

CREATING ECONOMIC ORDER
RECORD-KEEPING, STANDARDIZATION,
AND THE DEVELOPMENT OF ACCOUNTING
IN THE ANCIENT NEAR EAST



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INTRODUCTION

The Role of Accounting in Civilization's Economic Takeoff

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There has been a natural progression in these colloquia. Our first meeting, on privatization in 1994, found that the most important asset being privatized was rural self-support land. Our 1996-97 colloquia accordingly focused on land ownership and urbanization. Inasmuch as the primary lever making the land alienable was debt default, our third meeting, held in 2000, focused on debt and royal "Clean Slate" proclamations.

We might well have begun our series of colloquia with this fourth volume's topic of accounting, for all the topics we have been discussing stem from it. Accounting formats are our main source for understanding economic practices from the time the first written records appear. It is from them that we are able to reconstruct how the temples and palaces provisioned their labor and administrators and how they organized their trade and public infrastructure investment. Out of their record-keeping evolved pricing, monetary and debt relations, along with leasing arrangements for land and workshops.

Held at the British Museum in November 2000, this meeting addressed the extent to which accounting practices did more than just reflect the economic dynamics of an epoch prior to descriptive narrative. They actively shaped economic life. The papers in this volume trace the aims and functions of accounting practices from early Uruk c. 3300 BC down through the Neo-Babylonian period, as well as Egyptian practice. Also described are the accounting techniques that diffused from Sumer eastward to the Iranian plateau and, to the northwest, up the Euphrates through Syria and across the Mediterranean to Crete and Mycenaean Greece. Weights and measures were standardized among these regions, with the key measure becoming monetary weights as the basic unit of account.

From counting and accountability to accounting

Some discussion has gone into deciding on the most appropriate title for this volume. The term "accounting" focuses on "counting," and hence on the development of numeracy. "Bookkeeping" is less ambitious. On the one hand it reflects the fact that economic accounts were the first "books," out of which writing and literacy developed as well as numeracy. However, bookkeeping is done mainly for one's own use. It provides the source material but does not formally become an accounting statement until this data is supplied to someone. The essence of accounting is *accountability*, which implies ranking and subordination. Accounting systems are part of a broader system of administration, at least within the public institutions where they initially were developed. Being answerable to a higher party, early scribes followed the categories and format determined by Mesopotamia's palaces and temples.

Symbolic tokens existed already in the seventh millennium BC, as described most thoroughly by Denise Schmandt-Besserat. But these calculi were not organized in the context of a time frame. Full-fledged accounting went beyond merely tracking inventories. It scheduled, ordered and tracked the flow of inputs and output during specific time periods. By quantifying these resource flows, accounting became a management tool for forward planning. As such, it was used increasingly to squeeze out an economic surplus.

An accounting system's categories reflect the logic and world-view at work. The process is dialectical, involving how the accountant's mind operates as well as the "objective" conditions at hand. The formats designed by the Sumerians reflected how the large institutions worked administratively. Underlying their accounting records and categories is the perspective of institutions managing their extensive landholdings and herds, their workshops and specialization of labor.

Accounting systems as a means of ordering the administrative sphere

Non-agricultural labor did not possess its own means of support, but worked in an institutional context whose scale of operations required account-keeping for forward planning to provision this work force. Functions that had been free-form and amorphous within the family household had to be given measure and definition.

To coordinate these activities the Sumerians created a cluster of interlocking innovations in a "big bang" as a unified-field approach. An administrative calendar based on uniform 30-day months led to the

sexagesimal system of counting and dividing into 60ths, and a matching sexagesimal set of weights and measures to allocate rations to the work force for monthly and daily use. Mutual price equivalencies were assigned for key commodities and the rental rate for land (see Renger 1995). These prices served as coefficients to form a grid of equivalencies in which barley and silver emerged as the basic reference prices or "money-of-account." Setting these two commodities as a joint standard of value enabled disparate transactions to be organized into an integrated system in which an overall balance could be struck to measure the net gain or loss.

The standardization of time, measures and weights, and prices

The administrative logic can be inferred by working backward to peel away the layers of standardization and simplification that were the keys to shaping economic order out of what had been a more amorphous course of economic life.

Designing an accounting system started by standardizing units of time in order to regularize the distribution of rations and other resource flows within the large institutions. An awareness of calendrical regularities is reflected already in the Ice Age to coordinate group festivals and meetings (Marshack 1972, 1999). By neolithic times seasonal and lunar forecasting timed the planting and harvesting cycles. The calendrical keys were the year and its four quarters marked by the solstices and equinoxes, and the new moons occurring twelve or thirteen times annually.

By the Bronze Age a serious problem confronted planners. The lunation cycle had long been used to time public ceremonies and meeting dates, but the $354\frac{1}{2}$ -day lunar year is composed of months of varying lengths—"hollow" months of 29 days and "full" months of 30 days. This periodicity does not fit symmetrically into the $365\frac{1}{4}$ -day solar year. It was necessary to subordinate the lunar months to a synthetic system.

To allocate their resources on a regular basis, the large Sumerian institutions devised a 360-day administrative year composed of twelve 30-day months.¹ This divided time into uniform periods so as to avoid

¹ The most elaborate study remains Englund (1988). It seems logical to infer that sexagesimal fractions were developed to handle the monthly or other periodic distribution of resources in keeping with the public-sector calendar. Their legacy persists in today's practice of dividing minutes and hours into 60ths, as well as the 360 degree circle, perhaps one of the most deeply-seated modern vestiges of a practice that emerged initially out of Mesopotamian accounting needs.

the problem of lunar months of varying length, which governed the community's festivals and life outside of the temple and palace internal administrative rhythms. The 360-day calendar did not stem from the heavens as previous calendrical observation had done, but was artificial. It became the foundation for civilization's first managerial revolution, the first step in creating a symmetrically ordered world.

The sexagesimal system's fractions would seem to reflect these calendrical divisions, and Sumerian weights and measures followed suit by being divided into sexagesimal denominations convenient for distribution on the basis of the 30-day administrative month as rations to the workforce (Lambert 1960:22). Grain was measured in volumetric gur units divided into multiples of 60 (initially into 300 sila and later into 180 and at time only 144 sila) to measure out the food and other materials needed for the smooth functioning of the temples and palaces. And a gur-weight of grain was the unit needed to sow a gur-area of land.

In any accounting format the categories for the columns and lines reflect an implicit economic theory. Babylonian accounts translated food rations into labor time for each distinct category of labor—males, females and children. This enabled the large institutions to calculate the rations needed to produce textiles or bricks, build public structures or dig canals during any given period of time. Administrators calculated the lead times involved in planting and harvesting crops, estimated their prospective yields and rental charges, and set prices for the inventories they advanced to merchants. It was through such organizational planning that these institutions produced systematic annual surpluses.

A precondition for their account-keeping was standardization, starting with ration levels. To enable large quantities and their values to be readily calculated, the commodities being measured and weighed were assigned prices set in conveniently round numbers. "By at least the time of the sales contracts of the ED IIIa (Fara) period, c. 2600 BC," points out Robert Englund, "the concept of value equivalency was a secure element in Babylonian accounting." Major commodities such as gold and copper, wool and sesame oil were assigned values in an overall price grid that also could be used to calculate labor time and land rent. Any element in this grid could be used to measure others, so that accounting prices could be set for barley and silver, copper or gold relative to each other and to other key commodities. (To be sure, these coefficients differed from city to city and from period to period.)

There was little thought of letting market forces affect the administered prices of the major products. Although prices for grain that the

temples or palaces bought from outside suppliers sometimes shifted drastically in times of grain failure (as when the kingdom of Ur fell into crisis at the end of the third millennium), it would take many centuries, even millennia, for price-setting markets to evolve. When they did so, it was in the wake of collapsing central authority.

Account-keeping and the origins of money

The monetary breakthrough came when a common denominator was selected out of the overall price grid to measure diverse activities. Money was the ultimate abstraction, the most important price coefficient, providing the large institutions with a standard to value the output of their lands and herds, the products of their work force, the handicrafts they consigned to merchants, and to calculate interest on such advances.

The major commodity being distributed was barley to feed the labor force. The most important metal used in production was copper, which was alloyed with arsenic, antimony, and especially with tin, which is why archaeologists refer to this period as the Bronze Age, 3500-1200 BC. It could equally well be called the Silver Age, for it was an age of commercial outreach, in which silver emerged as the "money of the world" as 18th-century economists would call it. (Gold was used in much smaller quantities and usually in less public contexts.)

Silver owed its high status not to its technological role in production, but to the social role it played in the temples and palaces that served as society's administrative organs. Probably because of its rising status as the major form of religious donation, silver became the preferred payment vehicle for merchants to settle balances owed to the temples. And it was the temples that supplied it to the economy down through Greece and Rome, when mints were located in the temple precincts.

The essence of early accounting systems was the need of the large institutions to administer prices. The monetary pivot of Sumerian accounting practice was established by designating the relative value of silver and barley. A shekel of silver was set as equal in value to a gur "bushel" of barley. By the end of the third millennium, about a thousand years after the inception of Uruk accounting, the large institutions were stating the value of their activities in terms of silver. Minas and shekels were plugged into what originated as a barley-based valuation

system for distributing rations and charging rent on temple and palace land.

Starting in Early Dynastic documents, price equivalencies were expressed in terms of ratios to the value of copper that the temples imported and refined. Later, dividing the weight units—the mina—into 60 shekels made barley accounts easily rendered in terms of silver or other metals to quantify the crop rents or debts due upon harvest. The rate of interest was set in simple sexagesimal terms rather than reflecting the actual returns generated in trade and agriculture. In this and many other such cases the standardized rate used by the public institutions was adopted by the economy at large.

Silver's role as the key measure of value led it to become the most generally desirable means of payment. In keeping with what Georg F. Knapp called the State Theory of money, the large institutions gave silver value by making it acceptable in payment for proto-taxes and fees, as well as for goods and services purchased from these institutions.

The striking absence of money in Mycenaean Greek records, c. 1400-1200 BC, shows that tribute lists and tax accounts could be kept without making the monetary breakthrough that Mesopotamia account-keeping achieved. Although the Mycenaean period was highly cosmopolitan throughout the Near East and Mediterranean region, Michael Ventris found no evidence of "anything approaching currency. Every commodity is listed separately, and there is never any sign of equivalence between one unit and another." He was not "able to identify payment in silver and gold for services rendered" in the Linear B lists of "women, children, tradesmen, rowers, troops, flocks of sheep and goats, grain, oil, spices, land leases and yields, tribute, ritual offerings, cloth, vessels, furniture, bronze, chariots and helmets."² The delivery schedules found in Linear B records were rake-offs from each department under palace control rather than leading toward commercial relations.

From this long-term perspective, the development of account-keeping by Sumer's temples was as important a contribution to civilization as Quesnay's *Tableau Economique* and subsequent national income accounting has been for modern economic management.

² Ventris 1956:113, 198; see also 1970:101, cited in Buchan 1997:24.

Social origins and consequences of account-keeping

Writing and classifying as byproducts of accounting practice

Although accounting may seem at first glance simply to report economic phenomena, it has major effects on society's economic shape. Its early development consists of what Carl Lamberg-Karlovsky calls the "technology of social control," starting with the monitoring devices of seals, bullae and sealings, and proceeding via writing and the administration of weights, measures and prices to the creation of what today would be called an economic model to organize the activities of Mesopotamia's large institutions and their relations with the rest of society.

Two parallel developments evolved hand in hand for about half a millennium. First, numeracy and quantitative measurement were needed to extend the control over nature to include the rhythms of the large institutions—their seasonal schedule of planting and harvesting, and the monthly rhythm of provisioning their workshops and dependent labor so as to coordinate the large flows involved. Second, written notation was needed to track and quantify these resource flows, and to classify the disbursements and receipts for a myriad of activities.

As Alexander Marshack (1999) has pointed out in an earlier contribution to these colloquia, the first written notations were calendrical in character. Chiefs, priests and rulers were the time-keepers in early epochs. Yet it was not from their calendrical symbol systems that cuneiform writing evolved, but from the three-dimensional clay tokens that served as proto-accounting devices to represent animals, crop units, oil and other basic commodities starting c. 8000 BC.

The fact that most tokens have been found in temples and other public locations gives a hint that accounting and writing first developed within the large institutions. Their predominantly agricultural character led Schmandt-Besserat to infer that they were associated with the oversight of cultivation and herding. This would make writing an expression of bureaucratic control already at an early date, rather than "bills of lading" arising out of individuals pursuing their gain-seeking through trucking and bartering. "Contrary to a common misconception," she warns (1992:167), "the exchange of goods per se seems to play no role in the development of reckoning technology, presumably because bartering was done face to face and, therefore, did not require any bookkeeping. ... there is no evidence that [prehistoric long-distance

trade] involved any formal accounting ... because the product was bartered by nomads in the course of their annual round or because it was presented as a ceremonial gift, in which cases, the transactions were carried out face to face and, like local trade, did not require any recording.”

By the middle of the fourth millennium these tokens and the signs impressed on their envelopes became more complex, denoting “finished products typical of urban workshops, such as textiles, garments, vessels, and tools; processed foods, such as oil, bread, cakes, and trussed ducks; and luxury goods, such as perfume, metal, and jewelry.” However, she finds no archaeological indication that they were linked to trade consignments. Rather, they represent “local agricultural staples such as grain and animals” and basic products such as garments.

Late in Lagash’s Ur-Nanshe dynasty c. 2500 BC cuneiform tablets deal visibly with commerce. Throughout these early centuries of cuneiform, tablets consist primarily of accounting records and writing exercises to train scribes working in the temples and palaces. A large portion of the documents that survive from the early third millennium are thematic lists of words for metals, animals, trees and other plants, and geographic place names. These lexical texts are the earliest writing not linked to numerical documents, and are the first literate records (Bottéro 2000:26).

To be sure, the words on these lexical lists were intended to be attached to numerical accounts. And having been developed as a byproduct of the need to allocate and track resource flows, writing facilitated the creation of categories and ranks, extending control over nature and civic society by enumerating different species within each group or category. The more categories and species that could be named, measured and tracked, the more could be brought under control. The process of abstraction reflected the epoch’s economic ranking, starting with the oft-copied Professions List headed by the ruler and proceeding sequentially down through the administrative hierarchy.³

³ The term “hierarchy” (from *heiro*, sacred) reflects the originally religious organization of corporate households into ranks such as “deacons” and other officers. William Scott’s 1907 history of British corporations reveals the extent to which the antecedents of modern corporate practices extend at least as far back as Sumer, including their annual meetings replete with audited income-and-expense statements and balance sheets measuring the surplus being accumulated.

And with this writing went authority, not least because of the intensive scribal training it required. Subordinates reported to their superiors, documenting and sealing each transaction.

The organization of these lists mark the inception of literary texts. They reflect an administrative world view, evolving out of accounting practices in the public sphere that in turn reflected how the large institutions were administered. Out of this notation developed the foundation for writing literary documents, also largely public in character at their inception—ceremonial texts for temple dedications, hymns to the temple and city-gods, mythological stories, laws and letters.

Early records stop at the point where the administrative units end. No trade documentation has survived.

The creation of a bureaucracy to squeeze out an economic surplus

Many societies developed forms of information storage and record-keeping that did not involve writing, from Mesopotamia’s early tokens and calculi to the knotted *quipu* strings of Incan Peru and the tally sticks used in England to record royal debts as late as the 18th century. Noting that large Incan and Mayan city-states operated without written records, Piotr Steinkeller concludes that complex economies even on the scale of Uruk and other Sumerian cities could have functioned without accounting, but could not have processed this information for forward planning and economic cost rationalization. Calculations based on past yields and productivity were used to estimate quotas and allocate labor. The Ur III bala taxation system, for instance, “called for an extraordinarily high level of data-recording, since the provincial administration had to know exactly how much goods and labor it expended on behalf of the central government and its officialdom in order to be able to calculate the value of its contributions vis-à-vis the figure that had been assessed for the province by the central government.”

Ogden Goelet points out that “all effective systems of management require controls such as accounting and inspections to insure that resources are being allocated and consumed according to plan.” His paper cites the Old Kingdom Palermo Stone predicting crop yields on the basis of the level of the Nile’s annual inundation, the Abusir archive with its ruled papyrus blanks to be filled in to compare scheduled receipts and disbursements to actual deliveries, and the Wilbour Papyrus recording land rents or taxes as “evidence for the existence of a

basic sense of planning and control within the Egyptian state or proto-state . . . a system for checking and controlling a rather extended network of institutions from a distant central point.”

The earliest periods had the most detailed and sophisticated accounting practices, largely because of their more centralized character. To explain their quantum leap in management techniques it is necessary to reconstruct the social context. Accountants traditionally have been cost cutters, seeking ways to save money and squeeze more output out of labor by working it more intensively. The Sumerians started this tradition by developing a bureaucracy whose task involved making life more tightly managed. Planning from the Uruk period onward aimed at producing an economic surplus, not just at passively reporting what was happening. The public institutions, if not society itself, were obliged to conform to the dictates of their accountants.

Any review of the early impact of accounting must acknowledge Maurice Lambert's pioneering research on Lagash's royal bureaucracy. In an early article (1960:26) he described how the accounting innovations wrought by the city-state's scribes c. 2380-60 BC “mark a boundary between two epochs: that of empires established uniquely by force of arms, which usually perished with the death of their founder; and that of States adding to the power of their warriors with the vigilance of their scribes and managers, backed by the armature of a methodical bureaucracy, efficacious for its automaticism.” Reviewing the flowering of bureaucracy that accompanied the elaboration of this account-keeping into forward planning, he subsequently (1963:83) noted that *ad hoc* solutions to administrative problems were refined into an increasingly schematized “*planification* of the entire royal economy.” The word refers to France's “indicative planning” from the 1950s onward.

Our own epoch has discovered that when accountants are put in charge, they aim at working labor harder while cutting wage costs. Sumerian accounts show that this phenomenon has been occurring for over four thousand years. Dependent labor received only the barest subsistence minimum. When the nubanda Eniggal standardized accounting practice under Lagash's rulers Enentarzi, Lugaland and Urukagina, he did what accountants have been doing ever since: He used cost accounting as a management tool to squeeze more out of the temple labor force.

In scheduling and administering the flow of crops and other raw materials, rations and labor, accounts were used for “planning” in the sense of providing a formal structure to the large institutions and, via

their central role, to the world around them. Developing into an integrated system of resource allocation in the Early Dynastic and Ur III periods, accounting played an increasingly sophisticated role in central planning by such refinements as dating statistical records, streamlining their formats and widening their comprehensiveness.

The flowering of accounting between 3300 and 2000 BC imposed an order by a regime of standardization. After the Ur III period, however, planning—along with centralized rulership—became looser as control over agriculture and handicraft production was delegated and privatized. Accounting was little concerned with how the economy outside of the palace and temples operated. Michael Jursa finds that by Neo-Babylonian times the degree of bureaucratic control was limited to setting fiscal targets whose round numbers reflect a lack of empirical realism for sophisticated cost-accounting.

Given the changing role of the palace and temples from one period to the next, the colloquium's participants find the term “planning” to be ambiguous. Jursa asks whether the simple act of setting standard tax and rent quotas really constitutes “planning,” or whether the term should be reserved for a more detailed cost management. In his words, is the scope of accounting minimalist or maximalist? “Minimalists emphasize the administrations' restricted scope and claim that Mesopotamian institutional accounting fulfilled primarily what the classicist Moses Finley called a ‘police function’: keeping track of obligations. . . . The opposing, ‘maximalist’ position considers the bureaucratic administration primarily a means of enabling prognostication and planning for the future.”

Standardized proportions, from planning to fiscal levies

Steinkeller finds that early Sumerian accounts were used for planning purposes at least to calculate what the palace expected from the land and other resources leased or consigned to managers. Marc Van De Mierop notes that in making these estimates “the accountant viewed the world on the basis of standard rates, which may have been originally based on observation, but became mathematical formulae detached from reality.” Throughout the more than two thousand years of Mesopotamian record-keeping surveyed by this colloquium's members, round numbers were used as the basis for forecasting, setting leasing rates and levying taxes. Standardized proportions were calculated in

round numbers using "theoretical constants" according to fixed ratios such as 2:1 or 3:1. This practice led early interpreters to view such tablets as school exercises. But they turn out to be quotas used for planning purposes, proscriptive rather than descriptive.

If this sounds like a Procrustean bed, the fit became looser over time. Jursa finds that when Neo-Babylonian temples calculated expected yields by rule of thumb, they did so optimistically and in round numbers. To the large institutions the "plan" simply listed what the managers and "entrepreneurs" owed. As workshops and agricultural estates shifted into private hands, accounting evolved from what he calls a "maximalist" managerial function to more "minimalist" fiscal quotas and oversight. Reflecting the more limited role of the bureaucracy in Neo-Babylonian times, Jursa concludes, "administrative control over institutional property and economic affairs was . . . overall far less direct and strict than for example in the Ur III period." The palace concerned itself simply with how much it would receive in taxes or rents, leaving the underlying organization and productivity of labor to local proprietors. "Accounting as a source of data with which such rules could have been refined in an objective 'rational' way seems to have played a minimal role at best."

Shortfalls and carry-overs

As a result of such standardization, accounting lacked the realism that would have characterized actual records, being idealized and often in the character of wishful thinking when it pertained to economic forecasting. Van De Mierop points out that using round numbers meant that a disparity was bound to develop between the rents or quotas assigned to the land and its actual yield, as there is even today with crop forecasts. "If there were more credits than debits, there was a surplus (Sumerian *diri*), which often could be used for whatever purpose the official accounted for wanted." Otherwise, there was a deficit. "The fact that the scribe indicated both the expected harvest and what was really delivered indicates that actual measurements of the income were made." Goelet finds that in Egypt, projected yields were filled out in advance and shortfalls were written in red ink, inaugurating a tradition that survives in our own language as "red-ink entries." Bureaucrats had to show what they had disbursed and why they no longer had the resources that the palace or temples had provided them.

Shortfalls were carried over to the next year, but Jursa reports that whether the Neo-Babylonian leaser or bureaucrat had to pay the balance seems to have been a rather loose affair, as probably was the case in Old Babylonian times and perhaps also in Ur III. Sharecroppers and other cultivators who fell behind were burdened with onerous debt charges, and forfeited their land rights or other assets when they could not pay. Yet palace claims and carry-overs on the powerful often remained mere bookkeeping items. The large "entrepreneurial" leasers of property apparently were able to defer payment without penalty, at least in times when palace control weakened, until rulers cleared the slates with an *andurarum*, that is, a debt-remission act. A double standard was at work. In much the same manner Goelet points out that while shortfalls were noted in Egyptian records, there is no indication that actual indebtedness resulted when the crops failed. The palace recognized that its collectors had taken all they could.

We thus see that already by 2000 BC a long-standing social principle was being established. Debt claims were strongest when they were held by a person or institution of higher status on someone of lower status. Stated the other way around, it was much harder to collect a debt from a wealthy person or someone in the public sector than to enforce a debt against a lower-status person. Anthropologists have noted this for tribal communities, and it is familiar enough in today's world. Wealth and position always bring advantages in avoiding debt payments.

The technical development of bookkeeping and accounting

The growing articulation of the palace economic system created a need for increasing simplification of account-keeping. Each technical innovation was a step toward greater streamlining. Robson describes the development of the tabular formatting as making it easier to summarize accounts, enabling totals and subtotals to be added up without having to search through the text. The earliest tables with column headings and a horizontal axis of calculation appear full-fledged already in the Early Dynastic period (24th century), and were well established by the 19th century BC.

Hallo points out that the final column of data sums up the preceding columns, making it possible to perform the routine of cross-checking the sums vertically and horizontally. This put in place a precondition for double-entry bookkeeping, which almost was incipient. Or at

least it would have been if scribes had written out receipts and produced new tablets immediately as they allocated their resources, for the essence of double-entry bookkeeping is automatic simultaneity.

Hallo has found a set of such tablets whose inflows and outflows nearly match, and poses the question of how closely this meets the criterion for double-entry bookkeeping. Van De Mieroop counters that "There could not be double-entry bookkeeping for which a sheep, for example, appeared as a credit and a debit in the same account, for the time lag between the receipt and the issuing of the animal probably often surpassed the time it took clay to dry." The information needed to create a double-entry account was there, but the medium was not conducive to it as writing on clay could not be amended as readily as, say, Egyptian papyrus. "The scribe could only amend figures or correct mistakes soon after he made them, by erasing them with a wet finger and rewriting the entry. Once the tablet had fully dried, that became impossible." The concept of double-entry bookkeeping was merely incipient.

Van De Mieroop finds that "the greatest challenge to the ancient accountants was not the recording of a single transfer, but the combination of a multitude of transfers into a summary." Adding up daily and monthly statistics to compile annual totals required "that the scribe combine information from various records." Organizing them into an overall set of accounts spanning an entire year or a larger aggregation created problems that stretched the technical capacity of cuneiform documentation to the limit. Jursa points out that the Neo-Babylonian solution was to use wax writing boards to track totals and sub-totals.

The essentially "police function" of cross-checking totals by line and column was in place, creating a potential for double-checking from one set of accounts to another. However, the meeting's consensus was that from the modern point of view the methodology of double-entry bookkeeping was lacking. The accounts to which Hallo points are a tantalizing precursor, almost on the verge of a breakthrough, but not quite getting there. The "balanced accounts" were not balanced in a double-entry manner. The basic conceptual dimension of debts and credits, automatically and instantaneously balanced in a parallel set of accounts, was not achieved.

The fact that it did not quite get there raises the question of whether double-entry bookkeeping as such was so critically important, if the Babylonians achieved nearly the same thing. Hallo's evidence

shows what was missing: a thorough-going set of accounts tracking assets and debits as well as receipts and dispersals, such as the Venetians made explicit in the 15th century. As Steinkeller summarizes the situation in a recent paper (2003:38f.): "At least from Pre-Sargonic times (2450-2350 BC)—though probably true as far back as the Uruk III period (3100-2900 BC)—the administrative documents produced by a given institution generally formed a single, interconnected chain of records, tracing the passage of individual items through the local economy. Such a chain begins with a delivery tablet (optional), which is then followed by a sequence of receipt tablets; from the Ur III period onwards, individual receipts are commonly linked to one another by balanced accounts." Strictly speaking, the practice is best described as single-entry accounting in two strands of records, which is why Hallo refers to these "balanced accounts" as "implicit or latent" balance-sheet accounting.

Accounting errors often are found, but do not appear to be the result of fraud. Perhaps the oversight system was strong enough to deter cheating. More likely if someone did set out to cheat, the easiest way was to use false weights and measures. The practice was sufficiently prevalent to be denounced from Babylonian wisdom literature down through the Bible. Indeed, one of the reasons why the Sumerians carved their public weights so beautifully in the form of ducks was that attempts to shave or otherwise alter them would visibly mar the design. Artistically shaped weights thus played a role much like milling the edges of coins in later times.

Interregional contrasts

A decade ago Schmandt-Besserat (1992:170) found that writing and accounting did not emerge automatically out of the neolithic or Bronze Age agricultural and handicraft "mode of production," but from the centralized way in which Mesopotamian society was organized into "ranked societies and the state." Counting was compatible with egalitarian societies, she concluded, but accounting implied a hierarchical social structure.

Although accounting and writing were limited to regions with centralized public institutions, Alfredo Mederos and Carl Lamberg-Karlovsky find a much broader geographic area comprising ten regions whose weight systems dovetailed neatly with each other. This compat-

ibility suggests a process of diffusion as each region fit its weight standards into those of its early trading partners in order to facilitate trade.

To be sure, each region had its own distinct weights based on different unit-fractional systems—10s for Egypt, 2s for the Indus civilization, and 12s for Rome. These weight systems appear fully developed by the time they can be picked up on the archaeological record. But some weights must have come first, the two major candidates are Sumer and the Indus Valley, which traded with Sumer via the island entrepôt of Dilmun-Bahrain.

The Indus practice of dividing by 2s is so basic as to probably be universal. The sequential halving of weights until a suitably small set of fractional sub-units was reached was best suited to calculate halves, quarters, eighths and sixteenths. This procedure could have dealt conveniently with exponential doublings of loans and debts, but was not as well-suited to weigh or measure the flow of inputs and output over the 30-day months or deal with Uruk's sexagesimal system generally. The Indus practice of dividing by twos also could not have dealt easily with the major known annual rates of interest—one-fifth in Mesopotamia (the equivalent of 20 percent, that is, $\frac{1}{5}$ per month), a tenth (10 percent) in Egypt and Greece, and a twelfth ($8\frac{1}{3}$ percent) in Rome. This suggests that other regions had gone further than the Indus by the time they developed their own fractional weights.

Lamberg-Karlovsky suspects that the initial set of weight standards most likely came from Mesopotamia as a monitoring device developed as part of its technology of social control. He points out that while weights and measures were adopted nearly everywhere, account-keeping was not. Even syllabic writing seems to have been deliberately rejected, most likely because of its association with the large public institutions as part of their system of accountability and control. Evidently such centralized accountability was not desired outside of Mesopotamia, Egypt, Crete and Mycenaean Greece.

Englund describes the origins of the writing and account-keeping that developed in Uruk toward the end of the fourth millennium and spread outward to a rather narrow sphere of regions via trade, catalyzed by the exchange of prestige goods. Finding the sexagesimal system to be an intrusion into Elam's decimalized usage, he shows in a related paper (2001) that Proto-Elamite derived from Uruk practice. Lamberg-Karlovsky (2003:67) notes that Proto-Elamite happens to be the only known instance of "an illiterate culture adopting the technology of

writing." It had only limited success, being abandoned "after a century or two on the entirety of the Iranian Plateau. It took the passing of several centuries in Khuzistan, and over a millennium on the Iranian Plateau, before literacy was once again adopted."

Lamberg-Karlovsky finds that in the wake of Mesopotamia's long contact among different cultures during the third millennium, "in almost every instance we are forced to conclude that the illiterate culture *chose* not to adopt the technology of writing." After the Uruk "colony" at Godin Tepe was abandoned and melted back into the indigenous Godin culture, for instance, writing disappeared along with the use of seals, sealings, inscribed tablets and other control devices that had been introduced. Contrary to what "progressive" evolutionary theory might suggest, "the more 'advanced' organization did not, in fact, replace the indigenous tribal and/or village familial organization. In fact, in this instance the tribal and the familial appear to completely reject that which is deemed more 'advanced.'" He concludes (2003:72): "The export of a technology is no guarantee of its success if the social context is not present."

Egypt was one of the areas where accountability was long maintained. Golet finds that its accounting records were supplied mainly "for review by a higher outside authority, showing at least indirect evidence that there was some level of revenue control by the central administration during the Egyptian Old Kingdom, a 'paper trail' in modern parlance." Likewise in Mycenaean Greece, Palaima finds that economic records reflect the accountability of local administrators to the central authority.

What emerges from interregional comparisons is that the complex system of accounting practices, weights and measures, and even early writing was not a natural and inevitable mode of organizing handicraft production, trade and exchange. It was a choice to develop in one of a number of possible directions—a choice that became a foundation for much of the subsequent continuum of Western civilization.

As noted above, the mere fact of planning did not necessarily mean that it was enlightened. There are many ways to plan. But although some colloquium members criticize the early reliance on fixed proportions, these served as an early form of coefficient analysis along lines of today's input/output tables. If they were prone to deviate from reality, so does much planning today.

Although the Mesopotamian expansion led to a diffusion of weights, measures and money, as well as many other commercial formalities, not all societies chose to follow the path to which accounting led as a means of economic control. As Palaima notes in the discussion that concludes this volume, it was a mark of subject peoples to aim at "efficiency" in squeezing out an economic surplus, at least under conditions where this was turned over to public institutions which were turned into intermediaries to transfer resources from conquered populations to the most dominant military power as military empires were created. But today, efficiency principles, standardization and the use of accounting procedures to cut costs shapes the entire world. Accountants have become the planners of this world, for corporate business and finance if not on behalf of government bodies.

Why early accounting is important for understanding economic origins

Sumerian, Babylonian, Egyptian and Mycenaean account-keeping may seem anomalous to economic historians who start their narrative in medieval Italy more than four thousand years after accounts first appear in the historical record. Bureaucracy today is associated with inefficiency, not innovation. But when we look back to the epoch when civilization's most basic economic practices were being introduced, they first appear in the public institutions set corporately apart from the family-based households on the land.

The accounting practices developed in Mesopotamia five to six thousand years ago have survived to shape our modern world as part of its genetic DNA molecule, so to speak. Yet historians have neglected the early context of these practices, in particular the catalytic role of the large public institutions. Once having been put in place, the specialization of labor and related economic structures that formed the precondition for market exchange no longer required central planning or even cost accounting. The detailed accounts found in Bronze Age economies survived in late Egypt and in Persia, but no equivalent records are found in classical Greece or Rome. Economies were becoming decentralized and economic control passed into private hands, above all in what had been the western periphery of the earlier Near Eastern core. This is where most historians have chosen to pick up the thread of Western civilization, but they do so in the "second act" as it were.

Accounting and the establishment of formalized economic relationships and markets

The history of accounting practices extends the approach that our group has been developing since its inception in focusing on Near Eastern societies that passed beyond "anthropological" to formalized economic relationships. Neither the modern market-oriented economic view nor that of its anthropologically oriented "primitivist" critics is appropriate to describe the standardization and administered prices that were preconditions for organizing resource flows in the large public institutions.

The essence of accounting was to measure and quantify economic activity. As the large institutions organized their production and standardized weights and measures, society at large adopted their written notation and accounting practices. Also spreading from the public to the "private" sector were contractual formalities for charging interest and rent, along with monetary silver to provide a common denominator for exchange, to settle debts, and to provide a uniform general standard to track the accumulation and drawdown of resources.

Writing at first was an *aide memoire*, an adjunct to account-keeping, but soon took on a life of its own. The objective of written records was not merely to help the writer remember, but to enable outside parties to check on how resources were administered. Account-writing evolved into a means of operating on data, using it as the first step in calculating and planning. One hardly can track resource flows by memory or solve algebraic problems in one's head. It is necessary to write down figures in order to add them up, multiply and divide them. It was this combination with mathematical operations that gave writing its early power.

The early evolution of account-keeping and its proto-market exchange has major implications for the social sciences, above all economics. For one thing, an understanding of the economic origins of civilization requires some widely held preconceptions to be abandoned. Anthropologists almost unanimously find that societies since the neolithic have had to plan their economic life. Assyriologists find that the origins of modern economic practices can be traced back to centralized planning. Yet modern ideology holds public planning to be inherently inefficient at all times and places? Free-market economists have created a timeless and unhistorical mythology of individuals spontaneously creating free-form price-setting markets, money and interest.

This is not the picture that emerges from a review of civilization's first few thousand years of documentation.

Accounting concepts, weights and measures, money and prices, and the charging of stipulated rates of interest and land rent were part of the "technology of social control" that constituted civilization's quantum leap from personalized reciprocity to bulk resource acquisition, production and distribution. Public institutions developed these new modes of control to coordinate their resource flows and long-distance trade.

In contrast to the individualistic model used by free-enterprise ideologues to deduce the origins of economic practices, the findings of this colloquium are in line with Karl Polanyi's "redistributive" system of administered price equivalencies. Mesopotamia's experience and that of its trading sphere provides the missing link between reciprocity (gift exchange) and the modern price-setting markets that most historians have traced back only as far as classical Greece and Rome. Rather than assuming that such markets emerged naturally at the hands of individuals acting by themselves, these papers focus on the basic building blocks that took many centuries and even millennia to evolve in place in Sumer, Babylonia and their neighbors.

The initial objective was to provide stable value equivalencies, not to open the way for price flexibility responding to shifts in supply and demand. Such fluctuation was perceived as disorder, especially for transactions in barley and other crops at the interface with the family-based economy on the land.

The lesson of Near Eastern economic history in the fourth, third and second millennia BC is that free-market models that portray government planning and allocation as inherently destabilizing and self-defeating are products of modern ideology rather than historically grounded. The origins of most economic practices find their roots in Mesopotamia's public institutions.

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Proto-Cuneiform Account-Books and Journals

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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*,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 ethnographic sciences, yet we should remember that with the onset of urbanization in the mid-fourth millennium we are dealing with an historical,

¹ The working constellation of this long-term research project was described by its founder and director Hans Nissen in R. Englund and H. Nissen (2001): 9-10. Primary contributors to the decipherment of the archaic (now generally called "proto-cuneiform") texts include, beyond the original editors Falkenstein and Nissen, the following (in the order of their work on the archaic texts and on Late Uruk cylinder seal function and iconography): R.M. Boehmer, M.W. Green, K.-H. Deller, J. Friberg, R.K. Englund, P. Damerow, J.-P. Grégoire, A. Cavigneaux, R. Matthews. The publication of the Uruk exemplars of the archaic corpora will continue with a second volume on the texts of the Vorderasiatisches Museum (ATU 6, forthcoming) and two volumes on those in the collection of the Iraq Museum, for understandable reasons currently on hold (ATU 8-9). A revised Late Uruk sign list will be reserved for the pages of the *Cuneiform Digital Library Initiative* (<http://cdli.ucla.edu/>).