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THE LAND-TENURE TEXTS FROM HAGIA TRIADA

Ш

I. Introduction

In the preceding reports¹ we have analysed a number of texts that demonstrate the bureaucratic supervision by the HT administration² of various agricultural activities of the dependent population. The records deal with the allocation of plots of land, with the tenants thereof, with the harvest and its taxation, and also with the supervision of activities. Some other texts may be included within the same broad category, and it is the purpose of this report to analyse these in the light of progress so far. Finally, the various terms encountered in this series of reports are listed as a tentative contribution towards a Minoan vocabulary.

II. The interpretation of HT 128 and HT 913

These two texts have this in common: their headings mention barley (L67) and then proceed to list wheat in the case of HT 128, and various commodities in that of HT 91. HT 128 may be explained by assuming that it records the harvest from, or the seed required for, plots hitherto sown with barley⁴.

¹ Kadmos 17, 1978, 16-25 (Part I), 91-101 (Part II).

² Evidently the administration was done both in the royal villa and (in the case of tablets HT 85 and upwards) in the 'casa del lebete' in the village.

³ For the texts cf. W. C. Brice, Inscriptions in the Minoan Linear Script of Class A, 1961 (ILA); J. Raison and M. Pope, Index du linéaire A, 1971 (Index I) and Index transnuméré du linéaire A, 1977 (Index II), L. Godart and J.-P. Olivier, Recueil des inscriptions en Linéaire A, I, 1976 (GORILA I).

⁴ The ideogram for barley is followed by the notion pa.ra, cf. adv. πάλαι,, formerly considered as derived from k^wel-, an interpretation now to be rejected in view of Linear B pa.ra.jo (cf. Docs² 568).

HT 128

Face a		Face b ⁶			
barley, pa.ra				wheat + KU	6
tu.ru.nu.se.me ⁵	wheat + ?	10	L109.L123	wheat + KU	1
wa.tu.ma.re	wheat + KU	12	ru. $(X.X)^7$	wheat + KU	6
(X). mi.ta	wheat + PA	1/4			
	wheat $+ KU$	6			
di [
]	wheat + KU	4			
ma.72 [1		

From the first entry on face b, 'wheat + KU', it follows that face b follows face a. In view of the systematics of the text, the term tu.ru.nu.se.me must be on a par with the next full word, wa.tu.ma.re⁸ and not belong to the heading.

The notation 'wheat + PA' has been found's to signify wheat-land, or the harvest therefrom, taxable for the benefit of Phaistos; here it contrasts with 'wheat + KU', the only other occurrence of the wheat sign ligatured with a syllabic sign¹⁰; and although the issue cannot be definitely decided in the absence of other evidence¹¹, I suggest that the ligature refers to the supervision by the land-steward Ku.ni.su, who was entitled to withhold $\frac{1}{120}$ of the harvest¹².

The last term on face a may be completed as ma. 72.ta₂ which recurs on HT 90.3.

⁵ I follow the Indexes in transcribing the penultimate sign as L77 (se), not as L100 as in GORILA I, the latter less appropriate in my opinion: the subcategory L77c (Index II 50 j° 24) which appears also in HT 87.3 has been transcribed as L77 in GORILA I, 137.

⁶ Classification of the signs after Index II. The ideogram L109 occurs also on HT 23a.4, 135a.3; for the suggestion that it denotes a shepherd, cf. the author, Kadmos 12, 1973, 134-48. L123 might well be an ideogram also: it appears ligatured with L31 (sa) in the list of commodities of KH 6 (classified as L174 in Index II, 258).

For the two illegible signs cf. GORILA I, 221, but ILA has 'ru.sa wheat + PA 4', a reading supported by the juxtaposition of ru.sa with 57.mi.ta (L57 = ne?) on HT 96a, which suggests the same term on face a of our text. Whereas Index I, 127 has ru.X.pa, that reading has been amended to the one given here in Index II.

⁸ Apparently a complex term, cf. mo.nu.ma.re, ZA 4a.5-6, 5b.1, 15a. 4-5 (numeration following GORILA III, 1977), and ma.re, HT 55a.1.

⁹ On HT 120, cf. Kadmos 17, 1978, 22-25.

¹⁰ All other ligatures were made by adding fraction signs.

¹¹ The notation is found on the fragment HT 61, preceded by the term].mi.ti.,

¹² In that case, the list of HT 10, which enumerates the land under the supervision of the steward, would not have been exhaustive.

The question arises as to whether these terms refer to places or to persons. Unfortunately, their other contexts in the tablets afford no help in this dilemma. If, however, as seems likely from the separation of the taxes between Phaistos and the land-steward, the text deals with the harvest, the sizes of plot indicated by the figures ¹³ would be about right for individual allotments. If, on the other hand, the text was cadastral, the figures would have referred to plots four times as large ¹⁴, too big for individual holdings but possible for whole localities; so in that case the listed names would have been toponyms.

HT 9115

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i.ka, barley,

wheat \frac{1}{24}, barley \frac{1}{12}

oil + KI \frac{1}{12} oil + RO \frac{1}{12} oil + MI \frac{1}{12}

olives \frac{1}{12} figs \frac{1}{12} wine \frac{1}{12} vinegar <sup>16</sup> 5

te. 72,

oil + MI \frac{1}{12}. vinegar ? /
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The interest of this text lies in its contrast with that of HT 128, which also mentions barley in its heading. HT 91 lists a series of commodities in identical amounts, except that the quantity of the wheat is only a half of that of the barley: we recall that at Hagia Triada barley counted for only half the same amount of wheat. We remark further that the amounts listed represent regular fractions of the main units employed in measuring dry and liquid capacity, ¹⁷ as in other HT texts ¹⁸. For these

The size of a plot of land being in the average one-fifth of the harvest, the largest plot mentioned, which had a harvest of 12 medimnoi of wheat, would have required 2.4 medimnoi of wheat-seed, which corresponds to 3½ DA unit (2.4 med. = 288 khoinikes, and 90 khoinikes were required for one DA, which is about 48 ares).

¹⁴ As, on average, the harvest was five times the seed required,

Following GORILA I, 145; Index II reads te instead of te.72, ILA suggeste 'te oil + RO 1/12'. Instead of 'oil + RO' (also ILA) in the first part of the text, Index II has 'oil + U' (L523b, cf. pp. 55 and 269). However, this seems less appropriate, the notion 'oil + RO' being common in association with the other two species (the sequence being the same except on HT 101 where 'oil + KI' comes last).

For the suggestion that L44 denotes vinegar, cf. the author, Kadmos 12, 1973, 28-59.
 Respectively, the medimnos of 120 khoinikes for dry products and wine, and the metretes of three-tenths of that capacity for oil (cf. the author, Kadmos 11, 1972, 1-21; 12, 1973, 28-59.) One-twelfth of the metretes may correspond to the khoos.

¹⁸ Cf. e.g. HT 23a, 35 and 50.

reasons, it is suggested that these texts may represent the records of donations for a *panspermia*, in which case the heading could in each case have indicated the particular festival for which the offering was made.¹⁹

III. The interpretation of HT 115

HT 115 face a²⁰ face b 154. nu.ra.ja21, no, wheat + 72. $ta.ma, nu.wi^{22}$ pa.ra. 61 ti.nu.ja, nu.wi, wheat na. 111.61.mi.na $du.pa_3.na^{23}$ se.ku.tu pa.ra.61 ku.ru.ma, no a.se.ja 83.tu.ja. a.i/no.sa.ki.24 1 ka.po.ru L57725 1 ku.ta [

The text of this tablet has in its heading the notion 'wheat $+\frac{1}{8}$ ', followed by a number of items consisting of names and numbers. One possible interpretation is that these numbers indicate areas of land measured in units that require one-eighth of a medimnos (that is, fifteen khoinikes) of wheat-seed, corresponding to one-sixth of a DA unit²⁶. The smallest plots, listed as $\frac{1}{4}$, would in that case measure only $\frac{1}{24}$ DA (about two ares),

¹⁹ For i.ka cf. ἰχανάω.

²⁰ As this text is palimpsested, the transcription does not present those terms of the first layer which are still discernible. However, it is to be noted that the scribe took care not to write over the term 88. u.ra — which I read ri.u.ra — preceding the term na.111.61.mi.na on face a.

²¹ Following ILA, the indexes give L102, variant b, for the first sign, against which I protested in Nestor 1976, 1035 where I proposed the classification given here.

Probably two terms (cf. on face b, third entry), the dot on face a having been eroded (thus ILA and Indexes).

²³ For L1 = $56 = pa_3$ cf. the author, Minos 16, 1977, 7–11.

²⁴ GORILA I suggests a.no.ni.ki as an alternative which, with Index II, I consider less likely. The latter catalogue classifies the second sign as L100a or i (cf. M. Pope and J. Raison, Kadmos 16, 1977, 16-23), which, in view of the likelihood that the script, like Linear B, has a sign representing the bivocal ai, necessitates the reading a.hi.sa.ki.

²⁵ Index II tentatively suggests that L577 be interpreted as L48b ligatured with *mi*; L48b is the ideogram for sheep.

²⁶ Cf. Note 13.

and those listed as $\frac{4}{5}$ would correspond to $\frac{2}{15}$ DA; both quite abnormal subdivisions of the DA judging by the evidence unearthed as yet²⁷. It is equally unlikely that these sizes were subdivisions of the aroura²⁸. The odd mention of wheat on face b might be explained as implying that the plot concerned had been set apart for growing wheat. However, in view of these cumulative difficulties, it seems better to look for an alternative interpretation of the whole tablet. With this in mind, we may have recourse to the terms used.

The heading mentions 154.nu.ra.ja²⁹ which has the same structure as ki.ki.ra.ja in the heading of HT 85b where it represents a denomination of collective holdings,³⁰ and it seems possible that here we are dealing with another kind of such holdings. Obviously, only part of the terms listed in the text lend themselves to further analysis: the following cases may be relevant:

se.ku.tu, perhaps seghtu-, cf. ἕχω³¹, 'enclosable',
a.se.ja, alses-ya, adjective from ἄλσος³², 'pertaining to the grove',
ka.po.ro, καπρών, 'pig-sty',
ti.nu.ja, with -i- instead of -e- before -n³³, cf. στενή, a narrow
strip of land: orthography for stinw-ya³⁴,
ku.ru.ma, cf. κλύσμα, 'land washed by the sea'³⁵,
a.hi.sa.ki, cf. αἴσακος, myrtle branch and a.se.ja above³⁶.

Such identifications need to be considered with circumspection, but it may be noted that all refer to land of various kinds, none of which has any connection with arable land with the exception of the term ti.nu.ja,

At Pylos, the DA was subdivided into plots of ¹/₁₈ or multiples thereof (cf. the author, Kadmos 16, 1977, 26-35). Such a plot of ¹/₁₈ of a DA corresponds with an area of one thousand square royal cubits or one tenth of an aroura (cf. the author, Nestor 1977, 1204-5). Smaller units, of ¹/₅₄ and ¹/₂₇, were based not upon the royal cubit but upon the foot, and measured thirty feet square and double that size.

The aroura of 10,000 square royal cubits required fifty khoinikes of seed and was subdivided into tenths.

²⁹ Cf. Note 21.

³⁰ Cf. Part II.

³¹ In which case Linear A would still have retained initial s- before a vowel, cf. e.ko.to, PY Eb 913.

³² Cf. a.se.e, PY An 18: Aloekt (cf. C. J. Ruijgh, Etudes du grec mycénien, 1967, 94.)

³³ Cf. Arcad. μίνω for μένω.

³⁴ Here the orthography would have retained initial s- before a consonant, cf. Note 31.

³⁵ In the text the term is followed by L100b = no: could this represent the Indo-Eur. demonstrative particle (e)no-?

³⁶ The etymology of the term is unknown.

and it is precisely this term which, in the text, is followed by the wheat sign. Also, it is remarkable that both 'groves' are followed by a term possibly connected with an animal pen.³⁷ The areas of the latter counted 750 square royal cubits (25 by 30) for the pig-sty, and four times that for the sheep³⁸, which seem quite reasonable values. The groves, if these may be so called, measured 50 by 60, and 40 by 60 royal cubits, again within the bounds of possibility.

IV. The interpretation of HT 122

		HT 122		
face a, first p	art	second part	face b	
[ra.72,	,	7.di.ra 1	je.di, L11, L99	[]
u.de.za ³⁹	2	pa.de 1	83.ki.ta ₂	1
[]	2	ku.pa ₃ .nu 1	[]
da.57.85	2	pa.ta.61 1	a.ra.ju.u.de.za	2
pa. [83.tu 1	k ^w a.k ^w a.ru	2
] di	1	[] du 1	di	2
te.ki	2	ku.pa ₃ .nu 1	da.re	2
$k^{w}a.63.i/no^{40}$	3	da.72.da 1	ku.ro	65
ja.mi.da.re	1	ku.ro 31	po.to.ku.ro	97
57.da.re	1	ku.da 1		

The upper left corner of the tablet as seen from face a is lost, and with it part of the general heading. However, two totals (ku.ro) and a grand total (po.to.ku.ro) were successively listed, and, as the last corresponds to the sum of the two totals and the unit by the last term of face a, it follows that the text enumerates items of the nature indicated by the VIR ideogram L99 in the sub-heading of face b. That ideogram is preceded by the notation 'je.di, L11', this last sign being a hapax legomenon⁴¹. The first term is also found in the headings of HT 8 and 36, but these texts do not unfortunately help us to understand it.

³⁷ For the ligatured ideogram (sheep + mi, cf. Note 25), compare μίσκαιος κῆπος (Hesych.) in the sense of garden = enclosure.

³⁸ In metres ca. 13 by 16 and 26 by $31\frac{1}{2}$.

³⁹ In transliterating L23 = za I follow the convention in using the sound values of the Linear B cognates; however, it is to be expected that in Linear A L23 represents one of the precursors of Mycenaean za, possibly kya.

⁴⁰ For the issue of i/no cf. Note 24.

⁴¹ This sign may be compared with Egyptian N 37, used to indicate irrigated land, like s t 3 t = aroura (cf. A. Gardiner, Eg. Gramm. 3rd rev. 1969, 491).

The text of face a starts by listing toponyms, $u.de.za^{42}$, $da.57.85^{43}$. The latter in the list of HT 13 occurs in juxtaposition with te.ki, which must therefore also be a toponym. There follows $k^wa.63.i/no$, which on HT 85b is found in the position of an anthroponym.⁴⁴ The terms 7.di.ra, pa.de and 83.tu are found together on HT 9, which text, according to my interpretation⁴⁵, records amounts of wine from a vineyard at sa.ro. This had various owners,⁴⁶ and its output was shared with the workers at that site. In the present text these are mentioned in juxtaposition with pa.ta.61 who is a 'ki.ro man'⁴⁷ in the list of HT 94a, and with two nameless individuals referred to as $ku.pa_3.nu$, the 'man from Byblos'⁴⁸. The enumeration on face a ends with the toponym $da.72.da^{49}$, and after the total we find another item, ku.da, which is difficult to classify.⁵⁰

It seems therefore that the text deals with workers at particular sites, and with named individuals who were apparently of some importance as they are also recorded in other lists. There are other texts of this kind, for example HT 97 + 109 which lists workers from sites like Phaistos (cf. HT 85) and people such as $ma.di^{51}$. The sites were perhaps considered as having a collective responsibility.⁵²

The total listed on face a is larger than the sum of the numbers preserved in the text; in the lacunae nine workers should be reckoned.

Turning to face b, we find the anthroponym $k^wa.k^wa.ru$, which corresponds with Linear B $qa.qa.ro^{53}$, and further the abbreviation di for di.na.u, a textile workers' collective.⁵⁴ Next we have da.re, a toponym in other HT texts⁵⁵. A.ra.ju.u.de.za, it will be remarked, repeats the

⁴² Also written as u.37.za on HT 10 and 85 (cf. Part II). For L37 = /l/e, cf. the author, Minos 16, 1977, 12–16.

⁴³ Also on HT 85 and 99; for the former cf. Part II.

⁴⁴ Cf. Part II.

⁴⁵ Cf. Minos 17, 1980, 7-17.

One of which is pa.de, found in Linear B KN Fp 1+, Fs 8, Ga 455, 'a recipient of oil, possibly a divine name'. (Docs² 569). Cf. also G. J. Ruijgh, op. cit. 88: pandes.

⁴⁷ Cf. the author, Kadmos 11, 1972, 1-21.

⁴⁸ Cf. the author, Minos 16, 1977, 8-11.

⁴⁹ Cf. Part II.

The only term possibly connected therewith is the anthroponym ku.ku.da.ra in the ki.ro list of HT 117a.

⁵¹ Cf. Part II.

⁵² This would be in line with the absence of any record dealing with the leasing of damos land.

⁵³ KN As 604, cf. Docs², 576.

⁵⁴ Cf. the author, Kret. Chron. 25, 1973, 126-34, and Part II.

⁵⁵ HT 7, 10, 85; cf. Part II.

toponym u.de.za of face a preceded by the term a.ra.ju which is also found on HT 87.5 and 109.4, in the former of which it appears from its context to be an anthroponym⁵⁶. It follows that u.de.za is not used here as an ethnic but as a locative: possibly "A at U".

The only other term in this text is 83.ki.ta₂, possibly an anthroponym⁵⁷.

Thus, the list of face b would have contained only one possible toponym, da.re⁵⁸, which, as in Linear B, could be either an anthroponym or a toponym.⁵⁹ There is a similar ambiguity about the group je-di in the heading of side b. As remarked above, the other texts in which je.di occurs do not make clear its significance, but there may be a clue in the numerals of this tablet. In the lacuna at the beginning of face b, some numbers are lacking: of the total of 65 only 15 are accounted for, leaving 50 missing.⁶⁰ Thus the first three items should have shown a total of 59, and that figure allows for a correlation with the text of HT 36. That text starts:

je.di, L592, 'wheat-equivalent' ⁶¹ $44\frac{1}{4}$ in which L592, formerly Lc92 (= L56b + L56b) stands for a species of the servants of the palace administration ⁶². The symbol for 'wheat-equivalent' is invariably used in payment accounts, and the amount of $44\frac{1}{4}$ medimnos suffices for a payment of 59 men for a period of ninety days ⁶³. This suggests that je.di is a toponym ⁶⁴ and that the first part of face b should be thus understood:

'at the place je.di, for the purpose of L11, men 50 83.ki.ta₂, men 7 (allocated) to a.ru.ju at u.de.za, men 2

In juxtaposition with di.ki.se, an anthroponym in the ki.ro list of HT 117. Cf. also Linear B a.ra.i.jo, PY An 261.

⁵⁷ A term either in -kytas, -istyas, or -inthyas from -t(h)os.

⁵⁸ Perhaps Δάρης or Δάλει.

⁵⁹ Cf. ma.ro, PY Cn 40, a toponym; and ma.ro², PY Cn 328, a man's name.

⁶⁰ Some signs also are missing on line 2: however, a lower figure than fifty cannot be fitted in the available space on line 1. Consequently, the missing phonograms must have served to introduce the subsequent a.ra.ju.u.de.za.

⁶¹ L503, formerly Lc3 (= L42 ligatured with L91 = wheat + K^wE). For the interpretation of 'wheat-equivalent', i.e. cereals or figs counted as wheat, cf. the author, Kadmos 12, op.cit.

⁶² For L56b = 'servant', cf. the author, Kadmos 13, 1975, 95-116 and Report II, sub HT 85.

^{63 44&}lt;sup>1</sup>/₄ medimnoi of 120 khoinikes make 5,310 khoinikes (90 times 59). Payments in months are well attested.

⁶⁴ Cf. je.zo, KN Db 1274, Dv 5989, a man's name, perhaps for je.dyos from je.di.

In this reconstruction the conjunction of a place-name with an anthroponym makes good sense.

V. Summary of results

The HT texts analyzed in the three reports of this series confirm the opinion expressed earlier⁶⁵ that "the Minoans had a system which was copied in Pylos and expressed in the appropriate units"66. At Pylos the 'household' unit of land (abbreviated as DA in the texts), which measured 18,000 square royal cubits⁶⁷, was subdivided into plots $\frac{1}{18}$ of that size or multiples thereof, no doubt as such a size corresponded to ¹/₁₀ aroura. Sizes were expressed in medimnoi of wheat-seed required, and it may be observed that, in this respect, the Minoan unit of dry measure was better adapted than the Pylian one; for the Minoan unit of 120 khoinikes when applied to wheat represented the seed requirement of \(\frac{1}{3}\) DA or 240,000 square royal cubits. One DA therefore needed $\frac{3}{4}$ medimnos of seed; an aroura of 10,000 square royal cubits took 50 khoinikes or one talent of seed; and the usual subdivision of $\frac{1}{10}$ aroura called for 5 khoinikes or $\frac{1}{24}$ of a medimnos of seed-corn, which ratio must have influenced the fraction system of the Minoans⁶⁸. The Pylian system, by contrast, with a medimnos of one hundred khoinikes only, was less suited for expressing the subdivision of the inherited DA and of the aroura, but allowed for an easy conversion of that system into that of weight⁶⁹. This conversion can be illustrated as follows:

Unit of land	Size in square royal cubits	Seed in talents	Seed in PY units	Seed in HT units
DA	18,000	$1\frac{8}{10}$	54 V = 9 T	$90 \text{ KH} = \frac{3}{4} \text{ M}$
aroura	10,000	1	30 V = 5 T	$50 \text{ KH} = \frac{5}{12} \text{ M}$
$\frac{1}{10}$ aroura	1000	110	$3 V = \frac{1}{2} T$	$5 \text{ KH} = \frac{1}{24} \text{ M}$

Even smaller plots as registered at Pylos, requiring one or two V, were based on the foot, not on the royal cubit.⁷⁰

⁶⁵ Kadmos 16, op.cit.

⁶⁶ I.e. as adapted by the Mycenaean scribes.

⁶⁷ The royal cubit measured 52.38 cm and was 10% larger than the cubit of $1\frac{1}{2}$ foot.

⁶⁸ Cf. the author, Kadmos 10, 1971, 35-51.

⁶⁹ One talent of wheat had a volume of one-half of a Mycenaean medimnos, one mina of one-half V.

⁷⁰ As the foot was related to the common cubit (cf. Note 67) these plots may be measured in such cubits as well.

At Hagia Triada we find land measured by the medimnos of wheatseed required, and here the ligatures of the wheat sign suggest that the DA was divided into sixths⁷¹ and the aroura into tenths.

The HT administration evidently did not deal with damos land, and the terms for types of holdings, a.du and a.ka.ru, interpreted as 'growth' land and 'gracious gifts', seem to refer to land administered from the palace.

The sizes of the individual allotments correspond with those at Pylos. The temene of Pylos, held by the king and the peers, are of the same order of magnitude as those at Hagia Triada listed after the names of 'land-stewards', who may have enjoyed a social standing equivalent to that of the Pylos peers. In one case (HT 10) we have an enumeration of the lands at various sites either held or supervised by one of these stewards.

Allotments were held by collectives and by individuals, and some of these at least were dependent on the palace. Some, if not all, of these lands were taxed, remarkably enough for the benefit of Phaistos, a circumstance which throws a light on the relationship between the two palaces. This taxation differed according as the land was or was not under the supervision of the land-stewards, the latter being entitled to an additional tax of $\frac{1}{120}$ of the harvest.

Appendix I which follows is an attempt to reinforce the above conclusions by means of numerical data which can be extracted from an archive which, it must be recalled, has come down to us in an incomplete form.

Appendix 2 is a tentative beginning at compiling a Minoan vocabulary.

APPENDIX I

Numerical data

In an earlier study⁷² I have analysed the text of HT 1 and suggested that it records a census of the people dependent upon the palace administration grouped under the name of $k^we.ra_2.u$, possibly meaning 'those without a share' (of damos land)⁷³.

⁷¹ It is possible as well that the convention that one-sixth DA = 3000 square royal cubits belongs to the aroura system (= 0.3 aroura). In that case the DA was used only as a unit of calculation, perhaps in comparison with the damos land; although no evidence as to the latter is available, it may be taken that it was allocated in DA to the commons.

⁷² Minos 16, 1977, 7-11.

⁷³ Cf. βέλλιον ἀτυχές (Cret.) Hesych. 'those without share'.

Now74 this text reads

HT 1

	k ^w e. ra ₂ .u	
(1)	ki.ro	197
(2)	101.su	70
(3)	di.di.sa.ke	52
(4)	ku.pa ₃ .nu	109
(5)	a.ra.na.re	105

Of the five categories of people listed, two have been identified. The ki.ro are mentioned more than once in the role of supervisors of employed labour⁷⁵, and it seems possible that the term means 'debtors'⁷⁶; and the ku.pa₃.nu are immigrants from Byblos⁷⁷. The first term is related to ki.re.ta₂ and ki.re.ta.na, both of which are found in the land-tenure texts.

HT 108 lists as ki.re.ta.na (a collective holding by 'ki.ro people') seventy plots each of 1.4 aroura⁷⁸; and the same figure of seventy is found alongside the entry 101.su on HT 1. It seems likely therefore that 101.su is a sub-category of the preceding entry ki.ro; in other words, of the 197 ki.ro people, 70 were 101. su tenants.

If this is how the census list was set out, it would be logical to understand items (4) and (5) as similarly connected; of the 109 ku.pa₃.nu people 105 are a.ra.na.re tenants; and such a figure can be extracted from the land-tenure texts in the following manner. HT 120 lists⁷⁹ the harvest of sixty units of ki.re.ta.na holdings, each of a size requiring one-sixth of a medimnos of wheat-seed, that is to say 0.4 aroura⁸⁰. In addition⁸¹, the ki.re.ta₂ of HT 85 held eighteen aroura at the site called da.72.da. That amount of land suffices for forty-five plots of the same size (0.4 aroura), together with the sixty of HT 120, making a total of 105 such plots.

⁷⁴ Cf. GORILA I (ILA has '73 di.za.ke'); the Indexes are less useful in this respect as they do not mention numbers.

For this task they received, in addition to the basic pay of the labourers, a bonus of habitance of his task they received, in addition to the basic pay of the labourers, a bonus of habitance of his task they received, in addition to the basic pay of the labourers, a bonus of habitance of his task they received, in addition to the basic pay of the labourers, a bonus of habitance of his task they received, in addition to the basic pay of the labourers, a bonus of habitance of his task they received, in addition to the basic pay of the labourers, a bonus of his habitance of his task they received, in addition to the basic pay of the labourers, a bonus of his habitance of his habi

First suggested by E. Peruzzi, Le iscrizioni minoiche, 1960, 119 (Atti dell'Accad. Tosc. 24, 1959-60).

⁷⁷ Cf. the author, Minos 16, op.cit.

⁷⁸ Cf. Part II.

⁷⁹ Cf. Part I.

The total seed required (ten medimnoi) is found in the cadastral text of HT 95b (cf. Part I) after the entry $k^{\alpha}e.ra_{2}.u$, so these two texts may be interrelated.

⁸¹ Cf. Part II.

² KADMOS XX

We are assuming that the ku.pa₃.nu were treated, in the letting of the HT 'crown' land, somewhat like the ki.ro people. This seems quite possible as they are sometimes mentioned⁸² in ki.ro lists and along with individuals known to be ki.ro people in other records.⁸³ It follows also that four of this category of people were not a.ra.na.re tenants; and this consideration leads to the following step.

In the three lists⁸⁴ of people under the heading of ki.ro we find twenty-five different names and, in addition, three people mentioned by their ethnic ku.pa₃.nu. One other text, that of HT 49, which is too damaged to allow for a full analysis, lists a fourth man of that category next to an individual called 80.su.pu, who was quite possibly another ki.ro man⁸⁵. That would make a total of twenty-six ki.ro people, and four ku.pa₃.nu who had no a.ra.na.re. The figure of twenty-six is half that mentioned in item (3) of HT 1. Admittedly, this is too narrow a basis to allow for any firm conclusion, but there is more to it.

The cadastral text HT 96 lists on face a^{86} an amount of seven medimnoi after the entry $k^w e. ra_2.u$, which amount suffices for 16.8 aroura: and that area can be divided into fifty-six plots of 0.3 aroura each. After the deduction of four such plots for the $ku.pa_3.nu$ who did not hold an a.ra.na.re, fifty-two plots are left, which correlates with the figure of item (3) on HT 1.

This leaves us with the following picture; dependent upon the palace administration (the $k^we.ra_2.u$) were 197 ki.ro people and 109 $ku.pa_3.nu$. Of the first category, seventy were holding a 101.su plot of 1.4 aroura, whereas another twenty-six were employed as labour supervisors and held plots of 0.6 aroura made up out of two di.di.za.ke holdings of 0.3 aroura each. Of the 109 $ku.pa_3.nu$, 105 were a.ra.na.re tenants each holding 0.4 aroura, and four others were associated with the twenty-six ki.ro as labour supervisors and held single plots of 0.3 aroura each.

Consequently, 101 ki.ro people were unprovided for, but some of these may have had full employment in the royal villa and, judging⁸⁷ from the text of HT 2, which lists the yield of olive-oil from a collection of small plots (as follows from the entry ki.re.ta.na⁸⁸) some may have had a share in orchards.

⁸² HT 88, 117.

⁸³ E.g. HT 122.

⁸⁴ HT 88, 94 and 117.

⁸⁵ The two were recorded in juxtaposition, separated from other names by abbreviations which single them out as distinct from the others.

⁸⁶ For face b cf. Note 80.

⁸⁷ Cf. Part II.

⁸⁸ The same text shows that a.ka.ru land was used for orchards.

As to the size of the plots discussed above, the following may be added. Whereas the normal 'household-plot', the DA, measured 1.8 aroura, the ki.ro people not employed as labour supervisors had to be content with 1.4 aroura yielding as an average 350 khoinikes of wheat⁸⁹, sufficient for one khoinix per diem⁹⁰ during the whole year (assuming that the seed needed for the succeeding year's sowing was provided by the palace.) Those employed as labour supervisors received an allocation of wheat which fell 200 khoinikes short of that figure, so that they would have been employed for about 150 days each year⁹¹. The plots for the ku.pa₃.nu of 0.3 and 0.4 aroura are too small (ca. 11 and 8 ares) to have any significance for subsistence. Possibly these immigrants were employed as craftsmen and were granted these small plots as vegetable gardens⁹².

That only four of the 109 ku.pa₃.nu immigrants from Byblos were employed as labour supervisors may be because these alone had any experience of working on the land; farmers are understandably reluctant to become refugees.

APPENDIX 2

Minoan terms

Most of the texts of the HT archives consist of names of men and sites and a limited number of functional terms. These are presented in the following list which has been arranged alphabetically and (where transliteration is doubtful) numerically. Anthroponyms met earlier in the ki.ro lists have been included and, similarly, those which occur in an association or context which leaves no doubt that they belong to the same category; all these have been marked with a C (for 'cognate'). The notation A stands for anthroponym, T for toponym and F for functional; in addition, roman numbers refer to the various papers treating the evidence (though these may be lacking in cases marked with C). The references are as follows:

⁸⁹ Calculated as five times the requirement of wheat-seed (50 khoinikes per aroura).

This was the standard pay of employed labour at Hagia Triada. Some categories of labourers were paid less, e.g. \(\frac{4}{5}\) or \(\frac{1}{2}\).

At \(\frac{1}{3}\) khoinikes a day, or somewhat less when they were supervising people on less pay, cf. n. 90.

⁹² It may be observed that in the village bordering upon the royal villa a special set of shops had been constructed, perhaps to accommodate these people and to organise the sales of their crafts to the local population.

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I.
      Kadmos 10, 1971, 35-51,
      Kadmos 11, 1972, 1-21,
II.
      Kadmos 12, 1973, 28-59,
III.
      Kadmos 12, 1973, 134-148,
IV.
      Kadmos 13, 1975, 95-116,
V.
      Kadmos 16, 1977, 26-35,
VI.
     Kadmos 17, 1978, 16-25,
VII.
VIII. Kadmos 17, 1978, 91-101,
     Kadmos this paper,
IX.
X.
      A.A.A.VI. 1973, 304-306,
     Minos 16, 1977, 7-11,
XI.
     Minos 16, 1977, 12-16,
XII.
XIII. Minos 17, 1980, 7-17,
XIV. Kret.Chron. 25, 1973, 125-134.
  Fifty-five terms have been found to represent anthroponyms, thirty-
one toponyms, and thirty-four functional words: five others were
difficult to classify.
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a.du	F, HT 85a.1, 86a.4, 88.1, 92.1; 95b.1, 99a.1, 133.1, VI, VII, VIII, cadastral term denoting a certain kind of land (apparently only
	arable), cf. ἄλδη, = growth.
a.(h)i.sa.ki	F, HT 115b.4, IX,
u.\n)1.3u.kt	a patch of land of small size, perhaps a grove, cf. αἴσακος.
a.re	A, HT9a.5, b.2, 49a.6, XIII,
4.16	A, 1117a.3, 0.2, 47a.0, A111, = Arēs.
- u- i	A, HT 87.5, 109.4, 122b.3, IX,
a.ra.ju	•
(44)	cf. a.ra.i.jo, PY An 261.
a.ru.ra.(ta)	A, HT 11a.1, VI,
	cf. ἄρουρα, ἀροτήρ.
a.se.ja	F, HT 115a.4, IX,
	a patch of land of small size, perhaps a grove, cf. ἄλσος, and
	a.se.e, PY An 18, loc.
a.tu	A, HT 87.5, C,
	cf. a.to, KN As 40.
a.we.su	A, HT 118.3, X
	possibly a hypokoristikon from awersi-, e.g. ἀερσίπους, cf.
	Άρκεσος for 'Αρκεσίλαος.
da.du.ma.ta	F, HT 95a.1, VII,
	'land-stewards', cf. du.ma.te, PY Jn 829, nom. plur., here poss-
	ibly acc. plur.
dą.ķi	A, HT 6b.5 (GORILA I, the Indexes give me.ki, ILA da.pa3), C.
da.me	A, HT 86a.4, 95a.2, b.2, 106.3, 120.1, I, VII, VIII, one of the 'land-
	stewards' = Daimēn like ποιμήν?
da.mi.nu	A, HT, 117a.8,
·	a 'ki.ro man'; mi.nu might correspond to -μενος.

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da.kwe.ra.
                  T, HT 6a.6, 57a.1, 120.1, VII,
                     perhaps da(h)-guerai, 'hot lands', = arable lands.
                  T, HT 7a.4, 10a.3, b.1, 85a.5, PK 3a.2, VIII.
da.re1
da.re2
                  A? HT 122b.4, IX,
da.ru.33
                  T, HT 7b.2, IX,
                     cf. δάρυλλος = δρῦς (Mak.) Hsch.
                  A, HT 88.5, II, IX,
da.ta.re
                     a 'ki.ro man', cf. δαιταλεύς.
da.u.120
                  T, HT 120.3-4, VII,
                     different orthography for da.wo, KN Ak 621 + ?
da.57.85
                  T, HT 13.5, 85a.3-4, 99b.1, 122a.4, IV, VIII, IX,
                     L57 possibly = ne.
                  A, HT 117a.8-9,
da.61.ku.ti
                     a 'ki.ro man' (for L61 vide s.v. pa.ra.61).
da.72.da
                  T, HT 10a.5, 85a.2, 93a.7, 122a.7; VIII, IX,
                     (Indexes: da.94.da), cf. δάπεδον.
de.di
                  A, HT 94b.2, II,
                     a 'ki.ro man'.
di.de.ru
                  A, HT 86a.3, b.3; 95a.4, b.4, VII,
                     cf. di.de.ro, KN Dv 1504.
di.ki.se
                  A, HT 87.3, 117b.2,
                     a 'ki.ro man'.
                  F, HT 9a.3, b.5, 16.1-2, 25a.1, a.2, KN Z27 (ILA reads di.na.u on
di.na.u
                     HT 108.2 but = di.na.ro appears in GORILA I and Indexes),
                     XIV,
                     a denomination of a collective of textile workers, abbreviated as DI.
du.da.ma
                  A, HT 6b.4, C.
du.ja
                  T, HT 72.3, VIII,
                     cf. δύαν κρήνην, Hsch.
                  T, HT 19.3, C.
du.me.di
du.pa3na
                  F, HT 115b.2, IX,
                     a plot of land.
i.ka
                  F, HT 91.1, IX,
                     perhaps denoting the purpose of a panspermia, cf. ἰχανάω, ἶχαο.
i.ru.ja
                  T, HT 7a.2, VIII,
                     cf. Ιλύς.
                  A, HT 87.3, C,
ja.re.mi
                     cf. Ιάλεμος.
je.di.
                  T, HT 8a.1, 36.1, 122b.1, IX,
                     cf. je.zo, KN Db 1274, Dv 5989, perhaps for je.dyos.
ka.ju
                  A, HT 88.4 (GORILA I: .3 vacat), II, VIII,
                     a 'ki.ro man', cf. ka.jo, KN Dv 1451.
                  T, HT 97a.3, C,
ka.nu.ti
                     "si è tentati di vedere . . . il nome minoico di Hagia Triada",
                     E. Peruzzi, le iscrizioni Minoiche, 1960, 69.
ka.po.ru
                  F, HT 115a.5, IX,
                     a small plot of land, cf. καπρών.
ke.ki.ru
                  A, HT 94b.2, II,
                     a 'ki.ro man', perhaps κέρκιλλος, nickname for a weaver?
ki.da.ro
                  A, HT 117a.9, (47a.4: ki.da.ro),
                     a 'ki.ro man', cf. σκινδαρόν άραιόν, Hsch.
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22 Daniël A. Was ki.ki.ra.ja F, HT 85b.1, VIII, a collective holding of land, cf. κίκκη συνουσία κτλ., Hsch. F, HT 2.3, 8a.5, 108.1, 120.4-5, VII, VIII, ki.re.ta.na denotes a collective holding of land by 'ki.ro people', perhaps to be read kires-stanas. F, HT 85b.1-2, 129.1, VIII, ki.re.ta2 collectivity of 'ki.ro people': kirestia. ki.ro1 F, passim, (perhaps not on HT 123, vide s.v. ki.ro2) II, III, people dependent upon the palace administration and frequently acting as labour supervisors (Peruzzi, op.cit. 117, from Indo-Eur. (s)kel-, to be indebted, which fits the functional parallelism with τέλος, te.re.ta, KN Am 826+). F, HT 123a.2, a.4, a.5, a.7, a.9, b.6, ki.ro2 text not adequately analysed as yet, perhaps the adjective 'indebted', cf. ki.ro1. A, HT 117a.7-8 (GORILA I, the Indexes suggest ko.sa.ke.ti and ko.sa.i/no.ti ko.sa.ni.ti), a 'ki.ro man', cf. ko.sa.ma.ne, PY An 615, ko.sa.ma.to, KN Ga 685+, Aeol. κόρσα. ku.ku.da.ra A, HT 117a.7, a 'ki.ro man'. ku.ni.su A, HT 10a.1, 86a.1-2, b.1-2, 95a.3, b.3, VII, VIII, one of the 'land-stewards', (the ending of the term strikes as non-Greek, cf. κύτισος, a derivative from Κύρνος? ku.paz.nu F, passim, IX, XI, an ethnic, kubanu(s), from Eg. kbn = Byblos, also used as anonymous term for individuals. A, HT 117a.2-3, ku.ra.mu a 'ki.ro man'. A, HT 39.2, 117b.1, ku.re.ju a 'ki.ro man'. ku.ru.ku A, HT 87.4, C, cf. ku.ru.ka, KN Vc 5510. F, HT 115b.3, IX, ku.ru.ma indicating a plot of land, cf. κλύσμα. ku.ro F, passim, I, = total (etymologies: Peruzzi, op. cit. 119, Aeol. ἄγυρις, ἀγείρω; = sm-ger-yo, Vl. Georgiev, Les deux langues des inscriptions crétoises en linéaire A, 1963, 49, γυρόν, γυρώς, γυρόω), ku. 101.ni T, HT 13.4, 85a.4, VIII.

A, HT 93a.4-5, 111a.3,118.2-3, 122b.3-4, IX, X,

A, HT 8a.3, b.2-3, 85b.5-6, 122a.4, VIII, IX.

cf. qa.qa.ro, KN As 604.

in juxtaposition with ki.re.ta2.

F, HT 86a.3,

acc. of $k^w e.ra_2.u$.

A, HT 9a.3, b.4, XIII, vide s.v. kwe.su.pu.

F? HT 85b.2, VIII,

 $k^w a. k^w a. ru$

k^wa.ra₂.wa

k^wa.63.i/no k^we.ka

k^we.pu

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F, HT 1a.1, 95a.4-5, b.4-5, IX, XI,
k^{w}e.ra_{2}.u
                      denoting people dependent upon the HT administration, cf. βέλ-
                      λιον άτυχές.
                  A, HT 87.4, C,
kwe.su.pu
                      scriptio plena of kwe.pu?
ma.di
                  A, HT 85b.5, 97a.4, 118.1, HT? 170b.2, (possibly HT 3.7, 69.2), VIII,
                      cf. ma.di, KN As 603, Db 1168.
                  A, HT 117a.3,
ma.ru
                      a 'ki.ro man', cf. ma.ro<sup>2</sup>, PY Cn 328.
                  A, HT 6b.2-3, (GORILA I, Indexes: ma.94.i.no), C.
ma.72.re.i
me.za1
                  A, HT 85b.3, VIII,
                      Meghyas.
me.za2
                  T, HT 10a.5, VIII,
                      cf. μέλκιον κρήνη, νύμφαι, παίγνιον, Hsch.
                  A, HT 86a.5, 95b.2-3, 106.1, VII,
mi.nu.te
                      one of the 'land-stewards', (Georgiev, op. cit. 29, 72, from μινύθω).
mi.ru.ta.ra.re
                   A, HT 117a.4-5,
                      a 'ki.ro man'.
mi.tu
                  A, HT 117a.2, 135a.2,
                      a 'ki.ro man', cf. mi.ti, KN D1 463.
na.da.re
                  A, HT 117a.5,
                      a 'ki.ro man'.
na.111.61.me.na
                  F, HT 115a.2-3, IX,
                      denoting a plot of land, for -me.na cf. da.mi.nu, (L61 = ne? vide
                      s.v. pa.ra.61).
                  T, HT 13.5-6, C,
no.du.61.57
                      perhaps to be read no.du.nē.ne, cf. prec.
nu.wi
                  F, HT 115a.2, b.2, IX,
                      a qualifier of preceding terms, 72.ta.ma, ti.nu.ja.
                  Theonym? HT 9a.2, b.2, 122a.5, IX, XIII,
pa.de
                      cf. pa.de, KN Fp 1, Fs 8, Ga 456, Pandes.
                  T, HT 97a.3, 120.6, VII,
pa.i.to
                      Phaistos.
pa.ja.re
                  A, HT 8b.4, 29.2, 88.4, ZA 9a.5, II, VIII,
                      a 'ki.ro man'.
                  F, HT 128a.1, IX,
pa.ra
                      perhaps πάλαι.
                  F, HT 115a.4, b.1, IX,
ра.та.61
                      denoting a plot of land, cf. πρανής III
                      (HT 96a.1-2, b.1: a.pa.ra.61 for ἀμπρανής?).
                   A, HT 94b.1, 122a.6, II, IX,
pa.ta.61
                      a 'ki.ro man', (for L61 vide s.v. pa.ta.61).
                  T, HT 85a.2, 102.2, VIII.
pa3.ni
                   A, HT 6b.6, 93a.1, a.8, VIII,
pa3.ni.na
                      derivative of prec.
pi.ta.ke.57
                   A, HT 87.2, C,
                      Pithagenes?
pi.ta.ra
                  F, HT 96a.4,
                      possibly to be read pi + ta.ra, for L56a = 'servant' cf. V, for ta.ra
                      = kind of labour, cf. II.
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po.to.ku.ro	F, HT 122b.6, 131b.4, IX,
•	= grand total (etymologies: Peruzzi, op.cit. 121 = Linear B pa.te,
	πάντες, Georgiev op.cit. 75: pnt-ō-, πάντως).
ra.ti.se	A, HT 6b.2, C.
ra.43.ti	T, HT 17.1, 19.1 C,
	on a par with sa.ro.
re.di.se	A, HT 85b.4, VIII.
re.za¹	F, HT 88.1, II, VİII,
70.50	possibly = reghyai, 'groups' (cf. Alb. lagje).
re.za²	T, HT 13.2, C,
16.Zu	possibly from the root of re.za ¹ , but in the sense of 'lager, settle-
	ment'; in that case 2 should belong to an elder stratum.
vu ma ta	
ru.ma.ta	T, HT 29.1, 99b.2, VIII,
	(s)rumata, cf. δύμα.
sa.ma	A, HT 6b.5, 10a.1, ZA 9a.3-4, VIII,
	cf. sa.mi, KN Ap 639.
sa.ma.ro	A, HT 88.4-5, II, VIII,
	a 'ki.ro man', cf. sa.ma.ri.ro, KN Da 1147.
sa.ra ₂	F, passim, II, III, V,
	term initiating pay accounts ('this to let'?) possibly to be read as
•	two separate words.
sa.ro	T, HT 9a.1, 17.2, 19.2, 44.2 (Index II: sa. 188, which is unnecessary,
	188 a and b are much closer to 22 than to 188c, the latter likely an
	ideogram), XIII,
	vide s.v. sa.ru.
sa.ru	A, HT 94b.2, 95b.1, 123a.4, II, VII, = 'from sa.ro' (Georgiev, op.cit.
	77, connects with Σάρος, Σάρων).
sa.ta	T, HT 117a.7,
	on a par with u.mi.na.57 and 79.tu.61.
se.ku.tu	F, HT 115a.3, IX,
•••••	denoting a plot of land, seghtu-? = 'enclosable', cf. ἔχω, e.ke, KN
	Uf 835+, e.ko.to, PY Eb 913+, Hektor, here verbal adjective?
ta.na.ti	T, HT 7a.4, 10b.4, 98a.2, (49a.2: ta.na.ti), VIII,
<i>LW.73W.LJ</i>	Thamnatis, cf. θάμνος, θαμνῖτις.
ta.i/no.65	A, HT 92.4-5, b.4, 39.1, XIII,
ta.ra	F, HT 89.3, II,
4	indicating a kind of labour, also in pi.ta.ra.
te.ja.re	A, HT 117a.5,
. 1	a 'ki.ro man',
te.ke	T, HT 85a.5, VIII,
	possibly loc. te.kei, vide s.v. te.ki.
te.ki	T, HT 13.3, 122a.3, IX,
	vide s.v. te.ke.
te.tu	T, HT 7a.5, 13.3, VIII.
te.te.(X)	Ethnic from prec. HT 85b.2-3, VIII.
ti.nu.ja	F, HT 115b.2, IX,
	denoting a plot of land, stinwya? cf. στενή.
tu.ma	A, HT 94b.1, II,
	a 'ki.ro man'.
tu.ju.ma	A, HT 117a.3-4,
•	a 'ki.ro man'.

HT 128a.1, IX, tu.ru.nu.se.me either A or T. T, HT 10a.2, a.4, 85a.3, VIII, XII, u./l/e.za (Index II misprints as u.me.za: 97.27.23), 'Minoan' orthography for u.de.za. u.de.za T, HT 122a.1, b.3, IX, 'Mycenaean' orthography for u./l/e.za. u.di.mi A, HT 117a.4, a 'ki.ro man', u.mi.na.57 T, HT 28a.1-2, 117a.1-2, III, L57 = ne? (Georgiev, op.cit. 79: $v(\sigma)\mu\nu\alpha(\iota h)\iota$, loc.plur.). A, HT 117a.2, *u.su* a 'ki.ro man', cf. u.su, KN V 7512, obscure. wa.du.ni.mi A, HT 6b.1, 85b.4-5, VIII, (Georgiev, op.cit. 79: Lyc. βadunimi). HT 128a.2, IX, wa.tu.ma.re a composite term (cf. ma.re, HT 55a.1; ma.ru, HT 117a.3) from Faotu? if so, possibly an anthroponym. F, HT 118.4, X, we.ru.ma = substraction, from Fερύω, cf. ἔρυμα from (σ)ερύω, (Index II: HT? 170a.4: we.ru.ma.ti, but GORILA I: X.ru.ma.ti - under PH? 31.b.4). 7.di.ra A, HT 9a.4, b.3, 122a.5, IX, XIII, possibly (Index II,60) so.di.ra (thus Georgiev, op.cit. 77, *Σωζίλας, Σωζᾶς). T, HT 17.3, 122a.5, IX, 57.da.re ne.da.re? F, HT 115a.1 (palimpsest), a.6 (ILA; GORILA I, Indexes have 72.ta.ma 72.su.ma as on HT 81.2, probably less correct), IX, indicating a plot of land, pe.ta.ma? 79.tu.61 T, HT 7b.1, 87.1, 117b.1 (94b.6, GORILA I: 94b.4, GORILA 'vacat'; Indexes b.5, 79.tu.X), II, Georgiev, op.cit. 77: si.tu.ne; L61 = $n\bar{e}$? A? HT 122b.2, IX, 83.ki.ta, 83.tu A, HT 9a.2, b.3, 119.4, 122a.6, IX, XIII. F, HT 115b.3, IX, 83.tu.ja

Addenda

possibly a collective holding of land, cf. ki.ki.ra.ja.

a.ra.na.re

F, HT 1.4, IX,
a kind of holding of land of 0.4 aroura.

di.di.za.ke

F, HT 1.2-3, IX,
like prec. but of 0.3 aroura.

denoting a plot of land.

T, HT 99b.2, VIII.

F, HT 115a.1, IX,

101.du

154.nu.ra.ja

101.su F, HT 1.2, IX, like prec. but of 1.4 aroura.