

SCRIBE 103 AND THE MYCENAEAN TEXTILE INDUSTRY AT KNOSSOS: THE Lc(1) AND Od(1)-SETS¹

1. INTRODUCTION

Many of the Linear B tablets from Knossos were associated with the manufacture of textiles. These are records of a complex process, which inevitably required technical terminology. As a consequence, we have a large number of tablets from the palace archives which are relatively difficult to understand. The work of scribe 103 is particularly important because he left us coherent records, spanning a large part of the manufacturing process.

There have already been substantial advances in understanding the work of Scribe 103 and the aim here is not to reproduce those earlier discussions.² The purpose of the collaboration in the present paper is to bring together two different approaches to interpreting the evidence of the tablets: firstly, by recognising Scribe 103 as part of the general Mycenaean textile industry³; secondly, by considering the tablets as archaeological artefacts and considering their find-places and appearance.⁴

Our aim is to focus attention on the Lc(1) and Od(1)-sets of tablets which were found in and around Western Magazine XI. The Lc(1)-set records the setting of targets for the manufacture of textiles under the *ta-ra-si-ja* system, by which raw materials are distributed, workers are obliged to manufacture products with set targets and the finished goods are requisitioned by the palace.⁵ The Od(1)-set records distributions of wool. All the tablets that were recorded by Evans in his *Handlist* as being found in Western Magazines X, XI and XII were written by Scribe 103. Furthermore, the majority of these tablets were from the Lc(1) and Od(1) sets. These particular sets are describing relatively straightforward aspects of the textile industry and they are probably well-preserved. By concentrating attention on these sets, our aim is to construct a firm basis from which work could be done to review the remainder of the tablets by Scribe 103.

It is convenient to begin by giving general background information in SECTION 2. SECTIONS 3 and 4 consider the tablets which are contained in the Lc(1) and Od(1)-sets. SECTION 5 then analyses the contents of those tablets.

¹ The authors wish to acknowledge the support and guidance given to RJF by José Melena during the examination of the Lc and Od tablets in the Heraklion Museum.

² Killen 1966, 1968, 1974, 1988, 1999; Melena 1975; Landenius-Enegren 1995, 2000; Tegzey 1983.

³ See, in particular, Nosch 2000.

⁴ Firth 1998, 2001; Firth and Melena 2000, 2001a, 2001b.

⁵ Killen 1966.

2. BACKGROUND INFORMATION

The tablets written by scribe 103 were all found in the general area of the Western Magazines of the palace of Knossos. The find-places will be referred to using the following standard abbreviations,

F8	Western Magazine IX
F9	Western Magazine X
F10	Western Magazine XI
F11	Western Magazine XII
F12	Western Magazine XIII
F13	Western Magazine XIV
F14	Western Magazine XV
F17	Long Corridor, near entrance to Western Magazine VIII
F18	North End of Long Corridor
F19	N.W. Passage

In particular, deposits of two or more tablets by Scribe 103 were found in five separate locations according to the *Handlist*,⁶

- a large archive of tablets were found in F14 (with some spilling into F13).
- a deposit of Lc(1) tablets were found part way along F10.
- a deposit of Od(1) tablets were found in the Long Corridor, F18, and near the entrances to adjacent Magazines, F8, F9, F10 & F11.
- a small deposit of tablets of offerings [Gg(1), M(1), Od(2)] were found in the Gallery of Jewel Fresco.
- a small group of tablets were found in the passage at the west of Magazines XV and XVI (find-place F19).

It is perhaps helpful to think of these different locations as separate ‘desks’ or ‘shelves’ that were used by Scribe 103. It is very likely that all the Scribe 103 tablets fell from upper rooms. In particular, all the pieces found in the Western Magazines fell from the large North-West Hall, above Magazines XI to XVI.⁷ However, it should be emphasised although the tablets had fallen, it is evident that they fell more or less vertically, in other words the fall did not result in total disorganisation of the sets of tablets.

Many of the pieces, now attributed to Scribe 103, were considered, by Evans, too minor to have been included in the *Handlist*, however, it is possible to deduce some information about these fragments. This is largely on the basis of identified scribal hands, pieces from the same sets as tablets with known find-places and joins to pieces from a known find-place. We know that there are no fragments attributed to Scribe 103 amongst the 9000-series or the unnumbered fragments found in 1984.⁸ There are no 7000-series fragments (i.e. 7000-8075) joined to

⁶ Firth 1998.

⁷ Graham 1969, Fig. 86.

⁸ Melena 1999.

tablets known to have been found in F14, or from the same sets as pieces found in F14. The 5000-series fragments (i.e. 5192-6046) found in and around F10 appear to come from a limited number of batches, in particular, Batch C (5507 joined to Lc(1) 551; Od(1) 5511) and Batch G (Lc(1) 5746).⁹

The original classification of tablets into sets was done on the basis of the logograms written on the tablets. Following the publication of *Scribes* the sets were sub-divided, according to scribal hands, using criteria set out by Chadwick.¹⁰ He briefly described the criteria for the Lc(1) and Od(1)-sets as follows:

- Lc(1): F10 ; h 103
Noting that the following show certain abnormalities: 525, 557, 558, 561, 646, 7549.
- Od(1): F8, F9, F10, F11, F13, F14, F18, F19 ; h 103 ; Wool

It is evident, from the wide range of find-places listed by Chadwick, that the Od(1)-set represented a miscellaneous catch-all set of wool tablets, rather than a set of tablets that would have been recognised as such by Scribe 103 as part of his filing system. In the course, of the detailed examination of the tablets found in and around Magazine XI, we will be asking to what extent the records currently classified in each set (by the latest published index, i.e. *CoMIK* IV, p. 233) correctly reflect the sets as they were used by Scribe 103.

3. THE Lc(1)-SET

Lc(1) tablets listed in CoMIK IV

525-536, 540-541, 543, 546-553, 555, 557-558, 560-561, 582, 1580, 5053, 5746, 7285, 7289, 7318, 7321, 7376, 7392, 7549, 7901, 8572

Find-places according to Evans' Handlist

F10: Lc(1) 525-536, 540-541, 543, 546-553, 555, 557-558, 560

F11: Lc(1) 561

Lc(1) 582 was included in the *Handlist* as being found in F14. However, in view of the fact that it is clearly an Lc(1) tablet, this is assumed to be an error.¹¹

Description (following Scribes)

a) Lc(1) 526-534, 540-541, 543, 546-553, 555, 560, 582, 1580, 5053, 5746, 7285, 7289, 7318, 7321, 7376, 7392, 7901, 8572; *ca.* 15 x 2.3 x 1 cm.; 2 lines (A and B) of about equal height (but note that there is also no evidence of a line on the remaining fragments of tablets 546, 547, 548, 549, 7901); edges somewhat thinned and rounded.

⁹ Firth and Melena 2000, 2001b.

¹⁰ Chadwick 1972.

¹¹ Olivier 1967 (= *Scribes*), p. 46; Firth 2001, Part I, Section 6, p. 97.

b) Lc(1) 525, 557, 558, 561, 7549

- ⇒ 558, 561: 12 x 2.5-3 x 1.1 cm.: not lined; ends thinned and rounded.
- ⇒ 525 and 557: *ca.* (13.5) x 4 x 1.3 cm.; 2 lines (A and B) of about equal height; ends thinned and rounded.
- ⇒ 7549: (4) x 3 cm; 2 lines (A and B) of about equal height.

c) Lc(1) 535, 536; *ca.* <14> x 3 x 1 cm.; 3 lines (A B and C) of *ca.* 1 cm.; ends a little thinned and rounded.

Commentary on current classification

In addition to the above, it has been suggested that 544 should be re-classified as an Lc(1) tablet.¹² However, it is proposed below that there is a quasi-join, 544 [+] 5511, and the resulting tablet should be classified as Od(1). This is discussed further in the next section.

The bulk of the tablets fall into category (a) and are of similar size and shape. The two totalling tablets, Lc(1) 535 & 536 are somewhat larger and are grouped together in category (c).

The tablets in category (b) are evidently of a different shape to the other tablets in the set.

Lc(1) 558 & 561. Lc(1) 561 is not only a different shape, but it was also found separate from the remainder in find-place F11 (whereas all the remainder were found in F10). It is also unusual because, although the tablet is complete, it does not list the amount of wool required to manufacture the single TELA+TE listed on the tablet. In the case of Lc(1) 558, this is analogous to Lc(1) 561 because it records TELA+TE 20 but it does not list the amount of wool required to manufacture it (although it does list the 3 units of wool, required to manufacture the single piece of *tu-na-no* TELA which is included on the tablet). It is also unusual because the tablet is not lined. However, it is approximately the same size as the other Lc(1) tablets in category (a) (although it is at the upper end of the range of heights of these tablets). It seems possible that the absence of the wool to manufacture the TELA+TE is a simple omission.

Lc(1) 525 & 557 clearly have a much greater height than all of the other tablets listed (being almost double the height of the tablets in category (a)). There is a further difficulty in that the *wa-na-ka-te-ra* TELA+TE that is listed on Lc(1) 525 is not included on the corresponding totalling tablet Lc(1) 536.¹³ On this basis, Killen¹⁴ has suggested that 525 and 557 do not seem to belong to the main Lc(1)-set.

Lc(1) 7549 is significantly larger than the category (a) tablets, although it is not as large as Lc(1) 525 & 557. It is also unusual because it represents a repeat recurrence of the ethnic group, *da-wi-ja* (which also appear on Lc(1) 526).

¹² Firth 1998; Killen 1998.

¹³ An alternative suggestion is that it is the workers and not the cloth who are being described as royal.

¹⁴ Killen 1974, p. 89 n. 8.

Perhaps most significantly, it is clearly made from a different clay to the remaining tablets of the Lc(1) set (i.e. the clay is not so red and has more inclusions). It is proposed that this tablet should be reclassified as Lc 7549, removing it from the Lc(1) set and that it should be questioned whether this was written by scribe 103.

It is interesting to note that all of the tablets in category (b) were already included by Chadwick in his original list of abnormalities within the Lc(1) set. In addition, he listed tablet 646. This tablet, which was found in F14, is now classified as Lc 646.¹⁵

It is also worth noting that, although the majority of ethnic groups only appear once within the Lc(1)-series, *e-ra-ja* and *da-wi-ja* are both repeated (on 528 & 561 and 526 & 7549, respectively). Thus, the presence of the category (b) tablets, 561 and 7549 causes an anomalous repetition of two ethnic groups. This tends to indicate that the second target for these ethnic groups was made at another time, or that the scribe used another size of tablet to indicate a distinction from the main set.

It should also be noted that the clay of 7318 is unlike the other tablets in the Lc(1) set, but the same as that of Od 7309. Therefore, it is proposed that the classification of 7318 should be changed to Od 7318.

Finally, it is noted that, although 8572 was made from a similar clay to the other tablets of the Lc-set, its physical appearance is different. This fragment was re-discovered by M. A. S. Cameron in a tray of frescoes in the Apotheke, labelled «Knossos Palace. N. Threshing Floor Area 22 Z VIII». This fragment was published by Olivier (1967b) as X 8572 written by scribe 103, with a warning that the find-place should be neglected completely or considered with extreme caution. Chadwick (1972) proposed that the classification should be changed to Lc(1) 8572, implying that it was written by scribe 103 and found in W. Magazine XI. However, there are no clear indications that 8572 is an Lc tablet or that it was found in the excavations of W. Magazine XI, therefore, for the purposes of this paper, it will be excluded.

Proposed new quasi-join

It was judged that the current number of separate pieces probably exceeded the number of tablets in the set originally written by Scribe 103. Therefore, the tablets were re-examined to consider the possibility of new joins or quasi-joins. The following quasi-join is proposed based on the dimensions of the fragments but more specifically on the line of the straw which passed through the tablet in order to strengthen it.

¹⁵ It has been suggested that it is actually recording deliveries and should more correctly be classified as L 646 (Melena 1975, pp. 42-43; priv. comm.).

Lc(1) 547 [+] 1580 (103)
 .A]LANA 56
 .B tu-ni-ja[] LANA 3 [

Because the remaining fragments would have been separated by some distance in the original tablet, the quasi-join is not certain and, strictly it has a probability of validity of say ~50%¹⁶, therefore the quasi-join should be described as “not excluded”.

4. TOTALLING THE Lc(1) TABLETS¹⁷

The Lc(1) tablets had two purposes. Firstly, they set the targets for the manufacture of textiles for each of the groups of workers. Secondly, they noted how much wool would be required to manufacture each type of textile for each group of workers. The quantity of wool required to manufacture one piece of each type of textile is well-defined for four of the main types:

<i>pa-we-a ko-u-ra</i> TELA 1	requires LANA 1 M 2
<i>tu-na-no</i> TELA 1	requires LANA 3 ¹⁸
TELA+TE 1	requires LANA 7
<i>pe-ko-to</i> TELA+TE 1	requires LANA 10

In addition to these types of textiles, the Lc(1) tablets record, *pa-we-a ko-u-ra* *161 TELA, *wa-na-ka-te-ra* TELA+TE, *a-ro-zo ki-to* TELA.

Lc(1) 535 and 536 are totalling tablets within the Lc(1)-set. Unfortunately, none of the numerals have been conserved on 535, however, there are a full set of numerals present on 536. In addition, there are totals on Ld(1) 587, from find-place F14, which correspond to the amount of cloth of type, *pa-we-a*, that is stored. Thus, it should be possible to integrate the amounts of textiles listed on the component tablets of the Lc(1)-set and compare them with these totals, since there is a relatively high level of conservation of this set of tablets. However, it can readily be shown that the integrated totals exceed the given total, if the problem is approached in a flat-footed manner. Therefore, it is useful to consider this integration in some detail because, in turn, it is providing information about the contents of the tablets.

There are three different types of designation of groups of workers,

¹⁶ I.e. if we were lucky enough to suddenly discover, within the storerooms of the Heraklion Museum, a large number of new fragments from the Lc(1) set, then it is judged that there is roughly a 50% chance that the proposed new quasi-join would remain valid. This quasi-join was found by RJF and verified by José Melena (see Firth and Melena 2003).

¹⁷ It should be noted that, whereas the previous section aimed to give a straightforward description of the tablets, this section contains a greater level of interpretation of their contents.

¹⁸ Lc(1) 530 is exceptional, appearing to require 12 units of wool to manufacture 3 pieces of *tu-na-no* cloth.

- groups with occupational designations
- groups with ethnic designations
- ‘collector’ groups

Olivier (1967a) showed that, if we simply add the total amounts of *pa-we-a* on all the Lc(1) tablets, then it would exceed that given on Lc(1) 536. His solution to this dilemma was to suggest that the totals on 536 excluded the production of the ‘collector’ groups (by comparison with an analogous separation between collector and non-collector sheep within the Dn-series).¹⁹ This was considered recently in a paper presented at Austin, where one of the authors presented an integration of the Lc(1) tablets of the non-collector groups, for the tablets which contained a trace of the identification group of the workers.²⁰ However, if we were now to add in all the other tablets which are not explicitly known to be associated with collector groups, then the totals on Lc(1) 536 are exceeded. We can demonstrate this most easily, in the following paragraphs, by considering the quantity of production of *pa-we-a* and *tu-na-no*.

We know that there are a limited number of groups of workers involved in the *ta-ra-si-ja* system because the same names of groups recur frequently within the sets of tablets in the Western Magazines.²¹

The groups with occupational designations are *a-ra-ka-te-ja*, *da-te-we-ja*, *e-ro-pa-ke-ja*, *ne-we-wi-ja*, *to-te-ja*, and *a-mi-ni-so e-ne-re-ja*.²² The targets for cloth production for these groups are given in TABLE A1. All the groups in this table, with known targets, each manufacture around 12 pieces of either *pa-we-a* or *161 *pa-we-a*. Thus, we could estimate the combined total production of *pa-we-a* and *161 *pa-we-a* from the occupational groups to be approximately 70 pieces.

The groups with ethnic designations are: *a-mi-ni-so ko-u-re-ja*, *da-wi-ja*, *do-ti-ja*, *da-*22-ti-ja*, *e-ki-si-ja*, *e-ra-ja*, *(i-)ja-pu₂-wi-ja*, *ko-no-so ko-u-re-ja*, *ko-no-so te-pe-ja*, *pa-i-ti-ja*, *qa-mi-ja*, *ri-jo-ni-ja*, *se-to-i-ja*, *tu-ni-ja*, *tu-ri-si-ja*, *56-ko-

¹⁹ It should be noted that the statement of the quantities of cloth, given by Olivier 1967a at the bottom of p. 91, omitted the *a-ro-zo ki-to* and overstated the quantity of *pa-we-a ko-u-ra*.

²⁰ Nosch 2000a, Table 1.

²¹ Nosch 1997-2000.

²² Strictly, this is a minimum list. It is noted that the Occupational Groups also appear on the Ak(1)-set (written by scribe 103). Thus, *a-ra-ka-te-ja* appears on both Ak(1) 5009 and Lc(1) 531; *da-te-we-ja* appears on both Ak(1) 612 and Lc(1) 540. Therefore, for present purposes it is assumed that, where a partial word can be reconstructed as the full name of an occupational group based on the Ak(1) readings, then it should be reconstructed in that way. If this were not the case, then the amount of *161 *pa-we-a* and *pa-we-a* manufactured by this group would be correspondingly greater than that estimated above. In particular, it has been assumed that: *a-mi-ni-so* on Lc(1) 5053 represents *a-mi-ni-so e-ne-re-ja*, as on Ak(1) 638; *]ke-ja* on Ak(1) 620 is *e-ro-pa-]ke-ja*, as on Lc(1) 534; then, by elimination, *]ja* on Lc(1) 7376 is *to-te-]ja*, as on Ak(1) 611. It should be noted that *a-mi-ni-so e-ne-re-ja* has been categorised as an occupational group because *e-ne-ro* is a minor (decorative?) element (cf. L 695), whereas the ethnic groups produce large quantities of entire textiles.

we. The targets for textile production for these groups are given in TABLE A2. The amount of production of *pa-we-a* explicitly shown in TABLE A2 is 40 pieces of cloth. However, originally this list would have included the production of *pa-we-a* by the *e-ra-ja* and the *ko-u-re-ja* groups at *a-mi-ni-so* and *ko-no-so*. It also seems likely that one or more of the following three tablets originated from this category: Lc(1) 553 which had a target of 50 pieces of *pa-we-a* and Lc(1) 557, which had a target of 80 pieces of *pa-we-a* and Lc(1) 7285, which had 60 pieces of *pa-we-a*.²³

Therefore, if we gave a total of combined *pa-we-a* and *161 *pa-we-a* from the Occupational and Ethnic groups this would almost certainly be substantially in excess of 200 pieces of cloth. However, the total of *pa-we-a* on Lc(1) 536 is only 200 pieces.

The most obvious way out of this difficulty is to suggest that the *pa-we-a* listed on Lc(1) 536 does not include *161 *pa-we-a*. In practice, *pa-we-a* and *161 *pa-we-a* seem to be distinguished from each other throughout the manufacturing process, from the Lc(1) production tablets, for each production group, through to the storage tablets (where *pa-we-a* is listed by scribe 116 on the Ld(1)-series and *161 *pa-we-a* is listed by scribe 114 on the Ld(2)-series). Therefore, it seems entirely plausible that *161 *pa-we-a* should be listed separately on a totalling tablet. On this basis, Lc(1) 536 would be the totals for the ethnic groups only (i.e. excluding both the collector and the occupational groups).²⁴

Thus, we can rationalise the information on the totalling tablet, Lc(1) 536, in terms of the component tablets in the Lc(1)-series. However, there is also a delivery tablet, Ld(1) 587, which records the total amount of *pa-we-a* that has been delivered to the palace.²⁵ The totals on Ld(1) 587 combine to give 453 pieces of *pa-we-a* that have been delivered. Killen noted that this was not sufficiently large to encompass the total production of *pa-we-a* on the Lc(1)-set. This is because collectors are recorded for at least 366 *pa-we-a*, and if this is added to the 200 *pa-we-a*, we have a total production target in Lc(1) of at least 566 *pa-we-a*. Therefore, he resolved this by suggesting that the total on Ld(1) 587 corresponded to the total amount of *pa-we-a* cloth manufactured by the collector groups on the Lc(1)-set.

However, one of the authors²⁶ has recently suggested that the number, 149, on the *lat. inf.* of Ld(1) 587, which had hitherto been neglected, should be interpreted as the number of missing pieces of *pa-we-a*. This interpretation would be consistent with the use of the *lat. inf.* to record missing cloth on other tablets

²³ For 557, it is assumed that the bottom line should read, *tu-na-no*] TELA 7 LANA 21. The upper line should clearly be, *pa-we-a ko-u-ra*] TELA 80 LANA 130+.

²⁴ We are not able to discount the possibility that Lc(1) 536 gives a total for both the Ethnic and Occupational groups but specifically excludes *161 *pa-we-a*. However, this seems to be a less likely interpretation of the information available to us.

²⁵ Killen 1979.

²⁶ Nosch 2000, p. 52.

found in F14 (i.e. Ld(1) 598, Lc 646). On this basis, the total number of pieces of *pa-we-a* that were expected would have been $453 + 149 = 602$. Therefore, we should consider whether this new interpretation of the combined totals on Ld(1) 587 is consistent with the production of *pa-we-a* by the collector group alone.

There are three Lc(1) tablets known to contain collector groups,]*ku-wo* on Lc(1) 532 producing 16 *pa-we-a*, *e-me-si-jo-jo* on Lc(1) 551 producing 110 *pa-we-a* and *we-we-si-jo-jo* on Lc(1) 7392 producing 240 *pa-we-a*.²⁷ This gives a total production of *pa-we-a* by collector groups of 366 pieces.²⁸ It was noted above that Lc(1) 553, 557 or 7285 could possibly represent an Occupational group. It would follow that the other tablet(s) represented Collector groups. Furthermore, the combined production of *pa-we-a* from all groups exceeds the newly obtained total production on Ld(1) 587. Thus, there would appear to be a basis for continuing to accept Killen's hypothesis, that the delivery total on Ld(1) 587 represents the production of the Collector groups. This would now imply that the initial target for these groups was 602 pieces of *pa-we-a*.

It should be emphasised that the above reconciliation between the numbers in the component Lc(1)-tablets and the totalling tablets is not claimed to be unique. For example, if it was suggested that the Lc(1) tablets in category (b) were excluded, because they were anomalous and might have been written at a different time, we could readily arrive at a different solution. In particular, by excluding Lc(1) 557, we would reduce the production total of *pa-we-a* shown in TABLE A4 to $543+4x$, which would then allow us to assume that the total production of *pa-we-a* implied by Ld(1) 587 was the total for all groups (and not just for the Collector groups). This might be considered to be more logical because, once the *pa-we-a* was delivered for storage, it would not be important where (or by whom) it had been manufactured. On this basis, one would not expect the store records to draw a distinction between *pa-we-a* that was manufactured by the Ethnic groups and the Collector groups.

The key point that should be taken from the above discussion is that the integrated totals of textile production from the component tablets of the Lc(1)-series represents a large proportion of those on the totalling tablets (see TABLE A4). This is consistent with the hypothesis, that a substantial proportion of the original text that was on the original tablets in the Lc(1)-series has been preserved.

5. THE OD(1)-SET

Although there has been a significant amount of discussion on some of the tablets and some of the words from the Od(1)-set, there has generally been less work done on the Od(1)-set as a whole, than on the Lc(1)-set.²⁹ The reason for

²⁷ The targets for cloth production for these groups are given in TABLE A3.

²⁸ Note that Killen 1979, p. 156, obtained a total of 356 rather than 366 because he was using an earlier reading of Lc(1) 7392.

²⁹ See Killen's discussion of the *o-pi* tablets (1968); Killen and Nosch's discussion of Od(1) 562 (Killen 1966, 1974; Nosch 2000, p. 26); Leukart's discussion on the words *o-nu-kalo-nu-ke* (1987); Firth's discussion on find-places (2001, Part II, Section 15); and, more recently, Nosch 2005.

this is evident. The Lc(1)-set is very coherent and is, in practice, the Linear B equivalent of a modern-day spreadsheet. By contrast, the features that unite the Od(1)-set are simply that they were tablets written by the same scribe and dealing with distributions of wool. At first sight, they do not appear to have a close association with the Lc(1)-series because the total amount of wool on the Od(1)-tablets is clearly substantially less than that required to manufacture the textiles on the Lc(1)-set of tablets. Some of the tablets are recording distributions of wool which are sufficient to manufacture textiles. However, the majority of the tablets are dealing with relatively small quantities of wool and it has been suggested that this might be wool for 'finishing' cloth.³⁰ However, this explanation does not make it clear why Scribe 103 kept the Lc(1) and Od(1)-sets in adjacent locations.

The Lc(1)-tablets can be readily identified. However, by contrast, the Od(1)-tablets are more variable. It has been suggested that some of the tablets, which had hitherto been classified as Xe, should now be re-classified as Od(1). Therefore, in the listing that follows, we will include both the tablets that are currently included as Od(1) in *CoMIK IV* and the tablets from the vicinity of Western Magazine XI which are not Lc(1).

Tablets listed in CoMIK IV

Od(1) 539, 562-563, 570, 681-682, 687-690, 696, 5511, 5966, 7309?, 7310, 7324?, 8563?

M(1) 559, 683

Xe 524, 537, 544, 691-692

Find-places

F8: 570

F9: 524

F10: 537, 539, 544, 559, 689

F11: 562-563

F18: 681-683, 687-688, 690-692

F19: 696

It has been suggested that 696 should not be classified as an Od(1) tablet³¹: firstly, because it was found in F19, which is some considerable distance from the remainder of the set; and, secondly, because it is possibly part of the same tablet as L 698. If it is part of the same tablet as 698 then the joint tablet clearly becomes L 696[+]698, otherwise it should be re-classified as Od 696.

Similarly, it is suggested here that 5966 and 8563 should be re-classified as Od 5966 and 8563 because they are from Batches J and E respectively and, therefore, they probably were found in F14, some distance away from the remainder of the Od(1) set. Further, on the basis of an examination of the tablet, the attribution of 8563 to scribe 103 should be considered doubtful (i.e. 103??).

³⁰ Nosch 2000, p. 25, and also 2005.

³¹ Firth 2001, Part II Section 15.

Od(1) 7324 should remain included within the Od(1) set, written by scribe 103 (i.e. no question mark). From an examination of the tablets, it is evident that 7310 should be reclassified as Od(2) 7310 because of the similarity in its appearance with Od(2) 714, 715, 716, 718 from the Gallery of the Jewelled Fresco. It has already been noted that 7309 and 7318 are very similar and these should be classified as Od tablets, distinct from the Od(1) series.

Description (following Scribes)

- a) 682, 683, 690, 692; *ca.* (14) x 3.8 x 1 cm.; 2 lines of about equal height; ends thinned and rounded.
 - b) 524, 537, 563, 691, 7324 : *ca.* 9.5 x 3 x 1 cm.; 2 lines of about equal height; ends thinned and rounded.
 - c) 539, 544, 681, 687, 688, 689, 5511; *ca.* 11 x 3 x 1 cm.; not lined; ends thinned and rounded.
- 562: 13 x 3.2 x 1 cm.; 3 lines of *ca.* 1 cm.; ends thinned and rounded.
 559: (3.5) x 2.3 x 1 cm.; 2 lines of about equal height.
 570: (5.5) x 2.3 x 1 cm.; not lined; left ends thinned and rounded.

Commentary on the classification

Sub-group (c):

In *Scribes*, Olivier included a note to the following effect. The tablets, Od(1) 539, 570, 681, 687, 688, 689 & 5511 show particular traits in the way they are written (shape and thickness of the stroke) and in their appearance (particularly their colour), which sets them apart a little from the other tablets of this scribe, taken in general, but which brings them nearer to L(1) 648 and Xe 657, of Od(2) 714, 715, 716, 718 and of Xe 544. There does not exist sufficient evidence to attribute these tablets to a different scribe, but it is important to note that they constitute a separate group in the work of 103.³²

At first sight the tablets listed appear to be a miscellany. However, the fact that *Scribes* brings them together as pieces that have a particular type of clay and particular writing traits should be given due weight. It seems possible that the different writing, in terms of shape and thickness of the stroke, might be attributed to a different stylus. The difference in clay colour might be attributed to a difference in the batch of clay that was being used. Either of these would point to the possibility that this group of tablets were written at a different time to the remainder of the Od(1) tablets.

³² See *Scribes*, pp. 46-47. Note that in *Scribes*, there was a brief discussion about whether Od 5511 should be associated with the tablets from the Gallery of the Jewel Fresco or with those from around F10. Its subsequent classification as Od(1) 5511 implied that it should be associated with the F10 tablets. This is consistent with recent consideration of find-places, which indicates that a small number of Batch C tablets were excavated from around F10 (Firth and Melena 2001b).

L(1) 648 and *Xe* 657 were found in F14 (Magazine XV) and Od(2) 714, 715, 716, 718 were found in the Gallery of Jewel Fresco. Both these find-places are sufficiently far away from F10 that we can discount the possibility that they were stored together with the Od(1) tablets before the conflagration. Nevertheless, it should be emphasised that there is evidence of a common form and/or vocabulary between these tablets and the remainder of the tablets from sub-group (c).³³ Indeed there are strong links, via the vocabulary, between this sub-group and the remainder of the tablets written by Scribe 103.

However, on the basis of the separation of find-places, we shall exclude the tablets that were found in F14 and G1 from the rest of the discussion of sub-group (c). The physical characteristics of the remainder are given in TABLE 1.

TABLETS	HEIGHT (cm)	LINED?	PALM-PRINTS
<i>Xe</i> 544	2.6	not lined	
Od(1) 539, 681, 687-689	~3	not lined	R ZETA on 688
Od(1) 570	2.3	not lined	rough papillar lines
Od(1) 5511	2.6	not lined	

TABLE 1

It can readily be seen that there is a commonality about the form of these tablets. It will be noted that 544 and 5511 have the same height. Furthermore, on examination, it was found that there appeared to be a fairly high probability (say, ~75%) that these are pieces of the same tablet, giving,³⁴

Od(1) 544 [+]	5511	(F10; 103)
.a	pe-re-ko[]
.b	da-*22-ti-ja / a-ze-ti-ri[-ja] LANA 1

It seems reasonable to suggest that the group of tablets in TABLE 1 are a coherent subset of the Od(1)-set and ask whether they have a common feature. It is noted that the word, *a-ze-ti-ri-ja*, appears explicitly on Od(1) 544. On Od(1) 539, we have *ti-mu-nu-we*, who also appears on 683, associated with the word, *a-ze-ti-ri-ja*. In addition, *ne-ki-ri-si* (Od(1) 687) and *po-po* (Od(1) 689) both appear on Ln 1568, which includes the word *a-ze-ti-ri-ja*. Thus, four out of the seven tablets appear to be linked to *a-ze-ti-ri-ja*, which is conventionally interpreted as a word associated with the ‘finishing’ of cloth.³⁵

Sub-group (a):

682, 683, 690, 692 also appear to be a small group of tablets which are linked by their physical characteristics. In this case, these tablets are all about the same

³³ For example: L(1) 648 contains the name *po-po*, which also appears on Od(1) 689; *Xe* 657 contains the word *a-ze-ti-ri-ja*, which also appears on *Xe* 544.

³⁴ This quasi-join was found by RJF and verified by José Melena (see Firth and Melena 2003).

³⁵ *a-ze-ti-ri-ja* also appears on *Xe* 657 and *po-po* appears on L(1) 648. As already noted these tablets have the same scribal characteristics but were found in F14. See Killen 1979.

size (i.e. (14) x 3.8 x 1 cm.) with 2 lines of about equal height and ends thinned and rounded. They were all found in the Long Gallery (find-place F18). 682, 683 & 692 all contain the word, *o-nu-ke*, which is conventionally associated with the 'finishing' of cloth.³⁶ Od(1) 690 records the distribution of relatively small amounts of wool which could also be used for 'finishing'. Currently these tablets are classified differently as, Od(1) 682, M 683, Od(1) 690, Xe 692. It is suggested that they should all be classified as Od(1).

Considering the remaining tablets:

562 and 563 could be considered as a further small group of tablets. These were the only Od(1) tablets listed as being found in F11, according to Evans' *Handlist*. They are of a similar size and appearance (although they each differ in respect of the number of lines). Od(1) 562 records the distribution of large quantities of wool (606 kg). Od(1) 563 records the distribution of 42 kg of wool.

524, 537 and 691 could also be considered as a group of tablets. These appear to have had similar dimensions and each of them is concerned with transactions with *o-pi*. In practice, none of them have retained any ideogram signs, therefore, hitherto they have not been categorised as Od tablets. Nevertheless, it is highly probable that they are Od(1) tablets and it is suggested that they should be classified as such.

Finally, we should note that the shape and size of M(1) 559 more closely resembles that of the Lc(1)-set rather than any of the tablets from the Od(1)-set.

Considering the find-places of the tablets

The shape and stylus used in writing the tablets gives some indication about which tablets were written around the same time. However, it seems possible that the distribution of wool for the manufacture of cloth and for 'finishing' was a process that extended over a time period. Therefore, the tablets might have been filed according to their contents rather than when they were written. There is some evidence of this because the tablets, which are grouped together above according to appearance, were not necessarily found together.

In particular, the tablets that were found in the Long Corridor included examples from all three groups. These include tablets conventionally associated with 'finishing': 681, 682, 683, 692 include the word (or part of the word) *o-nu-ke*; 683 includes the word *a-ze-ti-ri-ja*; and 687 & 689 contain the names *ne-ki-ri-si* and *po-po* who are associated with *a-ze-ti-ri-ja* (on Ln 1568). However, 688 and 690 are associated with *ri-jo-ni-ja* (690 via *a-to-mo-na*, who is also included on 563, which was found in find-place F11).

The most plausible suggestion appears to be that there are effectively two groups of Od(1) tablets. The first group is associated with the supply of relatively

³⁶ Killen 1979.

small quantities of wool, possibly for 'finishing'. By contrast, the second group records the supply of large quantities of wool, which is most probably for various purposes, but the absence of 'finishing' vocabulary and the amounts of wool suggest that it might be used for weaving into cloth. The latter group would include Od(1) 562, 563, 688, 7324 and 537 (assuming that this tablet is listing 25 units of LANA).

6. CONSIDERING THE PURPOSE OF THE OD(1) TABLETS

In the previous section, we discussed the basic characteristics of the Od(1)-series as clay tablets written by Scribe 103. However, in considering the contents of the tablets we adhered to the interpretation of the vocabulary proposed by Killen, which has become the accepted convention. In this section, we will consider the interpretation of some of the vocabulary on the Od(1) tablets in a little more detail.

One of the problems with our interpretation of the Western Magazine tablets is that our understanding of the terms attributed to the 'finishing' of cloth is not very specific. As a consequence, there is a tendency for 'finishing' to become a catch-all for words which we do not understand.

There is a second difficulty, which has already been alluded to above; it is not clear why Scribe 103 chose to keep tablets listing distributions of wool for 'finishing' adjacent to tablets setting targets for cloth production (noting that most of his other tablets were found around Magazine XV, find-places F14 and F19).

The key words in this discussion would appear to be *o-nu-ke/o-nu-ka* and *a-ze-ti-ri-ja*. Killen³⁷ suggests that *o-nu-ke/o-nu-ka* are decorative items (relating loosely to the word, ὀνυξ, 'nail') and *a-ze-ti-ri-ja/a-ke-ti-ri-ja* are women who work as 'decorators' (relating to the word, /asketeres/) and who apply the *o-nu-ke*. Leukart³⁸ provides a good review of the interpretation of *o-nu-ke/o-nu-ka*, drawing attention to the inherent difficulties in its interpretation. He concludes by suggesting that there are two homonyms: a noun */onukh-/ corresponding to ὀνυξ and an adjective /o-nukh-/ 'stitched on'.

Although Barber³⁹ includes some discussion of linguistics, her suggestion for *o-nu-ke/o-nu-ka* and *a-ze-ti-ri-ja* is essentially pragmatic. However, before noting her suggestions, it is necessary to include a brief description of terminology. One of the first steps towards weaving a piece of cloth is the manufacture of a 'heading band' or starting band. This 'heading band' is made on a bandloom⁴⁰, separately from the bulk of the cloth. Once made, it is

³⁷ Killen 1979.

³⁸ Leukart 1987. See also Luján 1998, pp. 347-349.

³⁹ Barber 1991, pp. 271-273, 283, 325-327.

⁴⁰ Evidence for the existence of the bandloom is shown by the words *a-pu-ke*, 'head-bands' and *a-pu-ko-wo-ko*, 'head-band makers'. For a detailed discussion of starting bands, see Hoffmann 1974.

transferred to the top of the warp-weighted loom and forms the closed upper edge of the cloth that will be woven and also, as part of its construction, the band includes the warp threads of the cloth. (In fact, the weft threads of the heading band become the warp threads of the cloth.) The heading band essentially sets the standard of size and quality of the cloth that will be woven. It can be distinguished within the final cloth because of the difference of the weave.⁴¹ Furthermore, it is evident from Minoan and Mycenaean frescoes that the edgings to cloth were often manufactured with contrasting colours to decorate the cloth. Thus, the heading bands and edgings have a particular significance in the manufacture and the use of the cloth. We can now return to Barber's suggestion, which is that *a-ze-ti-ri-ja* are women who weave edgings, i.e. the *o-nu-ke/o-nu-ka*, and that some of these edgings would have been used as heading bands, to construct the warp of the loom.⁴²

There would appear, at first sight, to be large differences between the suggestions put forward by Killen and Leukart and those proposed by Barber. However, edgings of various types are a standard form used for the decoration of cloth. The edgings of the type described by Barber would have been manufactured on a band-loom, whether they were introduced at the beginning or the end of the manufacturing process. The difference would be that if they were applied as a heading band then they would have formed the basis for the warp of the cloth, whereas if they were applied at the end they would have been sewn onto the woven cloth, as part of the 'finishing' process. Thus, there would seem to be scope for accepting *a-ze-ti-ri-ja* as makers of edgings, which are part of the decoration of the cloth. There would also seem to be scope for drawing a distinction between the two types of edging: the *o-nu-ke* on the Od(1) tablets, which would be the heading band containing the warp; and the *o-nu-ka* on the Ld(1) tablets, which would be the edgings that are stitched on after the cloth has been woven (for example, in the workshop of *e-ta-wo-ne-u*).⁴³

⁴¹ Barber (p. 271) gives an example, where an edging band with a half-basket weave can have the appearance of corduroy, which could, with some imagination, relate it to the term ὄνυξ.

⁴² Similarly, the Lc(2)-set contains the word *to-u-ka*, which Killen (1979, pp. 163-164) interprets as 'prepare' and then goes on to suggest that this is preparing in the sense of 'finishing', i.e. receiving finishing touches. However, it seems preferable to interpret *to-u-ka* as wool used to prepare the loom for weaving, analogous to *o-nu-ka* on the Od(1) tablets.

⁴³ Although it clearly pre-dates the Linear B tablets by a substantial period, it is useful to note the fresco of the "Assembly on the Hill", which is part of the Miniature Frieze from the West House of Akrotiri. This shows a group of men wearing cloaks which are decorated with edgings of a contrasting colour. See, for example, Dumas 1992, pp. 58-59. It is interesting to return to tablet 544. At one stage it was suggested that this should be classified as Lc(1) 544 and, Killen (1998) supported this suggestion, interpreting the word *pe-re-ko* as *pe-re-ko[-sa]*, 'weaving' or *pe-re-ko[-si]*, 'they weave'. In the above, we have suggested the quasi-join 544 [+] 5511, so that the tablet would become Od(1) 544, describing the distribution of 1 unit of wool to the *a-ze-ti-*

In terms of find-places, this would be a very attractive solution. It would imply that some of the Od(1) tablets are distributing wool for the manufacture of heading bands and warp threads. Therefore, it would be entirely appropriate that such tablets should be kept in a location adjacent to the Lc(1) targets which set the targets for the manufacture of cloth. Thus, the process would be that the targets were set and then initial distributions would be made to begin the making of the heading bands.⁴⁴ It would also separate these tablets, dealing with the start of the production cycle, from those describing the 'finishing' processes which are found in F14 and F19.

In practical terms, it is almost certain that all the wool being discussed in the Lc(1) and Od(1)-series is raw (unwashed) wool because it is measured in coarse quantities with units of 3 kilograms (except on Lc(1) 532 and M 683, where the units of 1 kilogram are introduced).⁴⁵ This would tend to suggest that one unit (~3 kilograms) of wool is required to manufacture a single heading band. Such an assumption is reinforced by noting that the *ri-jo-ni-ja* received a total distribution of 30 units of wool on Od(1) 688 and was required to manufacture 30 pieces of TELA+TE on Lc(1) 529. However, less heavy pieces of cloth would require lighter heading bands. So, on this basis, M 683 would seem to imply that 1M of wool (~1 kilogram) was required to produce a heading band for a piece of *146 cloth. However, these estimates may not be literally correct because the heading band is not just the edging but also the warp threads and these alone could be 30-50% of the weight of the cloth if the cloth was fully woven⁴⁶, which is not consistent with the weights of wool that we have assessed above. Therefore, in that case we would be led to suggest that the wool provided for *o-nu-ke* was not for the complete production of the heading band. (Although, if the heading band itself is of a different colour(s) to the wool of the bulk of the cloth, then it seems reasonable to suppose that there would have been an advantage in providing an preliminary distribution of wool to start off the manufacturing process.) Alternatively, if TELA+TE was interpreted as a rug with a knotted pile, then the amount of wool required for the heading band and warp

ri-ja of *da-*22-to*. If we were to allow the suggestion that the *a-ze-ti-ri-ja* manufacture edgings woven on a band-loom, then Killen's interpretation of *pe-re-ko* could not only be retained, but it would also reinforce the suggestion that the *a-ze-ti-ri-ja* manufactured objects by weaving.

⁴⁴ It is tentatively suggested that, in the year in question, this process was never completed because of the destruction of the palace (see Chadwick's discussion on the month of the destruction of Knossos, 1976, pp. 188-189).

⁴⁵ Over 50% of the weight of 'raw wool' may be grease and dirt, which would be removed by washing, Forbes 1953.

⁴⁶ Clearly, if the number of warp threads was equal to the weft threads and they were threads of the same thickness then there would be a 50% contribution of each to the weight of the final cloth. However, if the cloth was weft-faced (with the weft hiding the warp because there were fewer warp threads, cf. Hesiod, *Works and Days*, 535 ff.) then the contribution of the warp to the final weight of the cloth would be lower.

threads would be considerably less than 30% of the total and it could be consistent with the allocation of one unit of wool.⁴⁷

It is worthwhile contrasting these coarse measures of wool on the Lc(1) and Od(1)-series of tablets with the inscriptions discussed by Killen where the quantities of wool are measured in units as low as 1P (~20 grams).⁴⁸ The specific inscriptions that he considers there are L 590, Od 666, Od 667, L 695, L 698, Ws 1703 and Xe 7857. These inscriptions tend to be rather fragmentary and so it is not possible to make definitive statements. However, it is suggested that in these cases, we are seeing the distribution of wool which has been washed and probably dyed or bleached or selected because it is 'fine' quality. This is clearer on Od 667, where the tablet contains the word, *pa-ra-ku*, which is interpreted as a colour.⁴⁹ In addition, in L 695, if the wool sign is implied (as Killen suggests), then the reference would be to 2N (~500 grams) of white wool (with the implication the wool, which is listed before it using smaller units, is non-white).

Thus, we are drawing a distinction between the wool distributed using fine measurements, which is washed and probably dyed or bleached or of higher quality (specifically on L 590, Od 666, Od 667, L 695, L 698, Ws 1703 and Xe 7857) and the unwashed raw wool which is distributed in coarse measurements on the other Od tablets and on the *verso* of Lc(2).

Thornbury, Bristol BS 35 2HX
12 Chiltern Park
RFirth9351@aol.com

RICHARD J. FIRTH

DK-2300 København S.
Institut for Historie, Københavns Universitet
Njalsgade 102
nosch@hum.ku.dk

MARIE-LOUISE B. NOSCH

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⁴⁷ Firth 2005.

⁴⁸ Killen 1985.

⁴⁹ Palmer 1963, p. 442; Nosch, 2000, p. 25.

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APPENDIX A: Totalling the Lc(1) tablets

The tables assume the correctness of the quasi-join listed in the main text.

Lc(1)-tablet	TELA+TE	pe-ko-to	tu-na-no	*161	pa-we-a	pa-we-a
531 a-ra-ka-te-ja			1	15		
534 e-ro-pa-ke-ja			1	10[
540 da-te-we-ja						9
560 ne-we-wi-ja						x
5053 a-mi-ni-so						
[e-ne-re-ja						
7376 to-te-]ja				10		
OCCUPATIONAL GROUP TOTAL			2	35		9+x

TABLE A1: Targets for the Occupational Groups

Lc(1)-tablet	TELA+TE	pe-ko-to	tu-na-no	*161	pa-we-a	pa-we-a
525 se-to-i-ja	40		3			
526 da-wi-ja	14	10	3			
527 e-ki-si-ja	19	2	2			
528 e-ra-ja			1			x
529 ri-jo-ni-ja	30		x			
530]ja	7		3			40
533 tu-ri-si-ja	x					
541 i-ja-pu ₂ -wi-ja	22					
543 qa-mi-ja	11		x			
546 pa-i-ti-ja	14*	2*				
547 [+] 1580 tu-ni-ja	8		1			
548 ko-no-so ko[-u-re-ja						x
549 ko-no-so te-[-pe-ja						
550 a-mi-ni-so ko-u-re-ja						x
561 e-ra-ja	1					
7549 da-wi-ja						
7901 da-*22-ti-ja						
do-ti-ja	6*					
56-ko-we	1					
ETHNIC GROUP TOTAL	152+21*+x	12+2*	13+2x			40+3x

TABLE A2: Targets for the Ethnic groups

Footnotes to TABLE:

- By including Lc(1) 525, we have effectively assumed that the reference to *wa-na-ka-te-ra* can be discounted for the purposes of this table.
- The x's in the table denote places where the numerical values have been lost.
- The entries with asterisks have been inserted on the basis of Le 641, 5646.
- Lc(1) 1580: it is assumed that the top line represents TELA+TE 8, and the lower line, *tu-na-no* TELA 1.

Lc(1)-tablet	TELA+TE	<i>pe-ko-to</i>	<i>tu-na-no</i>	*161 <i>pa-we-a</i>	<i>pa-we-a</i>
532] <i>ku-wo</i>	4		1		16
551 <i>e-me-si-jo-jo</i>	10	2	3		110
7392 <i>we-we-si-jo-jo</i>			10		240
COLLECTOR GROUP TOTAL	14	2	14		366

TABLE A3: *Targets for the Collector groups*

GROUPS OF Lc(1)-TABLETS	TELA+TE	<i>pe-ko-to</i>	<i>tu-na-no</i>	*161 <i>pa-we-a</i>	<i>pa-we-a</i>
OCCUPATIONAL GROUPS			2	35	9+x
ETHNIC GROUPS	152+21*+x	12+2*	13+2x		40+3x
COLLECTOR GROUPS	14	2	14		366
RESIDUAL TABLETS:					
552	11		1		
555	24		2		
558	20		1		
582	30		6		
5746	10	4	2		
7321	18		2		
553	10		2		50
557			7		80
7285					60
7289			1		18
INTEGRATED TOTALS	289+21*+x	18+2*	53+2x	35	623+4x
TOTALS FROM Lc(1) 536	267	18	48		200
TOTAL FROM Ld(1) 587					602

TABLE A4: *Overall totals based on component Lc(1)-tablets*

Footnotes to TABLE:

- Lc(1) 536: the totals given in the table exclude the single piece of *a-ro-zo ki-to*. This cloth does not appear elsewhere in the Lc(1) series of tablets.
- Lc(1) 555: in the early work for this paper, LANA 178 was originally interpreted as implying, *pa-we-a ko-u-ra* TELA 105 (approximately), however, this appeared to result in an over-production of this type of cloth. It is now suggested that the tablet should be read as LANA 168 (not 178, based on the *CoMIK* photograph) and that this corresponds to TELA+TE 24. The reading of the lower line should clearly be, *tu-na-no* TELA]2 LANA 6.
- Lc(1) 557: it is assumed that the bottom line should read, *tu-na-no*] TELA 7 LANA 21. The upper line should clearly be, *pa-we-a ko-u-ra*] TELA 80 LANA 130+.
- Lc(1) 582: similarly, in the early work for this paper, the top line was interpreted as, *pa-we-a ko-u-ra* TELA 30, but this tended to lead to an over-production of this type of cloth. For the purposes of the above table, it is taken as TELA+TE 30.

- Lc(1) 7321: again, in the earlier work, the top line was interpreted as, *pa-we-a ko-u-ra* TELA 72 LANA 120. Then, when this appeared to lead to over-production of this type of cloth, it was re-interpreted as TELA+*TE* 18 LANA 120+. The lower line is interpreted as *tu-na-no* TELA.