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## Mobility to, from and within Neopalatial Crete: The Evidence from the Sealings

### ABSTRACT

This paper focuses on the occurrence of sealings impressed by the same seal faces or by very similar seal faces at different archaeological sites in LM I. Sealings are small clay lumps impressed one or more times with one or more seal faces, and at times inscribed with Linear A signs. Such a sealing system was aimed at controlling the mobilization of resources and goods. The existence of a dense network of inter-regional trade in the Neopalatial Period is indeed well documented by the overall evidence from the material culture. Since impressions left on clay nodules by the same seals or by very similar seals occur on different types of sealing found in different sites in Crete (Knossos, Sklavokambos, Hagia Triada, Gournia, Zakros, and Chania) and outside Crete (Akrotirion on the island of Thera), we can argue that the inter-regional trade was, at least in part, managed by one or more central administrations. The aim of this paper is to clarify this last point and address the issue of whether or not we can infer the existence of diplomatic and legal bonds between the Knossos Palace and the other main Aegean settlements from the sealings.

KEYWORDS: Seals and sealings, "Replica rings", Neopalatial administrative practices

### 1. INTRODUCTION

Sealings, either as free-standing documents, or as labels fastened to objects, could be moved in various ways across the Aegean. Impressions left on clay nodules by the same seals or by very similar seals occur on different types of sealing found at different sites in Crete and outside Crete (Knossos, Sklavokambos, Hagia Triada, Gournia, Zakros, Chania, and at Akrotiri on the island of Thera). Most of these seal impressions come from LMIB archaeological contexts, only those found at Akrotiri dating back to LM IA (Karnava 2010). Unfortunately, evidence from Knossos is scanty and of uncertain chronology.

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\* The study I am presenting here is part of a wider research project, which I am currently carrying out at the Institute for Classical Archaeology of the University of Heidelberg, thanks to the generous support of the Alexander von Humboldt Foundation. It is my pleasant duty to thank the Institute for their hospitality, as well as for the permission to reproduce images, whose copyright belongs to the archive of the *Corpus der Minoischen und Mykenischen Siegel*. I must also express my keen gratitude to Dr. S. Mandalaki, director of the Archaeological Museum of Heraklion, for granting me permission to study and reproduce material housed in the Museum, and Dr. G. Flouda, curator at the Archaeological Museum of Heraklion, for collecting the material which I requested and for facilitating my work there. Finally, I must gratefully thank the director of the Italian School of Archaeology at Athens, Prof. E. Greco, for allowing me to study unpublished field notes of the Italian excavations at Hagia Triada.

As will we see in the next section, the vast majority of identical impressions occurring at different sites were left by gold signet rings. Although the practice of multiple copies of the same seal, in use for long periods of time (even centuries), is attested in the Ancient Near East (Collon 2010, 128-129), and although in general it is hazardous to claim that similar mud impressions were made by a single original (James 1968, 51), studies carried out by the CMS team, and based on X-ray photography, established that casting rings from the same mould was not a LM I practice. The oval bezel plates were first hammered into shape and then motifs were executed entirely by hand. Therefore, two identical gold signet ring impressions are always left by one and the same ring, and not by two identical rings cast from the same mould (Krzyszowska 2005, 131). If we accept this, we should dismiss the conventional label “replica rings”, which entered the literature before the results of such studies (Betts 1967, 25-26).

However, we also have impressions left by two or even three different, although very similar seals (either signet rings or stone seals), which are traditionally referred to as “look-alikes” (Weingarten 1986a, 290). As other scholars have suggested, they might have been purposely fabricated to reflect the same high-ranked group, or political high authority (Weingarten 2010, 411).

The focus of this paper, however, is not on the seals themselves, but on the clay documents which bear such recurring seal impressions. My aim here is to show what we can infer about the nature of this dense network of inter-regional relationships from the use and function of each sealing type.

### 2. REVIEW OF THE EVIDENCE

The same ring, with a battle or hunt scene,<sup>1</sup> impressed five Flat-based nodules found at Hagia Triada (CMS II.6 No. 15) and two Single-hole hanging nodules from Knossos (CMS II.8 No. 279) (Fig. 1).

Several Flat-based nodules found at three different sites feature the impression left by a gold signet ring featuring a chariot with two horses: two come from Hagia Triada (CMS II.6 No. 19), four from Sklavokambos (CMS II.6 No. 260) and three from Akrotiri (CMS V Suppl. 3,2 No. 391) (Figs. 2 and 3).

A gold ring with a bull-leaper moving over the head of the bull is attested on three Flat-based nodules: one found at Hagia Triada, one at Sklavokambos, and one at Gournia (CMS II.6 Nos. 44, 162, 255) (Fig. 4).

The impression from another ring with a bull-leaping scene is attested on three Flat-based nodules found at Hagia Triada (CMS II.6 No. 43), and on two Flat-based found at Sklavokambos (CMS II.6 No. 259), as well as on two *Noduli*, one from Gournia (CMS II.6 No. 161) and the other from Zakros (CMS II.7 No. 39) (Fig. 5 and 6).

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<sup>1</sup> The scene is interpreted as a battle (an armed male figure chases a running male figure) in CMS II.6 No. 15, but the possible presence of a dog would fit better with a hunt scene, as correctly noted by R. B. Koehl during the discussion at the end of my talk.

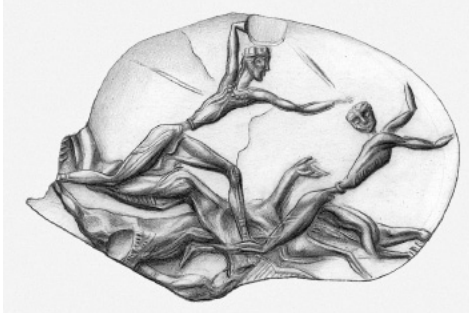


Fig. 1. Drawing of seal face CMS II.6 15 = CMS II.8 No. 279 (courtesy of the CMS Archive, Institut für Klassische Archäologie, Heidelberg Universität).

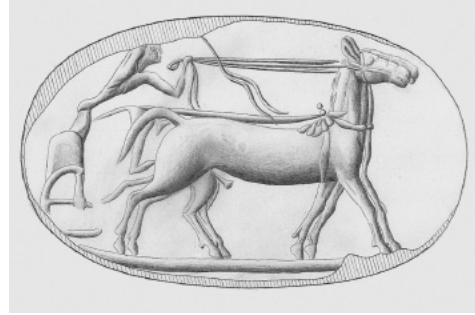


Fig. 2. Drawing of seal face CMS II.6 No. 19 = CMS II.6 No. 260 = CMS V Suppl. 3,2 No. 391 (courtesy of the CMS Archive, Institut für Klassische Archäologie, Heidelberg Universität).



Fig. 3. Two Flat-based nodules from Sklavokambos with Seal impression CMS II.6 No. 260: from top to bottom and from left to right HMs 632, upper and lower face, and 635, upper and lower face (courtesy of the Archaeological Museum of Heraklion).

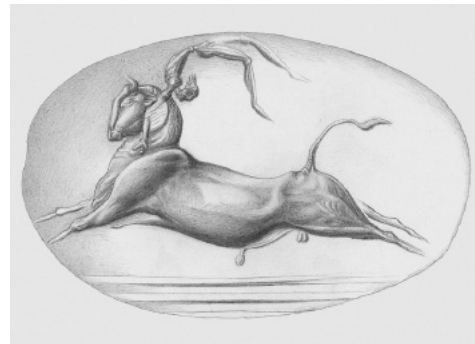


Fig. 4. Drawing of seal face CMS II.6 No. 44 = CMS II.6 No. 162 = CMS II.6 No. 255 (courtesy of the CMS Archive, Institut für Klassische Archäologie, Heidelberg Universität).

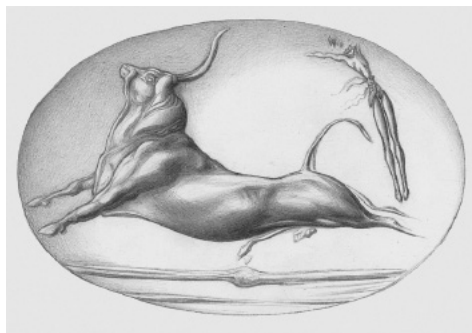


Fig. 5. Drawing of seal face CMS II.6 No. 43 = CMS II.6 No. 259 = CMS II.6 No. 161 = CMS II.7 No. 39 (courtesy of the CMS Archive, Institut für Klassische Archäologie, Heidelberg Universität).



Fig. 6. Flat-based nodule HMs 499 from Hagia Triada with seal impression CMS II. 6 No. 43. Upper face on the left, and lower face on the right (courtesy of the Archaeological Museum of Heraklion).

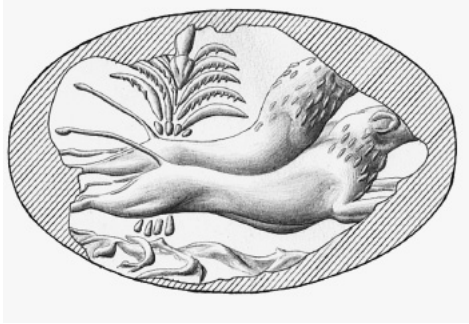


Fig. 7. Drawing of seal face CMS II.7 No. 71 = CMS II.8,2 No. 298 (courtesy of the CMS Archive, Institut für Klassische Archäologie, Heidelberg Universität).

A ring with two lions impressed on a Flat-based nodule found at Hagia Triada (Fig. 71980), two T-H hanging nodules found at Zakros (CMS II.7 No. 71), and three different nodule types at Knossos (CMS II.8,2 No. 298): one Two-hole hanging nodule, one Direct object nodule, and one Object-string nodule (*Objektschnurplombe*) (Fig. 7). I must stress that nodule Fig. 71980 was published by D. Levi among the sealings from Hagia Triada and not among those from Zakros (Levi 1925-1926, 145, No. 146). From my point of view, we have no reason to call this into doubt and presume that this nodule was instead found at Zakros, as suggested in CMS.

Flat-based nodules found at Hagia Triada, Sklavokambos, Zakros, Chania and Akrotiri are also linked by look-alike bull leaping scenes (CMS II.6 Nos. 41 and 258, CMS II.7 No. 36, CMS V Suppl. 1A No. 171, CMS V Suppl. 3,2 No. 392) (Fig. 8). And it may be no coincidence that at Hagia Triada this look-alike motif (CMS II.6 No. 41) occurs on the same Flat-based nodule in combination with the chariot ring (CMS II.6 No. 19) previously mentioned, since both may represent Knossian high-ranked officials and the nodule might have been sent from Knossos to Hagia Triada.



Fig. 8. From left to right: drawing of seal face CMS II.6 No. 41, CMS II.6 No. 258, CMS II.7 No. 36, CMS V Suppl. 3,2 No. 392 (courtesy of the CMS Archive, Institut für Klassische Archäologie, Heidelberg Universität).

Further to the evidence from the signet rings, I would also like to add the nodules impressed by stone seals. We do indeed find the same stone seal face featuring a bovine on four inscribed Single-hole hanging nodules: one from Zakros (CMS II.7 No. 45), and three from Hagia Triada (CMS II.6 No. 68). Moreover, the clay is apparently the same and Linear A sign \*03, corresponding to Linear B *ro*, is incised both on the nodule from Zakros (ZAWa 36) and on two of the three nodules from Hagia Triada (HT Wa 1117-1118). In CMS it is suggested that all four of these hanging nodules were actually found at Hagia Triada, but one was stored by mistake with the material from Zakros in the Archaeological Museum of Heraklion. Against this hypothesis I would highlight the fact that F. Halbherr mentions only three sealings with this seal motif from his excavation of



Fig. 9. Drawing of seal faces CMS II.6 Nos. 104 and 105 (courtesy of the CMS Archive, Institut für Klassische Archäologie, Heidelberg Universität).

the Hagia Triada Villain 1902 (Halbherr 1903, 36, no. 13, pl. V.4.1). In theory it is possible that a fourth nodule with the same seal motif was found during the 1903 excavation, when the nodules were not as accurately published as in the previous year. Nevertheless, the Doro Levi catalogue of the seal impressions from Hagia Triada mentions only two sealings with this motif (Levi 1925-1926, 108, No. 76). This is obviously incorrect, but it is possible that D. Levi recognised this seal face with certainty only on two nodules, because the third seal impression was not clear to him, since F. Halbherr, in his (unpublished) field note of 1902 (p. 35, No. 16), had also suggested that these three sealings (CMS II.6 No. 68) were perhaps not impressed by the same seal, but by two similar seals. To sum up, on the one hand we lack documentary evidence to prove the hypothesis that Single-hole nodule CMS II.7 No. 45, which is labelled in the Heraklion Museum as a Zakros finding, was actually found at Hagia Triada, and, on the other, it is perfectly acceptable that it hung from a commodity or document sent from Hagia Triada to Zakros in LM IB.

Finally, a Flat-based nodule found at Hagia Triada shows two seal impressions (CMS II.6 Nos. 104 and 105), whose iconographic style is peculiar to the so-called “Zakro Master” (Weingarten 1983, 173) (Fig. 9). These two seal faces are not otherwise attested, but it seems safe to say that these seals were produced in Zakros. However, only clay analysis would be able to establish if the sealing was sent from Zakros to Hagia Triada.<sup>2</sup>

### 3. INTERPRETATION OF THE EVIDENCE

The phenomenon of the occurrence of same ring impressions at different sites is explained by many scholars with the circulation of documents and officials sent by the Knossos Palace to peripheral areas that fell under its political and economic control (Weingarten 2010). This can also be regarded as one of the main elements proving the political unification of Crete in the Neopalatial period under the reign or the ring of King Minos, as one might say. In order to assess the evidence for this, I would like to contribute by adding some comments regarding the function of the sealings on which we find the same seal impressions at different sites.

I will start with the sealing type that we have most frequently met during the review of the evidence: the so-called Flat-based nodule. It is a little clay lump of about 2 × 1.5 cm, whose

<sup>2</sup> Although it is known that, in the Ancient Near East, deposits of special clay, usually fine and plastic, were exploited and the clay was shipped and sold for use as sealings (Frye 1989), the combination of two factors – clay analysis and seal impressions – would prove that the sealings were shipped, and not the clay or just the seals.



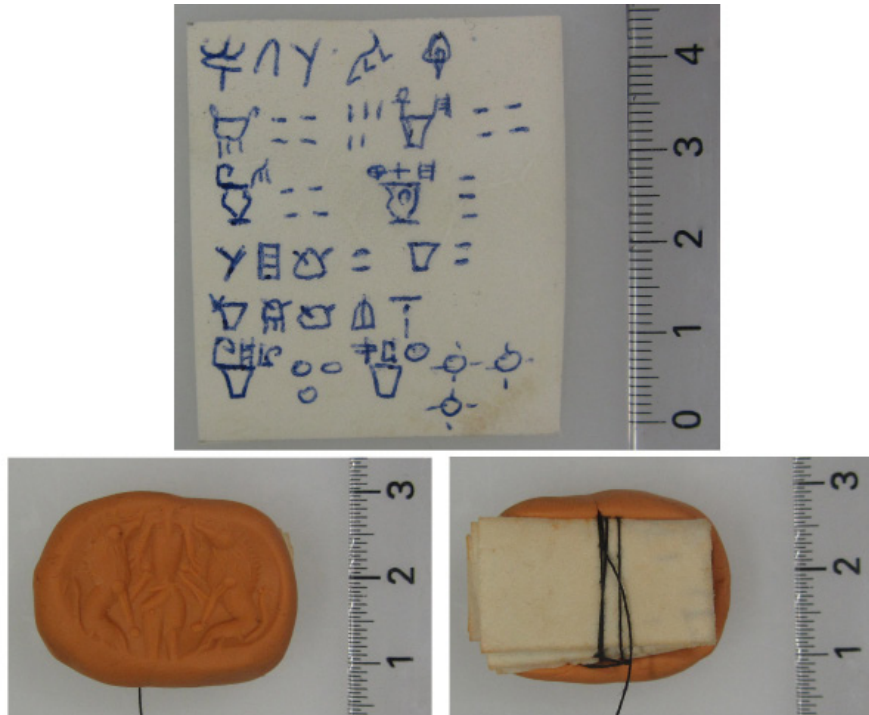


Fig. 10. Suggested reconstruction of a possible Linear A parchment document, subsequently folded up and wound with a thread, finally sealed with a clay nodule and impressed by a seal. Since I did not have any reproduction of Neopalatial signet rings, for this experiment I used a reproduction of LM II-III A1 stone seal CMS XI No. 177 (courtesy of the CMS Archive, Institut für Klassische Archäologie, Heidelberg Universität).

main characteristic is the negative impression on its reverse, which shows traces of fairly thin threads. Some scholars believe these nodules were attached to leather strips arranged along the lower margin of a written document, as with medieval parchment documents (Weingarten 1983, 40-41). In this case, the documents could be almost any size and could be imagined to be legal and/or diplomatic documents sent by the Knossos Palace to second-order administrative centres.

Nevertheless, this hypothesis no longer appears sustainable after careful observation of the traces detectable on the reverse of these nodules (Hallager 1996, vol. I, 135-145; CMS II.6, 349-360, 367-68; Krzyszkowska 2005, 155-158). The silicone casts held in the CMS archive reveal that the Flat-based nodules were pressed against folded pieces of small, thin, lightly worked leather, around which the thread was wound. Practical experiments show that the size of these worked leather sheets, folded and wound up like small packets, could range from approximately  $2 \times 2$  cm to  $6 \times 6$  cm, and, therefore, that they were likely to be short written documents (Fig. 10). Moreover, we must mention a sealing from Roman Sri Lanka, whose shape and imprints on the base are very similar to those of the Flat-based nodules and which likely served to secure a document on several layers of folded palm leaves (Müller 2005b, 250, pl. 2c-e). Nevertheless, this comparison is not overly informative, since we have no idea of the contents of this sealed document. To sum up, even if we cannot completely rule out another possibility, i.e. that they were packaging for precious powders, we cannot definitely rule out that Flat-based nodules

sealed long or medium-sized parchments, such as legal or diplomatic documents. Therefore, we can argue that we are likely dealing with short travelling messages, but what was their content?

W. Müller has suggested that they were short delivery notes, which accompanied shipments of commodities (Müller 2005a, 788). If we combine this suggestion with the idea that they were sent by the Knossos Palace, it seems to me that the overall frame begins to creak. On the one hand, we are, in fact, dealing with documents authenticated by gold signet rings, which are thought to be used by high Knossian officials; on the other hand, these documents are thought to be simple delivery notes.

Furthermore, as noted by W. Müller, Cretan Flat-based nodules are largely intact and this indicates that the “packets” could have been easily removed by careful cutting of the threads. At this point I would like to try to reconstruct a narrative, based on the hypotheses so far suggested. A good candidate for the setting is Akrotiri, because we know that the 75 Flat-based nodules found in room 18 of House Δ originated in Crete, possibly in Knossos (Doumas 2000; CMS V Suppl. 3, 2, 568; Karnava 2008; Goren and Panagiotopoulos 2009). We can therefore imagine a Cretan ship with quite a varied cargo arriving at the island of Thera. At the port, appointed people from Akrotiri pick up commodities and their delivery notes. Here the first issue arises: how can they recognise the still-sealed delivery note corresponding to the specific commodity (or set of commodities) they were picking up? Could the documents be opened at the port? Finally, how were documents and sealings archived once they reached their final destination (i.e. room 18 A of House Δ)? Should we imagine that the document and its sealing were placed next to one another, in order to maintain the connection between the document and its authentication device?

Having reviewed sealed documents in perishable material from Antiquity until the Middle Ages, I can say that most of them are legal documents and letters, whereas lists and accounts rarely show seal impressions. Among the latter, an Egyptian Early Middle Kingdom account is particularly interesting: for dispatch the papyrus document was folded twice along its length and twice laterally, the resulting packet being approximately 9.5 cm by 3.0 cm, and finally tied up with linen threads passing through a small unbacked clay sealing (James 1968). Another informative parallel for our area of concern is found among the Bactrian parchment documents from Northern Afghanistan, which date to the Sasanian Period (late 3<sup>rd</sup> cent. A.D. - 7<sup>th</sup> cent. A.D.). In general, Sasanian lists and accounts, although written on parchment, are not very different to those on Aegean clay tablets. As an example I can mention text af. It measures 5.5 × 10 cm, is made up of four lines on the *recto*, plus traces of script on the *verso*, and is not sealed (Sims-Williams 2000, 20-21; Sims-Williams 2012, 18, pl. 110b). For the convenience of the reader, provided below is the translation by N. Sims-Williams (Sims-Williams 2000, 156):

*From Astakhirs, (from) Tetuk: two men.*

*From G[...]: one [man].*

*From Muzda-mareg: one man.*

*From Pushey: one man.*

*From Khwarm-yoz: one man.*

*From Mihrbaman: one man.*

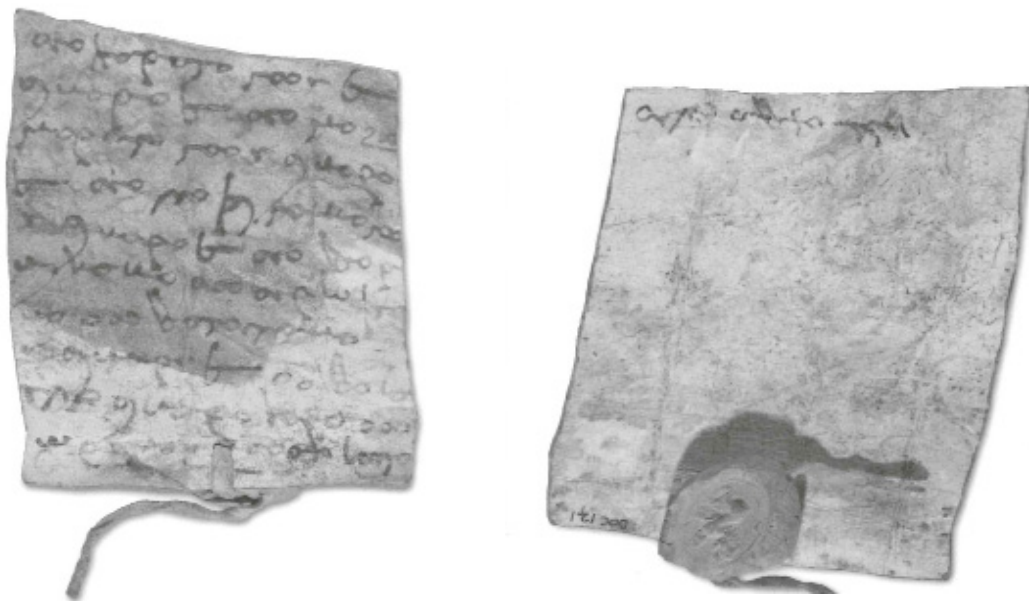


Fig. 11. Bactrian account document aj with seal impression  
(after Sims-Williams 2012, pl. 114).

Also included among such texts is aj, a rare example of accounts, showing one sealing attached to the bottom of the document with a thong through a hole pierced close to the lower margin (Sims-Williams 2000, 21; Sims-Williams 2012, 19, pl. 114). This is a list of payments for animals supplied by various named persons. The thong protruding from the sealing is long enough to be tied round the document, although the sealing only serves to authenticate the document, not to seal it (Fig. 11). Here follows the translation by N. Sims-Williams (Sims-Williams 2000, 160):

*From Kharag, one cow: one dinar.*

*From Muzda-mareg, a cow: one dinar.*

*From the Pushigan (family), a cow: one dinar.*

*From the Burnikan (family) and the Asroshan (family) and the Bagaspan (family),... : one dinar.*

*And for the horse: 10 dinars.*

*And the levy of Ormuzd together with Yat-asp.*

Based on the overall evidence, I currently think that the hypothesis that Flat-based nodules sealed short commercial letters/documents, such as lists of payments (obviously without the money), is the most likely. This does not necessarily imply that they accompanied shipments of commodities; it is also possible that they contained economic agreements, and that they were archived closed, to be opened in case of dispute.

Moving on to the second most attested sealing type bearing impressions from the same seals at different sites: the hanging nodules. They too are small clay lumps, about 2 cm in length, characterised by one or two holes which clearly show that they were fastened to a string or cord, although, at the current stage of our knowledge, it is not possible to prove definitively whether the strings were tied on as labels or tags to documents in perishable materials, and/



or to containers and commodities (Montecchi 2015, 63-64). The contents of such possible documents are obviously disputable, but again we cannot stray far from the field of accounting and commerce. After a closer examination of the clay of the sealings, it is now largely accepted that they were tied to something which, at least at times, was meant to be moved from one site to another, even over a long distance (Müller 2005a, 789).

In general, the clay of the hanging nodules does not always seem to be the same and come from the same area, namely Knossos. The vast majority of the hanging nodules have been found at Hagia Triada and Zakros, and the clay seems to differ not only between the two sites, but also among the pieces found at the same site (Hallager 1996, vol. I, 163-165). This would mean that some hanging nodules were locally produced and others not; however, it would be necessary to carry out non-destructive laboratory analysis in order to verify this suggestion.

As we have seen, impressions from the gold signet ring with a bull-leaping scene are attested on both Flat-based nodules and two *noduli* found at two different sites. The *nodulus* is a disk or dome-shaped small piece of clay. All are impressed by a seal up to three times, and a few are also inscribed. *Noduli* were not fastened to anything, meaning that they functioned as independent documents. They resemble Ancient Near Eastern and, even more closely, Hellenistic-Roman tokens (Müller 2005b, 250, pl. 2a-b).

So far three main hypotheses have been formulated regarding their function. The first postulates that they acted as docketts, i.e. receipts handed out by a central administration in return for occasional work or delivered commodities, to be exchanged later for rations or other payment (Weingarten 1986b, 17-21; Hallager 1996, vol. I, 130-133; Hallager 2002, 107-108). We can also envisage a variant of this hypothesis, in order to avoid postulating that *noduli* represented rations or payments corresponding to a specific amount of working hours or delivered items: they might work as vouchers given by the central administration to certain people on special occasions to be exchanged for agricultural commodities, i.e. a function similar to the Roman *tessera frumentaria* and *nummaria* (McLean 2002, 203, n. 115). The second hypothesis is that they acted as credentials for travellers for safe passage in their travels (Weingarten 1990, 19-20, n. 7). This last possibility may be encouraged by comparison with the Egyptian military *noduli* found at some Middle Kingdom Egyptian fortresses, which are thought to be passes in the Egyptian military establishment related to monitoring the local populations (Foster 2010, 200). Finally, since they were found both in central and common buildings, in store rooms as well as in archives, they could be simple counting and record-keeping devices, a kind of receipt for outgoing and/or incoming goods, including human resources (Montecchi 2015, 61).

Linear A inscriptions, which occasionally appear on the *noduli*, include ideograms, fraction signs, and syllabic groups. Some of these syllabic groups also occur on lists of personnel written on clay tablets. This is the case with *PA-TA-NE*, a syllabic sequence which occurs on a *nodulus* (HT We 1019a) and on a tablet (HT 94b.1), both from Hagia Triada. On the obverse of the tablet people are recorded along with agricultural commodities (Montecchi 2011, 120-125). On the reverse, we have two lists of syllabic groups followed by the number 1. The first list, which includes *PA-TA-NE*, is introduced by the word *KI-RO*, probably meaning something like “deficit”, and ends with the word *KU-RO* followed by a number which corresponds to the sum of the previous entries (5).

The second list is introduced by sign \*86, which also appears on the obverse of the tablet and likely represents a group of people. Therefore we can argue that they are two lists of personal names and that the first records absent persons, including *PA-TA-NE*. If we add this piece of evidence to that from the so-called “*replica rings*”, the idea that *noduli* were control devices which travelled, at least within Crete, along with commodities and people, becomes stronger.

Finally, we come to the last sealing types we met during our review of the evidence: the object-string nodule and the direct object nodule from Knossos. As the name suggests, both were fastened to commodities, with or without a string. The precise find-spot and, consequently, the chronology of these nodules found at Knossos are not known. In any case, the object-string nodule is not a Neopalatial but a Mycenaean sealing type (Panagiotopoulos 2014, 114-116, fig. 47). Thus it can be suggested that the ring which impressed one Flat-based nodule found at Hagia Triada, two hanging nodules found at Zakros, as well as the direct object nodule and the object string nodule we have just mentioned, was active for a long period at Knossos, even after the end of the Neopalatial period. This could be considered to speak in favour of its possible Knossian origin.

#### 4. CONCLUDING REMARKS

To sum up, according to the current dominant theory, all the Neopalatial administrative centres would have been connected centrally under Knossos, as a sort of hub and spoke system (*inter al.* Betts 1967, 15-40; Hallager 1996, vol. I, 219; Weingarten 2010, 411). Even if we do not have any of the gold signet rings which impressed the clay lumps at different sites, they are generally thought to have been produced in Knossos and to represent Knossian officials.<sup>3</sup> The results of the clay analyses do indeed show that all originated in North-Central Crete, except for one in the Hagia Triada region (Goren and Panagiotopoulos 2009).

Nevertheless, it seems to me that the overall evidence shows a more complex network than this. First of all, the vast majority of nodules bearing identical seal impressions come from sites other than Knossos. Of course, this is also thanks to the fortuity of the circumstances which allowed the preservation of the material, therefore this prevents us from reaching secure conclusions based on the available evidence. Nonetheless, we can only discuss what we have, and this shows stronger connections between several Cretan sites, rather than between each of those sites and Knossos. In other words, I think, the evidence allows us to see beyond the power of Knossos a dense network of inter-regional administrated trade.

Even if we lack a monumental “royal” iconography, I am personally sceptical about the peer-polity interaction model, at least in its pure form (Cherry 1986), because of the abstract and depersonalised structures it implies. Moreover, it seems to me anachronistic and unrealistic to separate cultural domination from political authority (Vansteenhuyse 2011, 71), therefore it is not my intention to minimise the wealth and the consequent power of the Knossos Palace, whose size and monumentality are plain to see,<sup>4</sup> or to overestimate the political role played

<sup>3</sup> See the contribution by N. Becker in this Congress.

<sup>4</sup> It is also worth remembering that the site of Knossos, with its relatively small material territory, would have needed to exploit available resources in the neighbouring sites to achieve its wealth (Vansteenhuyse 2011, 69-70).

by other smaller sites in the Neopalatial period simply because their archives have chanced to be better preserved. Rather, I would like to point out that the pattern of distribution of the commercial tags which have reached us is not very informative about political issues. However, it does add evidence for an increase in the trade network and economic inter-site relationships (also Schoep 1999, 214, n. 71), both within Crete and between Knossos and Hagia Triada on the one hand, and with Akrotiri on the other.

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