THE UNIVERSITY OF CHICAGO PRESS JOURNALS

Hard Work-Where Will It Get You? Labor Management in Ur III Mesopotamia

Author(s): Robert K. Englund

Source: *Journal of Near Eastern Studies*, Oct., 1991, Vol. 50, No. 4 (Oct., 1991), pp. 255-280

Published by: The University of Chicago Press

Stable URL: https://www.jstor.org/stable/545488

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at https://about.jstor.org/terms

The University of Chicago Press is collaborating with JSTOR to digitize, preserve and extend access to *Journal of Near Eastern Studies*

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

HARD WORK—WHERE WILL IT GET YOU? LABOR MANAGEMENT IN UR III MESOPOTAMIA*

ROBERT K. ENGLUND, Freie Universität, Berlin

I. INTRODUCTION

MUCH has been reported recently about the Erlenmeyer collection of cuneiform documents sold at an auction in London in December of 1988.[1] By far the greatest attention before and after the Christie's auction was commanded by the group of documents in that collection containing nearly 80 texts from the archaic period Uruk III/Jemdet Nasr (ca. 3100–3000 B.C.). These were indeed the finest examples of proto-cuneiform script, both in terms of state of preservation and in terms of accounting contents, which P. Damerow, H. Nissen, and I, in our work on such texts as members of the Uruk Project, Berlin, had heretofore seen; this archive of tablets has been dealt with summarily in a publication accompanying a Berlin exhibition including the proto-cuneiform Erlenmeyer texts,[2] and will be the subject of a text edition with extensive commentary to appear in due course as a volume in a new Berlin series entitled *Materialien zu den frühen Schriftzeugnissen des Vorderen Orients.*

Less attention, on the other hand, has been given the texts in that collection from later periods. Together with the major portion of the archaic tablets, the Senate of West Berlin was able to purchase a number of these later texts, altogether 12, of which 6 can be dated to the Ur III period (ca. 2100–2000 B.C.). Due to their particular importance, two of these latter texts will be the subject of special treatment. The first is the large account of guruš, "workmen," who were involved in the plowing, maintenance, and harvest of fields surrounding the town Umma.[3]

The second of these two texts, earlier with the collection number Erlenmeyer 155,[4] contains a one-year account of a group of female millers from Umma. These laborers,

* Thanks are due to the Berlin Senate for its permission to publish here the text Erlenmeyer no. 155 and to J.-P. Grégoire, J. Friberg, and P. Damerow for their helpful comments on earlier versions of this paper. Abbreviations of works cited are found in the dictionaries. Other abbreviations are: *Frühe Schrift* = H. Nissen, P. Damerow, and R. Englund, *Frühe Schrift und Techniken der Wirtschaftsverwaltung im alten Vorderen Orient* (Berlin, 1990); "Timekeeping" = R. Englund, "Administrative Timekeeping in Ancient Mesopotamia," *JESHO* 31 (1988): 121–85; *Ur III-Fischerei* = R. Englund, *Organisation und Verwaltung der Ur III-Fischerei* (Berlin, 1990).

[*JNES* 50 no. 4 (1991)]
© 1991 by The University of Chicago.
All rights reserved.
0022-2968/91/5004-0002$1.00.

[1] Articles concerning the collection were published in preparation of and subsequent to the sale of the tablets, for example, in the *Observer* (23 October 1988), the London *Times* (5 December 1988), the *Financial Times* (10 December 1988), the *Frankfurter Allgemeine Zeitung* (30 December 1988), and, subsequently, in the local Berlin press. See the auction catalogue published by Christie's, London, *Ancient Near Eastern Texts from the Erlenmeyer Collection, 13 December 1988.*

[2] See *Frühe Schrift,* in particular, pp. vii–xii and 66–75. An English translation of the book is in preparation, to be published by the University of Chicago Press.

[3] Cf. the preliminary translation of this account in *Frühe Schrift,* pp. 90–95.

[4] Listed in Christie's sale catalogue as lot no. 86, in *Frühe Schrift* as no. 10.14. The tablet is currently on loan from the *Land* (state) Berlin to the Seminar für Vorderasiatische Altertumskunde of the Freie

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

called in Sumerian géme, were, based on my knowledge of the Ur III documentation, wholly property of the state.[5] As such, they were treated in the state books as chattel placed at the disposal of state agents charged with managing organized production and service units. The economic and political mechanisms which led to this form of organized labor in the Ur III period have been the subject of an often heated theoretical debate carried on for the most part among Marxist oriented scholars from the former East Block, with some participation by western Assyriologists, the best-known of whom being I. J. Gelb from the Oriental Institute of the University of Chicago.[6] Due, however, in large measure to the paucity of key sources shedding immediately understandable light on these historical developments and due to the known difficulties in dealing with the mass of mundane Ur III administrative documentation without the use of such basic tools as a Sumerian lexicon and, in particular, a reliable prosopographical analysis of the Ur III texts, these discussions have often suffered from very subjective argumentation, in which primary sources were relegated to playing only a secondary role.

Among the approximately 30,000 published Ur III documents representing perhaps just one-third of the total number of Ur III texts in private and public hands, a few dozen texts from this period stand out as particularly apposite to any discussion of Ur III administrative forms. Texts such as Erlenmeyer 155,[7] in documenting the economic activities of a labor gang during a period of twelve months, for instance, offer a sharp insight into the internal organization of state units of manufacture and services during the Ur III period; moreover, the important developments in the economic accounting of state activities in the third millennium are best documented by an analysis of long-term accounts, of which those from the Ur III period are doubtless the most informative examples.

As is known from other studies of Neo-Sumerian bookkeeping, normal day-to-day economic activities were recorded on small tablets with such documents as receipts, disbursement slips, and invoices corresponding more or less to the cash slips, time cards, and credit memos of modern businesses. These records could but did not necessarily have to be entered into so-called journals with records of some or all of a productive unit's daily transactions. Such individual records were, finally, posted into a ledger

---

Universität, Berlin; it will presumably be transferred to the collection in the Pergamon Museum, Berlin, in the near future and will then receive a new museum registration number.

[5] Cf. the recent treatment of the controversial matter of definition of the function of géme and guruš in centrally organized economic units in my *Ur III-Fischerei,* pp. 63–90. The term "Betriebssklaven/innen" suggested there was meant to distinguish these dependent workers from the chattel slaves géme and ir_{11} in the hands of private persons and to avoid such "loaded" terms as I. M. Diakonoff's *helots* and I. J. Gelb's "serfs" for guruš/géme (cf. the discussion of these terms in H. Neumann, *Handwerk in Mesopotamien* [Berlin, 1987], p. 22, n. 13). The neutral terminology "female/male worker" used here should not distract attention from the importance of this discussion.

[6] See the literature cited in *Ur III-Fischerei,* pp. 65–67.

[7] The list of directly comparable texts available for study is in fact not long: *AnOr* 1, 250 (new copy D. Charpin and J.-M. Durand, *Documents cunéiformes de Strasbourg* [Paris, 1981], pl. 75–76); S. Levy and P. Artzi, *Atiqot* 4 (1965): no. 7 (géme and guruš): *STA* 2; *STA* 5; *TCL* 5, 5665; *TCL* 5, 5668 and 5670 with Erlangen 1 (see *Ur III-Fischerei,* pp. 78–90 and *Frühe Schrift,* pp. 125–30); *TCL* 5, 5669; *TIM* 6, 4 (géme and guruš). Less informative, because they are fragmentary, are *Amherst* 31; *HLC* 1, pl. 28, no. 244; and *ITT* 5, 6859; the probable géme accounts Hermitage 7501 and 15275 mentioned by M. Powell, *Bulletin on Sumerian Agriculture* 1 (1984): 55, remain unpublished.

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

which might cover a span of one or several months or—and this was the general rule—of a whole year.

Much work has been done recently on the accounts of the Ur III dam.gàr, "trade agents."[8] Although the accounts of the trade agents and those of the foremen in charge of domestic production were both drawn up by central agencies of the state, the principle of organization of the accounts of domestic production was radically different from that of external and internal trade. The accounts recording trading activities noted the material performance, that is, the products delivered by state trade agents converted, as a rule, into their value equivalencies expressed in silver; labor requirements in this process found no place in the documents concerned. The activities of production and service teams, which consisted for the most part of from 10 to 50 workers of varying performance categories (á.$^2/_3$, á.$^1/_2$, and so on)[9] and their foremen, were in contrast to dam.gàr accounts recorded in terms of their labor performance. The debit of such production and service teams[10] normally consisted of the disposable work time of the laborers assigned the units by the state, in some cases together with those raw or partially processed materials given the units charged with producing finished goods.[11]

The workers seem, as state property, to have been assigned to productive units for the full year.[12] The guruš and géme, as unskilled laborers, were not assigned to particular occupations, although their work teams always specialized in narrowly defined activities. The Ur III administration seemed interested in assigning foremen to control clearly defined modes of production and services; yet it wanted to keep work teams flexible enough that they could at any time assume other labor roles. This system of labor organization offered distinct advantages: variably assignable work teams could overcome, quickly and without serious consequences for their own specific labor performance quotas, those production bottlenecks which necessarily arose in an economic year consisting of obvious labor intensive periods (e.g., harvest or canal work).

The female laborers called géme kín.kín working under a foreman thus were mainly assigned work connected with the milling of grain; as need arose, however, they could be removed from these activities and, for example, assigned together with workers from other units to the unloading of a barge containing a shipment of barley.

[8] See, in particular, D. Snell, *Ledgers and Prices: Early Mesopotamian Merchant Accounts* (New Haven, 1982); H. Neumann, "Handel und Händler in der Zeit der III. Dynastie von Ur," *AoF* 6 (1979): 15–67; and my *Ur III-Fischerei,* pp. 13–55.

[9] See "Timekeeping," pp. 177–78, particularly with reference to S. Monaco, "Parametri e qualificatori nei testi economici della terza dinastia di Ur: I. Parametri qualificatori numerici," *Oriens Antiquus* 24 (1985): 17–44; idem, "II. Qualificatori non numerici," *Oriens Antiquus* 25 (1986): 1–20.

[10] Productive units were, for example, mills, weaving establishments, the fisheries and forestries; service units, on the other hand, were agricultural teams, canal excavators and maintenance personnel, reed harvesters, etc.

[11] See especially the important early works of the Soviet scholar V. Struve, "Obščestvennyi stroy . . . [Social structure in southern Mesopotamia during the Third Dynasty of Ur]," *Jubileinyi sbornik* . . . , vol. 2 (Moscow and Leningrad, 1947), pp. 720–42; and idem, "Some New Data on the Organization of Labour and on Social Structure in Sumer during the Reign of the IIIrd Dynasty of Ur," in I. M. Diakonoff, ed., *Ancient Mesopotamia* (Moscow, 1969), pp. 127–72.

[12] See already Struve in *Ancient Mesopotamia,* pp. 136–37. The lú.ḫun.gá, "day-laborers," who as hirelings had to be employed for such intensive labor needs as the harvest and canal maintenance and who on such occasions worked next to the dependent laborers guruš and géme, seem not to have been tied to state units. Although the term guruš. ḫun.gá is occasionally seen (see H. Waetzoldt, *Welt des Orients* 11 [1980]: 137), guruš were, as a rule, never confused with the lú.ḫun.gá, "day-laborers."

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

The purpose of these accounts is clear: the central organization of the Ur III state required strict control of its resources to ensure an even flow of goods and services to the crown and servants of the crown in Ur and in the provinces, including the military services and administrative personnel governing the periphery of the realm, to the managers in charge of production, and to the centrally organized depots from which the system of redistribution to the working classes was managed. Ledgers documenting these transfers of goods and labor from one administrative unit to another or, in more general terms, attesting to the wealth generated for the state by groups of state-held laborers abound in the archives unearthed at Girsu and Umma. They are found in lesser numbers from Drehem and Ur and are poorly represented in the records from Nippur.

We meet in the accounts from Pre-Sargonic Lagash and Akkadian centers nothing comparable in complexity to the bookkeeping methods developed in the course of the reign of Šulgi (ca. 2100–2050 B.C.). A developed method of drawing up "*running accounts,*" which, although something of a misnomer, may be compared to the use of balanced accounts in modern bookkeeping, was foreign to documents from both periods and to those from the Gudea and the early Ur III period of Ur-Nammu and early Šulgi. The flood of documents dating to the period following the 20th year of Šulgi's reign, however, contains in growing numbers not only such running accounts recording all the assets (primarily including arable land, raw materials, and laborers) and liabilities (maintenance, labor costs, and so on) of the central administration, but also a standardized method of calculating the expected performance of laborers and of achieving comparable units of value of labor. This method was accomplished by the use of unifying norms of performance and of a system of value equivalencies, by which the normed performances were rendered internally comparable.

The general structure evidenced in these accounts is presented in figure 1. The first section of Ur III accounts lists the debits of the foremen dealt with therein. These debits comprise goods and laborers put at the disposal of the foremen by the central administration of the Ur III state. They represent, in other words, state property: this includes first, should there be one, the deficit (expressed as real goods or as services, i.e., workdays) incurred at the conclusion of the previous accounting period. In addition, it includes, on the one hand, unprocessed or processed goods such as grain, wool, leather, and metals and, on the other hand, workers. It is important to realize that these workers, who in the accounts are converted into workdays, really are dealt with in parallel fashion to the material they are to process. In the case of millers, for example, both the grain to be milled and the women charged with milling the grain—converted into the workdays they are expected to perform during the timespan of the account—are totaled and qualified as sag.níg.gur$_{11}$.a(k), "the head of the goods," here from the standpoint of the foreman to be translated as "*debit,*" since the quantities of workdays and goods are to be covered by him in the form of real performance, i.e., in delivered flour and in other services of his work force.

This real performance is booked in the following "*credits*" section, together with compensatory allowances. Such performance records include the posting of the goods processed by the work gang during the accounting period (flour, textiles, etc.), the labor time which, according to conventionalized equivalencies, was considered adequate for the production of such goods, as well as the posting of the labor time spent on other projects (in the case of millers, for instance, in canal maintenance, harvesting, etc.) and,

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

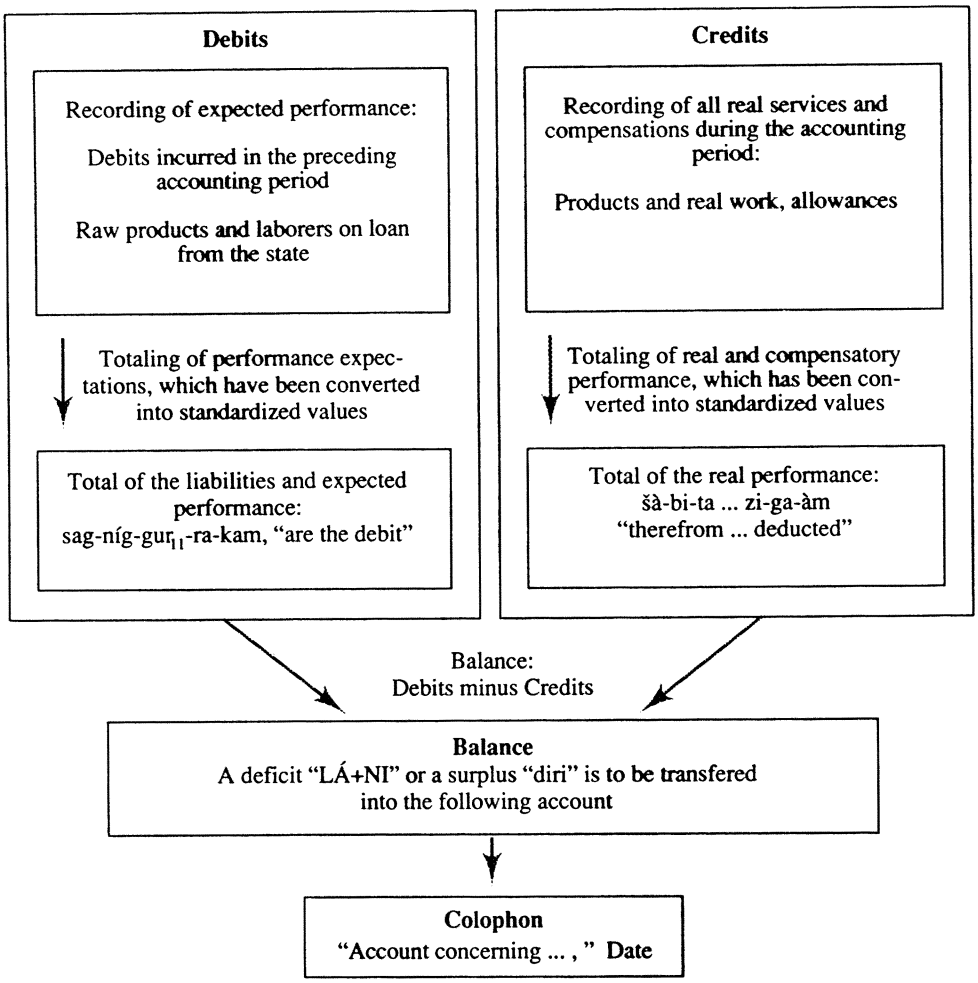

FIG. 1.—General structure of Ur III accounts

finally, of labor compensations, the so-called free time awarded the work gang according to standard allowances. The performance involved in these activities is, as a rule, expressed in a common value equivalency. In the case of millers, this comprises workdays for labor and barley for both processed and unprocessed grains. These equivalencies are totaled at the end of the debits section and qualified as (šà.bi.ta)—zi.ga, "(therefrom, i.e., from the debit) deducted."

Finally, a "*balance*" of the two preceding account sections is drawn and the text globally qualified with records of the officials responsible for the gangs and of the dates the account covers. The balance as a positive result of the subtraction of the posted credits from the debits is expressed as a remaining debit, qualified as LÁ+NI, "deficit"; it will, as a rule, be posted in the following account as the first entry of the debits section, qualified as si.ì.tum, "remainder." A very large majority of known Ur III accounts result

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

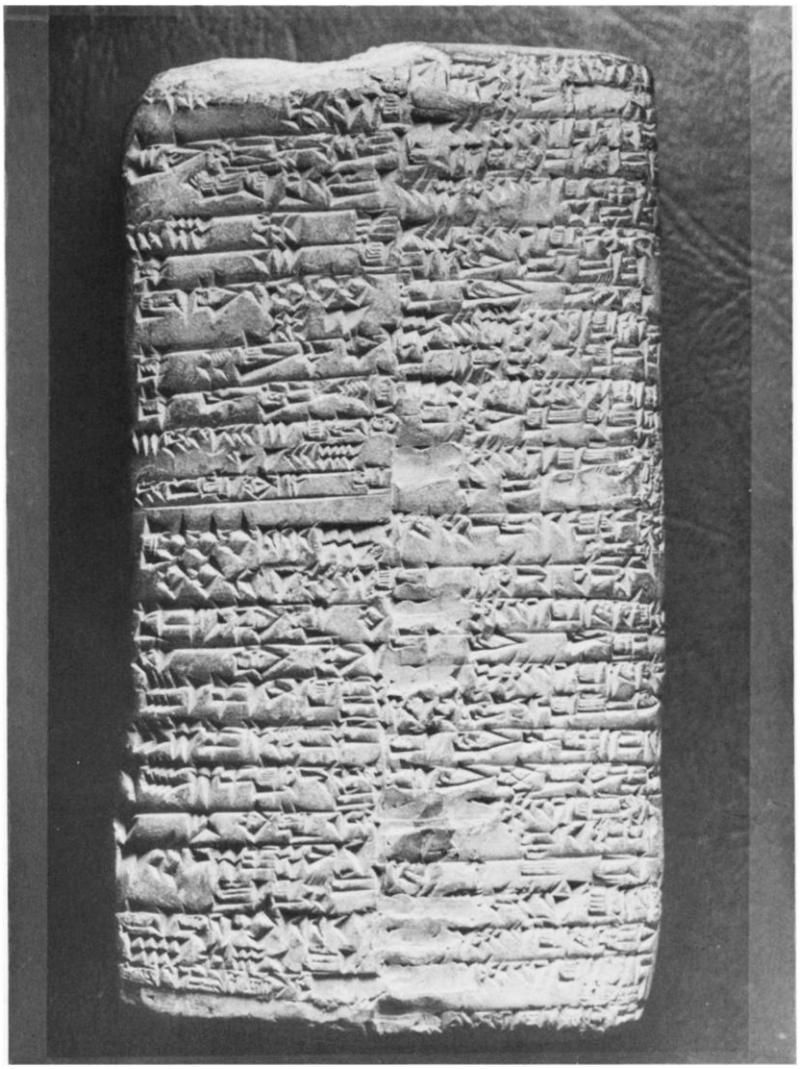

FIG. 2a.—Photograph of the text Erlenmeyer 155, obverse

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

FIG. 2b.—Photograph of the text Erlenmeyer 155, reverse

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

FIG. 3a.—Copy of Erlenmeyer 155, obverse

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

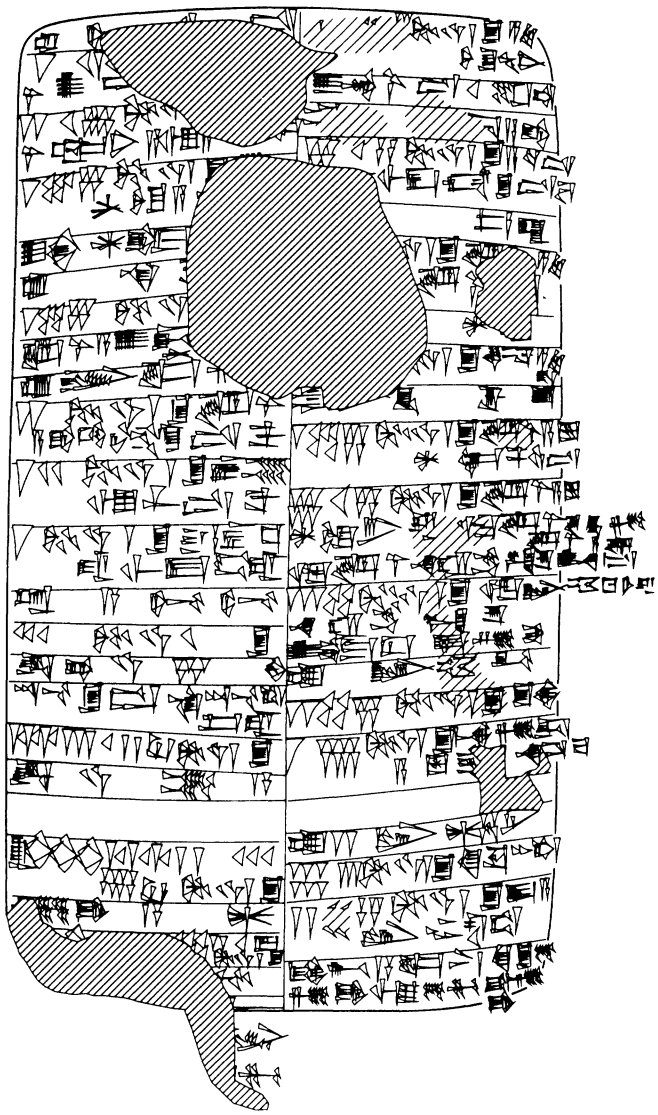

FIG. 3b.—Copy of Erlenmeyer 155, reverse

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

in a deficit. A negative result, in which the total of credits was larger than the initial debit, is qualified as diri, "surplus"; in these rare instances, the surplus seems generally to have been posted into the credits section of the following account, although it is quite possible that the foreman in charge of the work gang involved will have been free to utilize the surplus in other ways, including using it for his own enrichment.

II. TRANSLITERATION AND TRANSLATION OF ERLENMEYER 155 (Šū-Sîn 4/i–xii, Umma calendar)

I	⌜1.52.40⌝ géme u_4.1.šè	6,760 workdays, female workers,
	si.ì.tum mu Si.ma.núm^{ki} ba.ḫul	debit of the year: "Simanum was destroyed" (=Šū-Sîn 3).
	37 géme 0;0,3	37 female workers (receiving) 3 (bán of barley
	iti.12.šè	per month over a period of) 12 months,
5	á.bi u_4 3.42.00	performance involved: 13,320 days,
	iti.ŠE.KIN.ku_5.ta	from the month "Harvest" (first month)
	iti.^{d}Dumu.zi.šè	through the month "Tammuz" (twelfth month).
	3 géme u_4.33.šè á.bi u_4.1.39	3 female workers for 33 days, performance
	géme bar.ra.kar.ra	involved: 99 days, bara-kara workers.
10	(uninscribed line)	
	ŠU+NÍGIN 5.36.20 lá.1 géme u_4.1.šè	Together: 20,180 minus 1 workdays
	sag.níg.gur_{11}.ra.kam	are the debit.
	šà.bi.ta	Therefrom:
	8;1,2,1 sìla zì.sig_{15} gur	8 gur, 1 (barig), 2 (bán), 1 sila sig-flour,
15	2;4,2 eša(A.TIR) gur	2 gur, 4 (barig), 2 (bán) eša flour,
	18;4,2 zì.gu.sig_5 gur	18 gur, 4 (barig), 2 (bán) fine pea flour,
	0;2,0 ninda.àr.ra.sig_5	2 (barig) fine ground ninda flour,
	2.41;4,3,4 sìla 10 gín dabin gur	161 gur, 4 (barig), 3 (bán), 4 sila 10 shekels flour,
	á.bi u_4 1.39.46 10 gín	performance involved: 5,986 days, 10 shekels,
20	á u_4.du_8.a.bi u_4 (erased)	performance of the free days involved:
	(erased)	days,
	níg.ka_9 še.ta	from the grain account.
II	18.50 géme u_4.1.šè ŠE.KIN.a zàr.tab.ba	1,130 workdays, harvested and shocks laid;
	2.20 géme u_4.1.šè kun.zi.da i_7.dè.na gub.ba	140 workdays, stationed at the river lagoon of "Idena";
	25 géme u_4.1.šè nag.ku_5[13]KI.BAD gub.ba	25 workdays, stationed at the KIBAD reservoir;

[13] See the recent discussion of this irrigation device in P. Steinkeller, "Notes on the Irrigation System in Third Millennium Southern Babylonia," *Bulletin on Sumerian Agriculture* 4 (1988): 74–79 and H. Waetzoldt, "Zu ben Bewässerungseinrichtungen in der Provinz Umma," *Bulletin on Sumerian Agriculture* 5 (1990): 1–29, in particular 4–7.

This content downloaded from 202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

1.30 géme u_4.1.šè kun.zi.da
é.duru$_5$.lú.maḫ gub.ba
kišib Lú.gi.na
5.38 géme u_4.1.šè a.è.a bar.lá
a.ga.am.gu.la gub.ba
3.42 géme u_4.1.šè i_7 é.anše.šè ú
ga$_6$.gá ù saḫar si.ga
(erased) géme u_4.1.šè kiši$_{16}$ ku$_5$.rá
[ ]
a.šà gíd.da ù sig$_7$.TUR TUR
ga (?)
GÁN A.gu.gu
(erased) géme u_4.1.šè a.šà
KWU798.nu.dù a.rá
2.kam?
GÁN Lú.^{d}Šára
(erased) ⟪14⟫? géme u_4.1.šè a.šà
gibil
a.šà gu$_4$.súḫub ù ú.du Lú.sig$_5$
GÁN Lú.^{d}Šára a.rá 2.kam
kišib Lú.ḫé.gál dumu Ur.^{d}Utu

(erased) géme u_4.1.šè kiši$_{16}$ ku$_5$.
⟪x⟫.rá 10.šar.ta a.šà a.ú.da
(erased) géme u_4.1.šè a.šà gibil
(erased) géme u_4.1.šè a.šà
bàd.dù.a
(erased) géme u_4.1.šè a.šà
išib.e.ne
(erased) géme u_4.1.šè a.šà
gu$_4$.súḫub
III (erased) géme u_4.1.šè a.šà
KWU798.nu.dù
kiši$_{16}$ ku$_5$.rá 10 šar.ta
kiš[ib D]a.a.ga
5.14 géme u_4.1.šè a.è.[a a.š]à igi
é.maḫ.šè gub.ba
[kišib A].kal.la
[x géme] u_4.1.šè nag.ku$_5$ a.šà
[ ] nag.ku$_5$[ ]x
[kišib .]^{d}x
[x gém]e u_4.1.šè zàr.tab.ba a.šà
UD-*gunû*
kiši[b L]ú.kù.zu sukkal

1.55 géme u_4.1.šè nag.ku$_5$ i_7
^{d}Šul.pa.è

90 workdays, stationed at the river lagoon of the Lumaḫ village;
(the tablet bears) the seal of Lu-gina.
338 workdays, stationed at the sluice of the division box (?) of "Agam-gula";
222 workdays, to the "É-anše" canal grass carried and earth filled in;
workdays, acacia cut . . . ,

at the "long" field and . . . ,

land of Agugu;
workdays, at the second field "KWU798-nudu,"

land of Lu-Šara;
workdays, at the "new" field, the

"Gusuḫub" and the "Udu-Lusig" fields,
land of the second Lu-Šara,
(the tablet bears) the seal of Lu-ḫegal, son of Ur-Utu.
workdays, acacia cut at 10 šar (per day) in the "Auda" field;
workdays, at the "new" field;
workdays, at the field "erected wall";

workdays, at the field "išib-priests";

workdays, at the field "Gusuḫub";

workdays, at the field "KWU798-nudu";

acacia cut at 10 šar (per day);
(the tablet bears) the seal of Da$^{\circ}$aga.
314 workdays, stationed at the sluice of the field before Emaḫ
[(the tablet bears) the seal of A]kala.
[x work]days, at the reservoirs of the field
[ ] and [ ]x;
[(the tablet bears) the seal of]x.
[x wor]kdays, shocks laid in the field "UDgunu,"
(the tablet bears) the seal of the courier Lu-kuzu.
115 workdays, at the reservoir of the "Šulpa$^{\circ}$e" canal;

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

	6.15 géme u_4.1.šè nag.ku_5 i_7 ^{d}Nin.ùr.ra ù nag.ku_5 du_6.kù.ge nag.ku_5 a.bu_6? ù nag.ku_5 *Na-ra*-*am*-^{d}Su$^{\circ}$en ú na DU?	375 workdays, at the reservoir of the "Nin-ura", canal, of "Dukuge," of "Abu?" and of "Narām-Sîn . . . ."
	3.40 géme u_4.1.šè Ù.lugal.tum.ma.gar.ra *Na-ra-am*-^{d}Su$^{\circ}$en ú ga_6.gá saḫar zi.ga	220 workdays, at the "Lugal-tuma-gara bridge(?)[14] of Narām-Sîn," grass carried, earth excavated;
	kišib Lugal.ḫé.gál	(the tablet bears) the seal of Lugal-ḫegal.
	2.45 géme u_4.1.šè zì àr	165 workdays, flour ground;
15	1.08 géme u_4.1.šè kun.zi.da i_7.d[è].na gub.ba (uninscribed line)	68 workdays, stationed at the river lagoon of "Idena";
	kišib 2 Lú.^{d}Ḫa.ià	two (tablets bear the) seal of Lu-Ḫaya.
	6.03 géme u_4.1.šè ki.sura$_{12}$ 2;0,0.ta	363 workdays, threshing at 2 gur (per day);
	2.05 géme u_4.1.šè é.$duru_5$. lú.maḫ.ta $guru_7$	125 workdays, from the Lumaḫ village to the silo of Apisal, barley winnowed and
20	A.pi_4.sal_4^{ki}.šè še zi.ga ù še mu.ša zi.ga	muša-grain winnowed;
IV	kišib G[u.d]u.[d]u	(the tablet bears) the seal of Gududu.
	1.10 lá.1[géme u_4.1.šè nag].ku_5 ú.d[u]	70 minus 1 [workdays, at the reser]voir of "Ud[u-]";
	2.18 géme u_4.[1.šè nag].ku_5 bàd.dù.a ù a [ ]x	138 work[days, at the reser]voir of the "erected wall" and the . . . ;
	1.55 géme u_4.1.š[è] x ^{d}Nin.a.z[u]	115 workdays, x of Nin-az[u],
5	ú ḪAR.AN ug_6.[gá]	ḪARAN-grass carried;
	kišib Na.b[a.sa_6]	(the tablet bears) the seal of Nabasa.
	1.55 géme u_4.[1.šè] nag.ku_5 a.ú.d[a] AN [ ]	115 workdays, at the reservoir of "Aud[a" . . .] AN [. . .]; (the tablet bears)
	kišib Lugal.inim.g[i.na]	the seal of Lugal-inim-gina.
	2.00 géme u_4.1.šè nag.ku_5 a.ga. am.gu.la gub.ba	120 workdays, stationed at the reservoir of "Agam-gula";
10	1.20 géme u_4.1.šè sa.du_8 ù bar gub.ba	80 workdays, stationed at sadu . . . .
	1.00 géme u_4.1.šè e.sa.dúr.ra igi é.amar.ra	60 workdays, at the sadura ditch before E-amara;
	kišib A.gu.gu	(the tablet bears) the seal of Agugu.
	30 géme u_4.10.šè	30 female workers for 10 days,
15	á.bi u_4.5.00.kam bala.šè gen.na bala.ta gur.ra	performance involved: 300 days, traveled to the bala service, returned from the bala service.

[14] The very tentative identification follows Steinkeller, "Irrigation System," p. 81; Steinkeller presents there arguments for a reading of the sign Ù as $duru_x$.

This content downloaded from 202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

	33.12⅔ géme u_4.1.šè	1,992⅔ workdays,
	á u_4.du_8.a	performance of the free days.
	(uninscribed line)	
20	šu+níGIN 3.32.38⅚ géme u_4.1.šè	Together: 12,758⅚ workdays
	⌜zi⌝.ga.àm	deducted.
	[LÁ+NI] ⌜2.03.42⌝ 10 gín géme u_4.1.šè	[The debit:] 7,422 workdays, 10 shekels,
	[níg.ka_9.ak á g]éme (?)	[account of the performance of the] female workers (?),
	[ugula]x	[foreman:]x.
	[mu ^{d}Šu-^{d}Su$^{?}$en l]ugal [bàd Mar.t]u *mu-[ri-iq-ti-id-ni-im* mu-d]ù	[Year: "Šū-Sîn, the k]ing, bui[lt the Amor]ite wall '*mu[riq-tidnim*']" (=Šu-Sîn 4).

Erlenmeyer 155 contains the one-year account of a foreman responsible for a crew of 37 female workers of a cereal processing unit from the 4th year of the reign of the Ur III king Šū-Sîn (ca. 2034 B.C.). This account can be divided into the same three sections known generally from Ur III period accounts: the section of debits, that of credits, and that of the balance (see fig. 4 below).

The "debits" section posts first the debit incurred at the conclusion of the preceding year, a deficit of 6,760 "female worker days." There follows the labor expectation of 37 female workers during a period of 12 months of 30 days each, that is, a total of 13,320 workdays. Finally, a labor expectation of 99 workdays, derived from the employment of 3 female laborers for a period of 33 days, is added to the crew's debit, so that at the end of this account section a year debit of 20,179 days was booked.

The "credits" section begins with amounts of various flours—delivered to state officials during the accounting year by the milling foreman—which have been converted into the workdays necessary for their production. Although the workers were above all occupied with the milling of flour, they could also be transferred to other labor units in the economy. Thus entries follow recording the labor production of the work team performed under the supervision of other foremen in agricultural labor units. An entry concerning the performance of "communal" work, the so-called bala duty, which appears regularly in such accounts, and a record of the number of "free days" allotted the working women as time off complete this section. In the case of géme, this "time off" labor compensation is as a rule one-sixth or one-fifth of the expected full labor performance. The sum of these labor outputs and compensations, converted into workdays, results in the number of 12,757⅚ performed workdays.

The closing "balance" shows a correspondingly increased debit of 7,420½ workdays, which will have been carried over into the following year as a deficit and into the following account as the first entry in the debits section. We know from other texts the serious consequences such an uninterrupted control of work crew deficits could have for the foreman and his household. These deficits had obviously to be repaid at all costs. Upon the death of a foreman, the state had first rights to the assets of his estate. This meant that in the absence of other moveable goods, the members of his family and of his household (chattel slaves) themselves were transferred into state ownership as members

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

of the sort of work crews previously supervised by the deceased. The best example of this state of affairs is offered by the text *MVN* 10, 155:[15]

0;2,2,2 sìla ì.nun	2 (barig) 2 (ban) 2 sila clarified butter,
0;3,0 ga.àr	3 (barig) cheese.
mu a.rá.3.kam.aš	Year: "For the third time
Si.mu.ru.um^{ki} ba.ḫul	Simurum was destroyed" (Šulgi 32).
LÁ+NI Ur.KA.na.ra utul	Deficit of the herdsman Ur-KAnara.
Ur.KA.na.ra ba.úš	Ur-KAnara has died.
▷ Ba.ba dumu.ni	AŠ: His child Baba,
▷ Ba.a.b[a]	AŠ: Ba$^{\supset}$ba[ ]
▷ Í[r.]	AŠ: I[r-]
▷ A.ga.t[i]	AŠ: Agati,
▷ Za.la.a	AŠ: Zala$^{\supset}$a,
géme.me	—they are (chattel) slaves—
é.du$_6$.la	were as (his) "estate"[16]
mu LÁ+NI.šè mu.DU	delivered in place of the deficit.
LÁ+NI.bi ba.zi	That deficit is (therewith) resolved.

III. The Debits of Erlenmeyer 155

The debits section of the account Erlenmeryer 155 includes in simplified fashion only the debit carried over from the previous year (the third year of the king Šū-Sîn) and a recording of the women put at the disposal of the foreman for a period of 12 months (Šū-Sîn 4).[17] The Ur III accountant responsible for this text converted these workers in the debits section into disposable workdays, without regard to eventual irregularities in the work actually performed by the millers, and without regard to the time off generally granted by the state administration, the so-called free days u$_4$.du$_8$/KU.a. The crew recorded in Erlenmeyer 155 consisted of 37 females, who worked for a total of 12 months. Since the accounting month consisted always of an artificial 30 days,[18] the expected labor performance of these workers can be easily computed as 37 × 12 × 30 = 13,320 workdays. During that period, three female workers qualified as bara-kara, literally "taken (or: captured?) outside" (?),[19] performed an unspecified service for the

[15] Cf. *Ur III-Fischerei,* pp. 42–48.

[16] See now Waetzoldt, *NABU* 1990, no. 5.

[17] The name of this Umma foreman is unfortunately broken from the text colophon.

[18] See "Timekeeping," pp. 122–33.

[19] Both guruš and géme were qualified with the unclear term bara-kara; cf. the texts *HLC* 2, pl. 73, no. 55 obv. i 12–ii 3 (30;0,0 šabra / 2 nu.bànda gu$_4$ 20;0,0.ta / 7 engar 15;0,0.ta / 2.55;0,0 ; á.bi 10.56 / bar.ra.kar.ra.me, "30 (gur): the šabra, 2 nubanda-gu at 20 (gur) each, 7 engar at 15 (gur) each, (together:) 175 (gur), performance involved: 656 (workdays), they are bara-kara"; the calculation involved is (30 + (2 × 20=) 40 + (7 × 15=) 105 =) 175 gur ÷ $^{80}/_{300}$ gur to be threshed daily = 656¼ workdays; cf. T. Maekawa's interpretation in *ASJ* 8, 97 that bara-kara should qualify those persons who were not required to thresh grain using the su$_7$.du$_8$.a-method); *AnOr* 1, 250 (= Charpin and Durand, *Documents cunéiformes,* pl. 75–76), obv. i 6–7 ([5 gé]me u$_4$.30.šè á.bi u$_4$.2.30 / [géme ba]r.ra.kar.ra, "[5 female] workers for 30 days, performance involved: 150 days, [the female workers are ba]ra-kara"); *TÉL* 223 obv. 2–4 ([43]½ guruš bar.ra.kar / u$_4$.12.šè / [á].bi 8.42 guruš u$_4$.1.šè, "[43]½ bara-kara male workers for 12 days, [performance] involved: 522 workdays"); see, finally, A. Archi and F. Pomponio, *Vicino Oriente* 8/1 (1989): 12 to no. 2 obv. 2 (translating "brought outside" [portati da fuori]; there also p. 15, no. 5 obv. 2).

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

foreman corresponding to 33 workdays each. These workers will have been transferred for this period to a crew from another administrative unit. The total of these three entries represented the workdays which, converted into labor performance, was expected of the team foreman.

These debit entries recording the number of workdays allotted the foreman concerned would normally have been supplemented with the amount of grain distributed to the crew which was to be processed. The debits of the work unit under Ur-Šara in the account *TCL* 5, 5670, for instance, included both workdays and various sorts of grain. As is the case in other areas of Ur III bookkeeping, the grain entries were converted into the unit of basic value, barley, using the standardized equivalencies:

še (barley) = 1 × še
= 1 × zíz (emmer)
= 2 × gig (wheat)
= 2 × ìmgaga (spelt?)[20]

The technical reasons for not recording in the debits section of this text the unprocessed cereals which were to be the major tasks of the work force are not obvious. The closest parallel texts with this simplified format from the Ur III corpus, *TCL* 5, 5669 (dated Šulgi 48) and *AnOr* 1, 250 (=D. Charpin and J.-M. Durand, *Documents cunéiformes de Strasbourg,* pl. 75–76; Amar-Suen 1) also offer no indication of the reasons for such an accounting procedure. It is, in any case, not a difficult matter to envision, since it simply means that the foreman assumed no responsibility for the actual cereals milled by his crew; rather, the official in charge of grain distribution, presumably the head of a grain depot, ka.guru$_7$, or a šabra, would in these cases have retained the grain quantities in his books until such time as they could have been deducted. This deduction would have been achieved with the same sort of equivalencies as those mentioned above used to convert unprocessed cereals into the common denominator,

[20] That is, one measure of wheat or spelt(?) was converted into, and thus value equivalent to, two measures of barley. The rates used in Babylonia to artificially convert various cereals into barley were first published by F. Hrozný, *Das Getreide im alten Babylonien,* vol. I (Vienna, 1913), pp. 77 and 95–97. Compare, for instance, the debits section of the account *TCL* 5, 5668, obv. i 1–8:

3.04;4,4 še gur lugal	(× 1 =	3.04;4,4)
35;0,0 zíz gur	(× 1 =	35;0,0)
16;1,5 gig gur	(× 2 =	32;3,4)
3;0,0 še gur	(× 1 =	3;0,0)
ŠU+NÍGIN še.bi 4.15;3,2		4.15;3,2

The summations of both texts *TCL* 5, 5668 und 5670, make obvious the implicit conversion gig or imgaga × 2. The conversion 2:1 of gig is further necessary in the text *RTC* 305, obv. ii 12–14 (compare Hrozný, *Getreide,* p. 96):

ŠU+NÍGIN 1 guru$_7$ 3.35;0,3,3 sìla še gur ^{d}Šul.gi.ra	Together: 1 silo, 215 gur, 3 (bán) 3 sila barley (using the) Šulgi (measure),
ŠU+NÍGIN 1.20;0,0 gig gur še.bi 1 guru$_7$ 6.15;0,3,3 sìla gur	together: 80 gur wheat, the barley equivalent involved: 1 silo, 375 gur, 3 (ban) 3 sila,

since the calculation involved is:

		1.03.35;0,3,3
+ 1.20;0,0	(× 2 =	2.40;0,0)
		1.06.15;0,3,3.

The same conversion is indicated in the credits section of this text (cf. *Ur III-Fischerei,* pp. 83–85 for further evidence in this vein).

This content downloaded from 202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

barley. The difference here would be the conversion of processed (milled) grains into unprocessed barley, for which see below.

IV. THE CREDITS OF ERLENMEYER 155

From this total of expected labor performance was then deducted the real and compensating (time off) labor performance of the crew. This labor may be divided into four broad categories: milling, agricultural activities, bala service, and "time off."

MILLING

Somewhat less than half of the total labor output of the labor force documented in Erlenmeyer 155 was consumed by the natural activities of such groups of female workers in Umma, namely, by the milling of grain. The first section of the account's credits records in col. i 14–22 such work with the listing of various quantities of different sorts of flours milled by the workers. Far and away the greatest amount of flour was the last entry, qualified as dabin, the standard sort of flour attested in Ur III milling documents. The more than 160 gur (ca. 48,000 liters) of dabin flour represent close to 85 percent of the total amount of flour milled by the workers. Some 10 percent of the total is represented by the nearly 19 gur of fine pea flour of the third entry, followed by lesser amounts of other flours.[21]

These entries of milled flour are subsumed not in a capacity total, but rather are converted into the amount of labor time necessary for the milling of the flour. It is clear from numerous parallel accounts that the labor time thus recorded does not represent real expended labor. Rather, the number of workdays recorded resulted from the use by the ancient bookkeeper of a set of standardized performance expectations, in the case of flour it was the number of sila of grain to be milled per workday of the female workers. These may or may not represent realistic average amounts of different types of grain the women were capable of milling in a workday. The overwhelming numbers of debits incurred at the conclusion of similar accounts from Umma suggest that the quotas may have as a rule exceeded the average performance of working women of the day. Some examples of such quotas may be presented here briefly:

Flour type:	*Amount to be milled per workday:*
zì.gu.sig$_5$	8 sila
dabin	10 sila
zì.sig$_5$	10 sila
zì.sig$_{15}$	10 sila
zì.gaz$_x$	10 sila
eša	20 sila
ninda.àr.ra.sig$_5$	20 sila

[21] In contrast to other texts of this genre, Erlenmeyer 155 makes no mention of the delivery to this crew of the quantities of unprocessed grain required for the production of flour. See the treatment of *TCL* 5, 5668 and 5670 above.

This content downloaded from 202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

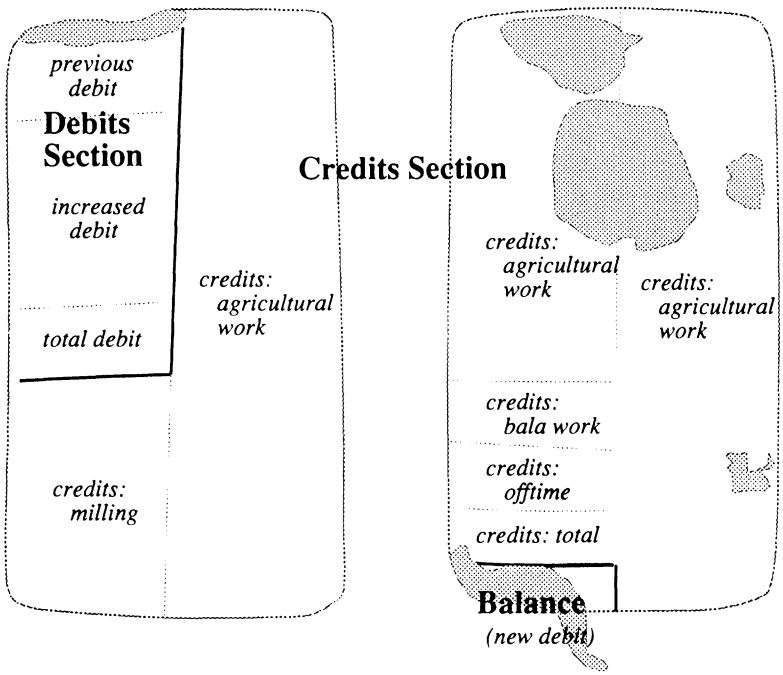

FIG. 4.—Account structure of Erlenmeyer 155

The differing amounts of flour to be milled per workday were doubtless due to the required fineness of the respective sorts of flour: the sorts qualified as eša and ninda.àr.ra.sig$_5$ were probably somewhat coarser than the other sorts, since twice as much flour of these two qualities was to be ground per day as flour of the sorts dabin and zì.sig$_5$/sig$_{15}$.[22] Based in part on these figures, a calculation of the labor time allotted the géme crew for the quantities of grain listed seems to have had the following form:

8;1,2,1 zì.sig$_{15}$	÷ 6⅔ sila per day	≈	6.12 ⅒
2;4,2 eša	÷ 20 sila per day	=	43
18;4,2 zì.gu.sig$_5$	÷ 8 sila per day	=	11.47 ½
0;2,0 ninda.àr.ra.sig$_5$	÷ 20 sila per day	=	6
2.41;4,3,4⅙ dabin	÷ 10 sila per day	≈	1.20.57 ½
			1.39.46 ⅒

[22] Texts such as *TCL* 5, 5669, best document these relationships with the notations obv. i 9–16: 4.02;2,5,7½ sìla dabin gur á.bi u$_4$ 2.01.17⅚ (72,777½ sila ÷ 10 = exactly 2.01.17¾); 11;3,2,8 sìla zì.sig$_{15}$ gur á.bi u$_4$ 5.50⅚ (3,508 ÷ 10 = exactly 5.50⅘); 9;3,2,5½ sìla eša gur á.bi u$_4$ 2.25½ (2,905½ ÷ 20 = nearly exactly 2.25¼); 1;4,1 zì.gu.sig$_5$ gur á.bi u$_4$ 1.08⅚ (550 ÷ 8 = exactly 1.08¾). The final entry books the sort of flour with the highest production costs, zì.gu.sig$_5$, "fine pea(?) flour," of which 8 sila

This content downloaded from 202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

According to this proposal, the rounding made in the first and last computations would have in fact been minimal. In the first case, the exact result of 8;1,2,1 ÷ 6⅔ is 6.12‰, in the second that of 2.41;4,3,4⅙ ÷ 10 is 1.20.57²⁵‰. It remains puzzling, however, that the accountant of this text has apparently used the production quota of 6⅔ sila per day for the flour zì.sig$_{15}$ instead of the otherwise attested quota of 10 sila. This may support the interpretation that Ur III bookkeepers enjoyed some measure of flexibility in the regulation of labor output, whereby numerous factors such as the categories of employed laborers or the season during which the work was performed may have played a role only implicitly recorded in running accounts. One might, on the other hand, interpret these data to mean that the scribe has made an error in his calculation, that is, that he has either used an invalid labor quota,[23] or has followed a faulty algorithm in a problem, the solving of which in the third millennium involved a procedure unclear to us.

The scribe included after notation of the labor time "expended" with the milling of the grain a notation of the number of "free days" granted with the performance of such labor. At the standard rate of ⅙, this would have been very close to 997⅒ workdays. However, since apparently the free days allotted for the entire labor production of the crew were tallied as the final entry of the account's credits section, this notation was erased (the sexagesimal notation would have been 16.37 41⅔ gín or more likely rounded to 16.37⅔, of which no obvious traces remain on the tablet).

Normally, a running account of a milling crew would continue to calculate the grain not only for its labor costs but also for its intrinsic value as flour. Of the sorts known from published texts, only the simple flour dabin (sign combination zì.ŠE) is in other accounts converted into unprocessed barley at a rate of 1:1. From numerous accounts, it is possible to assemble data leading to the following simplified table of value equivalencies between processed grains and unprocessed barley:

quantity of še	= 1 ×	quantity of dabin
	= 2 ×	quantity of zì.sig$_{15}$
	= 2 ×	quantity of zì.gaz$_{x}$
	= 2 ×	quantity of eša
	= ½ ×	quantity of ninda.àr.ra.sig$_5$[24]

was to be milled per workday. M. Powell, *Bulletin on Sumerian Agriculture* 1, p. 55, cited the unpublished Hermitage text no. 7501 with the relationship 5 sila zì.gu.sig$_5$, 6 sila zì.sig$_{15}$ and at most 8 sila dabin per workday; since, however, in the same text a quota of 20 sila eša per day was recorded, it will be necessary to await full publication of the text before an evaluation of the unusual quotas can be made. The following calculation in Erlenmeyer 155 would tend to support at least the quota of 6 sila for the flour zì.sig$_{15}$.

[23] That we are dealing here with an unpracticed hand is also obvious from the large number of erasures on the tablet, as well as from the fact that the number of "free days" recorded in the text exhibits no obvious relation with the total amount of labor time allotted the foreman, for which see below.

[24] That is, one measure of fine or eša flour was value equivalent to two, one measure of fine ground ninda flour to one and one-half measures of barley. These equivalencies will be the subject of a special study, *Getreideverarbeitungsanlagen* (tentative title), in preparation by J.-P. Grégoire. See preliminarily *Ur III-Fischerei,* pp. 86–87 with notes.

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

Thus we might have expected here the following barley conversions:

8;1,2,1 sìla zì.sig$_{15}$ gur	× 2?	=	16;2,4,2?
2;4,2 eša(A.TIR) gur	× 2	=	5;3,4
18;4,2 zì.gu.sig$_5$ gur	× 2?	=	37;3,4?
0;2,0 ninda.àr.ra.sig$_5$	× ½	=	0;3,0
2.41;4,3,4 sìla 10 gín dabin gur	× 1	=	2.41;4,3,4⅙
			3,42;2,3,6⅙ še

The section concludes with the notation níg.ka$_9$ še.ta, "from the grain account," to proceed on to activities of the crew performed in other fields. This notation has exact parallels in other accounts from Umma, for example in *AnOr* 1, 250 = Charpin and Durand, *Documents cunéiformes,* pl. 75, obv. ii 1–10 (directly after šà.bi.ta):

10;0,5,1 zì.sig$_{15}$ gur
0;0,4,5 sìla eša
7;0,1 zì.gu.sig$_5$ lugal gur
0;0,2,8 ⅔ sìla zì.ba.ba še
5;2,1,7 sìla zì.gu.sig$_5$ gur
15;1,5,5 sìla dabin gur
0;4,2,2 sìla ninda.àr.r[a.sig$_5$]
á.bi u$_4$.27.06⅔[25]

níg.ka$_9$ še.ta[26]

AGRICULTURAL ACTIVITIES

A total of 4,480 of the logged credits of 12,758⅚ workdays in the account Erlenmeyer 155 were performed in the agricultural sector of the Ur III administration. This sort of labor transfer worked in both directions: weavers, for example, were brought into the milling crews as the need arose.[27]

[25] I have been unable, using the standard performance expections 10 sila zì.sig$_{15}$, 20 sila eša, 8 sila zì.gu.sig$_5$ 10 sila dabin and 20 sila ninda.àr.ra.sig$_5$ per day, to make sense of this calculation. It seems that lower quotas must have been the basis of the account.

[26] Compare, in this regard, *STA* 2 with in the same position as níg.ka$_9$ še.ta in Erlenmeyer 155 and *AnOr* 1,250, the notation á.zì.àr.a / níg.ka$_9$ Lú. dingir.ra.ta. This will be the same Lu-dingira as recorded after the milled grain section of the accounts *TCL* 5, 5668 (obv. ii 12) and 5670 (obv. ii 16); compare also the account *TCL* 5, 5665 obv. 11 with níg.ka$_9$ še Lugal.ezen.ta following a notation of the number of workdays corresponding to 60 gur of barley, namely, 1.27.30 = 5,250. This correspondence seems based on the addition to a preliminary calculation of 4 sila per day of ⅙ (the "free day" allotment), i.e., 18,000 sila ÷ 4 = 4,500; 4,500 × ⅙ = 5,250.

[27] Compare the Umma text *SET* 274, an account of the yearly production of a large weaving establishment with a labor force of 184⅓ women and children (obv. ii 41–43). A section of the credits of this account (ix 323–26) records the following work of the weavers at a grain mill:

50.00 géme u$_4$.1.šè á u$_4$.du$_8$.a!.bi 8.20	3,000 workdays, performance of the time off involved: 500 (= ⅙),
á zì.àr.a	(labor) performance of grain milling.

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

The range of activities of the female millers in agriculture was very broad, covering nearly all of the tasks performed by their male counterparts, the guruš. These activities may be divided into the harvesting and preprocessing (threshing and winnowing; transport, etc.) of grain, reeds, and other wild plants and trees; the maintenance of the irrigation installations in the area around Umma; and excavation works. Each of the entries recording numbers of workdays will have been based on receipts verified by the official in charge of the particular activity. The first four entries in this section (obv. ii 1–4), for instance, were drawn from a tablet (or tablets) sealed by Lu-gina. This person may be the šabra official known from other Umma texts who was responsible for agricultural activities.[28]

The workdays recorded in these entries of course represent a given number of millers for a given number of days. Since in the case of Lu-gina all the four workday notations are divisible by five, one might speculate that in fact 5 women were assigned to his work team for a total of (1,130 ÷ 5 =) 226 + (140 ÷ 5 =) 28 + (25 ÷ 5 =) 5 + (90 ÷ 5 =) 18 = 277 days. Similarly, we might imagine that the two following entries (obv. ii 6–7) represent the employment of two women from the milling crew for a total of (338 ÷ 2 =) 169 + (222 ÷ 2 =) 111 = 280 days, the output of which was verified with the seal of Lu-ḫegal.

In this and the following subsections of the agricultural credits there are a number of erasures (indeed, all the amounts in the third subsection are erased), the reasons for which are unclear. There was most likely a mix-up in the individual receipts forming the basis of the first notations, which may have been brought to the attention of the scribe drawing up this document by the sealing official or which arose after the scribe began rechecking his figures. The fact that Erlenmeyer 155 is one of the most erased accounts from Umma suggests either that the scribe responsible for this text was particularly unpracticed, or that other accounts from Umma—cf., in particular, the texts published in *TCL* 5—may have been second or third drafts of texts which in their first form would have resembled Erlenmeyer 155.

For a full discussion of the activities and the topographical and personal names in this section, reference is made to the treatment of the large guruš account Erlenmeyer 152, forthcoming, which contains many of the same names and activities as are listed in this géme text.[29]

BALA SERVICE

Rev. iv 15–17 records the bala service of 30 members (more than 80 percent!) of the crew accounted for in Erlenmeyer 155 during a period of 10 days. This labor duty remains poorly understood, despite the rather imposing number of references to bala service in the Ur III text corpus.[30] No text of the period known to me, however,

[28] Cf. Grégoire, *AAS*, pp. 130–32 and the texts cited there.

[29] See the preliminary translation of the text in *Frühe Schrift*, pp. 90–95.

[30] One of numerous examples of bala reports is *BIN* 5, 74, according to which a fisheries crew fulfilled a bala duty:

12 guruš á.½ / u_4.33.šè	12 "half(day)" workers for 33 days,
á.bi u_4 3.18	performance involved: 198 days.
bala.a gub.ba bala.šè	(They were) stationed at the

This content downloaded from 202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

consolidates various bala labor services into a running account, from which it would be possible to chart the administrative directives leading to the imposition of these labor duties on individual labor crews such as the millers in Erlenmeyer 155.

"TIME OFF"

The last entry of credited labor performance in the labor account Erlenmeyer 155 records as *performed labor* the $u_4.du_8$/KU.a, "free days," of the workers. We would expect here, in conformity with other texts, a "nice number" of workdays, i.e., a number resulting from the artificial administrative calculation of ⅙ of the total workdays to be performed during the 12 months of the account by the 37 workers who represented the standing milling crew: 37 × (12 × 30) ÷ 6 = 2,220 = 37.00 or, including the bara-kara laborers, 2,236½ = 37.16½ workdays.

The text instead records here just 33.12⅔ = 1,992⅔ workdays or 227⅔ (/243⅝) fewer than expected. I have no explanation for this discrepancy; based on published Ur III texts, however, there can be little doubt that it in fact resulted from defective calculations by the scribe of this tablet.

There are two main reasons for this confidence. In the first place, very nearly all other published texts known to me which contain reference to the free days of géme or guruš base their calculations of this time off on standard fractions of the total number of workdays expected of standing work crews listed in the debits section of the accounts. These fractions are either ⅙ or ⅕ for the female workers, géme, and possibly also for the male workers designated dumu.gi_7[31] or 1/10 for the male workers, guruš. Compare the following examples:

$u_4.du_8.a$ = ⅙ (for géme in Umma):

Erlangen 1, obv. i 14 + ii 1 + ii 5 and ii 9:
á.bi u_4 2.40.12 u_4.1.šè + 28.48 géme u_4.1.šè + 2.24
= 3.11.24; 3.11.24 (÷ 6 =) 31.54 á $u_4.du_8$.a géme[32]
STA 2, obv. i 6 and iii 5–6:
á.bi u_4 11.26.15⅓ (÷ 6 ≈) 1.54[1].22½ u_4.1.šè á $u_4.du_8$.a[33]

---

bala, on their way to the bala
gen.na ù bala.ta gur.ra and returned from the bala.
ugula Ur.^{d}Su$^{?}$en šuku$_x$ Foreman: Ur-Suen, the fisherman.
gìri Ur.gi_6.par_4 dub.šar Responsible: Ur-gipar, the scribe.
mu Ḫa.a[r.š]i^{ki} b[a.ḫ]ul Year: "Ḫarši was destroyed" (Šulgi 48).

[31] See *Ur III-Fischerei,* pp. 75–76.

[32] See n. 7 above; compare in this text also the debit entry obv. ii 3 calculated from the credit entry rev. iii 27 ([á.bi] 12.20 ÷ 6 = 2.03⅓ [á [u_4.d]u_8.a géme b[a.úš.a]] with the calculation:
((1 × ((10 × 30) + 8) =) 308 + (3 × ((4 × 30) + 8) =) 384 + (1 × (10 + (1 × 30) + 8) =) 48 =) 740 ÷ 6 = 123⅓.

[33] The exact number of free days would have been 6,862⅝. Compare in this text also the debit entries obv. ii 16–17, 18–19, and 20–21, which have been calculated from the credit entries rev. iv 3–5 (thus 10.40 [géme u_4.1.šè / géme giš.ì sur.ra] ÷ 6 = 1.46⅔ [géme u_4.1.šè / á $u_4.du_8$.a géme giš.ì[!] sur.ra]), rev. iv 30–31 (6.28 [géme u_4.1.šè / en.nu.gá ti.la] ÷ 6 = 1.04⅔ [géme u_4.1.šè / á $u_4.du_8$.a géme en.nu.gá ti.la]) and, perhaps, obv. iii 17–18 (2.00 [géme u_4.1.šè / šà.gal nam.ra.ak du_8.a] ÷ 6 = 20 (géme u_4.1.šè / á $u_4.du_8$.a géme zi.ga didli]).

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

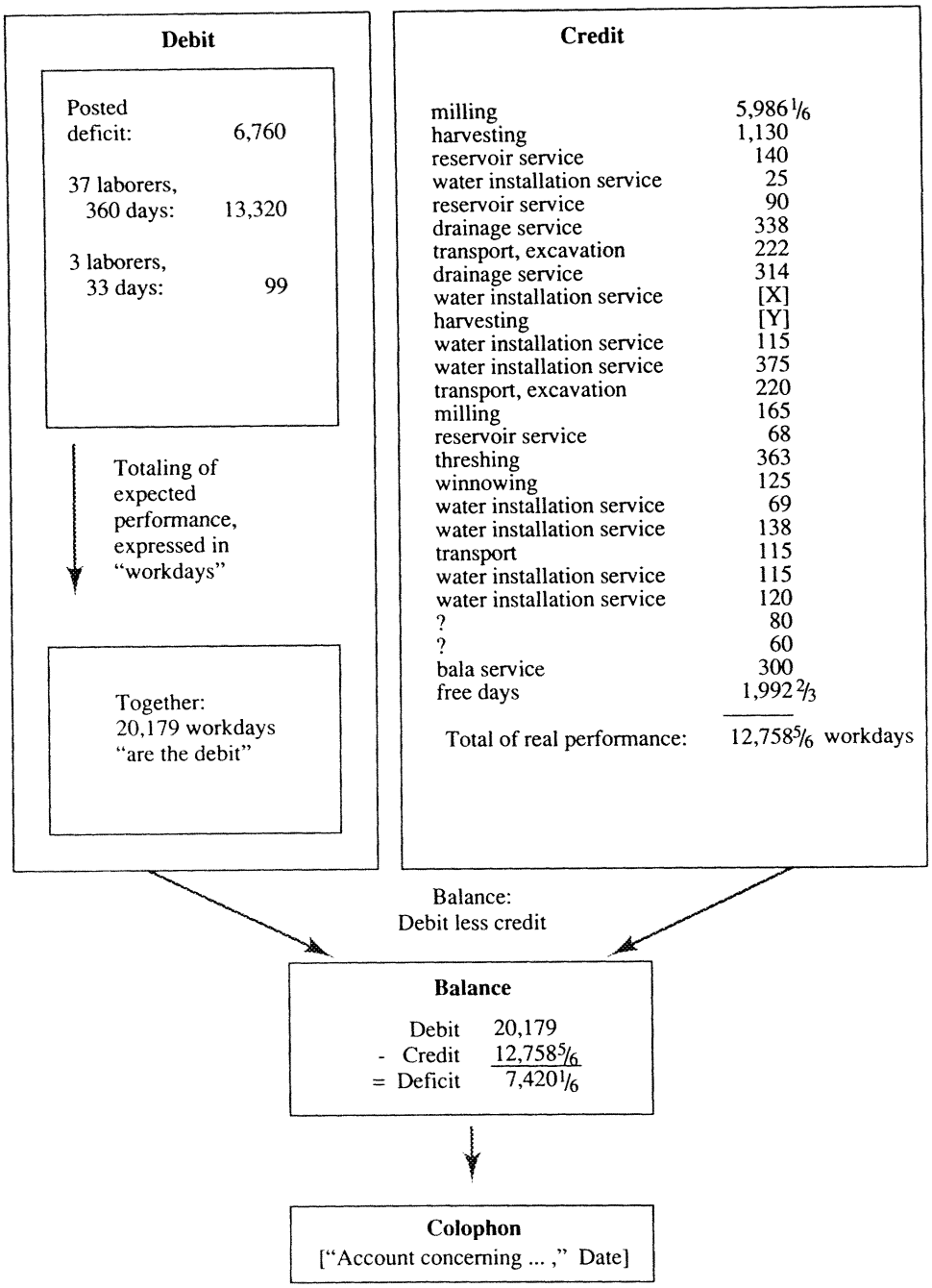

FIG. 5—The accounting calculations of Erlenmeyer 155

This content downloaded from 202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

TCL 5, 5668, obv. i 13 and ii 3–4:
á.bi 2.36.00 (÷ 6 =) 26.00 géme u_4.1.šè á géme u_4.du_8.a
TCL 5, 5669, obv. i 4 and 8:
á.bi u_4.3.36.00 (÷ 6 =) 36.00 á u_4.du_8.a
TCL 5, 5670 obv. ii 2 and 7:
á.bi 3.08.24 géme u_4.1.šè (÷ 6 =) 31.24 á u_4.du_8.a géme[34]

u_4.KU.a = ⅕ (including tu.ra/PA.URU, for géme and for géme together with guruš in Girsu):

BM 14308 = *CT* 10, 20–23 obv. iv 6–9 and rev. ix 13–16:
4½ géme kín.kín iti.13.šè á.bi 29.15 géme u_4.1.šè (÷ 5 =) 5.51 géme u_4.1.šè u_4.KU.a géme tu.ra igi.5.gál
TÉL 224 obv. 1–3 can be restored as
[18 géme . . .] á.bi [4,320 géme u_4.1.šè] iti.8.[kam], since obv. 12–13 has: 864 géme u_4.1.šè [á u_4.KU.a igi].5 gál and 864 × 5 = 4,320
TÉL 244 obv. 1 and 3–4:
117 géme gub.ba × (6 × 30) = 21,060 workdays; 21,060 − (21,060 ÷ 5 [u_4.KU.a.bi íb.ta.zi]) = 16,848 = 4.40.48
TIM 6, 4 ii 11 and 15–16:
á.bi 7.41.22½ géme u_4.1.šè ÷ 5 = 1.32.16 géme guruš u_4.KU.a tu.ra PA.URU igi.5.gál
TIM 6, 4 rev. vi 9 and 12–13:
á.bi 7.54.00 géme guruš u_4.1.šè ÷ 5 = 1.34.50 lá.2 géme guruš u_4.1.šè u_4.KU.a tu.ra PA.URU igi.5.gál

u_4.du_8/KU.a = ⅒ (for guruš):[35]

BM 19976 (M. Sigrist, forthcoming) iv 5–6:
n guruš u_4.1.šè u_4.KU.a igi.10.gál ùg.ga_6

MVN 11, 106 obv. i 3 and rev. i 20′–21′:
[4 guru]š ùg.ga_6 × 6.30 workdays ÷ 10 = 2.36 guruš u_4.1.šè u_4.KU.a igi.10.gál ùg.ga_6[36]

TÉL 239a, obv. i 2–3 and ii 15–16:
43½ ùg.ga_6 × 130 u_4 ÷ 10 = 565½ guruš u_4.1.šè [á u_4].KU.a ùg.ga_6

TCL 5, 5674, obv. ii 32 and iii 25:
á ùg.ga_6.bi 48.00 ÷ 10 = 4.48 guruš u_4.1.šè á u_4.du_8.a ùg.ga_6

[34] Compare in this text also the debit entry obv. ii 3 calculated from the credit entry rev. iv 4 ([á.bi] 3.08 ÷ 6 = 31 10 [gín géme u_4.1.šè / á u_4.du_8.a géme ba.úš.a] with the calculation ((6 × 30) + 7 =) 187 ÷ 6 = 31⅙). See "Timekeeping," pp. 172–73 and *Ur III-Fischerei,* p. 89.

[35] A system of compensations comparable to those known from the Ur III period seems to be attested for hirelings in the Old Babylonian period. See H. Klengel, *Hammurapi von Babylon und seine Zeit* (Berlin, 1976), pp. 72–78, with KU possibly to be read as dab_5.

[36] See *Ur III-Fischerei,* pp. 164–65, n. 534.

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

TCL 5, 5676, obv. i 3–10 and xii 16–18:
3 ùg.ga$_6$ × (4 × 30) ÷ 10 = 36 guruš u$_4$.1.šè á u$_4$.du$_8$.a ùg.ga$_6$ iti.4.šè

UNT no. 38, rev. iv 3:
3.41½ guruš u$_4$.1.šè u$_4$.KU.a igi.10.gál[37]

It seems that these compensatory workdays could also be simply added to the work load calculated per quantity of milled grain. Compare the following texts:

S. Levy and P. Artzi, *Atiqot* 4 (1965): no. 7, obv. i 15–ii 3:
iti.ezen.^{d}Ba.ba$_6$ 5.04 géme 50 géme á.½ 1.03 guruš
zì.bi 5.14;0,4,8 sìla gur igi.5.gál íb.ta.zi,
with the likely calculation:
[304 + 50 + 63] × 30 workdays × 10 sila flour milled per day = 6.32;0,0, and
6,32;0,0 − [6,32;0,0 ÷ 5; *íb.ta.zi*] = 5.13;3,0 with a slight miscalculation
TCL 5, 5665 obv. 6–7:
3.57;0,4,1 sìla dabin gur á.bi u$_4$ 2.18.20 igi.6.gál.bi ì.íb.gar
with the calculation:
3.57;0,4,1 ÷ 10 sila milled per day = 7,114.1 workdays,
and:
7,114.1 + (7,114.1 ÷ 6) ≈ 8,300, as in the text.[38]

Technically speaking, these free days were thus booked as real production of the workcrew, converted into workdays. In all probability, this time off of between 1/10 for men and 1/6 or 1/5 of the accounting period for women represented the time requisite to the regeneration of physical energy for the continuation of work. Such allowances will have been arrived at through experience with the workers themselves.

[37] I do not understand the texts A. Deimel, *Or.* 2 (1920): 63, Wengler 41 obv. 1 with 6,611 géme u$_4$.1.šè á zì.àr.a / á u$_4$.du$_8$.a.bi 248.àm and *Eames Coll.* H 26 = *NYPL* 144 with 2.19.07 géme u$_4$.1.šè / á zì.àr.a á u$_4$.du$_8$.a.bi 5.13 (both 6,611 ÷ 248 and 8,347 ÷ 313 very nearly equal 26⅔). The large account *SET* 274 should, further, contain enough information to reconstruct the calculation leading to the number of free days allotted a weaving work crew noted in line 196; the method chosen by the authors for converting sexagesimal into decimal notations in transliteration in their publications, however, makes any attempt to understand the debits section of this account (ll. 1–194) an exercise in speculation. The number recorded in line 196, 8,335½ workdays, should have resulted from the entry ll. 41–46. The notation ll. 45–46 has, however, been mangled (should be 18.26.00 = 66,360, from (170⅔ + (12⅔ × ½) + 7⅓) × 360; the same notational confusion in ll. 162–63, 241–42), so that it is difficult to picture the exact form of a large notation which might have led to a confused calculation of allotted free time. Neither the notation of the total work load of the female workers in ll. 41–46 nor that of their allotted free time was corrected by J. Snyder and M. Cooper, *ASJ* 8 (1986): 339, whereas the authors did present collation results of a number of lines which changed nothing in the transliteration publication, so that the text may still require further collation. Certainly, it is possible that weavers were allotted a different compensation from that of millers, who are in fact in the same text, ll. 323–26, allotted 1/6 of their work load as free time. It would nonetheless be peculiar that in the same text different workers should be allotted different work time compensations. The very difficult text *UET* 3, 1554 may be mentioned here for its notations rev. ii 9–10 2.09½ géme iti.1.šè / á u$_4$.KU.a.bi, which I have been unable to connect with the number of work months of the female weavers noted in the initial section of the account, obv. i 12–ii 4.

[38] See "Timekeeping," p. 124, n. 3, and parallel notations in the same text, obv. 15–17 and rev. 6–8.

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

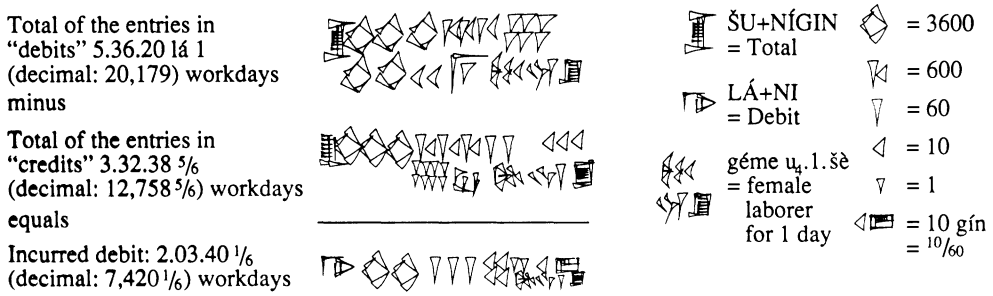

FIG. 6.—Balance of Erlenmeyer 155

V. THE BALANCE OF ERLENMEYER 155

The total of real and compensatory labor production, finally, is in the account deducted from the total crew debit in order to draw the current balance. The balance in this as in the great majority of similar accounts is recorded as a new debit, called LÁ+NI (see fig. 6). This debit will likely have formed the first entry (si.ì.tum) in the debit section of the account drawn up for the following year, Šū-Sîn 5. It may be noted that the work crew was in this account unable to hold ground in comparison to the debit calculated at the end of the year Šū-Sîn 3: the foreman must now assume responsibility for a debit of 7,422⅙ workdays, or over 660 more than the initial debit of 6,760 workdays. The incurred debt may on the other hand have been called in by the state in full or in part; in this case, the foreman would have been required to deliver to the central administration goods or services corresponding in full or in part to the value of 7,422⅙ workdays. Since we know from *CT* 10, pl. 48, BM 21429[39] that this value could be 2 shekels of silver per year, the foreman might have been able to cover his debt with the payment of $7{,}422\frac{1}{6} \div 360 \times 2 \approx 41\frac{1}{4}$ shekels. This, however, would have been no easy sum for a man who may have enjoyed a yearly compensation of at most 20 gur of barley, corresponding to ca. 20 shekels of silver.[40]

VI. SUMMARY

The bookkeeping of expected and real labor performance achieved its most developed form during the Ur III period. The administrative texts of this period documented a continuous reckoning of all real labor performance against theoretical debit entries and imposed duties. Accounts of the activities of foremen and workers, all of whom were subject to state control, were drawn up at regular intervals. In these accounts, the expected and the real labor performance of the workers were balanced against one another. The accounting period consisted as a rule of one administrative year, that is, a year of twelve 30-day months. The posting of a balance usually resulted in a debit, since

[39] With obv. 8: 20.48 = 1,248 workdays corresponding to rev. 11: 7 gín lá.12 = 1,248 še kù, or 1 grain of silver per workday.

[40] See *Ur III-Fischerei,* pp. 63–65.

This content downloaded from 202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms

the expected labor performance was in all likelihood simply beyond the capabilities of the normal worker. Moreover, an incentive for the workers to produce more was nonexistent; their remuneration consisted of no more than the minimum amount of grain and clothing to keep them able to produce. This debit was called in the Ur III documents LÁ+NI. The occasional surplus was called diri. In both cases the result was, as a rule, transferred into the following accounting period, resulting in a continuous bookkeeping.

Although we are able to document the performance standards and value equivalencies only through their appearance in accounting conversions, there can be no doubt that such norms really existed in explicit form and that they were strictly enforced in dealings with the foremen of work gangs. The conversions, from which they can be documented, were conversions into comparable products specific to particular sectors of the economic organization. Depending on the economic sector, silver, barley, fish, or *workdays* served as means of comparison or as measure of standardized norms and performance expectations. Workdays were in the debits sections of Ur III accounts the product of the number of workers multiplied by the number of days they were at the disposal of a given foreman. In the section of credits, the corresponding productive workdays were calculated through the division of real production—milled grain, delivered fish, and so on—by the amount of the product which the administration assumed could be processed by one workman in one day. A reconstruction of the conversions demonstrates that these workdays were based on stable conversion factors for the various labor performances and goods.

Only the working conditions of the foremen were the concern of the Ur III labor accounts. Beyond the labor inventories recording numbers of workers and ration lists guaranteeing for their victualing, almost no information about the fate of the male and female workers is given in the documents. If anything specific is reported about them, then usually at the time of their termination from state employment: this termination took the form either of flight (Sumerian zàḫ) into a very uncertain existence or of death (úš).[41]

[41] The question of "retirement" in the Ur III period is of course an interesting one; since, however, the old workers (qualified šu.gi) continued to be recorded in the work gang tallies, I assume that the exit from working life mirrored the entry: just as children will have entered the work force as soon as they could be exploited, so will elderly laborers have continued to work until they were incapacitated. This will be another subject of research dependent on an analytical Ur III prosopography.

This content downloaded from
202.47.36.85 on Wed, 13 Oct 2021 10:51:49 UTC
All use subject to https://about.jstor.org/terms