified by numerical notations, the sign N_{14} (a simple small circular impression) can represent ten clay pots of butter oil, a measure of grain corresponding to about 150 litres of barley, or a field of about 6 hectares. The real power of a clear understanding of the array of archaic numerical systems was first exploited by Friberg (1978–79), who published an analysis of the Uruk III period texts from Jemdet Nasr and other sites, in part made accessible to him by the Ashmolean Museum. Friberg's correction of an age-old misinterpretation of the structure of the archaic capacity system led to the partial decipherment of large numbers of accounts. Based in part on his work, Damerow and I were in the 1980s and 1990s able to abstract the systems shown in Figures 2.4a–b from a data set including the large numbers of texts from the German Uruk excavations (Damerow and Englund 1987).

THE STANDARDIZATION OF TIME IN GRAIN ADMINISTRATION ARCHIVES

These numerical representations afforded those working on the problem sufficient evidence to make a number of advances in the decipherment of proto-cuneiform, including the observation that already in the archaic period household administrators had imposed on the natural cycle of time an artificial year consisting of twelve months, each month of thirty days (Englund 1988). This realization and the subsequent discovery of the widespread use of time calculations in apparent rationing texts led to a fruitful exchange between Friberg and myself that identified a number of different grain
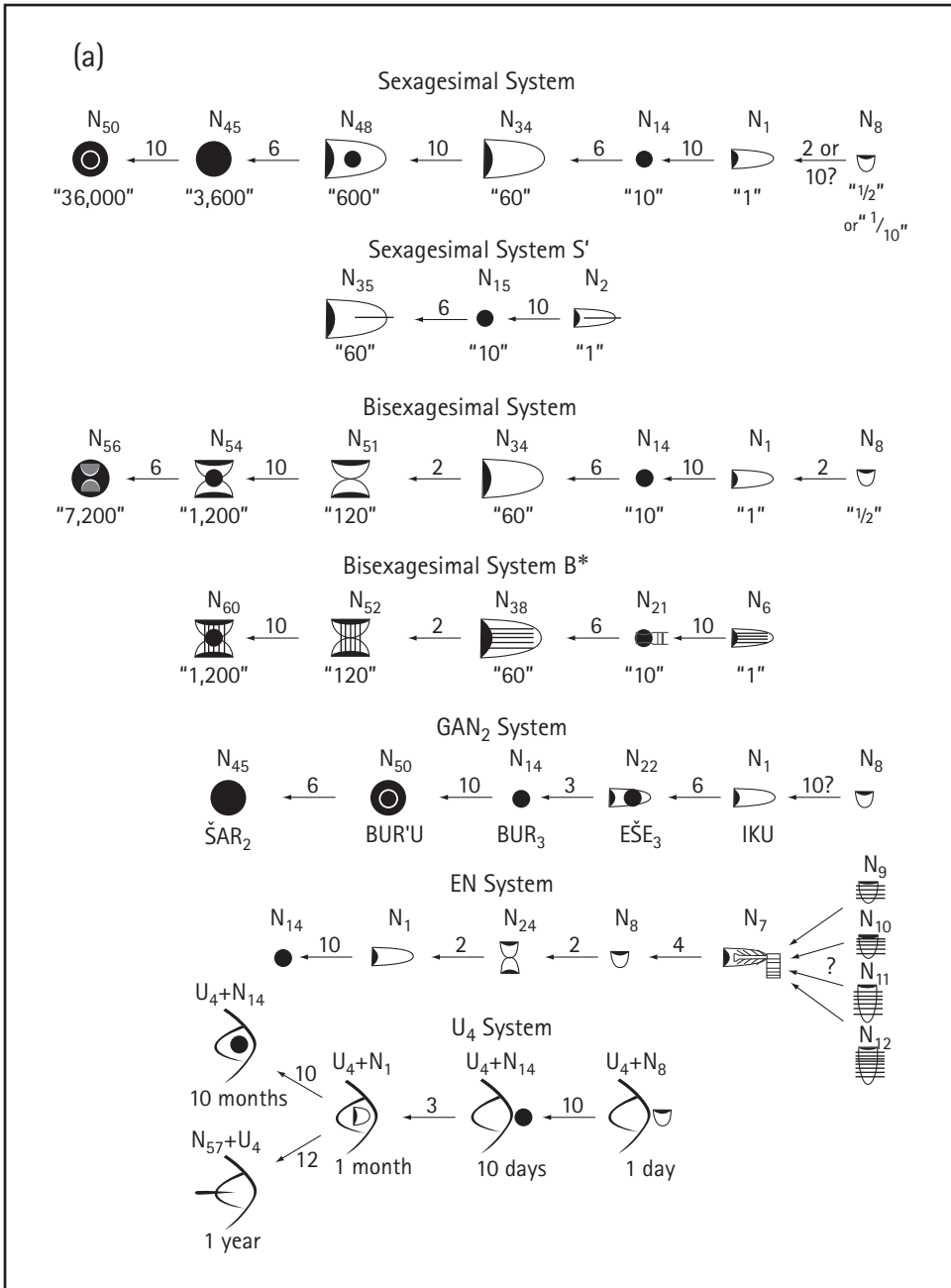
(a)

Sexagesimal System

N_{50} —10→ N_{45} —6→ N_{48} —10→ N_{34} —6→ N_{14} —10→ N_1 —2 or 10?→ N_8

"36,000"   "3,600"   "600"   "60"   "10"   "1"   "½" or "1/10"

Sexagesimal System S'

N_{35} —6→ N_{15} —10→ N_2

"60"   "10"   "1"

Bisexagesimal System

N_{56} —6→ N_{54} —10→ N_{51} —2→ N_{34} —6→ N_{14} —10→ N_1 —2→ N_8

"7,200"   "1,200"   "120"   "60"   "10"   "1"   "½"

Bisexagesimal System B*

N_{60} —10→ N_{52} —2→ N_{38} —6→ N_{21} —10→ N_6

"1,200"   "120"   "60"   "10"   "1"

GAN$_2$ System

N_{45} —6→ N_{50} —10→ N_{14} —3→ N_{22} —6→ N_1 —10?→ N_8

ŠAR$_2$ BUR'U   BUR$_3$ EŠE$_3$ IKU

EN System

N_{14} —10→ N_1 —2→ N_{24} —2→ N_8 —4→ N_7

N_9
N_{10}
N_{11}
N_{12}

U$_4$ System

U_4+N_{14}
10 months

U_4+N_1 —3→ U_4+N_{14} —10→ U_4+N_8
1 month   10 days   1 day

$N_{57}+U_4$
1 year

—10→   —12→

FIGURE 2.4 Proto-cuneiform numerical sign systems. Several systems of numerical signs served to qualify discrete objects (a), while others qualified measures of grains, (semi-)liquids, and time (a and b). (Drawing by Robert K. Englund)
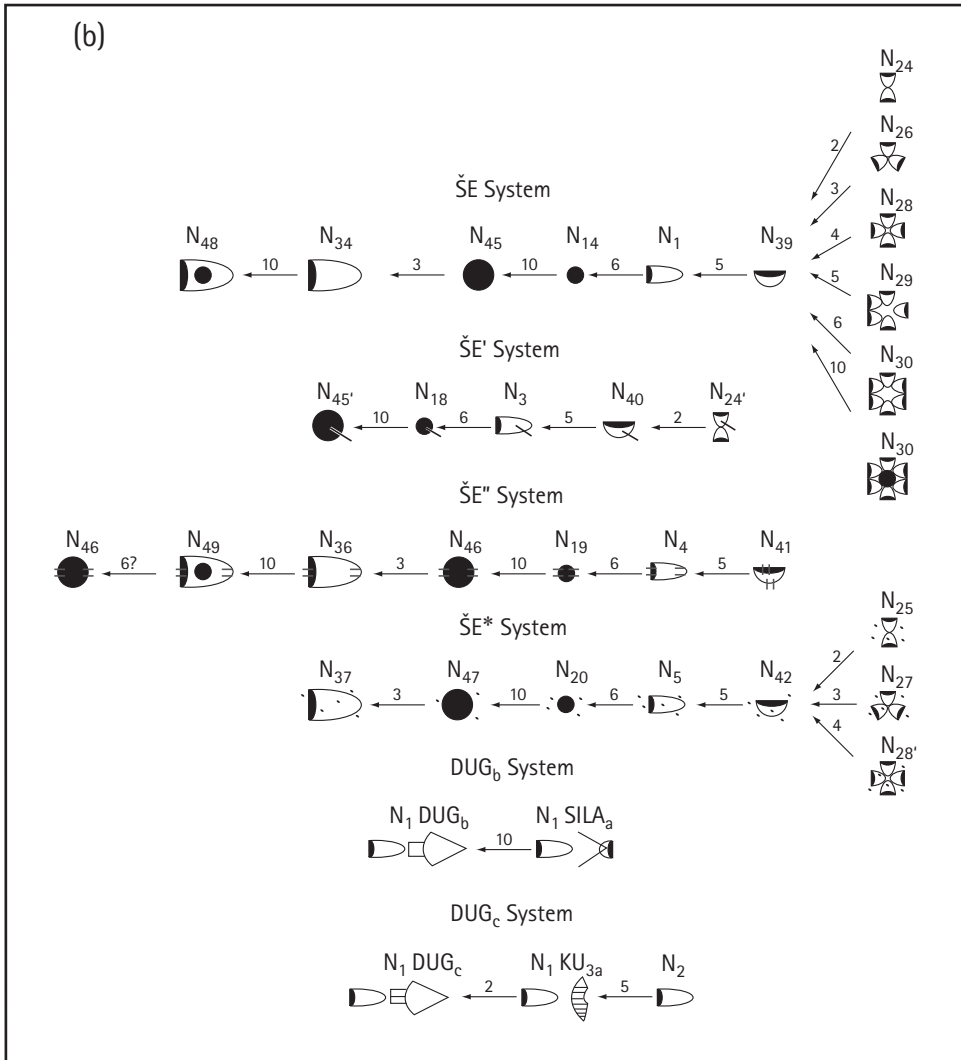
FIGURE 2.4. cont.

measure sizes employed in this rationing system, and to the plausible interpretation, first advanced by Friberg, that texts such as MSVO 1: 89 and 90, recording the daily disbursement of an amount of grain corresponding to the measure N_{24} (*c.* $2\frac{1}{2}$ litres) or N_{39} (*c.* 5 litres) over a span of three years, might document a system of long-term temple offerings (Englund 1988: 138). It is hard to understand why an account should reckon through several years the daily disbursement of a small amount of grain if this were not meant as regular alimentation for a cult figure or for a person dedicated to serve the donor in the cult.

The strengths and limitations of numerical analyses of archaic texts can be demonstrated using a group of documents from the Uruk III period recording the dispensation of agricultural products, above all dry and liquid grain products.

The key to understanding the important grain texts is in fact an artificial account, one of a number of school exercises known from the archaic period. Examples from later periods have received little attention. The text MSVO 4: 66 (Figure 2.5), possibly from Larsa, is something of a Rosetta stone in the decipherment of proto-cuneiform. In terms of both text format and sign meaning, this text resolved nearly all questions concerning a complex accounting mechanism. The individual entries of the text consist of notations that represent on the one hand discrete numbers of grain products—if dry products in the bisexagesimal, if liquid products in the sexagesimal system—and on the other hand notations that represent measures of grain equivalent to the amount necessary to produce the individually recorded products.

Once the information from MSVO 4: 66 could be marshalled, numbers of other complex accounts from the Uruk III period became clear to us, at least in their bookkeeping form. For instance, the Jemdet Nasr text MSVO 1: 93 (Figure 2.6 with reconstructions), shares much of its form and content with MSVO 4: 66 (Englund 2001). The obverse face of the tablet records in successive cases numbers of grain products together with notations that represent the amount of grain required for their production. As seems obvious based both on sign identifications and on production technology implicit in the types of cereals used, the first column lists dry goods—probably rough-ground flour and types of breads—while the first half of the second column lists liquid goods, certainly a type of beer represented by pictograms of ceramic vessels (Nissen, Damerow and Englund 1993: in particular 43–46). Following a double dividing-line, and therefore an accounting format device employed to indicate information derived from different primary sources, the scribe registers varying numbers of animals, animal products (butter oil, textiles, processed fish), and strings of dried fruit. Both sections are qualified, finally, with a set of ideograms representing the type of transaction recorded ('ration', GU_7), the originating place or office of the account (NI+RU, possibly representing the small settlement Jemdet Nasr itself), and the period of time covered in the account (Englund 2001: 18–21).

The ration system

The basic format of those entries recording dry goods is straightforward. In the first of two sub-cases of each entry, discrete objects were counted, using what we have, due to its continuation past the bundling phases of the more common sexagesimal system into units representing 120, 1200, and, probably, 7200 units (Figure 2.4), designated the bisexagesimal system (no adequate explanation of the origin of *either* system's numerical structure has been offered; cf. Englund 2004: 37 n. 21). The second sub-case records a notation corresponding to the amount of grain requisite for the production of the units recorded.

(a)

(b)

obv. i 1 $60 \times$ $1/5$ N_1 $= 12 \times$ N_5 $= 2 \times$ N_{20}

        2    $120 \times 1/10$ N_1 $= 12 \times$ N_5 $= 2 \times$ N_{20}

        3    $120 \times 1/15$ N_1 $= 8 \times$ N_5 $= 1 \times$ N_{20} $2 \times N_5$

        4    $300 \times 1/20$ N_1 $= 15 \times$ N_5 $= 2 \times$ N_{20} $3 \times N_5$

        5    $600 \times 1/25$ N_1 $= 24 \times$ N_5 $= 4 \times$ N_{20}

  rev. i 1   1200 $1 \times N_{47}$ $1 \times N_{20}$ $5 \times N_5$

  obv. i 6 $6000 \times 1/30$ N_1 $(GAR + 6N_{57})$ $= 200 \times N_5 = 1 \times N_{37}$ $3 \times N_{20}$ $2 \times N_5$
= rev. i 2

  obv. ii 1 $120 \times \sim 1/4$ N_1 $(DUG_a + U_{2a})$ $\approx 30 \times N_5$ $=$ $5 \times N_{20}$ $1 \times N_5$ $1 \times N_{42}$

        2   $180 \times$ $1/5$ N_1 $(DUG + A\check{S}_a)$ $= 36 \times N_5$ $=$ $6 \times N_{20}$

        3   $300 \times 1/15$ N_1 $(KA\check{S}_a)$ $= 20 \times N_5$ $=$ $3 \times N_{20}$ $2 \times N_5$

  rev. i 3 600 $1 \times N_{47}$ $4 \times N_{20}$ $3 \times N_5$ $1 \times N_{42}$

                             $1 \times N_{47}$ $1 \times N_{20}$ $5 \times N_5$

                    $1 \times N_{37}$ $3 \times N_{20}$ $2 \times N_5$

                             $1 \times N_{47}$ $4 \times N_{20}$ $3 \times N_5$ $1 \times N_{42}$

Grand total of flour used: $1 \times N_{37}$ $2 \times N_{47}$ $9 \times N_{20}$ $4 \times N_5$ $1 \times N_{42}$

Grand total of malt used:

        $1N_{47}$ $4N_{20}$ $3N_5$ $1N_{42a}$ (rev. i 3) $\times 3/5 \approx 8 \times N_{18}$ $4 \times N_3$ $1 \times N_{40}$

FIGURE 2.5 (a) The administrative exercise tablet MSVO 4: 66. This text formed the basis for Friberg's identification of the structure of the archaic metrological system, used to count grain measures, in particular the relationship of 1:6 between the two signs N_{14} and N_1, earlier believed to be 1:10. (b) The calculations implicit in the text MSVO 4: 66 (see figure 2.4 for sign designations). (Drawing by Robert K. Englund)
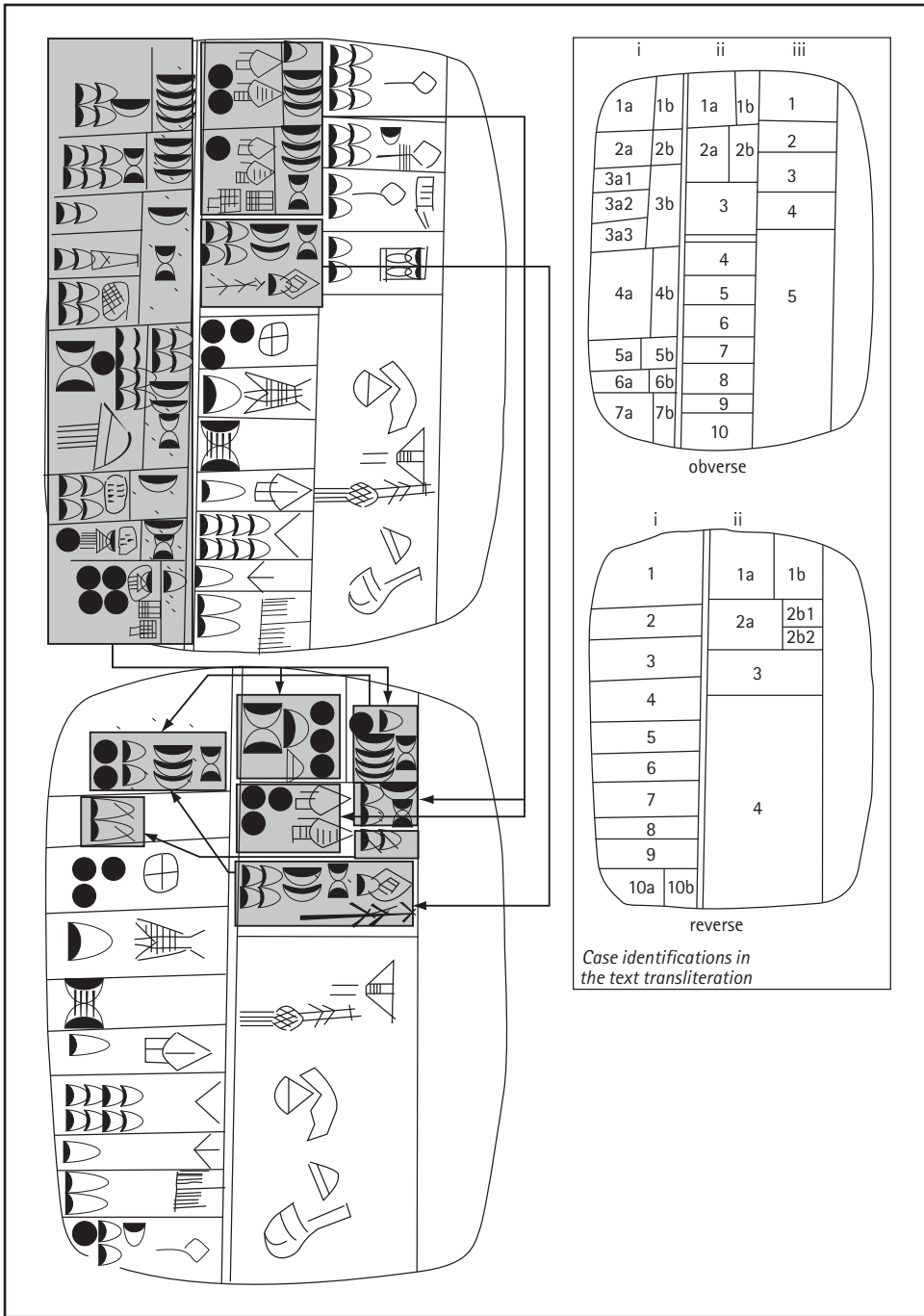
FIGURE 2.6 The account MSVO 1: 93 from Jemdet Nasr. It demonstrates many of the equivalencies, and the bookkeeping format of the exercise MSVO 4: 66, but includes ideographic notations representing agents, actions, and time spans connected with the account. (Drawing by Robert K. Englund)

The system used in this case corresponds in its numerical structure to the common grain capacity sign system, but is qualified by the addition of an arbitrary number of impressed dots that seem to graphically represent the ground barley used in the grain products.

Grain equivalencies

As is usually the case with proto-cuneiform accounts, eventual subtotals and totals are inscribed on the reverse face. Here too, the categories of goods are treated differently, with a full tally of products in a first sub-case of the right column. The second sub-case was used here to tally all grain products with grain equivalencies. These equivalencies evidently represent the final value of these goods and are thus alone included in the grand total of the left column (Figure 2.7).

This formation and use of grain product equivalencies as exemplified by the texts MSVO 1: 93, and MSVO 4: 66, must be considered an important step in the direction of general value equivalencies best attested in the Ur III period for silver, but then still generally applicable for other commodities such as grain or fish, including finally also labour time. It is not possible to determine whether, as would seem intuitively likely, these equivalencies simply describe the amount of grain expended in producing different types of bread, beer, and other cereal products. But even if this is the case and the accounts presume no value equivalencies for products that might, for instance, require in their processing more labour or different ingredients than would be represented by a one-to-one relationship between the capacity of the finished product and the amount of barley corresponding to the product's grain capacity, still the *seeds* of value equivalencies among disparate goods may have been sown in these accounting procedures. The concept of value equivalency was a secure element in Babylonian accounting by at least the time of the sales contracts of the Early Dynastic IIIa (Fara) period, *c.* 2600 BC (cf. Englund 2004: 38 n. 22).

While there are no evident notations in the archaic texts which exhibit the level of labour time and production norm complexity of the Ur III period, still at least two components of archaic accounts are instructive about the accounting procedures at the dawn of literacy. In the first place there appears to have been a close connection between the graphic system employed to record calendrical units and that used to quantify measures of grain. In both cases the unit 'month' played a central role. Only those calendrical notations representing one or more months employed the standard forms of the sexagesimal system, with the sexagesimal unit representing the discrete unit 'one.' Notations for days and years alike employed derivative numerical signs (N_8 and N_{57}, respectively). At the same time the capacity system centres on this same unit sign N_1, yet with diverging relationships between this and other signs in the system.

In particular the signs representing lower values in the system are arranged in a sequence that successively divides the basic unit into 'fifth' (N_{42}), and further on down to the sign N_{30a}, which represents a measure of grain 1/30th the size of the basic unit.

FIGURE 2.7 Equivalencies in grain accounts. The table lists, in order from largest to smallest attested values, the grain equivalencies of products found in the proto-cuneiform record, together with their respective ideographic correspondences (ideographic correspondence of the same numerical signs is not included). (Drawing by Robert K. Englund)

It cannot be a coincidence that this sign so regularly corresponds in the archaic accounts to the ideogram GAR. This latter sign is the pictographic representation of the bevelled-rim bowl, a clay bowl with a capacity equal to a standardized daily ration in Mesopotamia. It therefore seems reasonable to assume that the numerical sign N_1 represents one month-ration for one labourer in the archaic period.

In the second place we find in the archaic accounts good evidence for the quantification of household-dependent labour entirely compatible with later tradition. The Jemdet Nasr accounts MSVO 1: 212–214 belong together in a relationship of secondary and

primary documents and represent an accounting transfer without any gaps (cf. Englund 2004: 40 n. 23).

It should be noted that the ideographic qualifications of those persons recorded by name in the individual entries of MSVO 1, 212–214—namely, with the sign combinations SAL+KUR and SAG+MA, and with ERIN$_2$—are designations of dependent labourers, probably slaves taken as plunder in violent actions against Babylonian neighbours. The twenty-seven individuals so qualified do not constitute a large number of slaves, but other accounts are suggestive of larger groups, for instance W 9827 with a minimum of 211 such individuals (Englund 1994: pl. 118; 2010: 78–79).

ACCOUNTING FOR LABOUR

The method of bookkeeping employed by archaic scribes to record groups of labourers is not particularly complex. We have approximately fifty recognizable accounts of this sort with numbers qualified by sign combinations that represent 'labourer' and including sign combinations evidently representing personal names. These persons are also qualified according to gender and age. For instance, the text W 23999,1 (Cavigneaux 1991: 74) in Figure 2.8 distinguishes subgroups of five female and three male humans, these subgroups in each case further divided according to age, whereby presumable infants are qualified with sign combinations that might be translated as 'womb-suckling'. It is noteworthy that precisely the same accounting format is employed in the records of animals. Here, too, pigs are separated according to age and, in the case of small and large cattle, animals are divided according to sex. The gender qualifications for the young of these animals are represented by SAL and KUR, the same signs that generally describe men and women. Furthermore, as A. Vaiman (1991: 121–133) has shown, Uruk accounts record young animals and young 'slaves' with the same derived numerical sign N$_8$ (Figure 2.9), which generally qualifies a half (in some limited applications one-tenth) of some unit counted in the sexagesimal and bisexagesimal systems. This may derive from an apportioning of rations to children of productive age of approximately half that of adults, as was administrative labour practice in later periods.

Labour and slavery

We cannot be certain that the taxonomic differentiation in archaic Babylonia between higher-status humans on the one hand, and lower-status humans and animals on the other, is a meaningful one. Still, it might be of interest to compare Babylonian with archaic Persian data. The sadly neglected field of proto-Elamite studies has demonstrated the use of the same numero-metrological systems as those known in archaic Babylonia, with the addition of a purely decimal system. As far as we can tell, the sexagesimal system qualifies discrete goods in the same field of application as that of Babylonia, except that some objects were qualified specifically with the decimal system. This
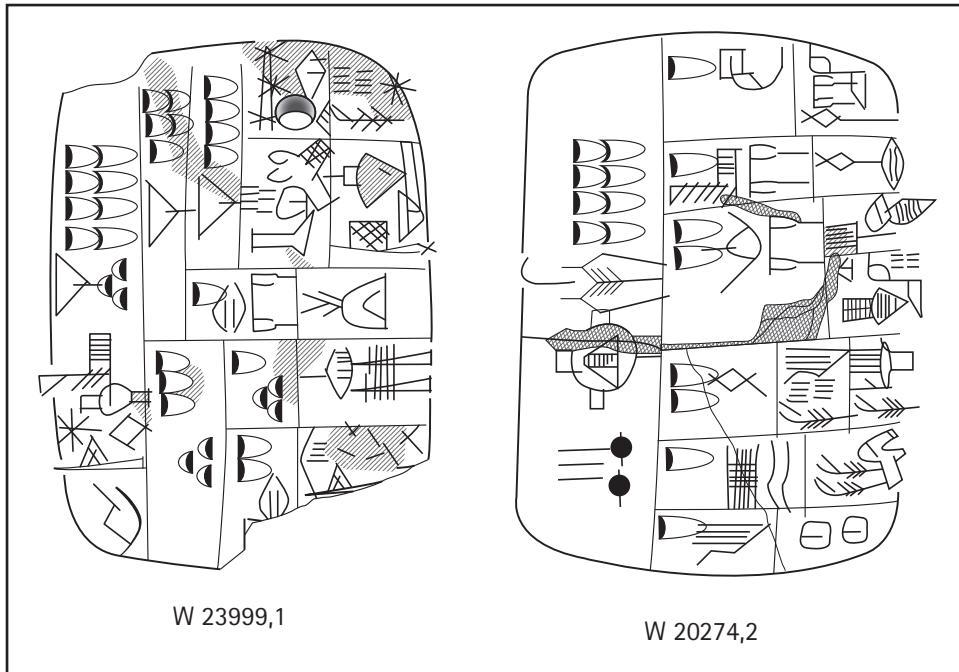
FIGURE 2.8 Accounts of domestic 'herds' of slaves (W 23999,1 and W 20774,2). Formal accounting practices suggest that these two accounts from Uruk in the Uruk III period record the make-up of two eight-member 'herds' of human labourers. (Drawing by Robert K. Englund)

decimal system, employing signs borrowed from the bisexagesimal system, qualifies what apparently are domestic animals, but also what we believe are lower-status humans. It appears that high-status humans—foremen and high officials—were, as all humans in Babylonia, qualified sexagesimally. If, as we suspect, these unusual numerical systems were introduced into Persia during the period of the Uruk expansion, then we can speculate that the inclusion of high-status humans in the Babylonian sexagesimal system represents a vestige of a two-tiered taxonomy of living beings practised in Babylonia, including domestic labourers with domestic animals. The concept of *homo sapiens sapiens*, seen relatively in different populations even today, must have been a much more fluid concept in prehistoric times.

Can we call the proposed taxonomy of the Late Uruk 'slave' = 'animal' an ideological perspective? It may be that we are looking at the enslavement and exploitation of foreign populations, reflecting a deep element of the earliest native Babylonian population. But it may also reflect a developing class-consciousness. Guillermo Algaze (2001: 211–213, 215–228, 415–418), arguing that this primitive categorization represents 'a new paradigm of the nature of social relationships in human societies', has stated that the identification of humans with domestic animals is even a *necessary stage* in the formation of early states. Certainly, when we speak of 'work force', 'farm hands', or 'factory hands',

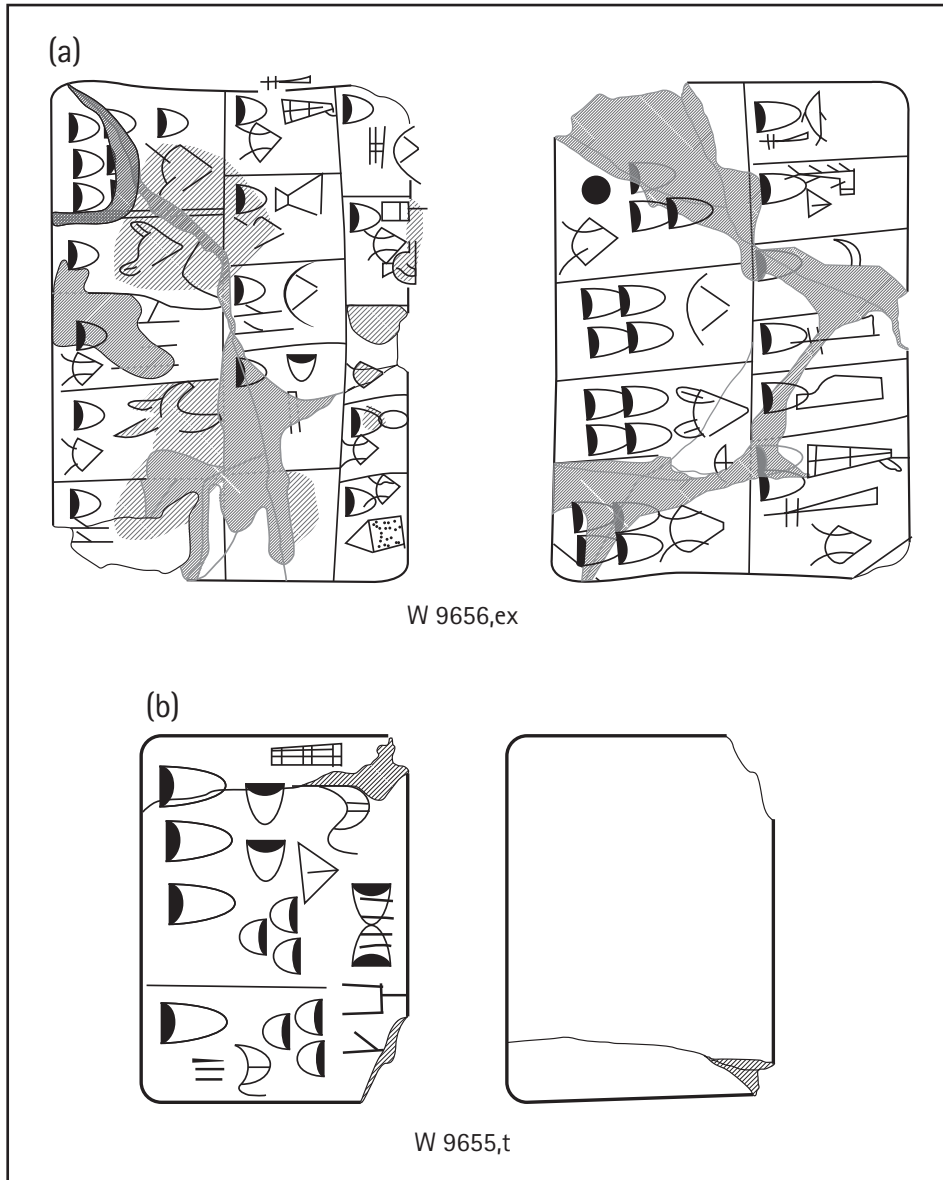(a)

W 9656,ex

(b)

W 9655,t

FIGURE 2.9 Numerical qualification of young animals and humans. Texts of the Uruk IV period record numbers of cattle (a) and humans (b), in both cases including the numerical sign N_8 designating young animals. (Drawing by Robert K. Englund)

we abstract labourers little less than Babylonian scribes, who recorded pigs and labourers in similar fashion, both serving the community of man. Our archaic accountants may have forgotten how close they were to membership in the same fraternity.[1]

Further reading

Nissen, Damerow, and Englund (1993) is a well-illustrated introduction to the early development of cuneiform, with a special focus on Late Uruk documents (*c.* 3500–3000 BC) while Englund (1998) offers a concise survey of these texts and their historical context. For the roughly contemporary, so-called Proto-Elamite texts from Iran, see Damerow and Englund (1989).

Specific aspects of accounting conventions and practices, and their social context, are analysed by Englund (1988, labour management; 2001, grain accounting; and 2010, slavery). For a study of proto-cuneiform texts that stresses the revolutionary impact of the 'invention of writing' see Glassner (2003; but cf. Englund 2005). Nissen (1993) is an attempt to reconstruct Mesopotamian society on the basis of archaeological and textual remains from the mid-fourth to the mid-third millennium BC, while Visicato (2000) traces the role of professional scribes during the same period.

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