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PIERRE CARLIER, CHARLES DE LAMBERTERIE, MARKUS EGETMEYER,
NICOLE GUILLEUX, FRANÇOISE ROUGEMONT, JULIEN ZURBACH



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THOUGHTS ON A POSSIBLE LINK BETWEEN THE PY Ea SERIES AND A MYCENAEAN TANNING OPERATION

Introduction

Tanning is the process whereby raw animal skins/hides, naturally susceptible to decomposition, are treated and transformed into durable leather.¹ It is generally thought that smoking was the most common leather-processing technique employed in prehistoric Europe,² but vegetable tanning was certainly known in Egypt at an early date,³ and it is possible that various tanning methods were used in the Bronze Age Aegean, with differing degrees of success.⁴ Irrespective of the particular method used, traditional leather-processing involves three main stages: (1) preparing the skin/hide – drying and salting would preserve it for travel to the tanner, who would then soak it in water, urine, dung or other solutions in order to soften it before removing its inner and outer layer, as well as the hair from the surface of the latter, leaving behind the middle layer or *derma*; (2) tanning – using one or more methods to turn the *derma* into long-lasting leather; and (3) finishing – e.g., smearing or ‘feeding’ the leather with animal fat, olive oil, etc. to make it supple, and stretching, dyeing, drying, etc. to render it suitable for its end-use.⁵

¹ The term ‘tanning’ is derived from vegetable tanning, in which the raw material is soaked in solutions of tannin, obtained from certain barks (e.g., oak), leaves, woods or nuts. However, the term is often used to refer to any of the various methods by which skins/hides may be processed into leather: e.g., smoking (exposure to formaldehyde and other chemicals in the smoke given off from a fire), vegetable tanning (soaking in tannin baths), tawing (soaking in mineral [e.g., alum] baths), etc. It is in this general sense that it is used here. For details, see R. J. FORBES, *Studies in Ancient Technology*. Vol. V. (2nd ed), Leiden 1966, p. 5-9; also *OED* s.v. tanning. The terms ‘skin’ and ‘hide’ are largely interchangeable, referring to the same part of an animal’s carcass (R. J. FORBES, p. 1): the former is often used for smaller animals (e.g., calves, goats, sheep, pigs, reptiles, fish) and the latter for larger ones (e.g., bulls, cows).

² W. GROENMAN-VAN WAATERINGE, M. KILIAN, H. VAN-LONDEN, “The curing of hides and skins in European prehistory”, *Antiquity* 73 (1999), p. 884-890. The chemical processes involved in smoking are largely reversible, which may account for the lack of preserved leather finds in Europe during the prehistoric period. The introduction of vegetable tanning, whose chemical processes are largely irreversible, is thought to explain the preservation of leather from the Classical period onwards (p. 886, 889-890).

³ Vegetable tanning was practised at the Predynastic tannery discovered at Gebelein, which included finds of finished leather, tools and tanning material of acacia pods. R. J. FORBES, *Studies*, cit. (n. 1), p. 23. For the early use of mineral (alum) tanning in Egypt and the Near East, see R. J. FORBES, *Studies*, cit. (n. 1), p. 7, 26, 41.

⁴ R. J. FORBES, *Studies*, cit. (n. 1), p. 20-21. Note also that traces of leather have been found in prehistoric Aegean contexts: e.g., alongside the Dendra panoply, dated by accompanying pottery to the LH IIB-III A1 period: P. ÅSTRÖM *et alii*, *The Cuirass Tomb and other Finds at Dendra. Part I: The Chamber Tombs*, Göteborg 1977, p. 7-25.

⁵ For the three main stages: R. J. FORBES, *Studies*, cit. (n. 1), p. 1-21, esp. p. 3; J. W. HUMPHREY, J. P. OLESON, A. N. SHERWOOD, *Greek and Roman Technology: A Sourcebook*, London 1998, p. 367-368; K. ZARKIA, *Preindustrial Tanning in Greece* (Transl. by G. Cox, J. Solman), Athens 1997, p. 19-31.

The Linear B evidence demonstrates that leather products were in use at late Bronze Age Pylos. For instance, animal skins and leather items are recorded on the **Ub** tablets found in Room 99 of the Northeastern Building:⁶ tablets **Ub 1316** and **1317** seem to record the delivery of deerskins owing from last year's tax assessment; **Ub 1318** records animal skins of deer, lamb, goat, pig and ox being distributed to five individuals potentially associated with workshop operations, or in charge of them,⁷ and thereby responsible for the working of these materials into the items listed, such as sandals, laces for sandals, saddlebags, straps and basket-like containers; **Ub 1315** records finished leather goods, including reins with stitching work, headbands and halters, and red-coloured hides. Tablet **An 1282**, also from Room 99, records men assigned to work on chariot and horse equipment, while chariot wheels (**Sa** series) and corslets and helmets (**Sh** series) feature in tablets which were probably written in the same building before being transferred to the Archives Complex.⁸ The uses of leather support these textual associations between animal hides, chariot equipment and military attire: the red-coloured hides of **Ub 1315** could have served as coverings for the sides of chariots, strips of leather would have been used to bind the spokes to the circular rims of chariot wheels, as well as to strap together bronze pieces of body armour, and so on.⁹ Pointing in part to the spatial constraints of the Northeastern Building, Flouda¹⁰ and Bendall¹¹ have convincingly argued that while the tablets found in it relating to leather and military equipment reflect administrative activity and the movement and storage of raw materials and finished products, they do not constitute evidence that the actual production of these items took place in the Northeastern Building. The final assembly of chariot parts may have occurred

⁶ Detailed discussions of these texts are available in G. S. FLOUDA, "Inscribed Pylian Nodules: Their Use in the Administration of the Storerooms of the Pylian Palace", *SMEA* 42.2 (2000), p. 213-245 (p. 227-229); L. M. BENDALL, "A Reconsideration of the Northeastern Building at Pylos: Evidence for a Mycenaean Redistributive Center", *AJA* 107 (2003), p. 181-231 (p. 217-220). For **Ub 1318** see also: *Docs*² p. 489-493; M. S. RUIPÉREZ, J. L. MELENA, *Οι Μυκηναίοι Έλληνες*. (Transl. by M. Panayotidou), Athens 1996, p. 261-263.

⁷ The man named **au-ke-i-ja-te-u* (**Ub 1318**), for example, appears on **An 1281** along with others to whom one or two individuals are allocated (presumably for work assignments). See C. W. SHELMEERDINE, "Industrial Activity at Pylos" in *Tractata Mycenaea*, p. 333-342 (p. 340).

⁸ T. G. PALAIMA, *The Scribes of Pylos*, Rome 1988, p. 156; C. W. SHELMEERDINE, "Industrial Activity", cit. (n. 7), p. 333; L. M. BENDALL, "A Reconsideration", cit. (n. 6), p. 220. For the full range of subject matter of tablets and nodules found in the Northeastern Building, see I. TEGYEY, "The Northeast Workshop at Pylos", in *Pylos Comes Alive*, p. 65-79 (p. 67-75); C. W. SHELMEERDINE "Industrial Activity", cit. (n. 7), p. 333-334; G. S. FLOUDA, "Inscribed Pylian Nodules", cit. (n. 6), p. 222-230; L. M. BENDALL, "A Reconsideration", cit. (n. 6), p. 203-226.

⁹ Leather was also used to line boar's tusk helmets, shields and body armour. It was used to make reins, saddles, footwear, clothing, containers (including skins to hold cheeses and wine), tents, and many other military and domestic items, e.g., R. J. FORBES, *Studies*, cit. (n. 1), p. 31-34, 46-47; *Docs*² p. 520; K. ZARKIA, *Preindustrial Tanning*, cit. (n. 5), p. 6, 36; G. S. FLOUDA, "Inscribed Pylian Nodules", cit. (n. 6), p. 229; J. T. KILLEN, "The Commodities on the Pylos Ma Tablets", in *Colloquium Romanum*, p. 431-447 (p. 440-441).

¹⁰ G. S. FLOUDA, "Inscribed Pylian Nodules", cit. (n. 6), p. 219-232, 236.

¹¹ L. M. BENDALL, "A Reconsideration", cit. (n. 6), esp. p. 203-207, 218-221, 224-225.

here,¹² likewise some final working of leather products, but the bulk of the work was probably carried out elsewhere.

Is there any textual evidence, then, for a location where the processing of leather, specifically the arduous task of tanning, might have occurred? This paper represents a preliminary attempt to explore the possibility that (some of) the individuals recorded in the **Ea** series from Pylos may have been involved in a tanning venture in the territory with which the Ea texts are concerned. It should be noted that the people of the **Ea** series are usually viewed, instead, as landholders registered in a *non-occupational* context.¹³

The Ea series

The **Ea** series is a landholding register. Written by a different scribe (S28 H43) from those responsible for the *pa-ki-ja-ni-ja* **Eo/Eb** (H41) and **En/Ep** (H1) texts, it concerns a different group of people and presumably a different locality.¹⁴ L. Palmer viewed two landholders, *ke-re-te-u* and *du-ni-jo* of **Ea 59** to be identical with *ke-re-te-u-ti-no* of **Na 565** and *du-ni-jo ti-ni-ja-ta* of **Fn 79.3** (*ti-ni-ja-ta* being a toponymic related to **ti-ni-ja* ‘region of *ti-no*’), and therefore proposed that the Ea tablets concern landholdings at a place called *ti-no*.¹⁵

The 62 tablets comprising the Ea series were found in Rooms 7 and 8 of the Archives Complex¹⁶ and consist almost exclusively of preliminary single entry drafts.¹⁷

¹² G. S. FLOUDA, “Inscribed Pylian Nodules”, cit. (n. 6), p. 229-230, 232.

¹³ E.g., M. LINDGREN, *The People of Pylos. Parts I – II*, Uppsala 1973, II p. 34.

¹⁴ E. L. BENNETT, Jr., “The Landholders of Pylos”, *AJA* 60 (1956), p. 103-133 (p. 120, 129); L. R. PALMER, *The Interpretation of Mycenaean Greek Texts*, Oxford 1963, p. 218; M. LEJEUNE, “Analyse du dossier pylien Ea”, *Minos* 15 (1974 [1976]), p. 82-115 (p. 82).

¹⁵ L. R. PALMER, *Interpretation*, cit. (n. 14), p. 220; C. J. RUIJGH, *Études sur la grammaire et le vocabulaire du grec mycénien*, Amsterdam 1967, p. 196; P. DE FIDIO, “Palais et communautés de village dans le royaume mycénien de Pylos”, in *Tractata Mycenaea*, P. Ilievski, L. Crepajac (ed.), Skopje 1987, p. 129-149. The adjacent entries of *ti-no* and *pa-ki-ja-si* on **PY An 18.9-11**, separated only by a vacant line, may allude to the relative proximity of the two locations. L. R. PALMER (p. 220) further suggested that the **En/Ep** texts recorded the *wanaks*’ estate in which the goddess *Potnia* was worshipped, while the **Ea** series dealt with the *ra-wa-ke-ta*’s estate, featuring the god *Hippos*. As will be seen below, however, a secular function is preferred here for the single horse appearing in the **Ea** series (**Ea 59.5 recto**). The only (clear) exception in terms of individuals appearing in both land registers is that of *o-pe-te-re-u* who holds land in one series ‘on account of manslaughter’ *e-ne-ka a-no-qa-si-ja* (**Ea 805**) and is described in the other as *qe-ja-me-no* ‘having been paid/compensated (as part of a religious fine/penalty)’ (**Eb 294**, **Ep 704.1**). The overlap might therefore be the result of a special situation in which land could be appropriated as compensation for manslaughter or homicide, perhaps as a substitute for blood vengeance. See e.g., H. J. TRESTON, *Poine. A Study in Ancient Greek Blood-Vengeance*, London 1923; W. F. HUTTON, “The Meaning of *qe-te-o* in Linear B”, *Minos* 25-26 (1990-1991 [1993]), p. 105-131 (p. 124-125 for *qe-ja-me-no*); J. T. KILLEN, “Observations on the Thebes Sealings”, in *Mykenaiika*, p. 365-380 (p. 379-380); J. L. GARCÍA RAMÓN, “Mykenisch *qe-ja-me-no* und *e-ne-ka a-no-qa-si-ja*, alph.-gr. τεισάμενος und ἀνδροκτασία ‘Mord’ und der PN Τεισίφωνος” in *Στέφανος Απιστεῖος*, F. Lang, C. Reinholdt, J. Weilhartner (ed.), Vienna 2007, p. 113-123.

¹⁶ M. LEJEUNE, “Analyse”, cit. (n. 14), p. 84 n. 5. The **Ea** finds appear in two groups, one in Room 7 and one in Room 8, but their shared Hand and common content suggest that they belonged to “a single unified

The lack of cross-checking opportunities such as those afforded by the comprehensive *pa-ki-ja-ni-ja* (**Eo/Eb**) drafts and (**En/Ep**) redactions makes it extremely difficult to unravel the tenancies recorded on the **Ea** tablets. This poses serious obstacles to interpretation. For example, compare the straightforward texts **Ea 824** and **Ea 825** with the more opaque **Ea 822**:

PY Ea 824 (S28 H 43)

.a po-me
ko-do , eke , o-na-to , pa-ro , da-mo GRA T 4
shepherd (nom.)
ko-do holds a lease from the da-mo

PY Ea 825 (S28 H 43)

.a po-me-ne
ta-ra-ma-ta , e-ke , o-na-to , pa-ro , ko-do GRA T 1
shepherd (dat.)
ta-ra-ma-ta holds a lease from ko-do

PY Ea 822 (S28 H 43)

.a ra-wa-ke-si-jo
e-u-me-ne e-ke , o-na-to , pa-ro su-qo-ta GRA T 5
lāwāge(r)sian (nom. or dat.?)
e-u-me-ne holds a lease from the swineherd

On **Ea 824** and **825**, the shepherd in question is named *ko-do* (nominative *po-me* and dative *po-me-ne*). On **Ea 822**, the adjectival form *ra-wa-ke-si-jo* could be either nominative (modifying the individual named *e-u-me-ne*) or dative (modifying the *su-qo-ta* ‘swineherd’). Lejeune prefers the latter.

PY Ea 59.4 (S28 H 43)

ke-re-te-u , e-ke , o-na-to ... pa-ro , ra-wa-ke-si-jo , e-[] GRA 2
ke-re-te-u holds a lease ... from lāwāge(r)sian e-[] GRA 2

PY Ea 808 (S28 H 43)

.a pa-ro , da-mo
ka-ra-pi , e-te-do-mo , e-ke , o-na-to , GRA 1
ka-ra-pi, the armourer, holds a lease from the da-mo GRA 1

series that entered the Archives Complex at a different time.” K. PLUTA, “A Reconstruction of the Archives Complex at Pylos. A Preliminary Report”, *Minos* 31-31 (1996-1997 [1998]), p. 231-250 (p. 249). Often a personal name appears on tablets found in both Rooms 7 and 8 in connection with landholdings of various types (i.e., there is no clear pattern of distribution of **Ea** texts). For a succinct and currently accurate overview of the **Ea** series, see M. DEL FREO, *I censimenti di terreni nei testi in lineare B*, Rome 2005, p. 71-84.

¹⁷ Tablets **Ea 59** and **Ea 481**, both from Room 8, form the exceptions, each with more than a single entry.

The existence of *ra-wa-ke-si-jo* ̣-[on **Ea 59.4** and the otherwise complete absence in the series of a '*lāwāge(r)sian*' *su-qo-ta* (other references to an unnamed *su-qo-ta* do exist) might be seen as favouring a nominative case for *ra-wa-ke-si-jo* on **Ea 822** above, modifying the personal name *e-u-me-ne*. Lejeune's reconstruction of *ra-wa-ke-si-jo* ̣-[(**Ea 59.4**), however, involves the *e-te-do-mo* 'armourer' who appears (without the adjective) on **Ea 808**.¹⁸ One could argue that *e-u-me-ne* is more likely for **Ea 59.4** since the norm appears to be for the adjective *ra-wa-ke-si-jo* to modify *either* an occupational term without a personal name (e.g., **a-mo-te-u*: **Ea 421** and **Ea 809**) *or* a personal name without an occupational term (e.g., *ru-ko-ro*: **Ea 782**) but not both (and the *e-te-do-mo*'s name *is* stated on **Ea 808** to be *ka-ra-pi*). But this state of affairs may be misleading, given the preliminary character of these records.¹⁹

Another problem concerns the possible incompleteness of the series. On **Ea 59 verso**, a total amount of GRA 137 was entered (for the whole series). Lejeune's approximation of GRA 100 for all the extant **Ea** texts, including those lacking GRA figures, falls short of the recorded total, suggesting that perhaps only about 75% of the **Ea** corpus is preserved.²⁰

It is also often difficult to determine the types of landholdings involved in each case. For instance, several individuals have both *ki-ti-me-na* and *ke-ke-me-na* lands so the type of land allocated to their subleasers could theoretically be of either type. Often the sublease is described rather generically as '*o-na-to*' or '*o-na-to* of X's *ko-to-na*' without being clearly specified. *Ka-ma* land also existed (e.g., **Ea 28**) and the formulaic *pa-ro da-mo* (e.g., **Ea 52, 59.4, 136, 208, 259, 773, 778, 808, 816, 824**) points to a land-administering body similar to that of the *pa-ki-ja-ni-ja* records. Still, the landholding details are far from clear.²¹

¹⁸ M. LEJEUNE, "Analyse", cit. (n. 14), p. 92 n. 10. This is based on Lejeune's observation that Hand 43 usually places the adjective *ra-wa-ke-si-jo* *after* personal names but *before* occupational terms (e.g., **Ea 132**: *ru-ko-ro ra-wa-ke-si-jo* 'ru-ko-ro, the *lāwāge(r)sian*' versus **Ea 809**: *ra-wa-ke-si-jo-jo a-mo-te-wo* 'of the *lāwāge(r)sian* wheelwright'). This does not happen, however, on **Ea 421** in the only other existing reference to this wheelwright, where the adjectival *ra-wa-ke-si-jo-jo* was added *after* *a-mo-te-wo*.

¹⁹ M. DEL FREO (*I censimenti*, cit. (n. 16), p. 77-78, 79 n. 56) explains that, on the basis of the extant **Ea** tablets, the adjective on **Ea 59.4** could designate either the occupational term *e-te-do-mo* or any of the personal names attested in the series starting with *e-* and followed by three or four signs as required to fill the number of spaces estimated to be missing (e.g., *e-u-me-ne*, *e-ri-qi-jo*, *e-ro-2-qo*, *e-u-me-de*).

²⁰ M. LEJEUNE, "Analyse", cit. (n. 14), p. 83, 88-89. See also M. DEL FREO, *I censimenti*, cit. (n. 16), p. 84.

²¹ A complete list of the formulaic vocabulary is provided by M. DEL FREO, *I censimenti*, cit. (n. 16), p. 80-81; S. DEGER-JALKOTZY, "Noch Einmal zur Ea-serie von Pylos", in *Texts, Tablets and Scribes*, J.-P. Olivier, T. G. Palaima (ed.), Salamanca 1988, p. 97-122. Also see Lejeune's detailed but tentative Table of landholders, their subleasers and types of plots in M. LEJEUNE, "Analyse", cit. (n. 14), p. 106-110. For the most part, his classifications seem valid. On **Ea 481**, for instance, line 1 records *ra-pa-do*'s (unspecified) holding from the *me-ri-te-u* 'honey-man' and line 2 his (unspecified) holding from the *su-qo-ta* 'swineherd'. Since the extant corpus has no record of *ki-ti-me-na* belonging to either man, and since the only other tablet containing more than a single entry appears to record like-items (i.e., *ke-ke-me-na* holdings on **Ea 59**), it is likely that *ra-pa-do*'s subleases from the honey-man and the swineherd on **Ea 481** also relate to like-items, i.e., in both cases to *ke-ke-me-na* (ibid., p. 85). Due to the nature of the evidence, not all his assumptions are as fully substantiated (which he himself recognises).

In terms of size, the land parcels seem to be generally larger in the **Ea** series than in the **En/Ep** records. For example, in the **En** records, whole *ki-ti-me-na* usually range between GRA 1-3 in size, whereas in the **Ea** series, they range between GRA 1-6.²² Could an **Ea** location removed from a densely inhabited centre and therefore free from the accompanying pressures of land availability help to explain the generally larger size of the **Ea** landholdings?

The individuals of the Ea series

In general, the approximately 36 individuals²³ recorded in the **Ea** series lack the associations with the religious sphere and with the *wanaks* that are typical of those found in the **En/Ep** documents.²⁴ In the **Ea** series, there are no *te-o-jo do-e-ro/-ra* ‘slaves/servants of the god(dess)’, no *wa-na-ka-te-ro* personnel, and no individuals explicitly designated *te-re-ta*.²⁵ There are also no women.²⁶ Where occupational designations are provided, they suggest that the men concerned could have participated, directly or indirectly, in various stages of a tanning operation (see Table 1). Four such men deal with livestock: two *po-me-ne* ‘shepherds’ (named *mo-ro-qo-ro* and *ko-do*); one **qo-qo-ta* ‘oxherd’²⁷ (named *pe-re-qo-no*); and an unnamed *su-qo-ta* ‘swineherd’. Specialist craftsmen include three *ra-pte-re* ‘sewing men’ or ‘leather-stitchers’²⁸ (named *ti-ri-da-ro*, *e-ro₂-qo*, and *ze-pu₂-ro*) and an *e-pi-we-ti-ri-jo* ‘garment-worker’²⁹ (named

²² Tablets **PY En 609, 74, 659, 467; Ea 71, 756, 781, 817, 821**. Consider, for instance, the *ki-ti-me-na* holdings on **Ea 817** (over GRA 3) and **Ea 821** (over GRA 5). Note also Lejeune’s observation (“Analyse”, cit. [n. 14], p. 111) that, overall, there seems to be less fragmentation of land in the **Ea** series than in the *pa-ki-ja-ni-ja* records.

²³ M. LEJEUNE, “Analyse”, cit. (n. 14), p. 92; Cf. M. DEL FREO, *I censimenti*, cit. (n. 16), p. 76-78 (33 or fewer personal names) and p. 79-80 (designations of unnamed individuals).

²⁴ In comparison, the **En/Ep pa-ki-ja-ni-ja** records deal with about 82 individuals and land totalling about GRA 102 T 4 (**PY Ed 411**): cf. M. DEL FREO, *I censimenti*, cit. (n. 16), p. 106, 113 (**En**), 137-139 (**Ep**); M. LEJEUNE, “Analyse”, cit. (n. 14), p. 94 (85 individuals).

²⁵ The term *te-re-ta* is absent from the **Ea** series, but M. LEJEUNE (“Analyse”, cit. [n. 14], p. 84) considers the holders of *ki-ti-me-na* to be *telestai* (as in the final *pa-ki-ja-ni-ja* documents).

²⁶ The sole feminine name in the **Ea** series, *i-ma-di-ja* (**Ea 816**), is probably a scribal error, given the existence of masculine *i-ma-di-jo* (**Ea 29**). M. DEL FREO, *I censimenti*, cit. (n. 16), p. 77; M. LEJEUNE, “Analyse”, cit. (n. 14), p. 92. In the *pa-ki-ja-ni-ja* series, about a third of the surviving names belonged to women involved in the religious sphere. M. LEJEUNE, *ibid.*, p. 94.

²⁷ Following Lejeune, the form *qo-u-ko-ro* ‘oxherd’ (βουκόλος) is taken here as a personal name ‘Oxherd’ (e.g., **Ea 781**) whereas the alternative form **qo-qo-ta*, probably dissimilated from *qo-u-qo-ta* (βουβότας), is used in the **Ea** series to denote the occupation ‘oxherd’ (e.g., **Ea 270**). M. LEJEUNE, “Analyse”, cit. (n. 14), p. 91 n. 9; *Docs*² p. 577.

²⁸ J. T. KILLEN, “Conscription and Corvée at Mycenaean Pylos”, in *Fiscality in Mycenaean and Near Eastern Archives*, M. Perna (ed.), Naples 2006, p. 73-87 (p. 78 “*ra-pte-re* ... probably ‘leather-sewers, saddlers’”). As M. LINDGREN, *People*, cit. (n. 13), II p. 134 also notes: “the women who sew are dealing with clothes, etc.; the men are concerned with leather work (armour, horse equipment, etc.).” See *DMic. s.v. ra-pte*.

²⁹ **epiwestrios* ‘one whose craft deals with outerwear, perhaps cloaks’ (cf. ἐφεστρίς ‘upper garment/outerwear’ e.g., wrapper, cloak, robe). C. J. RUIJGH, *Études*, cit. (n. 15), p. 116-117; M. LINDGREN,

wi-ri-ja-no). The *a-re-po-zo-o* ‘unguent boiler’³⁰ (named *e-u-me-de*) is considered to be the same individual mentioned by name as a recipient of olive oil on tablet **PY Fr 1184**. Given that olive oil is often rubbed into leather in the finishing stage to make it supple and durable,³¹ one wonders whether he might have supplied this product, or whether he was involved in melting/boiling it or other ingredients used in the process.³² Similarly, the **me-ri-te-u* ‘honey-man’/perhaps beekeeper of the **Ea** series (named **ku-ru-no*) may have supplied beeswax, often used in waterproofing leather.³³ The *di-<pte->ra-po-ro* ‘hide-bearer’ (named *o-ke-u*), whose title clearly connects him to animal hides, may have served a religious or secular purpose, or a combination of both.³⁴ An unnamed *di-pte-ra-*

People, cit. (n. 13), II p. 44. In *Works and Days* 543-545, Hesiod offers advice about stitching together goatskins with the tendons of oxen to make leather capes to put on one’s back for protection during winter: could such capes or similar wrapping materials have been the specialty of the *e-pi-we-ti-ri-jo*?

³⁰ Phonetic variant of *a-re-pa-zo-o* *ἄλειφαζός from ἄλειφαρ ‘unguent/ointment’ (cf. ἀλείφω ‘anoint the skin with oil; polish’) and ζέω ‘boil’. C. J. RUIJGH, *Études*, cit. (n. 15), p. 260 n. 131, 379-380; *DMic*. s.v. *a-re-pa-zo-o*.

³¹ K. ZARKIA, *Preindustrial Tanning*, cit. (n. 5), p. 27-28. Other oils and fatty materials, including the hide’s own fats, could be used for the same purpose: R. J. FORBES, *Studies*, cit. (n. 1), p. 20, 48; *Iliad* 17. 389-393.

³² Shelmerdine effectively demonstrates that *e-u-me-de*’s receipt of OLE+WE 18 on the transaction tablet **PY Fr 1184** was linked to his role in the palace’s perfume industry: C. W. SHELMEKDINE, *The Perfume Industry of Mycenaean Pylos*, Göteborg 1985, p. 24, 41, 110. Another tablet, **PY Fr 1223**, records a disbursement of oil described as ‘sage-scented and rose-scented, for anointing’ to the site of *ti-no*:

PY Fr 1223

.1]ti-no-de , e-ra-wo pa-ko-we , we-a-re-pe OLE+A S 2

.2]wo-do-we-qe we-a-re-pe OLE+A § 2

OLE+A seems to be a treated oil product, with adjunct *A* standing for *a-ro-pa* (cf. Homeric ἀλοιφή ‘anything which can be anointed or smeared’). OLE+A, sometimes indicated by the ideogram AREPA ἄλειφαρ, is considered a liquid, perhaps oil which has been thickened for use as an ointment, e.g., for clothing: C. W. SHELMEKDINE, *Perfume*, *ibid.*, p. 17 n. 26, 34, 82, 92-93. For *we-a-re-pe*, derived from the noun *a-ro-pa*, see also C. J. RUIJGH, *Études*, cit. (n. 15), p. 379-380. If]ti-no on this tablet represents *ti-no* and if this was the name of the locality of the **Ea** series (see above), it is not impossible that Eumedes was also responsible for the specialised use of this oil product there, especially if it was intended for professional use. In this respect it is important to note the well-attested connection between perfumery and tanning. This is evident, for example, in the evolution of the seventeenth century French rural city of Grasse from a site known for its high quality perfumed leather output to a wealthy centre of perfume production. It managed to hold a monopoly on the trade by keeping its specialist perfumery art a secret. The link between perfumery and tanning is also clear in the practices of Spanish artisans of the same century who would steep their animal skins in perfumed oils. For both points, see R. A. MILLER, I. MILLER, *The Magical and Ritual Use of Perfumes*, Vermont 1990, p. 56-57.

³³ E.g., J. T. KILLEN, “The Commodities on the Pylos Ma Tablets”, cit. (n. 9), p. 441. (Liquifying the substance leads to better penetration into the leather.)

³⁴ Olivier advances an appealing case for the *di-pte-ra-po-ro* as *διφθεραφόρος, a religious official clothed in animal hide during ritual ceremonies, pointing to the LM IIIA Hagia Triadha sarcophagus for iconographic support. See J.-P. Olivier, “Étude d’un nom de métier mycénien: *di-pte-ra-po-ro*”, *L’Antiquité Classique* 28 (1959), p. 165-185. He rejects the notion that the term refers to a hide-seller (*διφθεράπωλος, cf. Classical διφθεραπώλης ‘leather-seller’), arguing that the *-po-ro* element is not known to denote ‘seller’ in the Mycenaean period. This element is contained in the Linear B term *ka-ra-wi-po-ro*, unanimously interpreted as ‘key-bearer’ and very likely belonging to the religious sphere, where it could reflect the

po-ro, possibly *o-ke-u* of the **Ea** series, appears elsewhere as a recipient of commodities **RA** and **O** on **PY Un 219.6** and of **HORD** on **Fn 50.6**. It is possible that the *i-je-re-u* ‘priest’ of the **Ea** series, named *sa-ke-re-u*, was associated with the fire-altar of Dionysos (**Ea 102** – see below), while the *a-ke-ro* ‘messenger’³⁵ (named *wa-tu-o-ko*) may have provided an efficient courier service, along with the single horse recorded in the series (**Ea 59.4**), between the palace and this site.³⁶

The occupational designations of these men provide internal evidence to suggest that at least some of the **Ea** individuals may have been directly or indirectly associated with the processing of animal hides. The messy and smelly work of tanning, in which offensive odours of decaying animal flesh are often compounded by the use of urine and dung, has traditionally been established outside village centres, away from concentrated human habitation, and close to (a) a constant supply of water (needed to soak the skins/hides during the preparation and actual tanning stages) and (b) a thriving stock-breeding sector to ensure the procurement of skins: fine - from sheep and goats, semi-fine - from pigs and calves, and thick - from cattle.³⁷ It would appear that the shepherds, the swineherd and the oxherd of the **Ea** series would be in a position to provide precisely the raw materials required.³⁸ The presence of the leather-stitchers would allow for the possibility that some working of the finished leather occurred on site (discussed further below). It is also worth noting that the often back-breaking work of tanning heavy hides

action of either ‘wearing’ or ‘carrying’. In fact, taking into account both the Classical Greek *kanephoroi* ‘basket-carriers (during ritual processions)’ and the Linear B *to-pa-po-ro-i* on **TH Av 101.6** (taken here to reflect ‘basket-carriers’ [cf. *to-pa* gen. of *τάπη* ‘large basket’ on **PY Ub 1318.3**, *Docs*² p. 587], but alternatively interpreted as ‘light/torch-bearers’ [*AGS 2001*, p. 169-172] and ‘rope-bearers’ [see A. BERNABÉ, this volume]), the possibility arises that ‘carrying’, rather than Olivier’s ‘wearing’, might lie behind the term *di-pte-ra-po-ro*. If the designation refers to a cultic official, the coexistence of the clearly religious title *i-je-re-u* ‘priest’ (e.g., **Ea 756**) would argue at least for a differentiation in function. Sacconi suggests that the *di-pte-ra-po-ro* was a sanctuary official who received the hides of sacrificed animals. See A. SACCONI, “Ideogrammoi di pelle e cuoio”, *SMEA* 3 (1967), p. 97-134 (cf. Classical period: W. BURKERT, *Greek Religion*, Cambridge, MA 1985, p. 57, 96-97). Perhaps, instead, the *di-pte-ra-po-ro* was the figure responsible for transporting (‘carrying’) and ensuring the safe arrival of the processed hides (*di-pte-ra* properly refers to *treated* hides) from the leather-processing area(s) to the palace, or elsewhere, for distribution or further working. Whether or not this would have constituted a strictly religious role is unknown.

³⁵ An occupational title, possibly ἄγγελος ‘messenger/herald’. *DMic.* s.v. *a-ke-ro*.

³⁶ In pre-industrial tanneries in Greece, tanning materials were ground in horse-driven mills (K. ZARKIA, *Preindustrial Tanning*, cit. (n. 5), p. 42), but there is no clear evidence at present to argue that the horse of the **Ea** series was used in a similar way.

³⁷ K. ZARKIA, *Preindustrial Tanning*, cit. (n. 5), p. 6, 11. Finer skins could be used for clothing and thicker ones for harnesses and saddle equipment.

³⁸ For a similar idea about the herdsmen recorded in the **Ea** series possibly providing the raw material for leather to be worked by the ‘sewing men’ see S. DEGER-JALKOTZY, “Noch Einmal zur Ea-serie”, cit. (n. 21), p. 121. Furthermore, if *ti-no* was indeed the name of the territory recorded in the **Ea** series, then the large number of oxherds recorded at *ti-no* on **PY An 18** (90 of them, presumably working for the palace) would further support the area’s livestock-producing capabilities.

has traditionally been a male occupation.³⁹ Could the lack of women in the **Ea** series be explained in part as the result of a link between it and a gender-specific work activity?

The **Ea** series also features a handful of men described as *ra-wa-ke-si-jo*, perhaps four or five in number depending on how one interprets the evidence: (1) **a-mo-te-u* – a ‘wheelwright’ or ‘fitter/joiner’,⁴⁰ (2) *ē-[te-do-mo(?)* ‘armourer’⁴¹ named *ka-ra-pi*, (3) *e-u-me-ne*, (4) *ru-ko-ro* and (5) *ku-ro*.⁴² Their adjectival designation, *ra-wa-ke-si-jo*, connects these men to the office of the *ra-wa-ke-ta*. Traditionally interpreted as the military commander of the Mycenaean polity, the *ra-wa-ke-ta* /*lāwāge(r)tās*/ may have played a significant role in mobilizing human labour for state-wide projects.⁴³ Why were these men designated *ra-wa-ke-si-jo*? Were they under the *ra-wa-ke-ta*’s exclusive control or were they his ‘associates’? Clear-cut answers are not forthcoming, but the *ra-wa-ke-si-jo* men accompanied by occupational titles bring to mind the *wa-na-ka-te-ro* personnel of the *pa-ki-ja-ni-ja* texts.⁴⁴ It is possible that, as specialist craftsmen experienced in the use of leather, the *lāwāge(r)sian* **a-mo-te-u* ‘fitter’ and possibly *ē-[te-do-mo* ‘armourer’, and perhaps the other three *lāwāge(r)sian* men of the **Ea** series as well,⁴⁵ were members of one or more workgroups dealing with leather-processing. Given the registered professional expertise in the use of leather of at least one or two of these men (**a-mo-te-u*, *ē-[te-do-mo* – as noted earlier, leather was used in the production of wheels and body armour), it is not impossible that they were supervisors of such workgroups.

³⁹ K. ZARKIA, *Preindustrial Tanning*, cit. (n. 5), p. 7-8, 45.

⁴⁰ Attested as *a-mo-te-wo* (gen.). (a) Taking the Mycenaean word *a-mo* to refer to a chariot’s undercarriage (wheels) and the vehicle as a whole, L. R. PALMER (*Interpretation*, cit. [n. 14], p. 219-220, 320-321, 341) interpreted the **a-mo-te-u* as the *ra-wa-ke-ta*’s ‘charioteer’. (b) Taking *a-mo* as the Mycenaean word for ‘wheel’, **a-mo-te-u* was interpreted as ‘wheelwright’ in *Docs*² (p. 371, 531). (c) Since *a-mo* ‘wheel’ is derived from the stem **ar-* of the verb ἀρρίσκω ‘fit together, join’, **a-mo-te-u* may be translated as ‘joiner’ or ‘fitter’ (e.g., of wheels), quite applicable to the context of chariot-making and repairing. See C. J. RUIGH, *Études*, cit. (n. 15), p. 129 n. 150. Options (b) and (c) are favoured here.

⁴¹ *e-te-do-mo*: *ἐντεσδόμος (cf. ἔντεα ‘armour’, δέμω ‘construct’) ‘armourer’(?) *DMic. s.v.*

⁴² Five individuals if (2) and (3) are viewed as distinct; four if (2) in fact reflects *e-u-me-ne*. In contrast, Lejeune’s *ra-wa-ke-si-jo* men include the **a-mo-te-u*, the *ē-[te-do-mo?*, *ru-ko-ro*, *ku-ro* and, on **Ea 822**, the unnamed swineherd, not *e-u-me-ne* (as discussed earlier). Given the fluctuation between Hand 43’s inclusion and omission of the term in question, M. LEJEUNE, “Analyse”, cit. (n. 14), suspects that others may have been *ra-wa-ke-si-jo* men even if not specifically designated as such in the extant texts.

⁴³ S. NIKOLOUDIS, “The Role of the *ra-wa-ke-ta*. Insights from **PY Un 718**”, in *Colloquium Romanum*, p. 587–594.

⁴⁴ For the three craftsmen described as *wa-na-ka-te-ro* (*ke-ra-me-u* ‘potter’, *ka-na-pe-u* ‘fuller’ and *e-te-do-mo* ‘armourer?’), see T. G. PALAIMA, “Potter and Fuller: The Royal Craftsmen”, in *TEXNH*, R. Laffineur, P. P. Betancourt (ed.), Liège-Austin 1997, p. 407-412.

⁴⁵ Note that each of the three men designated *wa-na-ka-te-ro* in the PY E-series were specialist craftsmen, though this need not necessarily imply that all *ra-wa-ke-si-jo* men were such as well. Nevertheless, *e-u-me-ne* is recorded as a bronzesmith on **PY Jn 725.15** and such skills would be of use to the armourer’s work. The other two *ra-wa-ke-si-jo* men, namely *ru-ko-ro* and *ku-ro*, do not appear outside the **Ea** series (although Lejeune’s tentative restoration might identify *ru-ko-ro* as a craftsman on **An 1281.13** – see Table 2).

In this respect, it is relevant to note that the associated feminine singular form *ra-wa-ke-<si->ja* appears in what may qualify as another work-related context on Knossos tablet **As 1516**. It refers to a collective of 31 men who may have been specialist craftsmen⁴⁶ recruited from the local community to carry out a work assignment for the palace. At Pylos, the term *ra-wa-ke-si-jo* appears once outside of the **Ea** series seemingly qualifying another group of male specialists, though the precise meaning of the term *ma-ra-te-we* on **PY Na 245** is debated.⁴⁷

Hand 43

Another clue is provided by the tablet-writer responsible for the **Ea** series. This is Hand 43, who drew up only two other tablets in the surviving corpus of texts from Pylos:⁴⁸ tablet **An 207** records specific numbers of male workers such as gold-workers, sewing-men/leather-stitchers, sword-makers, potters and others, while **An 261** includes a list of 18 men, belonging to four separate *ke-ro-si-ja*, who have been interpreted as bronzeworkers called to carry out specialised work at the palace.⁴⁹ Hand 43's associations with skilled workers and workgroups is therefore suggestive with respect to the nature of the **Ea** series, specifically the possible *occupational* context surrounding its compilation.⁵⁰ Furthermore, given the *ra-wa-ke-ta*'s connection with the military sphere, it would not be surprising if craftsmen connected to his office were skilled in working with, producing and/or overseeing the production of leather, a great deal of which would have been used in the manufacture of the state's varied military equipment. Additionally, if the *ra-wa-ke-ta*'s identification as **we-da-ne-u*, one of the 'collectors' at Pylos (**Cn** series) is correct,⁵¹ his experience as a 'collector' in the sphere of livestock management would assist him in overseeing, or perhaps instead collaborating with, the

⁴⁶ P. CARLIER, "*QA-SI-RE-U et QA-SI-RE-WI-JA*", in *Politeia*, R. Laffineur, W.-D. Niemeier (ed.), Liège-Austin 1995, p. 355-365 (p. 359, 361-362); S. DEGER-JALKOTZY, "Working for the Palace: Some Observations on PY An 261", in *Studies Killen*, p. 65-81 (p. 74-75). For an alternative interpretation of these men as soldiers, serving perhaps as an elite personal bodyguard of the king at Knossos, see J. DRIESSEN, "Quelques remarques sur la 'grande tablette' (As 1516) de Cnossos", *Minos* 19 (1985), p. 169-193 (p. 190, 192-193).

⁴⁷ *DMic.* s.v. *ma-ra-te-we*. 'Sailors' is one of the tentative interpretations, none of them entirely satisfactory.

⁴⁸ See T. G. PALAIMA, *Scribes Pylos*, cit. (n. 8), p. 105-108.

⁴⁹ S. DEGER-JALKOTZY, "Working for the Palace", cit. (n. 46); P. CARLIER, "*QA-SI-RE-U et QA-SI-RE-WI-JA*", cit. (n. 46), p. 363; J. T. KILLEN, "Conscription and Corvée", cit. (n. 28), p. 77-81. With regard to **PY An 261**, *recto* 1-17 and *verso* 1-2 were the work of Hand 43, while Hand 1 entered the lines on *verso* 4-9.

⁵⁰ Indeed, the total number of approximately 36 males recorded in the **Ea** series, if accurate and not merely the result of an incomplete database, would represent precisely double the size of the workgroup enumerated by name on **An 261** by the same scribe, thereby potentially adding support to the notion that one or more specialist male workgroups, formed on the basis of sizes encountered elsewhere in the Pylian corpus (e.g., also **An 1282**), constituted a key motivation behind the compilation of the **Ea** series.

⁵¹ M. LINDGREN, *People*, cit. (n. 13), II p. 134.

four herdsmen in the **Ea** series and in the acquisition of animal hides thought to be associated with the series.

The setting

From an archaeological perspective, it is unclear if the tanning thought to be associated with the **Ea** series would have taken place in a built workshop or outdoors. The soaking of hides in water required at different stages of the process could have been carried out in pits or stone vats indoors or outside, or even in makeshift tanks built of stones set up in the shallow waters of springs, rivers or coastal sites.⁵² Wooden tables could be set up to facilitate other aspects of the work. Following the idea pursued in this study, namely that the personnel recorded together in the **Ea** series interacted with each other in the context of work, the mention of three leather-stitchers would suggest that some working of the finished leather occurred on site. The *ra-pte-ri-ja a-ni-ja* ‘reins with stitching work’ noted on **PY Ub 1315.2** might be the kind of items produced by these men. The recording of an armourer and a fitter might point, more specifically, to a portion of armour- and chariot-manufacture, both of which would have utilised leather, taking place in the same area. Perhaps tanning was carried out in an ‘industrial area’ characterised by a variety of workshops specialising in the manufacture and repair of military equipment, including armour and chariot parts.⁵³

A unique feature of the **Ea** series is the mention of a ‘fire-altar of Dionysos’:

PY Ea 102

di-wo-nu-so-jo , e-ka-ra GRA 2 T 6 [

⁵² R. J. FORBES, *Studies*, cit. (n. 1), p. 8, 19 (pits); K. ZARKIA, *Preindustrial Tanning*, cit. (n. 5), p. 11, 19 (by the water’s edge). It is interesting to note that speculations about the toponym reflected by *ti-no* have included Greek θίς, θινός ‘(sandy) beach, shore’, although the later Greek declension of the word argues against it. *DMic* s.v. *ti-no*. Regardless of the particular method used, water would have been required for the cleaning/washing and preparation of the hides (Stage 1), e.g., R. J. FORBES, *Studies*, cit. (n. 1), p. 18-19. Vegetable tanning would have required additional water for the repeated immersions in solutions of increasing intensity (Stages 1 and 2).

⁵³ The allative form *a-mo-te-jo-na-de* (**PY Vn 10**) ‘to the fitter’s/chariot workshop’ (see L. M. BENDALL, “A Reconsideration”, cit. (n. 6), p. 220 n. 209, with references) might refer to such a workshop, though not necessarily the one thought to be alluded to in the **Ea** series. It is unclear at present if, or how precisely, the single reference in the Pylian corpus to a fitter’s/chariot workshop whose location is not specified (**Vn 10**) and the single reference to a fitter (**a-mo-te-u* in the **Ea** series only) are to be connected. S. LUPACK, “The Northeast Building of Pylos and An 1281”, in *Colloquium Romanum*, p. 467-484, argues that the workshop of **Vn 10** was located at *ja-ke-si* (**PY An 1281.9**) generally restored as the locative of the toponym *po-ti-ja-ke-e* (p. 481-482). In fact, there may have been a number of such industrial establishments, including tanning sites, scattered throughout the kingdom. Ethnographic evidence certainly suggests that this would have been the case. As K. ZARKIA, *Preindustrial Tanning*, cit. (n. 5) notes, up until the mid-20th century, in pre-industrial Greece: “In most places, tanneries attracted those who practised similar occupations: rope-makers, cobblers, saddlers, shoe-makers...” (p. 6). Also, according to her figures from the early 1900s, the town of Ermoupoli (on Syros) and the island of Chios hosted about a dozen tanneries each (p. 42, 44).

The word *e-ka-ra* (ἐσχάρα) denotes portable braziers on **PY Ta 709**. Melena interprets the *e-ka-ra* on **Ea 102** as an altar for burnt offerings, perhaps hollowed out in the ground, noting that the word is used in later Greek, especially when accompanied by the name of a divinity, to mean ‘sacrificial hearth.’⁵⁴ It is tempting to consider whether this source of fire could have played a role in the hypothesised tanning operation. As noted earlier, processing animal skins/hides into leather by smoking was common in the prehistoric period.⁵⁵ It is at least possible, then, that the smoke issuing from the *di-wo-nu-so-jo e-ka-ra* was used in such a process. Perhaps once a certain number of skins/hides had been collected and prepared, they were treated together, using the smoke from Dionysos’ fire-altar.⁵⁶ Whether or not smoking was actually the method used, the presence of Dionysos’ altar could reflect the well-known Bronze Age Aegean connections between the religious sphere and craft production.⁵⁷ Still, the reason for the contribution expected in relation to this altar remains unclear.

The landholdings

Indeed, any interpretation of the **Ea** series must also take into account that it is fundamentally a series of landholding documents. How might the inherent issue of the contribution expected in connection with this land (presumably to be worked out by the palace authorities on the basis of the amount of seed grain GRA recorded against each parcel of land) be reconciled with the notion of a tanning operation?⁵⁸ A number of

⁵⁴ J. L. MELENA, *Textos Griegos Micénicos Comentados*, Vitoria 2001, p. 36-37; J. L. MELENA, “24 Joins and Quasi-Joins of Fragments in the Linear B Tablets from Pylos”, *Minos* 35-36 (2000-2001 [2002]), p. 357-369 (p. 357-360); M. DEL FREO, *I censimenti*, cit. (n. 16), p. 78-79. For ‘Dionysos’ as a theonym, see also FR. ROUGEMONT, “Les noms des dieux dans les tablettes inscrites en linéaire B”, in *Nommer les Dieux. Théonymes, épithètes, épicleses dans l’Antiquité*, N. Belayche et alii (ed.), Turnhout 2005, p. 325-388 (p. 332).

⁵⁵ I sincerely thank Eric Methven for his answers to my queries about the possible use of fire in the production of leather (email communication, 20 September 2009): the chemicals in the *smoke* generated by a fire ensure that the leather remains soft even after getting wet. See also notes 1-2 above.

⁵⁶ If the *di-wo-nu-so-jo e-ka-ra* constituted an indoor hearth, such as the one found in the Room with the Fresco at the Cult Centre at Mycenae, hides might be hung on a wooden frame above the altar for smoking or moved back and forth over a fire lit in a sunken smoke-pit (cf. Amerindian practices in W. GROENMAN-VAN WAATERINGE, M. KILIAN, H. VAN-LONDEN, “The curing of hides and skins”, cit. (n. 2), p. 887; R. J. FORBES, *Studies*, cit. (n. 1), p. 19-20). If outdoors, like the open air altar terrace at the site of Apollo Maleatas at Epidauros, makeshift enclosures might be set up around it to reduce windy draughts. For an overview of representative indoor and outdoor Mycenaean cult areas, see C. W. SHELMEARDINE, “Review of Aegean Prehistory VI: The Palatial Bronze Age of the Southern and Central Greek Mainland”, *AJA* 101 (1997), p. 537-585 (p. 570-576); S. LUPACK, “The Northeast Building”, cit. (n. 53), p. 477-479. The sacrificial offering (animal or other) associated with altars might have preceded the treatment of the hides.

⁵⁷ E.g., L. R. PALMER, *Interpretation*, cit. (n. 14), p. 230; I. TEGYEY, “The Northeast Workshop”, cit. (n. 8), p. 77-78. One could further speculate that a source of fire such as this could have been used in tanning to liquify beeswax or thickened oil (cf. oil in the perfume industry, C. W. SHELMEARDINE, *Perfume*, cit. [n. 32], p. 38-39).

⁵⁸ I thank Maurizio Del Freo, Dimitri Nakassis and Ruth Palmer for discussing this issue with me. I hope to explore this complicated matter in detail in future work. For the problems associated with determining

possibilities exist, each with additional questions to be addressed. At least two are worth noting at this stage. (1) First, it might be possible to view the two issues as separate: that is, (a) the land of the Ea series was allocated to individuals and therefore, as seems to be usual for land recorded in the palace's archives, incurred a levy, and (b) some of the men holding Ea plots were involved in tanning, whether or not this tanning operation was directly sponsored or supervised by the palatial administration. (2) Second, the contribution presumably expected by the palace for the use of the land registered in the Ea series may have been sought specifically in return for the opportunity afforded to these individuals to take part in what may have been a potentially lucrative enterprise for them. They may have been able to keep for themselves a portion of the leather or finished goods,⁵⁹ after they had helped to supervise the making of leather and supply the central authorities with an essential component of palace production. It might be relevant in this respect that *a-pi-a₂-ro*, a landholder in the Ea series (see Table 2), appears in a prominent position on **PY On 300.2** as the recipient of six hides (ideogram *154), potentially as payment⁶⁰ for services rendered to the state, whereas most other palatial officials on this text receive only two or three hides each. A supervisory role or other important function in the hypothesised tanning venture may have entitled *a-pi-a₂-ro* to a greater number of hides.

Given the textual evidence suggesting that some land was granted by the Mycenaean authorities in return for goods or services (e.g., rowing, bronze-working, flax-growing, etc.), the idea that the work in question - argued in this case to be tanning - might occasionally be carried out on that very land is not an entirely radical proposition.⁶¹ And, as noted earlier, some of the occupations recorded in the Ea series might suggest that further processing was also taking place here (e.g., leather-stitchers, garment-worker, fitter, armourer).

Discerning clear and meaningful patterns of leasing arrangements is extremely difficult given the characteristics of the tablet entries stressed at the outset, and most individuals in the Ea series seem to lease land *from* others as well as *to* others. Nevertheless, it may be significant that the four men clearly identified as overseeing, if not owning, animals, namely the oxherd, the swineherd and the two shepherds, do not themselves hold land *from* anyone else, apart from the *da-mo* (*pa-ro da-mo*). The lands leased out to others by these herdsman are either explicitly stated to be of *ke-ke-me-na*

whether land was owned by the palace or not and whether land-related contributions to the palace constituted rent or tax, see R. PALMER, "Models in Linear B Landholding: An Analysis of Methodology", in *Studies Killen*, p. 223-250 (esp. p. 240).

⁵⁹ Compare I. TEGYEY's suggestion ("The Northeast Workshop", cit. (n. 8), p. 71) that some contributors of animals may have expected to receive a share of the finished leather products manufactured from the hides of the animals that they supplied to the palace.

⁶⁰ E.g., D. NAKASSIS, "Reevaluating Staple and Wealth Finance at Mycenaean Pylos", in *Political Economies of the Aegean Bronze Age*, D. J. Pullen (ed.), Oxford 2010, p. 127-148 (p. 132). S. DEGER-JALKOTZY ("Noch Einmal zur Ea-serie", cit. [n. 21], p. 118) considers *a-pi-a₂-ro* to be a functionary, possibly of the rank of *ko-re-te* or *du-ma*, which are titles of other men on **PY On 300**.

⁶¹ Cf. J. T. KILLEN, "Mycenaean Economy", in *A Companion to Linear B. Mycenaean Greek Texts and their World*, Vol.1, Y. Duhoux, A. Morpurgo Davies (ed.), Louvain-La-Neuve 2008, p. 159-200 (esp. p. 177 n. 43).

type, and therefore probably *damos*-related, or otherwise more vaguely recorded in each case as an *o-na-to* of individual X's *ko-to-na* (**Ea 439, 800, 822, 825**) or an *o-na-to pa-ro* individual X (**Ea 109, 270, 481**). Could these 'herdsmen' be locals, or locally influential men, who assist in making these landholdings available to the tanners, supervisors and associated personnel, including perhaps lower-level general labourers (who might be invisible in the texts), during a short stay in the **Ea** locality, or for a longer period of time, as land on which to live, grow food, tend animals, produce and work leather, or all of the above, depending on the time of year?⁶²

The three largest landholders in the **Ea** series are *ke-re-te-u*, *sa-ke-re-u* and *ta-ra-ma-ta*.⁶³ *ke-re-te-u* holds a variety of lands, including one plot *e-ne-ka i-go-jo* 'on account of the horse' (**Ea 59.5**), perhaps as pasture for the animal – whether he supplied the horse or he was merely responsible for its maintenance is unclear;⁶⁴ the priest *sa-ke-re-u* is listed as a Potnian bronzesmith on **Jn 431.17**; and *ta-ra-ma-ta* has animals being watched over by shepherds in the **Ae** texts (see Table 2). Such men, whose larger holdings might reflect an elevated position,⁶⁵ may have had key responsibilities in connection with the **Ea** series. Two herdsmen, the 'shepherds' *mo-ro-go-ro* and *ko-do*, also had relatively extensive total landholdings.⁶⁶ Moreover, the 'oxherd' named *pe-re-go-no*, may have been the father of an *e-qe-ta* identified as *pe-re-go-ni-jo a-re-i-jo* on *o-ka* tablet **An 656.6**.⁶⁷ So a high status for these herdsmen cannot be ruled out. Still, the relative independence of such men with respect to the central administration remains unclear, as does the ultimate ownership of the animals under their supervision whose hides are thought to have ended up in the hypothesised tanning operation.⁶⁸

⁶² Traditionally, the best animal skins were acquired by tanners between August and November, before the arrival of ticks and other parasites during the autumn rains. K. ZARKIA, *Preindustrial Tanning*, cit. (n. 5), p. 17. Since the hides could be preserved temporarily (by salting and drying) and stored until they were worked into leather, it is impossible to know for certain at what time of the year Mycenaean tanning occurred. Whether it was a year-long activity or a seasonal occupation lasting only several months at a time is also unknown. Methods such as vegetable or mineral tanning (the use of which is possible but as yet not clearly confirmed as widespread for the Mycenaean period), which involve the repeated soaking of hides in solutions to achieve the required result, might take months, even a year. R. J. FORBES, *Studies*, cit. (n. 1), p. 8. Smoking would have required less time: the actual smoking over a fire might range from half a day to a week. W. GROENMAN-VAN WAATERINGE, M. KILIAN, H. VAN-LONDEN, "The curing of hides and skins", cit. (n. 2), p. 887.

⁶³ Overall, *ke-re-te-u* is the largest landholder recorded in the **Ea** series (with over GRA 15 in total), followed by *sa-ke-re-u*, the priest, and *ta-ra-ma-ta*, each with over GRA 6. M. LEJEUNE, "Analyse", cit. (n. 14), p. 111.

⁶⁴ E.g., S. DEGER-JALKOTZY, "Noch Einmal zur Ea-serie", cit. (n. 21), p. 114-115.

⁶⁵ For *ta-ra-ma-ta*, see P. DE FIDIO, "Palais et communautés", cit. (n. 15), p. 133; for *ke-re-te-u* see S. DEGER-JALKOTZY, "Noch Einmal zur Ea-serie", cit. (n. 21), p. 121.

⁶⁶ M. LEJEUNE, "Analyse", cit. (n. 14), p. 111.

⁶⁷ E.g., D. NAKASSIS, "Named Individuals and the Mycenaean State at Pylos", in *Colloquium Romanum*, p. 549-561 (p. 558-559).

⁶⁸ S. DEGER-JALKOTZY, "Noch Einmal zur Ea-serie", cit. (n. 21), p. 119, follows Lejeune in taking the adjective *ra-wa-ke-si-jo* on **Ea 822** to refer to the swineherd. This enables her to link the swineherd directly to the palace and to suggest, more generally, that the herdsmen (pl.) of the **Ea** series were managers of palatial herds. In the present study, the designation *ra-wa-ke-si-jo* is not seen to describe any of these four

Questions and Concluding Remarks

A fresh study of the precise types and amounts of land and leasing arrangements recorded in the **Ea** series might help to shed more light on the situation, despite the obstacles noted above. Another unresolved issue concerns the connection, if any, between the production and working of leather arguably associated with the **Ea** series and the leather items clearly mentioned on texts such as **PY Ub 1315** and **1318**, as well as the collection of animal hides recorded in the **Ma** taxation series.⁶⁹ Given the expertise required for high quality tanning, it is possible that while some animal hides arrived at the palace as fully processed leather, others may have arrived dry-salted so that full processing and quality control could be executed by choice tanners appointed by the palace. The overall number of leather-processing establishments, skilled tanners and leather-workers around Pylos and their relative independence from the palace is also unclear: e.g., was there a separation between palace-run operations and local ones and, if so, in which category would the **Ea** tanning operation belong? The earlier point about *a-pi-a₂-ro* receiving a larger number of hides (**PY On 300**) perhaps as a result of his service (**Ea** series) might suggest that it was a palace-supervised initiative. On the other hand, it is possible that locally influential men, who were not necessarily members of the palatial bureaucracy, controlled the operation, from which the palace benefitted. At present, the contextual associations of *a-pi-a₂-ro*, and other strong palatial links provided by both the *ra-wa-ke-si-jo* men (their designation is directly tied to a palatial official's title) and *e-u-me-de*, the unguent-boiler, who is elsewhere active in the palace-controlled perfumed oil industry, not to mention the palace's clear (archived) interest in the land, at least, of the **Ea** series, would seem to argue in favour of a high level of involvement, but not necessarily absolute control, of the palace.⁷⁰ The type of work that the producers and workers of leather may have undertaken in relation to the palace (e.g., *ta-ra-si-ja* 'working of raw materials into objects' and *o-pa* 'finishing' or refurbishment work carried out on previously manufactured items'⁷¹) and the extent of that work (full-time, part-time, etc.) are also issues to be explored.

herdsmen. Deger-Jalkotzy's proposal that they were not simple, low-status shepherds is accepted and affirmed (this is especially well reflected perhaps by their common trait, exclusive to their group, and not shared by even the *ra-wa-ke-si-jo* men, to lease land to, but not from, other individuals). Questions about their relationship to the palace and the animals they managed (were they the palace's or their own?) seem more difficult to answer.

⁶⁹ For instance, were the same incoming oxhides (ideogram *152) of the **Ma** series destined to be tanned in the work believed to be associated with the **Ea** series (if they were not already tanned) and also used in the manufacture of some of the items listed on **Ub 1315** and **1318**? While this is possible, the processing of hides could have followed any number of trajectories, the individual stages of which may not always be neatly reflected in the extant tablets.

⁷⁰ See discussions of P. DE FIDIO, "Centralization and its Limits in the Mycenaean Palatial System", in *Economy and Politics in the Mycenaean Palace States*, S. Voutsaki, J. T. Killen (ed.), Cambridge 2001, p. 15-24; C. W. SHELMEERDINE, "Industrial Activity", cit. (n. 7), p. 337 for range of possible relationships of workers to palace; J. T. KILLEN, "Mycenaean Economy", cit. (n. 61), p. 189-194.

⁷¹ For the distinction between the two systems, see J. T. KILLEN, "Mycenaean *o-pa*", in *Floerant*, p. 325-341 (esp. 331, 336, 338). See also M.-L. NOSCH, "More Thoughts on the Mycenaean *ta-ra-si-ja* System", in

For now, it is hoped that this paper has demonstrated that (1) the occupational designations in the Ea series plausibly associated, directly or indirectly, with the process of tanning and the leather produced by it (e.g., various herdsmen, an unguent-boiler, a hide-bearer, a wheelwright/fitter, etc.), (2) the regular involvement of men associated with the *ra-wa-ke-ta* in specialised work activities (e.g., **KN As 1516**, **PY Ea** *ra-wa-ke-si-jo* men, etc.), (3) the apparent preoccupation of Hand 43, the scribe of the **Ea** series, with skilled male crafts personnel (**PY An 207**, **An 261** and **Ea** texts), and (4) the likelihood that the **Ea** precinct was situated beyond the immediate vicinity of the settlement at Pylos, which would reflect the standard practice of carrying out tanning at a reasonable distance from densely inhabited centres, all make a possible link between the **Ea** series and leather production a hypothesis worthy of further investigation.

Fiscality in Mycenaean and Near Eastern Archives, M. Perna (ed.), Naples 2006, p. 161-182. The overall Linear B corpus furnishes evidence of the *ta-ra-si-ja* production system in relation to some bronzework, cloth production and chariot wheel manufacture. The *o-pa* system is represented in the 'fattening' of animals and in connection with cloth, chariots, wheels, weapons (javelins) and armour (corslets). *DMic.* s.v. *ta-ra-si-ja*, *o-pa*. Such systems may have operated in relation to leather production as well, but clear evidence of the relevant technical vocabulary in texts dealing specifically with leather products is currently lacking.

Table 1. Occupational designations recorded in the **Ea** series**Herdsmen**

- 2 shepherds – sing. *po-me* (named *mo-ro-qo-ro*, *ko-do*)
 1 oxherd – **qo-qo-ta* (named *pe-re-qo-no*)
 1 swineherd – *su-qo-ta* (unnamed)

Specialised craftsmen or personnel

- 3 leather-stitchers – sing. *ra-pte* (named *ti-ri-da-ro*, *e-ro₂-qo*, and *ze-pu₂-ro*)
 1 garment-worker – *e-pi-we-ti-ri-jo* (named *wi-ri-ja-no*)
 1 unguent-boiler – *a-re-po-zo-o* (named *e-u-me-de*)
 1 honey-man – **me-ri-te-u* (named **ku-ru-no*)
 1 ‘hide-bearer’ – *di-<pte->ra-po-ro* (named *o-ke-u*)
 1 ‘messenger’(?) – *a-ke-ro* (named *wa-tu-o-ko*)
 1 priest – *i-je-re-u* (named *sa-ke-re-u*)

Men designated *ra-wa-ke-si-jo*

- 1 ‘wheelwright’ or ‘fitter/joiner’ – **a-mo-te-u* (unnamed)
 (?) 1 ‘armourer’ – *e-[te-do-mo]* (named *ka-ra-pi*)
 1 man (named *e-u-me-ne*)
 1 man (named *ru-ko-ro*)
 1 man (named *ku-ro₂*)

Note: shepherds and oxherds occur elsewhere in the Pylian corpus, but the term ‘swineherd’ appears only in the **Ea** series. The craft-related terms also occur elsewhere, except for *e-pi-we-ti-ri-jo* ‘garment-worker’ and *me-ri-te-u* ‘honey-man’. Another *e-te-do-mo*, named *a-tu-ko* and described as *wa-na-ka-te-ro*, exists at Pylos (**En 609.5/Eo 211.2, Ep 301.5**), but the designation *ra-wa-ke-si-jo* occurs only in the **Ea** texts and tablet **Na 245**, and the term **a-mo-te-u* ‘wheelwright/fitter’ is unique to the **Ea** series.

Table 2. Names attested in the **Ea** series and elsewhere in the Pylian corpus

| Name | Ea series | | Other texts |
|------------------------------|--|-------------------------|---|
| <i>o-pe-te-re-u</i> | Ea 805 | | Eb 294, Ep 704.1 |
| <i>ti-ri-da-ro</i> | Ea 28, 460, 754 | <i>leather-stitcher</i> | |
| <i>e-ro₂-qo</i> | Ea 29, 325, 813 | <i>leather-stitcher</i> | |
| <i>ze-pu₂-ro</i> | Ea 56 | <i>leather-stitcher</i> | |
| <i>wi-ri-ja-no</i> | Ea 52 | <i>garment-worker</i> | |
| <i>wa-tu-o-ko</i> | Ea 136 | <i>messenger(?)</i> | |
| <i>*ku-ru-no</i> | Ea 801 | <i>honey-man</i> | |
| <i>o-ke-u</i> | Ea 259, 814 | <i>'hide-bearer'</i> | |
| <i>e-u-me-de</i> | Ea 773, 812, 820 | <i>unguent boiler</i> | Fr 1184.2 |
| <i>ka-ra-pi</i> | Ea 808 | <i>armourer</i> | |
| <i>ku-ro₂</i> | Ea 814 | | |
| <i>ru-ko-ro</i> | Ea 132, 782, 799, 823, 882, 1424 | | ? |
| <i>e-u-me-ne</i> | Ea 757, 822 | | Jn 725.15 |
| <i>ke-re-te-u</i> | Ea 59, 304, 305 771, 800, 806, 809, 827 | | Na 565(?) |
| <i>sa-ke-re-u</i> | Ea 56, 304, 756, 776 | <i>priest</i> | Jn 431.17 |
| <i>pe-re-qo-no</i> | Ea 270 | <i>oxherd</i> | Jn 605.10, 725.3 |
| <i>i-ma-di-jo</i> | Ea 29, (816), (827) | | Cn 436.5; Jn 310.15 |
| <i>a-pi-a₂-ro</i> | Ea 109, 270, 922 | | An 192.1; On 300.2; Qa 1297 |
| <i>du-ni-jo</i> | Ea 59.7, 811 | | Ae 8, 72, 264; An 192.3, .5; Eb 169, Ep 705.3; On 300.6; Fn 79.3(?); Un 138.1. |
| <i>ta-ra-ma-ta</i> | Ea 336, 778, 821, 825 | | Ae108, 134, 489; Vn 851.3 |
| <i>ko-do</i> | Ea 71, 754, 803, 824, 825 | <i>shepherd</i> | Vn 130.11 |
| <i>mo-ro-qo-ro</i> | Ea 439, 782, 800, 817 | <i>shepherd</i> | |

Note: texts in boldface are believed to record the same individual as in the **Ea** series. See also Lejeune's list (M. LEJEUNE, "Analyse du dossier pylien Ea", *Minos* 15 (1974 [1976]), p. 93) which includes a tentative restoration of *ru-ko-ro* on one tablet outside of the **Ea** series (**An 1281.13**).