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EDITED BY

PETAR HR. ILIEVSKI
Macedonian Academy
of Sciences and Arts

and

LJILJANA CREPAJAC
University of Belgrade

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Thomas G. Palaima

MYCENAEAN SEALS AND SEALINGS IN THEIR ECONOMIC AND ADMINISTRATIVE CONTEXTS*

Abstract: This paper attempts to interpret the function of sealings as record-keeping devices within the overall Mycenaean economic and administrative systems. It is crucial to an understanding of Mycenaean bureaucratic methods to explain why Mycenaean sealings were more limited in their apparent applications and types than Minoan and Near Eastern sealings. It is suggested, *inter alia*, that sealings at Mycenaean palatial centers may have served as fundamental contractual and performance records within a tightly controlled economic system based on a three-tiered chain of control focused on the palaces and their officials.

I would like to make clear why it is appropriate to discuss sealings, uninscribed as well as inscribed, at a colloquium devoted to the interpretation, analysis and general evaluation of texts written in the Mycenaean and Aegean scripts. The main reason is that Mycenaean seals and sealings served primarily administrative and economic purposes similar to those of the overwhelming majority of documents

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CMS: *Corpus der minoischen und mykenischen Siegel*, Berlin, 1964—;

GORILA: L. Godart, J.-P. Olivier, *Recueil des inscriptions en linéaire A*, vols. 1—4, Paris, 1976—;

PCA: C. W. Shelmerdine, T. G. Palaima, *Pylos Comes Alive: Industry and Administration in a Mycenaean Palace*, New York, 1984;

Res Mycenaee: A. Heubeck, G. Neumann, *Res Mycenaee*. Akten des VII. internationalen mykenologischen Colloquium in Nürnberg vom 6.—10. April 1981, Göttingen, 1983;

SaS: McG. Gibson, R. D. Biggs, *Seals and Sealings in the Ancient Near East*, Malibu, 1977;

Sphrag.: I. A. Papapostolou, *Tà Σφραγίσματα τῶν Χανίων*, Athens, 1977;

Studies: M. A. Morrison, D. I. Owen, *Studies on the Civilization and Culture of Nuzi and the Hurrians*, Winoka Lake, Ind., 1981;

ZM: J. Weingarten, *The Zakro Master and His Place in Prehistory*, Göteborg, 1983.

References to Minoan-Mycenaean sites follow the standard abbreviation scheme of GORILA and Linear B corpus volumes.

in the Aegean linear scripts¹. Seals and sealings in Linear B society also resemble Linear B writing on clay in having a relatively narrower range of applications when compared to the wider applications of seals and sealings, and writing, throughout the history of many civilizations in the ancient Near East². As in the Near East, the administrative and practical, economic functions are to be emphasized. In Mesopotamia in the millennia between the Late Uruk and Seleucid periods, "aside from writing, sealing was the most important part of the controlling mechanisms of the economy"³. The same can be said of seals and sealings in the Minoan-Mycenaean world, where proposed non-sphragistic uses of seals, when not idiosyncratic scholarly chimeras, must be considered secondary and in no way irreconcilable with the primary, sphragistic functions⁴.

¹ Of the many classes of Linear A and Linear B inscriptions, only Za, Zc, Ze, Zf, Zg, all Linear A (GORILA 4, xx), contain inscriptions which were most probably not used for economic or administrative purposes. These texts make up an extremely small percentage of the current Minoan-Mycenaean corpus: 40 of 6166 inscriptions (0.65%).

² For Aegean scripts generally we lack evidence that would parallel the legal, diplomatic and even literary uses of seals in the Near East. However, this may be due to the restricted nature of the Linear B evidence, lacking the kinds of documents *in clay* that so well illustrate these practices in, for instance, Mesopotamia. [See J. Renger, "Legal Aspects of Sealing in Ancient Mesopotamia", *SaS*, 75–88.] For, in fact, Mycenaean practices might have been similar to those in Egypt, where higher level documents of *papyrus* were authenticated by seal impression on clay formed around binding string [B. Williams, "Aspects of Sealing and Glyptic in Egypt", *SaS*, 136] apparently in the fashion of Linear B and certain Linear A nodules. These do not bear the traces of folded leather strips and fine binding cord that characterize the special document sealings from the Linear A period identified at Zakro [ZM, 38–44, n. 20; I. Pini, "Neue Beobachtungen zu den tönernen Siegelabdrücken von Zakro", *AA* 98, 1983, 559–572] and at Khania [*Sphrag.*, 13–14, 18–19]. M. Pope, "The Cretulae and the Linear A Accounting System", *BSA* 55, 1960, 201, advances several arguments that the 250–300 *cretulae* from the gypsum chest in Rooms 54–55 at Hagia Triada [L. V. Watrous, "Ayia Triada: A New Perspective on the Minoan Villa", *AJA* 88, 1984, 124, ill. 1; 125–128] must have originally sealed non-clay documents, even though they lack Weingarten's diagnostic features. We should consider this particular hypothesis far from certain [ZM, 43, n. 7], but it is theoretically possible that Linear B nodules and comparable Linear A nodules, like their Egyptian counterparts, sealed *papyrus* documents without leaving identifying traces [ZM, 43, n. 12]. V. Aravantinos, "The Use of Sealings in the Administration of Mycenaean Palaces", *PCA*, 43–48, emphasizes the use of Mycenaean sealings to label and identify commodities, containers, transactions, but he does not exclude the possibility of their use with written documents. One should note the almost invariable association of Linear A roundels with tablet records and nodules at KH, HT, ZA, PH and KN.

³ H. J. Nissen, "Aspects of the Development of Early Cylinder Seals", *SaS*, 15. See also V. E. G. Kenna, "Seals and Script. With Special Reference to Ancient Crete", *Kadmos* 1, 1962, 1–4. McG. Gibson, *SaS*, 151, summarizes:

... it can be seen that seals were used within state and temple bureaucracies, but were also part of the record-keeping and safeguarding equipment of some private persons. Seals safeguarded goods transported from place to place, or stored in depots. They certified written records of commodities and protected the officials who did the sealing. Counter-sealing by higher officials also safeguarded the lower officials. The use by private individuals of seals seems to have been, in at least some instances, as formalized as was sealing within bureaucracies. In general, it might be said that sealing was intended to keep people honest and was in essence regulatory.

⁴ Here I must emphasize, as Edith Porada (personal written communication of November, 1985) has pointed out persuasively to me, that the Minoan-Mycenaean world, within the limits of our current understanding in which the total absence of formal religious and ritualistic texts creates a large interpretative lacuna, seems to be much different in this regard from the Near Eastern, where amuletic, religious and magical uses of seals are well-attested. It is a mistake, however, to import these notions directly into the interpretation of Aegean prehistory, as some have tried. The resulting non-sphragistic interpretations of Minoan-Mycenaean seals and sealings can be frankly preposterous, e.g.: the view that ideogram *190 on sealing Wt 700 from Mycenae is not

The focus in Mycenology has so far been very specialized, concentrating on inscribed sealings and especially on those individual sealings or coherent groups of sealings whose brief inscriptions⁵: (1) relate directly to the contents of tablets found in exactly or approximately the same archaeological contexts⁶; (2) relate to

a linear sign at all (despite its clear association with Oi 701—706, *MT III*, 36—41, 66) but a countermark of “extra talismanic, religious or magical value” [A. Tamvaki, “The Seals and Sealings from the Citadel House Area: A study in Mycenaean Glyptic and Iconography”, *BSA* 69, 1974, 286]. J. Younger, “Non-sphragistic Uses of Minoan-Mycenaean Sealstones and Rings”, *Kadmos* 16, 1977, 141—159, tries the same approach, but his specific evidence for the use of seals as charms is highly suspect. Given the condition of the seals and the characteristics of their locations, the find-spots of all three Pylos seals so interpreted seem to be due to chance, not to ritualistic or even intentional placement: (1) in the main drain (broken lentoid *CMS I* 296); (2) in cistern 102 (broken rock crystal *CMS I* 300); and (3) in a storage jar in the N. corner of corridor 95 (crudely cut black steatite *CMS I* 297). The tomb evidence is reduced by the author himself to Mycenaean T. 515, where the discovery of 6 seals, including the twins *CMS I* 144 and 145, does not require an exceptional explanation, especially when one considers the Near Eastern evidence, where there is some evidence at least that seals in burials indicated identity and status. For multiple seals owned by the same person, see P. Steinkeller, “Seal Practices in the Ur III Period”, *SaS*, 41—53, esp. 46; M. A. Morrison, “Evidence for Herdsmen and Animal Husbandry in the Nuzi Documents”, *Studies*, 258, n. 10; and for Minoan practices, the views of Weingarten, *ZM*, 18—24, esp. nn. 2, 23. That Aegean seals were worn in different ways, dedicated in sanctuaries, placed as votives in tombs, and possibly collected does not contradict the view that their importance derives chiefly from their practical use to identify by sealing. Seals throughout Near Eastern history were assigned a high legal and, one might say, “ritualistic” significance *because of* their function as identifiers of individuals on documents. See W. W. Hallo, “Seals Lost and Found”, *SaS*, 55—60. V. E. G. Kenna, *Cretan Seals*, Oxford, 1960, 3, puts matters in proper perspective when he remarks of Minoan seals that “in addition to their sphragistic character, allowance must be made for a religious or magical undertone.” [Italics mine.]

⁵ A compilation of the information for labels (Wa, Wb) and sealings (Wr, Ws, Wt) from A. Bartoněk, “The Linear B Series and Their Quantitative Evaluation”, *Res Mycenaee*, 17, 23—26, tables Ib, III, makes the brevity of sealings, labels and vase inscriptions (Z) clear. What has so far been published about the Thebes sealings (series Wu) suggests that they conform to this pattern: Aravantinos (*supra* n. 2) 47—48. The Z series has been updated for recent finds from Khania. See Hallager, *AAA*, 16, 1983, 58—73.

Site	Series	A	B	C	D
		2 syll. signs	2—4 syll./id.	5—9 syll./id.	10—24 syll./id.
PY	Wa	3	8	5	3
KN	Wb	20	10	5	0
PY	Wr	9	10	4	0
KN	Ws	9	4	9	2
MY	Wt	1	0	7	0
	Z	87	54	8	5

We can see then that the mere brevity of the sealing inscriptions does not account totally for lack of attention. The vase inscriptions have similar percentages, but have been thoroughly studied because of: (1) their typological singularity; (2) their value as data for major archaeological questions (e. g., the date of the Knossos tablets, the organization of Crete in LM III); and (3) their special formulaic nature (containing so many toponyms that recur on the Knossos tablets).

⁶ Most notably MY Wt 501—507 and Ue 611 obverse from House of the Sphinxes, Rms. 1 and 6: *MT II*, 102—105; MY Wt 700 and Oi 701—706 from Citadel House: *MT III*, Plan VII, 35—46, 66 [the attribution of this sealing to South House by Tamvaki (*supra* n. 4) 270 and *CMS V*, 2, 414, 472 is puzzling]. For this reason labels, particularly at Pylos, have received better treatment despite comparable brevity, e. g., J. Chadwick, “The Mycenaean Filing System”, *BICS* 5, 1958, 1—5.

the function of the areas where they were discovered, as determined by artefacts, architecture, and the overall archaeological record⁷; (3) contain lexical items pertinent to more general discussions⁸.

The Knossos sealings alone have been treated as a coherent set, but only insofar as to identify them and to determine their provenience which, as in the case of the Knossos tablets, presented formidable problems requiring Herculean and Holmesian efforts, sometimes to no avail⁹. This led first to what one might consider an *editio minor* of the inscribed subset, to which an interpretative discussion of a single text was appended¹⁰. Next came a preliminary consideration of the technique of manufacture and the purpose of individual members of the inscribed group¹¹. No complete study of sealing practices at a single site has been attempted. Aravantinos (*supra* n. 2) has presented an instructive, though selective, overview of Mycenaean sealing use, concentrating on those sealings with clearly interpreted inscriptions (mainly from Mycenae, Pylos, and Thebes) and known archaeological contexts. We await eagerly his full edition and interpretation of the Thebes material, by far the largest homogeneous group of inscribed sealings (55) from a single area at any Mycenaean site¹².

Sealings from the Minoan palace periods have fared better for several reasons. Attention was drawn to the larger numbers found in discrete caches at major Cretan sites: Hagia Triada [864 (portico 11); 250–300 (Rms. 54–55)], Phaistos [over 1500 (Rm. 25)], Kato Zakro [ca. 525 (House A, Rm. vii)], Khania [86 sealings, 109 roundels (Odos Katré)], Knossos [indeterminate large numbers: ca. 160 (East Temple Repository), ca. 37 (Hieroglyphic Deposit)]¹³. A large percentage of the sealings from Khania and Hagia Triada are inscribed. Their brief inscriptions in

⁷ Notably PY Wr 1325–1334 from the NE Workshop: M. Lang, "The Palace of Nestor Excavations of 1957 Part II", *AJA* 62, 1958, 191; PY Wr 1358–1361 from the Wine Magazine: M. Lang, "The Palace of Nestor Excavations of 1958 Part II", *AJA* 63, 1959, 133–135; and KN Ws 1704, 1705 from the Arsenal.

⁸ E.g., KN Ws 1704, 1705, 8495, 8498, 1703, 8152, 8153, PY Wr 1325, 1326, 1328, 1330–1334, 1358–1361, 1415, 1457: J. L. Melena, "Further Thoughts on Mycenaean *o-pa*", *Res Mycenaeae*, 258–286, esp. 274–276, 278–280, whose lucid treatment considers both textual and archaeologically contextual data.

⁹ Nevertheless no separate study of those sealings that are postpalatial (or contemporary with the tablets) has been done. M. A. V. Gill, "The Knossos Sealings: Provenience and Identification", *BSA*, 60, 1965, 58–98; J. H. Betts, "Some Unpublished Knossos Sealings and Sealstones", *BSA* 62, 1967, 27–45. Cf. L. R. Palmer, *The Find-Places of the Knossos Tablets* in L. R. Palmer, J. Boardman, *On the Knossos Tablets*, Oxford, 1963.

¹⁰ J.-P. Olivier, "La série Ws de Cnossos", *Minos* 9, 1968, 173–181.

¹¹ M. A. V. Gill, "Seals and Sealings: Some Comments. The Knossos Sealings with Linear B Inscriptions", *Kadmos* 5, 1966, 1–16. Gill stresses the association between sealings and tablets, but seems to have mistaken Chadwick's discussion (*supra* n. 5) of the connection between labels (Wa) and tablets at Pylos for a discussion of sealings (Wr) and tablets.

¹² Only the East Temple Repository at Knossos yielded a larger batch of sealings (ca. 160), but these are MM III in date [V. E. G. Kenna, "Seals and Script III. Cretan Seal Use and the Dating of Linear Script B", *Kadmos* 3, 1964, 33]. We do not take into account large collections which are separated into distinct subgroups by architectural divisions within more broadly defined areas at Knossos, e.g., the East Wing and the Little Palace: Gill (*supra* n. 8) 69–71, 76–84, 85–91. At Pylos the largest number from any single architectural unit is 36 (4 inscribed) from Room 105 of the Wine Magazine, which contained 50 sealings total in its two rooms.

¹³ *Hagia Triada*: D. Levi, "Le cretule di Hagia Triada", *ASAtene* 8–9, 1925–26, 7–156. *Phaistos*: I. Pini, *CMS* II, 5, IX–XIV; D. Levi, "Le cretule di Festos", *ASAtene* 35–36, 1957–58; E. Fiandra, "A che cosa servivano cretule," *Πεπραγμένα τοῦ Β' Διεθνούς Κρητολογικῆ Συνεδρίου*, Part 1, 1968, 383–397. *Kato Zakro*: *ZM*, 2–3, 7–14, 20 n. 1; D. G. Hogarth, "The Zakro Sealings", *JHS* 22, 1902, 76–93; "Excavations at Zakro, Crete", *BSA* 7, 1901, 132–133. *Khania*: *Sphrag.* and I. A. Papapostolou, L. Godart, J.-P. Olivier, *Γραμμικὴ Α στὸ μινωικὸ ἀρχεῖο τῶν Χανίων*, Rome, 1976.

Linear A do not seem so unpromising material for research alongside the Linear A tablets, which themselves are considerably briefer than their Linear B counterparts and, of course, are still undeciphered¹⁴. Moreover, the CMS volumes have covered the proto- and neo-palatial periods on Crete very thoroughly, but only smaller collections for the post-palatial (Mycenaean) period of the island¹⁵. Consequently, scholars have already begun to analyze many aspects of how sealings might have been used within the Linear A economic and administrative systems at specific sites¹⁶, while the Linear B period has been somewhat neglected.

In order to understand sealing use in the context of Mycenaean administrative and economic organization, it is necessary to examine the relationship between inscribed and uninscribed sealings within the overall economic systems at Knossos, Mycenae and Pylos. These sites in their present states of excavation reveal different features of the mechanisms that controlled economic activity in their respective regions. Consequently study of the seals and sealings through an analysis of distribution, context and contents¹⁷ should add to the general picture so well presented by Aravantinos.

It is difficult to characterize Mycenaean seal and sealing use from the archaeological record. Kenna has rightly warned that the quality of seals in collections might lead to the perhaps unwarranted view that the use of seals in the Mycenaean palatial period was confined to the higher strata of society¹⁸. In addition the focus of excavations on primary sites (even to the near exclusion of surrounding towns) and tombs in the separate geographical and economic regions of the Mycenaean world skews our view of the range of functions that seals and sealings may have served and of the extent of their use within Mycenaean economy and society, whether restricted to specific social or economic classes or widely employed. So a broader perspective may be useful.

We may take as a given that administrative methods in a society develop in response to the peculiar features of its economic and political systems¹⁹. A degree of

¹⁴ *Hagia Triada*: 862 nodules, 2 *scellés*, 21 roundels inscribed; *Khania*: 20 nodules, 81 roundels (from Odos Katré) inscribed. See *GORILA* 2, 3.

¹⁵ E. g., The Metaxas Collection in CMS IV. The CMS volumes are complete for the Herakleion Museum's Old Palace and New Palace periods and for such isolated collections as the seal impressions from MM IB-II(A/B) Phaistos.

¹⁶ Chiefly M. Pope, I. Pini, J. Weingarten (all *supra* n. 2). In general see also J. H. Betts, "New Light on Minoan Bureaucracy", *Kadmos* 6, 1967, 15–40, and for a comparative view T. G. Palaima, "Preliminary Comparative Textual Evidence for Palatial Control of Economic Activity on Minoan and Mycenaean Crete", *Proceedings of the 4th Int. Symp. of the Swedish Archaeological Institute in Athens*, 10–16 June 1984 (forthcoming).

¹⁷ The absence of uninscribed sealings from *tablet contexts* at Mycenae and of inscribed sealings at Tiryns is undoubtedly due to chance, if one judges by the spatial separation of categories of inscribed materials at Thebes (only one uninscribed multiple stamped clay stopper [CMS V, 2 669] was found in the same area as the tablets) and the relatively low percentage of architectural units at Pylos and Knossos – not to consider Linear A and Minoan sites – that produced sealings. Iconographical analysis, so well used by Weingarten and Papapostolou for the LM IB sealings from ZA and KH, is here left out because (1) it constitutes a second, separate stage of study, and (2) the CMS volumes have not yet treated post-palatial Knossos.

¹⁸ V. E. G. Kenna, CMS IV, p. VII.

¹⁹ This is documented in Nissen, *SaS*, 15–19. Even external influences and borrowings from other cultures are predicated upon the peculiar needs and susceptibilities of a given society. One might attribute the typological differences between records in Linear A and Linear B Crete to a significant change in the controlling economic and political mechanisms [Palaima (*supra* n. 16)]. For somewhat differing views of Linear B Crete, see J. Bennet, "The Structure of the Linear B Administration at Knossos", *AJA* 89, 1985, 231–249 and T. G. Palaima, "Inscribed Stirrup Jars and Regionalism in Linear B Crete", *SMEA* 25, 1984, 189–203.

caution, therefore, is necessary when theorizing by analogy with other cultures or periods. Still when the main elements of economic and political organization are similar, administrative methods should show some similarities as well. And the Minoan-Mycenaean palatial system has found its closest parallels in the contemporary Near East²⁰.

In macro-terms, Mycenaean economy works through a hierarchical system of control, a network of decreasing authority radiating from (a) a central regional controlling site to (b) principal second-order centers in control of sub-regions or districts to (c) other lesser settlements within these districts. This system is seen clearly in Pylos taxation records (Ma, Mn, Na, Ng) and in the reconstruction of Messenian geography from toponyms on tablets (Cn 608, Vn 20, Jn 829 etc.). It has now been hypothesized for Mycenaean Crete, too, although the geographical limits and specific nature of control by the presumed central authority, Knossos, must remain open to question²¹.

The micro-economy works in the same way. Moving in reverse direction, (c) the smallest units (individual cloth-workers, shepherds, bronzesmiths, agricultural workers) are under the authority of (b) workshops and their stewards, collectives and collector/owners, guilds and their leaders, lessors or the collective *da-mo*; these in turn are responsible to (a) officials at settlements and centers of any order²². The need for recording at all levels is obvious²³. The Mycenaean tablets come predominately from the highest macro-level; but, through their range of subjects and the variety of archival classes of their texts, they reflect the information-gathering process at all levels of both the micro- and macro-chains. Sealings, however, are either textually terse or completely silent. We must therefore carefully scrutinize the evidence connected with them in order to find out what levels in the system of recording and interlinking responsibilities they represent.

Typologically Mycenaean sealing practice is more restricted than the Minoan. Inscribed sealings have been reduced from three general categories (nodules,

²⁰ The difficulty lies not only in bringing about the condition of *mutatis mutandis*, but also in ascertaining that a secure basis for analogy exists, i.e., that the societies or periods in question really are parallel in various necessary features. J. T. Killen, "The Linear B Tablets and the Mycenaean Economy", *Linear B: A 1984 Survey*, BCILL 26, Louvain, 1985, 1–2, nn. 3–5, surveys how scholarly opinion from 1957 onward has stressed the parallelism between Mycenaean and Near Eastern economies.

²¹ Bennet (*supra* n. 19) and Palaima (*supra* n. 19).

²² One must allow for a degree of flexibility. In different contexts individuals in micro- (c) class might "transact" with class (b) or (a) figures. For example, *pe-ki-ta* the *ka-na-pe-u* might "transact" as an *o-na-te* with both *ru-*83* and *pi-ke-re-u* at *pa-ki-ja-na* (En 74.3, .23), but with officials of the central *wa-na-ka* according to his occupational designation. Similarly provincial capitals would function on both macro- (a) and (b) levels. Different economic transactions might also require different lines of contact between settlements and individuals on all three levels. [I apologize for the jargon-term "transact", but it seemed the only choice for a universal neutral term meaning "have an interest in and relationship with."]

²³ We might also stress the need for contractual relationships on all levels of the sort that are involved in the dispute over the nature of the landholding arrangement between *e-ri-ta i-je-re-ja* and the *da-mo* (Eb 297, Ep 704, 5–6) and in the obligations of communities or collectives of professionals to furnish or be exempted from furnishing specific amounts of commodities (Ma, Na series).

scellés, roundels) to one (nodules)²⁴. Moreover, there may be a shift of function in the continuing nodule class. Weingarten's analysis of the Kato Zakro sealings indicates that the nodule shape in the Minoan period was designed primarily for use with multiple seal impressions, most often on all three faces²⁵. The Mycenaean versions are invariably single-sealed. However, the Mycenaean and Minoan nodules do share the technique of counter-inscription, though the Mycenaean texts on the whole are much fuller and have something of a canonical arrangement of the text on the three faces of the nodules²⁶.

Keeping such distinctions in mind, we should still notice the strong presence of seals and sealings in the Mycenaean period. The evidence for the Minoan period is clear. Finds of seals are widespread for both palace periods on Crete, blanketing the many districts of the island and its palace, villa, town and sanctuary sites in both the proto- and neo-palatial periods²⁷. Seal use in Minoan Crete constitutes a "constant and unbroken tradition" in which even Egyptian and Mesopotamian imports find a place²⁸. The full introduction of Linear A writing does not seem to have appreciably affected the major role played by seals and sealings in the operation of the Minoan economy. The LM IB collections of sealings from Hagia Triada, Khania and Zakro prove this by their sheer numbers²⁹. The total absence of writing in the Zakro group of 525 sealings and in the Khania set of 58 simple sealings and the spatial separation of the groups of sealings from major tablet areas at Hagia Triada and Zakro demonstrate that these administrative tools served an important purpose within the Cretan economy during the very period in which Linear A

²⁴ *GORILA* 2, xvii–xix, explains the typology of Minoan sealings. For sealings *per se* in the transition from Minoan to Mycenaean, roundels disappear and *scellés* are surprisingly in little evidence. *CMS* I 160–162 (MY HOM), 164 (House of Sphinxes); *CMS* V, 2 669 (Epaminondas-Metaxas plot, Sector E 2, *TT II*, 40, 56–58); and 2 clay spout sealings (House near the Menelaion, *BSA* 16, 1910, 7–11, plate III) provide the only parallels to the large number of very practical *scellés* from protopalatial Phaistos. This is not even to consider the disappearance of the subtler categories of shape of Linear A sealings distinguished by Weingarten, *ZM*, 25–26, A/17, A/18, A/26, at Zakro, Hagia Triada and Khania. The striking uniformity of shape of Mycenaean sealings may imply a degree of standardization only possible through centralized control of the entire sealing process.

²⁵ *ZM*, 27–36. Pope (*supra* n. 2) 201 analyzes many instances of multiple sealing on the Hagia Triada nodules. One should note, however, that most of the Khania nodules bear single seal impressions: (26 of 28 3-sided [i. e., Mycenaean type] nodules [other 2 fragmented], 56 of 58 simple [with rectangular impressions on verso] sealings [other 2 are 3-sided, with 2 impressions]). *Sphrag.*, 11–14, 157–159. It should be noted that inscribed nodules have predominantly a single seal impression.

²⁶ Khania nodules and roundels bear equally brief inscriptions (*Sphrag.*, 157–165). At Hagia Triada, however, all but 4 of roughly 736 inscribed nodules have inscriptions consisting of either a single ideogram or one or two signs, mostly phonetic. The remaining four have the much longer inscriptions characteristic of roundels at the site. Pope (*supra* n. 2) 206–210.

²⁷ See the end maps in *CMS* II, 2; *CMS* II, 3 for the respective periods. *CMS* V, 1, pp. 185–251, completes the picture for neo-palatial western Crete.

²⁸ Kenna (*supra* n. 11) 52. For imports see: Khania (*CMS* V, 1 237 [Egyptian cartouche of Amenophis III]); Knossos (*CMS* II, 3 190 [Egyptian]), Royal Road (*CMS* II, 2 34 [Egyptian 13th Dynasty]) and west of North Lustral Basin (*CMS* II, 2 29 [NW Mesopotamian-SE Anatolian cylinder seal]); Tylissos (*CMS* II, 3 128 [old Assyrian cylinder seal]); Phaistos? (*CMS* II, 3 158 [Egyptian]).

²⁹ For dating, see discussions in *ZM*, 3–4 and *Sphrag.*, 88–90.

was in full use³⁰. Finally the number of seal-types from these three sites is convincing proof of the administrative importance of seals and sealing methods throughout at least the districts controlled by these sites: Hagia Triada (147 seal-types on 1043 examined sealings); Khania (32 types on 195 sealings); Zakro (214 types on 525 sealings)³¹. As Linear A economic record-keeping developed from MM II through LM IB, seals and sealings came to play a larger and larger role in Minoan economic transactions in conjunction, not in competition, with written records.

There seems to have been a marked decline in quantity and quality of seal manufacture after LM/LH IIIA1³². Nonetheless sealings continued to be an important economic controlling device. One can plot a spread of seal finds roughly comparable to the Minoan for the major mainland regions in the Mycenaean palace period³³. Introducing Mycenaean Knossos into the picture reinforces the impression of an active use of the sealing technique by a proportionately large number of persons³⁴: Knossos: palace proper (130 seal-types on ca. 300 sealings), Little Palace

³⁰ It is worth noting also that the main sealing collections at Zakro and Hagia Triada were found apart from the principal tablet deposits: Hagia Triada (864 *cretulae* and 18 roundels fallen from above portico 11 with only 11 tablets; 250–300 *cretulae* in Rms. 54–55 with no tablets; 45 *cretulae* in area of Rm 27 with only 1 tablet nearby in Rm. 26; 2 large deposits of tablets located elsewhere making up the total number of 84 from the villa proper; the remaining 70 tablets and fragments from the Casa del Lebebe 100 yds. northeast of the villa proper [but cf. *GORILA* 1, xxi-xxii, for reservations about the separation of the main tablet deposits]); Zakro (525 sealings and 1 tablet in House A, room vii; 10 tablets in Palace Rm. XVI; 4–5 sealings in Rm. XXV). F. Halbherr, E. Stefani, L. Banti, "Haghia Triada nel Periodo Tardo Palaziale", *ASAtene* 50, 1977, passim. *GORILA* 3, 14; N. Platon, *Zakro*, 1971, 147–151.

³¹ "Seal-types" is used by Levi, Pope, Weingarten, *GORILA* as the standard term for "a distinct seal motif belonging to a single seal identifiable from its impression on a sealing." One need not assume that the Zakro seal holders congregated on the spot in House A, as Weingarten, *ZM* 46, suggests. It is enough that they were part of the regional or extra-regional (in light of a nodule identical to Zakro 80 + 134 being discovered in the region of Knossos) system that had its administrative focal point in House A. *ZM*, 37, A/9, Table 1; *Sphrag.*, 157–165.

³² I. Pini, "Minoan Glyptic after the Assumed Fall of the Palace at Knossos", *BICS* 29, 1982, 130, would assign an LM IIIA1 or earlier date of manufacture to most Minoan seals of both hard and soft stone discovered in LM III A2/B contexts. The same factors are also at work on the mainland: "almost half of the sealings from the Palace of Nestor must be dated considerably earlier."

³³ For example, consider the sizable number of single finds of seals from the acropolis of Mycenae and from the chamber tombs of its lower town area (*CMS* I, 20–43; 44–59) together with those from the House of Idols (= Citadel House, *CMS* V, 2 597–600), House A (*CMS* V, 2 601), and area south of the northern circuit wall (*CMS* V, 2 602) which are dated securely by context to LH III B/B2. The Pylos region supplies a large number of seals from chamber tombs (e.g., Volimidia [*CMS* V, 2 302–304] and palace area [*CMS* I 295]), tholos tombs (Tragana [*CMS* I 263–268], Routsis [*CMS* I 269–286], Nichoria [*CMS* V, 2 430–441], and palace area [*CMS* I 287–294]), the palace and its appendages (*CMS* I 296–301; *CMS* I Suppl. 33; *CMS* V, 1 307–310), and even habitation areas of the one excavated settlement, Nichoria, plausibly identified [Shelmerdine, *AJA* 85, 1981, 319–325] as an important regional center on the Pylos texts, *ti-mi-to-a-ke-e* (*CMS* V, 2 442–448). It should be noted that most of the tomb finds come from pre-LH IIIB contexts, the exceptions being those from the Nichoria tholos, several from the Nichoria site proper, and the seal from the palace area chamber tomb.

³⁴ Seal-types can be used to obtain an approximate minimum number of individual parties whether the seal designs served as personal identifiers or marks of official status or office or of social standing, in the following way. First, we must remember that our sealings in the Mycenaean period come from single, chronologically limited destruction horizons at each site. Thus, if a seal-type does identify an office-holder, this is equivalent, at a single point in time, to identifying the individual who held that office. If, the less probable case (see below n. 52), the seal-type identifies an administrative or economic unit, e. g., a scribal department, a storeroom or workshop, an

(48 seal-types on ca. 60 sealings); Pylos (91 seal-types on ca. 147 sealings); Mycenae (11 seal-types on 18 sealings discovered on the acropolis, its Citadel and South Houses, and the houses outside the citadel [Wine Merchant, Shields, Sphinxes, Oil Merchant])³⁵. The Mycenaean groups have a higher proportion of seal-types to sealings than the Minoan:

Hagia Triada: 14.1%	Knossos Palace: 43.3%
Khania: 16.4%	Mycenae: 61.1%
Zakro: 40.7%	Pylos: 61.9%
	Knossos Little Palace: 80.0%

We have already seen that the Mycenaean period differs from the Minoan in types of sealings and in the size of separate caches. It seems reasonable to assume that the percentages listed here also reflect changes in the precise ways sealings were used in the Minoan and the Mycenaean administrative systems. Viewed in another way, these statistics reveal a measurable decline in the number of multiple uses of the same seal-type upon the sealings. At each of the Minoan sites the three most often used seal-types are found in large numbers and percentages: *Hagia Triada*: 480 (46.0%); *Zakro*: 100 (19.0%); *Khania*: 42 (54.0%). At the only mainland Mycenaean site with a data base of comparable size the statistics are: *Pylos*: 22 (14.9%). The Palace at Knossos has 39 (13.0%), while the material from the Little Palace is too poorly recorded to draw sound conclusions³⁶. This means that, so far as the limited evidence indicates, a few parties or units (see n. 34) dominate the Minoan transactions in a way unattested for the Mycenaean period.

Since we understand the Mycenaean written records, it is logical to ask how this modified use of sealings fit into the systems of writing and general bureaucracy which the Mycenaeans had also adapted to their own conditions. The tablets provide us with detailed information about the outreach of the palace and the daily management of its production, collection, storage and distributive operations. Are we to interpret the sealings as serving the same kinds of functions as the tablets? Do these two categories of recording devices deal with transactions on the same administrative level?

The lowest administrative and economic level at which Mycenaean sealings work is only a slight degree higher than the merely practical action of closing. In workshops and storerooms, associated with stirrup jars, have been found clay

industrial establishment, the subordinates of a particular official, then the seal-type indicates the existence of one or more parties in that unit and therefore still provides us with a minimum number. It is possible, too, that one individual could use several seals when functioning in different capacities. The limited chronological span of the preserved sealings, site to site, should limit the number of these instances. So, by counting the number of different seal-types, we can arrive at an approximate number of the individuals using seals who impressed the surviving sealings.

³⁵ Also now 23 seal-types on 55 inscribed sealings from Thebes. For Knossos, see Kenna (*supra* n. 12) 40, 50. For Pylos, see C. W. Blegen, *The Palace of Nestor* I, 1, Princeton, 1966, *passim*. For Mycenae, Rhyton Well (CMS I 19), Citadel House (CMS V, 2 594, 596), South House (CMS V, 2 595), House of the Wine Merchant (CMS I 170), House of the Oil Merchant (CMS I 160–162), House of the Sphinxes (CMS I 163–164), House of the Shields (CMS I 165).

³⁶ ZM, A/3, A/9. Pylos: CMS I 323 (10), 312 (6), 329 (6). Knossos: Gill (*supra* n. 9) 71, 74–84, 85–91.

mouth stoppers representing at least three different methods of closure. At Mycenae these clay stoppers come from the House of the Wine Merchant (HWM), House of the Columns, and the House of the Oil Merchant (HOM)³⁷. They are also attested in a house excavated by Dawkins near the Menelaion and from Spyropoulos's excavation of the Thebes tablets³⁸. Many are unsealed. The sealed examples (HOM [CMS I 160–162], HWM [CMS I 170], the clay rim seal from the House of the Sphinxes [CMS I 164], and perhaps the Theban disk with 10 identical seal impressions [TT II, 53, fig. 11, ph. 101] found in the area of stoppers and at least one stirrup jar) immediately record an operation, hardly of overwhelming economic importance (because the numerous unsealed stoppers prove that this procedure was not standard and therefore not essential to the Mycenaean economic system) and almost certainly local (for Haskell notices the same seal impression used on stoppers sealing a locally manufactured and an imported, doubtless reused, Knossian jar from the HOM)³⁹. The use of seals here does identify a responsible party by means of the seal impression, but the action is beneath the level of the most fundamental tablet records and even of the inscribed nodules, which specify other details of a transaction by means of written characters. None of the Mycenaean *scellés* is inscribed. And there are no large collections of these *scellés* for administrative purposes.

The highest administrative or record-keeping level seal impressions could attain would be as necessary identifiers on contractual or legal documents. It is startling that there are no examples of this in the Mycenaean corpus of texts. In the Near East this official, legal use is common. Individual shepherds even use their own seals on bullae and consignment texts to confirm the legal relationship they have entered into with owners of sheep⁴⁰. Other persons, besides scribes and officials, use seals on legal contracts, e.g., land documents. The absence of Mycenaean seal impressions of this type might be explained in several ways.

1. The decline in seal manufacture and quality after LH IIIA1 might correspond to a restriction of seal use within the tightly organized and monitored Mycenaean palatial administrative system⁴¹. Seals would have been used by officials and official palace employees. The kinds of relationships entered into privately in Near Eastern (and even Minoan?) society would now have been strictly defined

³⁷ H. W. Haskell, "Coarse-Ware Stirrup-Jars at Mycenae", *BSA* 76, 1981, 230–231, n. 18. See A. J. Leonard, Jr., "Considerations of Morphological Variation in the Mycenaean Pottery from the Southeastern Mediterranean", *BASOR* 241, 1981, 91–92, for Hittite parallels.

³⁸ R. M. Dawkins, "Excavations at Sparta 1910", *BSA* 16, 1910, 7–10; *TT II*, 52–53, 56–58.

³⁹ Haskell (*supra* n. 37) 236, n. 35.

⁴⁰ Morrison (*supra* n. 4) 269–275. T. Abusch, "Notes on a Pair of Matching Texts: A Shepherd's Bulla and an Owner's Receipt", *Studies*, 2–6; J. N. Postgate, "Some Old Babylonian Shepherds and Their Flocks", *JSS* 20, 1975, 2.

⁴¹ In fact, remembering the destruction context of our evidence, we may propose that the restriction of seal use was part of an overall tightening of palatial control over means of production in the period preceding the destruction of the mainland palaces. Clear indications are the construction within the circuit walls at Mycenae, economic activity in the crowded area of the Unterburg at Tiryns, and architectural modification to the Palace of Nestor at Pylos. See J. C. Wright, "Changes in Form and Function of the Palace at Pylos", *PCA*, 26–29; T. G. Palaima, J. C. Wright, "Ins and Outs of the Archives Rooms at Pylos: Form and Function in a Mycenaean Palace", *AJA* 89, 1985, 259–261. Note also Killen's remarks on the centralization of the Pylian cloth production industry in contrast with the decentralized Knossian system, "The Textile Industries at Pylos and Knossos", *PCA*, 55–61.

and controlled by the official palatial apparatus. Thus it would have been sufficient for the palace and its subservient centers in the macro-chain to keep records of activities (e.g. C-, D- series at Pylos and Knossos) that they themselves carefully controlled.

2. The palace records might represent only a *monitoring* of activities of concern to the central administration [the same would apply to lower order centers]. Certain records (e.g., Aa-Ad, Jn, Ma, Na, the An *o-ka* tablets) deal with matters which the palace and its designated officials would have directly arranged and overseen. Other records (Ea, Eb, En-Ep, Cn) treat activities which might have involved the main administration, but which it may not have totally controlled. Thus the palace undoubtedly had to monitor wool production in order to operate its cloth workshops and estimate the probable production of various kinds of materials. However, the individual shepherds and owner/collectors could have entered into the equivalent of personal (although, on the Near Eastern model, most likely strictly, limited and invariable) contractual agreements. And records of these agreements, whether on clay or more ephemeral materials, would have had no place in the palace archives.

With this notion of a dichotomy between *monitoring* tablet records and *contractual* or *authorizing* seal impressions, one could explain the finds of sealings along with deposit documents in palace work and storage areas. The sealings would provide official documentation that a specific delivery (*VIN*, *TELA* + *PU*, *AREPA*) or obligation (*o-pa*) was fulfilled by an individual. The central administration would monitor such activities through scribes locally in departments and bureaus or on the spot in the workshops and storerooms, and perhaps eventually by processing this information in summary form in central archives. It would have no concern to keep the official verification of an activity (the sealing) after it had the information recorded on its own official record⁴². This would explain the discarding or less than clustering of sealings in work or storage areas.

In viewing some of the sealings as contractual "performance records" of individuals, we should also make note of Aravantinos's keen observation that, on the rare inscribed nodules which lack a seal impression, the inscriptions take the place of the seal impressions⁴³. Of the five Mycenaean nodules of this type, four have word-groups which probably represent the names of acting individuals in the nominative or genitive (Wr 1199, Wr 1247, Ws 8499, and Ws 1707)⁴⁴. The fifth, Ws 8493, is exceptional in that it appears that a toponym (*se-to-i-ja*) alone can take the place of the expected personal name. It contains, however, the same *do-ke* formula as Ws 1707:

<i>Sealing</i>	<i>Recipient</i>	<i>Verb</i>	<i>Object</i>	<i>Subject</i>
Ws 8493	<i>ki-ri-ta-de</i>	<i>do-ke</i>	<i>te LANA</i>	<i>se-to-i-ja</i>
Ws 1707	<i>]ke-wo-re-u-si</i>	<i>do-ke</i>	— —	<i>[.]ja-wo-ne</i> .

⁴² This same principle may work even on a non-palatial level, if the houses outside the citadel walls at Mycenae are independent of the central administration. See the case of Ue 611 and the apparently discarded sealings Wt 501—507 (*supra* n. 6).

⁴³ Aravantinos, (*supra* n. 2) 45.

⁴⁴ J. Chadwick, "The Muster of the Pylian Fleet" (preliminary paper for Ohrid Colloquium) n. 10, rightly remarks that *[?wi]-ja-wo-ne* on Ws 1707 must be a nominative singular personal name.

Several explanations present themselves. First, it is possible that the defaced side of this poorly preserved nodule actually may have borne a seal impression, as Evans thought⁴⁵, in which case it should not be considered an exception to the principle here suggested for those sealings without seal impressions. Second, the uncertain reading *se-to-i-ja* is incorrect, and we should seek our nominative singular personal name in its position on face .a. It should be noted that this toponym does not appear on any of the over 300 tablets from the location where Ws 8493 was found, the Room of the Chariot Tablets. However, *se-to-i-ja* occurs elsewhere in series by Hand 103 dealing with *TELA* + *TE* (Le 654.4) and *TELA* + *TE* and *LANA* (Lc 525), in each case with designations that may mark out a special relationship with the central palace (*wa-na-ka-te-ra*, 'wa'). Thus the conjectured reading makes very probable sense. Third, the toponym, which also seems to enjoy a special status connected with Knossos on As 1516, here does replace the anticipated personal name. The collective community or workshop operation at *se-to-i-ja* thereby declares responsibility for the shipment. Finally, it is even possible that another uninscribed sealing from the same location as Ws 8493 provided the seal identification of the person in charge of a group shipment, the absence of an impression on Ws 8493 being an accidental oversight. Eleven uninscribed sealings were found in the Room of the Chariot Tablets, including Her. s. 124 whose condition exactly matches that of Ws 8493 and suggests a close contextual association⁴⁶.

Here then the exceptions may prove the rule. We might theorize that the sealings serve, normally through sphragistic (the individual seal impressions), or exceptionally through written (personal or place names inscribed on nodules), means, as basic records of personal identification indicating that a party, whether officially or personally, saw to the fulfilment of an obligation within the terms of a standard arrangement or contract. Melena has shown in his analysis of the subjects of Knossian and Pylia sealing inscriptions that many of the sealings indicate the presence of raw materials or manufactured items in the workshops or storerooms of the palaces as the result of a "due contribution" (*a-pu-do-si*) or "a special contract on the part of the worker . . . in a peculiar labor service" (*o-pa*)⁴⁷. Those subjects connected explicitly with *o-pa* on sealings are hides and pelts (PY Wr 1325, 1330, 1331, 1332, 1333, 1334 [by association of seal design]⁴⁸; KN Ws 8498 [*ko-we?*]) and javelins (KN Ws 1704, 8495, 1705 [by association of seal design]). But a survey of all the sealing inscriptions reveals a nearly invariable concern with such concrete materials and goods: wine (PY Wr 1358-1361); unguents (*AREPA* PY Wr 1437); an unidentified type of foodstuff (*190 MY Wt 700); vessels, implements, fittings (*ke-ni-qa/ke-ni-qe-te-we* KN Ws 8497 / MY Wt 503; *pa-ke-te-re/pa-ke-te-ri-ja* PY Wr 1415 / MY Wt 506; etc. MY Wt 501, 502, 504, 505, 506, 507); wool and woven materials (KN Ws 1703, 8152, 8153, 8493, 8499); hides and animal

⁴⁵ Gill (*supra* n. 9) 72 does not definitely exclude this possibility.

⁴⁶ Gill (*supra* n. 9) 72. This, however, cannot be a universal explanation for the unimpressed sealings. PY Wr 1199 was found in Room 32 with no other sealings; Wr 1247 with only one other sealing (inscribed, Wr 1437) in Room 24.

⁴⁷ Melena (*supra* n. 8) 283-285.

⁴⁸ Perhaps Wr 1326 should be included here also by association of seal design with Wr 1330 find-spot (Room 98), and plausibly appropriate subject (*de-mi-ni-jo*).

products (PY Wr 1327, 1416, 1457; KN Ws 8712⁴⁹); men (KN Ws 1708) and women (KN Ws 8713, 8752); grain (KN Ws 8500); *185 and *257 (KN Ws 1701, 8494).

It is hardly unexpected then to find at Mycenae that the distribution of sealings is such that no seal-type is found in more than one building. The same is true for the scribal hands of the tablets. Both these facts reflect the focus of these establishments upon their own specialized interests: House of the Sphinxes (spices, vases, foodstuffs, *KU, DU*); House of the Oil Merchant (oil, wool); Citadel House (*190 and concerns of the ivory workshop and shrine⁵⁰); House of the Wine Merchant (liquid commodity thought not to be oil because of the lack of oily residue in pottery stored there); West House (grain, foodstuffs [including *190, *155 + *NI, GRA, OLIV, CYP, VIN*], *RE*); House of Columns (woven goods [*pa-we-a₂*]). The exclusiveness of individual seal-types to single establishments may derive from special contracts between workers/suppliers or officials of other establishments or industries and those operating these establishments. Thus the party identified by CMS I 163 on Wt 501-507 worked directly and, so far as we know, especially with the House of the Sphinxes in supplying the vessels eventually recorded on Ue 611. Similarly the individual whose seal (CMS V, 2 595) is found on Wt 700 was involved perhaps in the delivery or distribution of the quantities of *190 listed on Oi 701-706 for the operators of Citadel House. Whether these buildings were under the direct control of a central administration or not, they relied on outside workers, agents, suppliers, and took care to record on deposit documents the fulfilment of services by those persons.

Turning to Pylos, we do not find a much wider range of goods and materials listed on the sealings. Nor, surprisingly for a palace whose administrative organization in its final period depended on close monitoring of industrial activities that had been brought intentionally within a tight orbit of the palace, do we find the same seal-types in more than one establishment [and here the data are more numerous than at Mycenae]. The only cross-links between sealings occur within the NE Workshop (sealings with the same seal-types in Rooms 95 and 99, 95 and 98, 98 and 99, 98 and 100, 99 and 100) and Archives Complex (Rooms 7 and 8). Otherwise the sealings discovered in the separate work or storage areas 24, 32, 62, 95-100, 104-105 and even in the central archives and SW slope all identify parties who had apparently exclusive relationships with the separate, well-defined areas of activity within and around the palace.

There are 24 distinct seal-types on 40 sealings from the NE Workshop and 34 total (10 from Room 104, 24 from Room 105) on the 50 sealings (14 from Room 104, 36 from Room 105) from the Wine Magazine. Rooms 24 and 32 each have a sealing on which an inscribed name apparently replaces the seal-type. Room 24 has one other sealing with a unique impression. We have then some 60 parties

⁴⁹ Despite the cautious opinion in the *Docs²* glossary, the contexts of *e-po* on KN Ce 283, Ws 8712 and PY Vn 493 do suggest that we are dealing here with the same sort of animal in all cases. Ce 283 and Ws 8712 both come from the Room of the Chariot Tablets together with other livestock texts of Hand "124" (*BOS, CAP, OVIS, SUS*). On Ce 283 *e-po* is associated with *OVIS*: *e-po* 60[*OVIS* 40. On PY Vn 493 one has place names listed with comparable quantities (20-50) beneath a heading with strong livestock/collector associations: *a-ke-ro* (cf. Cn 1287) *e-po a-ke-ra₂-te* (cf. *a-ke-re* on Cc 660).

⁵⁰ W. D. Tylour, "Mycenae, 1968", *Antiquity* 43, 1969, 91-97; "New Light on Mycenaean Religion", *Antiquity* 44, 1970, 270-280. Notice the divine and occupational names on Oi 701-704.

involved in special services in areas of the palace whose activities were monitored through deposit documents and occasionally through eventual processing in the central archives.

The level of these services is indicated by contrast with those sealings found in Rooms 7–8 of the Archives Complex. Room 7 contained 3 sealings each with its own seal-type. Room 8 had 14 sealings and 10 distinct seal-types. There is one match between the rooms (*CMS* I 307 [Room 7] and *CMS* I Suppl. 173 [Room 8]). The sealings here are associated by find-spots with tablets of a non-deposit nature: Aa 98, Eb 169, En 467, Es 644, 648–652. It is not implausible that these associations are meaningful. Here we might have evidence of the use of sealings as confirmation of an entirely different category of obligation, service, or contractual status: land tenure arrangements; responsibility for female workers in the Further Province (note that 3 Knossos sealings list simply *VIR* or *MUL* without any further qualification); and fulfilment of religious obligation (*do-so-mo*). In this last connection we should stress that the one inscribed sealing from the Archives Complex, Wr 1457, refers to a similar kind of “due contribution,” an *a-pu-do-si* of *152, as in the records of proportional, regional tribute (Ma series).

An alternative to this “contractual” interpretation is that the seal-types on sealings in the Archives Complex may denote the palace officials or information-gatherers in charge of monitoring these higher order transactions. This would explain why only 1 of 17 sealings is inscribed (5.9%) amidst the confusion of an archives containing documents on a very wide range of subjects⁵¹. One might propose that the sealings were stored with the specific sets and thus identified the responsible officials or sources of information. This explanation is made somewhat less attractive, however, by the number of sealings (5) associated with tablets of a single series (Es). Nonetheless it finds some support in the cluster of 5 sealings, 3 inscribed (Wr 1358–1360), from Room 105 each bearing the same seal impression. The counter-inscriptions were written by possibly three different hands (H 13, S628–Ciii, and unidentified). Individual scribes, therefore, had access to the same seal (perhaps that of their superior or possibly the bureau in which they were working⁵²) and used it to enact a transaction for which they took immediate responsibility. If Lejeune’s suggestion that the words entered on Wr 1359 and 1360 are not qualifications of the ideogram *VIN*, but personal names is correct, we would have here an instance similar to a Knossos example discussed below and to the names written on the unsealed nodules: the names (N. B., of the scribes?) would identify the immediately responsible parties, whereas the impressed seal-type would identify the person with ultimate responsibility⁵³.

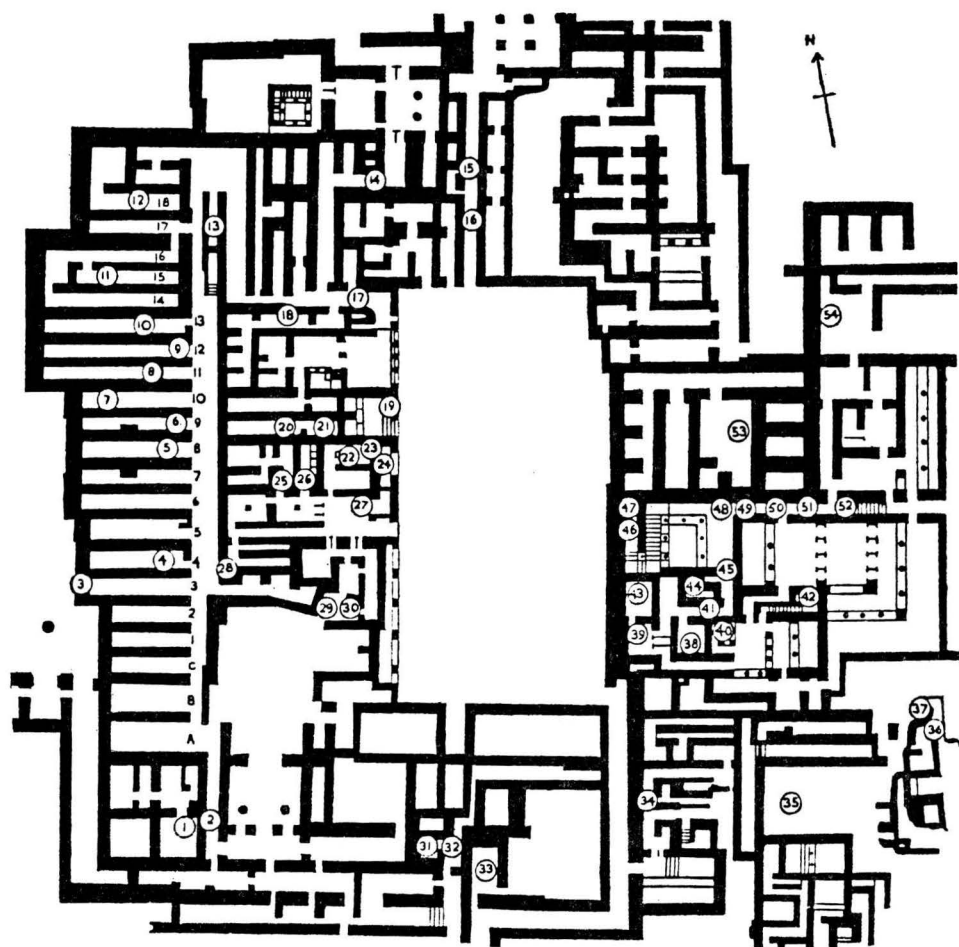
Like the Knossos tablets, the sealings from the Palace of Minos have a broader distribution that probably also results from the less centralized approach to administrative record-keeping⁵⁴. Mycenaean sealings were found in approximately 50 different locations plus the Little Palace, North-East House and Arsenal (roughly

⁵¹ Vs. 25% for the NE Workshop, 8% for the Wine Magazine, 100% for Rooms 24 (2 of 2), 32 (1 of 1).

⁵² The large number of seals from burial contexts argues strongly against identification of seal-types with administrative offices, economic departments, etc. and forcefully for the identification of seal-types with individuals.

⁵³ Melena (*supra* n. 8) 278, n. 97, citing M. Lejeune, *Mémoires de philologie mycénienne* II, Incunabula Graeca 42, 1971, 153 ff.

⁵⁴ For a comparison, see J.-P. Olivier, “Administrations at Knossos and Pylos: What Differences?” *PCA*, 11–18. For distribution, see Gill (*supra* n. 9) 63, 85–91. Numerical references are to Gill’s figure 1.



Knossos Palace with numbered find-spots of sealings (Gill, *BSA* 60, 1965, 63)

the same number of locations as the tablets); inscribed sealings in 9 locations plus the Arsenal. Also in contrast to Pylos, there are several instances where the same seal-type occurs on sealings from completely separate areas⁵⁵. Of primary interest is Ws 8754 from the area of the SW Door (1), the seal impression of which is found in four other areas: Rooms of the Jewel Fresco (20), Warrior Seal (21), Egyptian Beans (33), and the Secret Staircase (42), i.e., in the central, southwestern, southern and eastern areas of the palace. Moreover, Ws 8754 is inscribed:

ku-wa-ta o-pi a-nu-wi-ko.

Since *o-pi* seems to indicate at Knossos “at, chez, close to” or a relation of dependence” or “dans l’atelier de,” one might ask what sense it makes to have a sealing in the Palace of Minos declaring that X (a personal name) is *o-pi* Y (a personal

⁵⁵ Sealings in Gill’s areas 4 and 5; 20 and 21; 20 and 51; 47, 50 and 51; 34 and the Arsenal; plus the example discussed in the text: 1, 20, 21, 33, 42.

name)⁵⁶. I would suggest that this sealing is exactly parallel to PY Wr 1359 and 1360, i.e., that the person named *ku-wa-ta* is here assigned immediate responsibility for whatever service is being performed on behalf of the workshop controlled by *a-nu-wi-ko*. Olivier's suggestion that *a-nu-wi-ko* is himself a person of high status, perhaps a *ra-wa-ke-ta*, would explain both the need for a subordinate in charge of his workshop and the spread of *a-nu-wi-ko*'s seal design in various areas of the palace. As an important official he would have had interests in many of the palace's activities, as attested by the association of his sealings with tablets from the following series (and areas): As(1), B(33), D- (33,42), F- (20,33), G- (20, 21, 42), L (21), M (20, 21), O (20, 33).

It should also be noted that the less centralized Knossian record-keeping system naturally increases the number of instances in which inscribed sealings and corresponding on-the-spot tablet records are found together⁵⁷. Gill (*supra* n. 10, 4-5), in an analysis of a few cases, took this to mean that the sealings were used as labels on the tablet storage boxes. This is disproved by our survey of sealing practices at Mycenae and Pylos, particularly by the number of uninscribed sealings from the Pylos Archives Complex associated with tablets of a single series (Es) and by the fact that sealing Wr 1457, though thoroughly appropriate by subject for the kinds of subjects handled by the central archives, could not have labelled any of the extant series properly. Rather the sealings seem to be direct indicators of responsible parties in the activities eventually monitored by the tablets⁵⁸.

Conclusions: Mycenaean sealings were more limited in their functions and typology than Minoan and Near Eastern sealings. A decline in seal manufacture and quality after LH IIIA1 might have been due to an intentional restriction of the range of uses of these basic recording devices by the Mycenaean administrators who sought closer control of economic activities. Nevertheless sealings continued to be important economic controlling mechanisms. Some few examples exist of sealing use of the simplest kind (on clay stoppers). However, it is here suggested that sealings at Mycenae, Pylos and Knossos may have served as primary contractual and performance records within the economic system of the palace and its three-stage micro- and macro- chain of control. The sealings thus would have identified the parties responsible for transactions, which information might or might not be recorded on the "monitoring" documents of the workshop areas or the central administration. At Pylos most clearly one notes a dichotomy in levels of obligatory service and a corresponding difference in inscriptions on sealings used in the performance of the different types of service. Pylos and Knossos also furnish a few excep-

⁵⁶ A. Morpurgo Davies, "Mycenaean and Greek Prepositions: *o-pi*, *e-pi*, etc." *Res Mycenaeae*, 300, and Olivier (*supra* n. 10) 181.

⁵⁷ Ws 1703 with Lc and L texts of Hands 103, 113, 209; Ws 8152 with Lc, Ld, L texts of Hands 103, 116, 211; Ws 8499 by Hand 103 who writes L texts from nearby west magazines; Ws 8153 and L 771; Ws 8497 and K texts of Hand 224, and K 872, 740 of Hand 102 with metallic vases as on the sealing; Ws 8500 and E 71, 132, 165, 8122 of Hand "124"; Ws 8712 and Ce 283 [+] 7250 of Hand "124", and other C, Ce texts by the same hand; Ws 8493 and L 104, 178 + 281, 192 + 8022 of Hand "124"; Ws 1808 and As tablets of Hands 101, 102, 105; Ws 1704, 1705, 8495 and R 1815, 4482. Only the sealings with *hapax graphomena* ideograms and *MUL* from the Room of the Niche do not have obviously related tablets in close context. The latter are unperforated and are neatly explained by Gill as passcards issued to women workers by an authorizing official.

⁵⁸ This may even be true in the case where previously three sealings were thought to secure containers, i.e., the chests of *pa-ta-ja* in the Arsenal. Two of these sealings (Ws 1704, 8495) have *o-pa*, indicating that they came as a contractual delivery from the individual who is identified by the same seal impression on only these three of the fourteen sealings from this building.

tional examples of sealings on which the names of second parties are inscribed perhaps to designate them as immediately responsible as opposed to the owners of the seal design who are ultimately responsible. It is finally suggested that no sealings need have been used to label collections of tablets or storage boxes.

I should like to stress that these conclusions are hypothetical and represent an attempt to interpret the function of sealings within the overall Mycenaean economic system. A next stage will be to study the distribution of iconographically distinct seal-types on sealings from the major Mycenaean sites in order to see whether the seal designs can be linked with individuals within classes of officials, bureaucratic or economic departments, social ranks or groups, etc. The Minoan sealings should also be examined more closely, coordinating the analyses of Weingarten, Papapostolou, and Pope with examination of the Linear A documents and the distribution of both these classes of administrative tools across the specific Minoan sites and in context with the architectural and material remains so well studied by Hallager, Platon, Watrous, Banti *et al* *Investigatores rerum Mycenaearum procedamus*⁵⁹.

DISCUSSION

Responses

To remarks by Prof. Morpurgo Davies: I do believe that the question of language and literacy must be taken into consideration in interpreting the administrative changes that occur in the transformation from Minoan to Mycenaean Crete. The surprising point is that one would expect that the restriction of literacy that seems to take place moving from the Minoan Linear A period to the Mycenaean Linear B period would promote a greater use of non-literate recording mechanisms, i.e., seals and sealings. However, we have seen that there is a drop-off in seal manufacture and a reduction in the range of sealing types. One might explain this paradox by suggesting that the palace administrators imposed a stricter control on even these more basic means of recording.

To remarks by Prof. Chadwick: Any attempt to assess the extent to which literacy and formal administrative record-keeping permeated Mycenaean society is hindered by the selective pattern of archaeological excavation. Despite our knowledge of major provincial centers and lesser settlements from the Pylos records, the only non-palatial site so far excavated in Messenia is Nichoria, which did yield LH III B seals from the tholos tomb and more significantly from the poorly preserved habitation areas. Elsewhere the buildings outside of the fortification walls at Mycenae and even near the Menelaion at Sparta contained *scellés* and sealings. This makes me somewhat confident that excavation of such areas as the significant lower town at Pylos would confirm the suggested outreach of the palatial administrative system, at least via the means of seals and sealings, into outlying communities. The selectivity of excavation is similar in LM III Crete where so far only excavation at Mallia and Khania has brought to light secure, albeit limited, destruction

⁵⁹ This paper is dedicated to Mrs. Bonnie Coppey, without whose considerable skills, including chirographical decipherment, it would have missed several deadlines by even more than is customary *entre mycénologues*.

levels. Yet these sites along with other converted Minoan centers were undoubtedly integrated into the LM III administrative network so well sketched out by Bennet.

To remarks by Prof. Shelmerdine: One could indeed devise a scenario whereby sealings were not manufactured, impressed or inscribed until shipments came to the environs of the palatial centers. Then administrative literacy would be totally restricted to the palaces and their ancillary buildings. Aravantinos's study of the Thebes sealings, which mention rather remote toponyms, should shed light on this and the previous point.

To remarks by Prof. Teghey: In no way do I mean to elevate sealings above what we might call a lower archival status. They should, however, be studied as part of the entire economic monitoring system.