CHAPTER 5

FORMS, MATERIALS AND SEQUENCES

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5.1 Introduction

The contexts in which Cretan Hieroglyphic texts were used, stored and displayed, along with the social practices which involved them, have a prominent role in their interpretation process, as was explained in the preceding chapters. Other factors of paramount importance, strictly related to their find contexts, are the materials and formats of the writing supports on which these texts were written, and the different writing techniques employed.[1] In fact, as is well known,[2] the writing support makes a paramount contribution to the significance of what is written on it. As we will see below, in the case of Cretan Hieroglyphic script, particular texts (or even sequences) presuppose specific physical properties of the surface, because – we can assume – the same text on supports with different physical characteristics (from the selection of its form to the materials chosen for its manufacture) may not be able to convey the intended sense; in fact, in some cases, it is the text itself that determines the choice of its writing support. Within the two major categories of inscribed texts, seals and clay documents, hieroglyphic administration relied on very specific formats[3] that would have guided their use and facilitated the unambiguous interpretation of their textual contents, being as important as the written words.[4] Therefore, given that these distinctive document typologies had a precise role in the different steps of the Cretan Hieroglyphic administrative chain, we can establish that formats, materials and written contents, analysed jointly with the places in which the inscribed artefacts were used and stored, work

[1] They were incised with styli in the case of clay documents, clay vases (*CHIC* #316, #324, #327) and a pithos lid (*CHIC* #323); engraved (using the freehand technique or cutting wheels and different drill bits) on soft- and hard-stone seals; painted on a single Chamaizi vase (*CHIC* #326); carved and punched on two metal seals (*CHIC* #192 and #306); carved on a libation table from Malia (*CHIC* #328).

[2] Harris 1995: 113–20. [3] Finlayson 2013.

[4] Cf. Zinna 2004: 88–9: '*Le scritture non hanno alcuna esistenza fuori dal contesto delle altre unità o dal supporto che ne determina l'uso*'; […] '*La scrittura è il punto di contatto tra la memoria interna e intensa del soggetto verso una memoria oggettivata nello spazio esterno ed estenso delle materie*'.

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synergically in any comprehensive interpretation of Cretan Hieroglyphic inscriptions.[5] In accordance with this assumption, a careful analysis of the distribution patterns of syllabic sequences on the various document formats that were aimed at performing different specific purposes in Cretan society and administration can help us to define, at least in a broad fashion, the semantic field in which to place some of the most frequently recurring Cretan Hieroglyphic words – albeit that this script remains undeciphered.

5.2 Cretan Hieroglyphic Sequences on Different Document Formats: Distribution, Materials, Forms and Functions

Starting with the most numerous – at least, at the moment – category of inscribed document format, Cretan Hieroglyphic seals, we can group their total number known to date (145; see Index I.1, this volume) into four basic typologies based on their forms: twenty-three 1-sided seals (15 *Petschafte*: *CHIC* #180–93 and P.TSK06/145;[6] five half-ovoid seals: *CHIC* #194–8; two half-cylinders: *CHIC* #199–200); and six 2-sided seals (two discoid seals: *CHIC* #202–3; one amygdaloid seal: *CHIC* #204; two cushion seals: *CHIC* #205–6 and one wedge-shape seal: *CHIC* #207). The corpus of Cretan Hieroglyphic 3- and 4-sided prisms, in turn, consists of 112 seals in total, distributed among seventy-four 3-sided (*CHIC* #208–77, to which we can now add P.TSK14/2604;[7] P.TSK13/1485;[8] MA/V S (1/3) 02[9] and P.TSK12/1249)[10] and thirty-eight 4-sided seals (*CHIC* #278–312, plus P.TSK05/259,[11] VRY S (4/4) 01[12] and P.TSK05/291[13]), inscribed on a differing number of faces. To these, must be added the irregular cushion with four unequal engraved sides recently published by Kanta, Palaima and Perna[14] (KN S (4/4) 01; Jasink and Weingarten, this volume).

As for recorded textual information, the majority of seals we know to date (52%) are inscribed with just one syllabic sequence; 11% have

[5] For some evaluations of the relations between Cretan Hieroglyphic documents, their uses, materials and contents, see Ferrara and Jasink 2017. Cf. Olivier 2000; Poursat 2000; Perna 2014; Jasink 2002.
[6] Krzyszkowska 2012: 148–50, fig. 4.
[7] Krzyszkowska 2017: 149–50, fig. 5; Del Freo 2017: 8 (PE S (1/3) 02).
[8] Krzyszkowska 2017: 149–50, fig. 5; Del Freo 2017: 8 (PE S (1/3) 01), and n. 31.
[9] Del Freo 2012: 6. [10] Krzyszkowska 2017: 151, fig. 6; Del Freo 2017: 8 (PE S (2/3) 01).
[11] Krzyszkowska 2012: 151–2, fig. 6 and n. 24; Del Freo 2017: 7 (PE S (3/4) 01).
[12] Hallager, Papadopoulou and Tzachili 2011: 65–70, figs. 4–5; Del Freo 2017: 8–9.
[13] Krzyszkowska 2012: 152–3, n. 30, 31 and fig. 7; Del Freo 2017: 7–8 (PE S (3/4) 02).
[14] Kanta 2018 cat. 305; Kanta, Palaima and Perna 2023.

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Table 5.1 *Amount of textual information on seals*

	1F Seals (23)	2F Seals (5)	3S Prisms (74)	4S Prisms (37)	*Varia* (3)	**TOT /143**[15]
Seals with 1 inscribed sequence	#181–201; P.TSK06/145 **(22)**	#202–5 **(5)**	#208–41; #256; P.TSK14/2604; P.TSK13/1485; MA/V S (1/3) 02 **(37)**	#278–82, #292 **(6)**	#313, #315, KN S (4/4) 01 **(3)**	**74 (52%)**
Seals with 2 inscribed sequences	#180 **(1)**	#207 **(1)**	#242–50, #259; P.TSK12/1249 **(11)**	#284–6 **(3)**		16 (11%)
Seals with 3 inscribed sequences			#251–5, #257–8, #260–75, #277 **(25)**	#283, #287–90, #305; P.TSK05/259 **(7)**		31 (22%)
Seals with 4 inscribed sequences			#276[16] **(1)**	#293, #295–6, #299–304, #306–12; VRY S (4/4) 01; P.TSK05/291 **(18)**		19 (13%)
Seals with 5 inscribed sequences				#298 **(1)**		1 (< 1%)
Seals with 6 inscribed sequences				#294? (probably more), #297 **(2)**		2 (1, 3%)
Seals with 11 inscribed sequences					#314	1 (< 1%)

two inscribed sign groups; 13% have four; and 22% have three carved sequences (Table 5.1). The number of inscribed sequences is broadly (but not necessarily) linked with the forms of the seals. On the one hand, not all the prism faces are inscribed; on the other, one single face (of any kind of seal) can be carved with two sequences. Among 3-sided prisms, in fact, thirty-nine have one inscribed side; ten cases have two inscribed sides, and twenty-seven cases have three. Among 4-sided prisms, five seals have just one face inscribed, four have inscriptions on two faces and five are inscribed on three sides, but the majority of them (twenty-two seals out of thirty-eight, i.e. 58%) are inscribed on all

[15] Olivier 1996c: 4 ('*super tampon*').
[16] From the total number of 147 seals, we have subtracted #206 (cushion seal) and #291 (stepped 4-sided prism), inscribed with klasmatograms and logograms only.

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four sides. Although, in some cases, more than one Cretan Hieroglyphic sequence can be carved on one inscribed face, round, oval or elliptical faces of 1-sided seals are generally carved with just a syllabic sequence (but see #181, bearing two syllabic sequences), whereas 3- and – most of all – 4-sided prisms can host from one to six (or more) sequences. For example, the 4-sided prism #298 is carved with five sequences, #297 with six and #294 with probably even more sign groups. Finally, the only 8-sided prism that has been found to date (#314, from Neapolis) is inscribed on its eight sides with eleven sign groups, and for this reason was described as a 'super stamp' by Olivier.[17]

Very significantly, the number of inscribed faces of prisms and the amount of textual information written on them are linked to the materials employed in making the seals. As extensively demonstrated by Poursat[18] and Karnava,[19] in fact, it is possible to prove the existence of a recurrent correlation between soft and hard stones and the amount of textual information carved on prismatic seals. On the total of sixty-eight 3-faced prisms published in *CHIC* and analysed by these scholars, 53% are made of soft stone and 47% of hard stone; but while soft-stone prisms mainly have hieroglyphic texts on a single face (80%), hard-stone seals are mainly inscribed on three faces (66%). The same picture is confirmed by the analysis of 4-sided prisms: most of them (71%) are engraved on hard stones and, among them, 18 seals (53%) bear inscriptions on all four faces. Of course, hard materials were better suited than soft stones for carving inscriptions and produced sharper clay impressions, but they probably also had an intrinsic value as a luxury product destined to be used or possessed by the upper strata of Cretan society.[20] Moreover, the choice of these materials implied the use of highly sophisticated carving techniques, made possible by the introduction of the fixed lapidary lathe with a fast rotary or horizontal bow-drill,[21] resulting in the manufacture of prestigious inscribed artefacts.

Thus, it seems possible to hypothesise a frame of reference in which a higher amount of textual information (all prism faces inscribed = four or more written sequences) corresponds to more valuable materials and, according to Poursat, to a higher social status of the seal-owners: the more sign groups they were allowed to use administratively, the higher

[17] On its face γ, #276 bears the sequence 005-044-049, for which *CHIC* suggests a reading 044-005 (γ_1) and 044-049 (γ_2) by analogy with #259, #283, #297 and #298.
[18] Poursat 2000: 189. [19] Karnava 2000: 192–4, tab. 38–9.
[20] For a *comparandum* with the Mesopotamian milieu, cf. Nissen 1977: 20: 'another correlation becomes evident between the cost of a seal and the rank of the seal owner/user within the economic system'.
[21] Krzyszkowska 2005: 83.

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would be their position in the administrative machine of Middle Minoan Crete. Conversely, a lower amount of textual information (only one face inscribed) would correspond to less valuable stones and to a lower social status of the seal-owners. In addition to the prisms studied by Poursat and Karnava, there are now the four newly discovered, 3-sided examples already mentioned (P.TSK14/2604; P.TSK13/1485; MA/V S (1/3) 02, P.TSK12/1249) and three 4-sided prisms (P.TSK05/259, VRY S (4/4) 01, P.TSK05/291), the materials of which and the number of sequences engraved on whose faces fit the picture outlined above, with the 4-sided prism coming from Vrysinas being part of the minority 4-sided prism group made of soft stones (Table 5.2). Obviously, we are talking about trends, not about absolute rules, but trends are meaningful.

For their part, while 2-face seals (notably, cushion seals) were made principally of soft stones or bone, 1-face seals (and, most of all, *Petschafte*) were 'among the most carefully and elaborately worked Minoan seals'[22] – in some cases, being real masterpieces – and were probably manufactured as prestige artefacts. Finally, it should be stressed that among seals with only one face inscribed is the only extant inscribed figurative seal (#187, in the form of a pitcher), made of rock crystal and masterfully executed. As for materials, they were predominantly of hard stone and in two cases of metal (#182 and #192). Accordingly, making a joint evaluation of forms, materials and amount of textual information, it seems sufficiently clear that these different seal formats in Middle Minoan Crete were used for different purposes – a likelihood confirmed by their sphragistic use on nodules of different types (*noduli*, direct sealings, crescent-shaped nodules) and other artefacts (mainly, pots[23]) – and

Table 5.2 *Prismatic seals found after* CHIC

3-sided prisms	1/3 faces inscribed	P.TSK14/2604	fine-grained soft to medium-hard stone (limestone?)
		P.TSK13/1485	fine-grained soft to medium-hard stone (limestone?)
		MA/V S (1/3) 02	ivory
	2/3 faces inscribed	P.TSK12/1249	carnelian
4-sided prisms	3/4 faces inscribed	P.TSK05/259	dark green jasper
	4/4 faces inscribed	VRY S (4/4) 01	red serpentine
	3 or 4/4 faces inscribed	P.TSK05/291	mottled jasper

[22] Yule 1980: 89. [23] Civitillo 2016a: 119–33, with previous bibliography.

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that they were intended to be written with sequences pertaining to different semantic fields (anthroponyms, titles and administrative/countability/trade terms; *infra*).

Moving on to the second category of Cretan Hieroglyphic texts, of those incised on different formats of clay documents,[24] we can count, to date, 133 total specimens distributed (see Index I.3) among thirty-three crescent-shaped nodules (*CHIC* #001–029, #097 [Ha]; PE Ha 003–005),[25] forty-three medallions (*CHIC* #030–047; #072–084; #098–104 [He]; PE He 006–015),[26] seventeen 2-sided lames (*CHIC* #085–094; #105–110 [Hf]; SY Hf 01),[27] thirty-two 4-sided bars (*CHIC* #049–067; #095–096; #111–118; #121 [Hh]; PE Hh 016–017),[28] five tablets (*CHIC* #068–069; #119–20; #122 [Hi]), two cones (*CHIC* #070–071) and a roundel (PE Hc 002).[29] These document formats were conceived for different kinds of registrations, as recently discussed by Finlayson.[30] Their basic hierarchy seems to have counted, on the one hand, crescent-shaped nodules (the only kind of nodule bearing, in some cases, incised Cretan Hieroglyphic texts along with seal impressions), 2-face lames and medallions. These documents, all pierced, are very likely to have been designed and used for accompanying commodities (hanging from them) that arrived at magazines or storage areas. Crescent-shaped nodules are inscribed on their faces with a different number of sequences, from one to four; they could be inscribed with syllabic sequences only, with logograms identifying products (like **153* on #006, **156* on #007) or with syllabic sequences *and* logograms (cf. #021, bearing a Cretan Hieroglyphic sequence and logogram **153*; #023: a sequence and logogram **195bis*; #024 and #026: a sequence and logogram **153*). They could be stamped by one to three seals, often inscribed in turn with Cretan Hieroglyphic sequences.

Medallions are lentoid-shaped clay disks, generally bearing a sign group on one face and a logogram (**153*, **156*, **166*, **174*) and/or a short inscription plus numerals on the other.[31] Among more complex specimens, for example, #039 (from Knossos) is inscribed with three sequences on face *a* and two sign groups plus numerals on face *b*; #043 has two sequences inscribed on face *a* and another one, plus a logogram (**153*) and numerals, on face *b*. Since medallions record numbered quantities of something, they could have been attached to objects as a

[24] For a detailed analysis, see Karnava 2000: 101–9, 116–56.
[25] Tsipopoulou and Hallager 2010: 155–6. [26] Ibid.: 158–61.
[27] Lebessi, Muhly and Olivier 1995. [28] Tsipopoulou and Hallager 2010: 161, 165.
[29] Ibid.: 157.
[30] Finlayson 2013: 133–5, with previous bibliography; see also Younger 1996–1997 [1998]: 385–400.
[31] Hallager 1996: 33–4.

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sort of label. The presence of some medallions in workshops at Malia *Quartier Mu* has suggested to Poursat[32] their function as working documents, associated with commodities delivered, stored or distributed to personnel. Registrations on lames, in turn, written on one or two faces, seem to refer to just one transaction, both when logograms and numerals are specified and when only sign groups are attested on their faces.[33] Finally, information about deliveries might have been written on cones.[34] However, it should be noticed that only two cones (*CHIC* #070 and #071) have survived in our documentation and, in this case as well, they come from Malia; therefore, it is very difficult to reach any consensus on their uses and purposes, at least judging on their format alone.

On the other hand, and at a different textual and archivistic stage, hieroglyphic administration relied on 4-sided bars (pierced and unpierced) and tablets, upon which more complex accounting texts seem to have been compiled. In fact, these document formats carried more textual information than other clay documents seen so far and are formatted in a way that permits the identification of headings, lists of commodities (also indicated with logograms) and numerals. The only clay documents written with a number of sequences between five to ten or, in just one case, greater than ten (#059) are, in fact, 4-sided bars (Table 5.3). Whatever the precise function of pierced 4-sided bars,[35] unpierced ones could have fulfilled an intermediate function between bars and so-called tablets. In fact, Hallager[36] has suggested that bars were basically variants of tablets and, in the same vein, Olivier[37] interpreted them by analogy with Linear B 'palm-leaf' tablets. In fact, just like unpierced 4-sided bars, Cretan Hieroglyphic tablets seem to have been conceived according to a shape and size determined by the specifics

[32] Poursat 1990a: 28–9.

[33] Karnava 2000: 145–9. Contrary to *CHIC* and based on observations of the forms and dimensions of the documents, Karnava has suggested that #90, #105 and #108 are not lames, but a 'tag', a tablet and a palm-leaf shaped document respectively. Apart from the specimen from the sanctuary at Syme (Lebessi, Muhly and Olivier 1995), lames seem to be specific to Malia: until now, in fact, they are absent from both Knossos and Phaistos.

[34] Younger 1996–1997 [1998]: 385–6.

[35] Two main hypotheses have been suggested for the purposes of pierced 4-sided bars: according to Olivier (1994–1995: 268–9), they were stored hanging from some sort of horizontal rod that enabled their sorting; if it were necessary to add additional information to texts written on them, they could be taken down from the rod and inscribed again. According to Younger (1996–1997 [1998]: 385–400), instead, they could have been attached to the commodities themselves, or to boxes that contained them, on the way to central places. These two hypotheses are not necessarily in mutual contradiction, since hanging bars accompanying commodities could have been stored in archives hanging from rods.

[36] Hallager 1996: 33. [37] Olivier 1994–1995: 268–9.

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of their scope: namely, for being stored and not attached to anything. Therefore, as in the case of Linear A and B page-shaped tablets, it has been suggested that they recorded more elaborate data.[38] However, it should be stressed that, among the only five Cretan Hieroglyphic 'tablets' known so far (*CHIC* #068–069, from Knossos; #119–120, from Malia, Palace; #122, from Phaistos), the two coming from the palace at Malia (which distinguishes itself as the place where the largest variety of Cretan Hieroglyphic documents were in use) have thick sides and, just like the bars, are inscribed *on three faces*. Tablets from Phaistos and Knossos are thinner and inscribed on the *recto* only, but their interpretation remains controversial.[39] As a consequence, although we have very scanty documentation to deal with, it seems sufficiently clear that the tablet format is very poorly represented in the Cretan Hieroglyphic corpus, so it appears as a rather unusual document format in the bureaucratic practices that relied on this script (Jasink and Weingarten, this volume).

Table 5.3 *Amount of textual information on clay documents*

	Cones	Crescent-shaped nodules	Medallions	2-sided lames	4-sided bars	Tablets
One or two sequences	#070–071	#001–002, #004–005, #008, #010–017, #019–026; #097	#030–031; #033–037; #041; #044–047; #072–084; #098–104; PE He 006–007; PE He 009–012	#085–089; #090–094; #105–108; #110; SY Hf 01	#051; #055; #060; #064; #066–067; #095; #111; #115–118; #121; Hh 017	#068–069; #122
Three to five sequences		#003, #018, #027–029; PE Hh 003	#032; #038–040; #042–043	#109	#050, #052–054; #057; #065; #114	#119; 120
Six to ten sequences					#049; #056; #058; #061–63; #112–113; PE Hh 016	
More than ten sequences					#059	

[38] Hallager 1996: 31; Younger 1996–1997 [1998]: 386.

[39] It should be noted that some peculiarities they show in the use of some signs have led Karnava (2000: 154–5) to hypothetically suggest that the tablets from Knossos could have been written in Linear A.

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5.3 Cretan Hieroglyphic Sequences on Different Media: 'Formulae' and 'Non-Formulaic' Sign Groups

By looking at Cretan Hieroglyphic documents and jointly evaluating forms, materials and the amount and typology of sequences written on them, we can gain some interesting results about the apparently codified patterns of use of specific sequences on precise document formats made of particular materials. In fact, Cretan Hieroglyphic sign groups are unequally distributed not only among clay documents (crescents, medallions, cones, lames, bars, tablets) and seals (and their impressions), but also – as regards seals – among 1- and 2-sided seals and 3-/4-sided prisms. The total number of sequences of two or more signs recurrent on seals, in fact, is 286 (cf. Index I.1 and Index II.a–d), but the total of *different* sequences attested (each counted once) is 143, with a very high degree of word repetition. As may be observed in Index III.a, the sequences attested five or more times[40] are the so-called 'formulae'. This definition was first used by Evans[41] to indicate sequences frequently attested on seals and, in some cases (four, to date: cf. Index III.a), on clay documents as well. According to him, these sign groups would have been used for indicating official titles,[42] ideographically representing designations such as 'warrior and founder' (, trowel[43] + arrow), 'overseer and builder of palaces' (, trowel + eye), 'guardian and leader' (, gate + leg), 'builder or founder' (, adze + trowel'), etc.[44] In 2000, Poursat recognised eight 'formulae' plus the so-called 'Archanes formula'.

As for the recurrence of these sequences, it seems possible to discern meaningful patterns of attestation on specific seal typologies. In fact, they recur mostly on 3- and 4-faced prisms, as confirmed by the analysis of sealed documents (cf. Index III.a).  (trowel-arrow, CH 044-049), for instance, is the most frequently attested sequence in the entire Cretan Hieroglyphic corpus, with seventy-six total occurrences. It recurs fifty-nine times (78%) on seals, fifty-four of which are on prisms (thirty-five times on 3-sided and nineteen on 4-sided prisms); this medium-specific recurrence is confirmed by its five impressions, all coming from prisms (one from a 3- and four from a 4-sided). Conversely, this 'formula' recurs only three times on 1- and

[40] Olivier 1990: 11–24; Godart 2001: 144. [41] *SM* I: 260.

[42] Ibid., 265: 'groups or single word-signs which, both for their apparent ideographic value and their recurrence on seals, we have good reason for identifying with official titles'.

[43] It should be observed that the so-called 'trowel' sign more probably represents a *Petschaft*: Ferrara and Cristiani 2016.

[44] *SM* I: 268. In some cases, those 'titles' could have been accompanied by signs used as 'canting badges', i.e. 'types parlants' expressing personal badges, actual names or *cognomina* of the seal-owners like, for example, 'Cat', or 'Lion', 'Fish', etc. Cf. *SM* I: 263–72.

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2-face seals (#180, #188, #207.β) and two times on the 8-sided prism #316. 𓌹𓆓 (trowel-eye, CH 044-005), for its part, recurs on prisms thirty times out of its forty total recurrences, and seven times out of eight on impressions made from this seal typology. As in the case of 𓌹𓅓 (trowel-arrow), we can observe a considerably minor use of this 'formula' on 1- and 2-face seals (once, on #194) and on impressions from this seal form (just one, on #138). The same picture is confirmed by other formulae like 𓋴𓎛 (038-010), 𓋴𓎛𓏏(038-010-031) and 𓊽𓋴 (042-038), predominantly attested on prisms and impressions from them and just once on 1-face prisms, while 𓃭𓎟 (036-092), 𓃭𓎟𓏏(036-092-031), 𓌀𓀀𓍿 (057-034-056), 𓂋𓌹 (046-044) and 𓊽𓃒𓎛 (042-054-061) are attested on prisms and their impressions *only*. Thus, the surface *along with* the texts carved on it appear to be codified and, therefore, meaningful.

The so-called 'Archanes formula' (42-019-019-095-052)[45] (Valério, Flouda, and Jasink and Weingarten, this volume) is decidedly a case apart. As already observed,[46] its attestation patterns are very specific (and thus, probably, codified) and different from other 'formulae'. This sign group, in fact, is *never* on standard prisms, but on discs (#202), discoids (#203), cushion seals (#205), cubes (#313), a 4-sided stepped prism (#292.α-γ), two gable-shaped prisms (#251.β-α, #252.β-α), a triple-stacked cube (#315) and an irregular cushion with four unequal engraved sides (KN S (4/4) 01),[47] mostly made in soft stone or bone. Its imprints (or its partial imprints) on sealings, made almost exclusively from cushion seals, fits this picture, as well as the typology of impressed sealings, that are not crescent-shape nodules (the main stamping support of prisms engraved with the other 'formulae'),[48] but different kinds of *noduli*.[49] Consequently, in this case as well, the surface *along with* the texts carved on it *and* the materials chosen appear to have been recurrent and codified. Finally, while the other 'formulae' often recur with other 'formulae', the 'Archanes formula' *never* appears together with these special sign groups, showing a completely different use (and, therefore, belonging to a different semantic field).

Coming back to prisms, their main feature, in fact, is to be inscribed with a 'formula' (different from the 'Archanes formula') accompanied or not by other 'formulae' or other sequences (which we refer to as 'non-formulaic' sign groups). On the other hand, the attestation on prisms of sequences *different* from 'formulae' *only* is limited: on

[45] For a more appropriate definition of this sequence as 'Archanes inscription', see Karnava 2021: 246.
[46] Civitillo 2016b.
[47] Kanta 2018 cat. 305; Kanta, Palaima and Perna 2023.
[48] Poursat 1989: 221–2; 1990a: 28–9; Weingarten 1995.
[49] Civitillo 2016b.

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sixteen out of seventy-five 3-sided prisms and in seven out of thirty-five 4-sided prisms considered (see Table 5.4). One-faced seals (*Petschafte*, half-ovoid and half-cylinder seals, a cylinder), instead, mainly have sign groups different from 'formulae', with only five attestations of 'formulae' (and one of the so-called 'Archanes formula' on a cylinder) out of a total of twenty-two seals (cf. Index IV). These five cases apart, the

Table 5.4 *Sequence typologies attested on seals: formulae and non-formulaic sign groups*

	1F Seals (22)	2F Seals (5)	3S Prisms (75)	4S Prisms (35)
Seals with sequences different from 'formulae' only	#182, #183, #184, #185, #186, #187, #189, #190, #191, #192, #193, #196, #197, #198, #200, P.TSK06/145 **(16)**	#204 **(1)**	#224, #225, #236, #239, #241, #234, #222, P.TSK14/2604, P.TSK13/1485, P.TSK12/1249, #243, #245, #259, #271, #273, #256 **(16)**	#280, #282, #289, #304, #306, #307, P.TSK05/291 **(7)**
1 'formula' seals	#181, #188, #194, #195, #201 (Arch. f.) **(5)**	#202, #203, #205 *(in all cases, Arch. f.)* **(3)**	#208, #209, #210, #211, #213, #215, #216, #220, #226, #227, #230, #231, #237, #240, #233, #235, #212, #214, MA/V S (1/3) 02, #229, #238, #217, #219, #221, #228, #223, #218 **(27)**	#278, #281, #279 **(3)**
1 'formula' + non-formulaic sequence/s	*#180* ***(1)***	*#207* ***(1)***	*#209, #246, #242, #251, #252, #270, #267, #255* ***(8)***	*#286, #285, #290, #292* ***(4)***
2 'formulae' seals			#244, #249, #248, #250, #247 **(5)**	#284 **(1)**
2 'formulae' + non-formulaic sequence/s			*#268, #275, #272, #266, #277, #269, #265, #264, #254* ***(9)***	*#283, #287, #305, #300, #301, VRY S (4/4) 01, #312, #303, #296, #297* ***(10)***
3 'formulae' seals			#260, #274, #261, #258, #253, #257, #262, #263 **(8)**	#288, P.TSK05/259 **(2)**
3 'formulae' + non-formulaic sequence/s			*#276* ***(1)***	*#302, #295, #309, #310, #311, #308, #293, #298* ***(8)***
4 'formulae' seals			#299 **(1)**	

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sequences inscribed on their surface are, in all cases but one (analysed *infra*), *hapax legomena* and, for this reason, probably express anthroponyms; they could have indicated titles, as already proposed (Jasink and Weingarten, this volume), but we wonder if, in that case, we should have expected a wider attestation of these terms.

To this picture must be added the 8-faced prism #314, with six 'formulae' + four non-formulaic sequences. As for what we can tentatively call the 'syntax' of the sequences written on prisms, it is interesting to observe (cf. Index IV) that, among 'formulae', 𓄿𓁹 is attested jointly with 𓄿𓀀 twenty times in its thirty total attestations (in #247, #253, #261, #264, #266, #274, #276, #277, #283, #287, #295, #297, #298, #299, #301, #305, #308, #311 and VRY S (4/4) 01, sharing a sign in #298.δ1-δ2; #276.γ e #259.β-α; β-γ). However, while 𓄿𓀀 is the 'formula' more widely attested on 3-sided prisms with one side inscribed only (twenty-one times out of twenty-seven attestations of 'formulae' on this kind of seal) and – as we have already seen – made of soft stone, 𓄿𓁹 is *never* attested on one-face-inscribed-only seals, but starts to be written on prisms with two (or more) faces inscribed. 𓃾𓂋/𓃾𓂋𓏏 (probably inflected),[50] 𓃀𓂋 and 𓃰𓄿𓏏 are rarely attested on prisms with just one face inscribed, recurring primarily on prisms with two or more faces bearing inscriptions (and thus more frequently made of hard stone), along with 𓃀𓂋𓏏, 𓃀𓄿, 𓄤𓆑 and 𓄤𓃾. As a consequence, if all-sides-inscribed prisms (made with progressively more valuable materials) can be written with all 'formulae', the other prism typologies (i.e. with fewer than 3 inscribed sides) only attest about half of the formulae. Thus, it seems possible to glimpse a sort of hierarchy in the use of 'formulae'. If 𓄿𓀀 is primarily attested on one-face-inscribed-only, 3-sided prisms, when the number of inscribed faces is two or three, this 'formula' is associated principally with 𓄿𓁹 (sixteen times out of the total of seventy-three prisms with more than one face inscribed). When this last 'formula' is absent, 𓄿𓀀 is associated mainly with 𓃾𓂋/𓃾𓂋𓏏 (on #249, 258, 260, 284, 300, 293). If, on the contrary, 𓄿𓀀 is absent, 𓄿𓁹 is associated (with just one exception: #254) with 𓃾𓂋/𓃾𓂋𓏏 and, if another 'formula' is carved, this is 𓃀𓂋𓏏/𓃀𓂋. Finally, when 𓄿𓁹 and 𓄿𓀀 are absent, the most frequent 'formulae' association is 𓃾𓂋/𓃾𓂋𓏏 with 𓃀𓂋𓏏/𓃀𓂋 or 𓃀𓄿 on six prisms (#248, #257, #265, #269, #272, #275). Only one seal is carved with 'formulae' on all sides (#299, made of green jasper and masterfully carved), which are: 𓄿𓀀 - 𓄿𓁹 - 𓃀𓂋 - 𓃾𓂋𓏏. Finally, only #314 (made of agate) has five 'formulae' written on its surface: 𓄿𓀀 - 𓃀𓄿 - 𓃾𓂋𓏏 - 𓃀𓂋𓏏 - <𓄿>𓁹.

[50] On the possibility that these two terms were variants (inflections?) of the same term, see e.g. Olivier 2000: 153–4.

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Therefore, it seems conceivable, in accordance with Poursat[51] – albeit with the necessary caution – that the number of faces inscribed and the differences in the appearance of diverse number and typology of 'formulae' according to this criterion, and jointly with the evaluation of the materials chosen, corresponded to the functions that the owner of a seal could perform within the administration, through the active use of these sequences for stamping documents, accessing progressively more complex bureaucratic/administrative responsibilities. The increased recording complexity of 4-sided prisms with all faces inscribed, combined with the more frequent use of them to seal written documents (notably, crescent-shaped nodules), seems to witness a distribution of such artefacts through a hierarchy of administrators operating on MM II–III Crete. All that said, the precise meaning of 'formulae' remains an open question.[52] On the basis of their frequent associations, Olivier[53] hypothesised that 044-049 and 044-005 could have indicated two extremely popular institutions involved in the same sphere of influence, perhaps mutually complementary, cautiously suggesting an interpretation of them as referring, *exempli gratia*, to the notions of temple/palace. Weingarten,[54] on the other hand, hypothesised that they could indicate two different branches of the palace administration, 'perhaps one as the royal estate, the other as a department of bureaucracy', considering the 'temple' as the place referred to by the so-called 'Archanes formula'.[55]

The analysis of the attestation of these sequences on administrative documents, along with the contextual analysis of sign groups attested in association with them, may provide more glimpses into the evaluation of their possible meanings. In fact, as already said, among 'formulae', four are attested on clay documents as well. More specifically, 044-049/044-049 is attested on eight 4-sided bars (#049.a, #049.b, #050.c, #056.aA, #056.<aB>*, #056.b-e #056.dB, #059.dA) and on two medallions (#040.b1, #042.b1) from Knossos. In its attestations, 044-049 *always* occurs (except in #059.cB, where it is followed by a *lacuna*) before numerals. 042-054-061 when incised on bars (#050.a, #058.a, #062.[a], #062.cB and #062.*dB**) is also associated (when there are no *lacunae*) with numerals. Finally, 036-092 is attested on a 2-face lame from Malia (#109.b) along with *hapax* sequences. The attestations of 044-005 on clay documents provide even more

[51] Poursat 2000: 188–90.

[52] For different hypotheses, cf. Olivier 1990: 17–18; Weingarten 1994: 179–80; 1995: 303; Poursat 2000: 189; Boulotis 2008: 75.

[53] Olivier 1990: 17–18.

[54] Weingarten 1995: 303.

[55] In the same vein, for an interpretation of this 'formula' as referring to something like 'offerings/things delivered to the deity', cf. Civitillo 2016b with bibliography.

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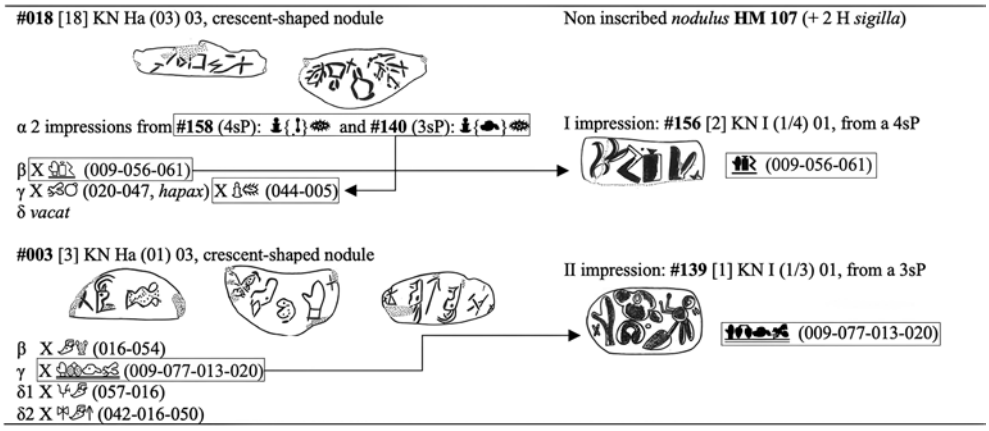


Figure 5.1 *CHIC* #018, #003 and HM 107

stimulus for a general discussion on these special sequences. Aside from the 4-sided bar #059.aA, where it is followed by numerals, it was incised on the crescent-shaped nodule #018.γ that was, in turn, stamped from two different prisms with the same 'formula' (#140 and #158; see Figure 5.1).

Based on this evidence, Younger[56] – rightly, in our opinion – hypothesises that this sequence 'actually means something like "received"', whereas its impression on the nodule 'authenticates and verifies the incised statement'. The same authentication value could have been expressed also by (044-049), when stamped on sealings, always from 4-sided prisms (#157, #159, #161, #170). Therefore, if 'formulae' would belong to a shared administrative/transactional vocabulary, we can tentatively hypothesise – in the same vein as Poursat[57] – that the progressively more complex administrative tasks assigned to the owners of seals with a different number of inscribed 'formulae' could have been related to things checked or to be checked, paid/delivered/received or to be paid/delivered/received, sent or to be sent, used or to be used for something, and the like. Consequently, we may imagine a hierarchy of officials who could operate or validate different transactions, of increasing complexity, for which precise 'formulae' were needed. The hypothesis that they could refer to titles[58] could also fit with their pattern of attestations on clay documents, where they might have indicated the recipients of the things/operations registered – which is why they were followed by numerals. However, this does not seem to take adequate account of the evidence that, as we have seen,

[56] Younger 1996–1997 [1998]: 391–2. [57] Poursat 2000. [58] Finlayson 2013: 133–4.

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one or more 'formulae' often occur together on the same prisms; at least, this hypothesis would require a precise explanation for the combined presence on prisms of what would appear to be a 'hierarchy' of titles, but with different combinations.[59]

The information expressed by 'formulae' could have been completed, on prisms, using other terms. The latter appear in most of the cases of *hapax legomena* (see Index IV) and, for this reason, it is generally agreed that they represent anthroponyms[60] (or the names of families/clans of the seal-owners) or titles; this last hypothesis, however, seems – again – more uncertain for *hapax* words. Titles would more probably have been expressed, in our opinion, by sequences attested more than one time on seals and sealings like, for example, 𐄁𐄂𐄀 (044-036-018) (Index III.b). This word is attested on three 3-sided prisms: P.TSK12/1249.α (in association, on face β, with 𐄃𐄁 ><, 077-051 ><, *hapax*); P.TSK14/2604.β (on the only inscribed face of the seal); and #255.α, from Crete, in association with a 'formula' on face γ (𐄇𐄁, 046-044) and a very long *hapax* sequence (if they are not two sequences written in *scriptio continua*) on face β, *hapax*. Finally, the same sequence recurs on face *c* of #300, from Crete (?), in association with two 'formulae' (𐄁𐄐, 044-049, on face *a*, and 𐄉𐄋𐄎, 038-010-031, on face *b*) and one *hapax* on face *d*. On these two seals we can hypothesise the presence of two administrative/bureaucratic terms ('formulae'), a title (𐄁𐄂𐄀, 044-036-018) and an anthroponym (the *hapax* sequence). Unfortunately, 𐄁𐄂𐄀 (044-036-018) is the only sequence different from 'formulae' attested more than one time on seals which we have detected so far; consequently, our hypothesis has to be taken as just a suggestion.

In turn, it seems possible to hypothesise that other sequences, different from 'formulae', attested more than one time on seals/sealings *and* on clay documents,[61] could have expressed less common bureaucratic, economic or transactional terms (see Table 5.5).

Looking again at Figure 5.1, it seems very interesting that face β of the crescent #018 has the engraved sequence X 𐄆𐄇 (009-056-061), which recurs on a non-inscribed Knossian *nodulus* (HM 107) impressed from a 4-sided prism (#156). This *nodulus* is stamped with a second impression as well, from a 3-sided prism (#139), inscribed

[59] On this point, discussing his own hypothesis, see Olivier 1990: 18: 'something like "palace" and "temple" would not be unsuitable, but it would perhaps be difficult to explain their conjunction'.

[60] Cf. Karnava 2000, vol. I: 200: sequences different from 'formulae' on seals would designate 'personal names, indicating perhaps the owner of the seal'. 'The frequent sign group [sc. 'formulae'] seems to intermingle randomly and they do not attach any special characteristics to a seal. What is special and particular are actually the non-frequent sign groups.'

[61] For a more detailed account, see Karnava 2000: 60–2; Olivier 1990; 2000; 2010.

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Table 5.5 *Sequences attested on seals/sealings and on clay documents (selected most secure cases)*

1	𐄁𐄇𐄐	006-057-092 o[62]	#243.β (3-sided prism from central Crete)
	]𐄀𐄁𐄇𐄐	]oo6-057-092 ><	#063.a1 (4-sided bar from Knossos)
2	𐄇𐄂 ><	011-056 ><[63]	#297.γ (4-sided prism from central Crete)
	𐄉𐄋	011-056	#024.γ (crescent-shaped nodule from Knossos)
	]𐄉𐄋[><	] 011-056[><	#015.γ (crescent-shaped nodule from Knossos)
3	𐄂𐄃𐄌	009-056-061[64]	#156 (impression from a 4-sided prism on a non-inscribed *nodulus* from Knossos)
	𐄍𐄋𐄌	009-056-061	#018.β (crescent-shaped nodule from Knossos)
4	𐄂𐄀𐄎𐄏	009-077-013-020	#139 (impression from a 3-sided prism on a *nodulus* from Knossos)
	𐄍𐄀𐄎𐄏	009-077-013-020	#003.γ (crescent-shaped nodule from Knossos)
5	𐄇𐄈𐄌	031-021-061[65]	#149 (impression on a crescent-shaped nodule from a 3-sided prism from Malia); #197 (half-ovoid seal from Malia); P.TSK05/291 (4-sided prism from Petras)
	]𐄇𐄈𐄌	031-021-061	#059.cB (4-sided bar from Knossos)
6	𐄃𐄀𐄇	056-047-031	#166 (impression on a crescent-shaped nodule from a 4-sided prism from Knossos)
	𐄋𐄁𐄇	056-047-031	#032.a (medallion from Knossos)
7	𐄐𐄑	057-023[66]	#243.γ (3-sided prism from Crete)
	𐄎𐄏	057-023	#049.b (4-sided bar from Knossos)
	𐄎𐄏𐄒	057-023-**051**	#039.b (medallion from Knossos)

with the sequence X 𐄍𐄀𐄎𐄏 (009-077-013-020), in turn attested on a crescent-shaped nodule from Knossos (#003.γ), thus signalling another 'bridge' between seals and clay documents. Another link between seals and crescents is given by the sequence 𐄇𐄂 ></𐄉𐄋 (011-056), attested in #297.γ (4-sided prism, all sides inscribed, from central Crete), in association with 'formulae' 044-049 and 044-005, and 3 *hapax*: 050-019 ><, 038-008 >< and 036-010 >< (Table 5.5 and Figure 5.2). In #024 (crescent-shaped nodule from Knossos), it is incised on face γ, while face δ is inscribed with logogram **153*; on face α, there are two impressions from the same 3-sided prism (#142), bearing the sequence 018-039-005 o, *hapax*. The same sequence is possibly attested, in the form]𐄉𐄋[>< (] 011-056[><), on #015.γ (crescent-shaped nodule from Knossos), which on face α bears an impression from a 4-sided prism (#167) carved with the sequence 049-070-070 ><. It has to be observed

[62] *SM* I: 261, fig. 116g; Olivier 2010: 289. [63] Olivier 1990: 16, b.4, 19; Olivier 2010: 289.
[64] Olivier 1995: 180 and n. 39; Olivier 2010: 289. [65] Ibid. [66] Olivier 1990: 16, b.3, 19.

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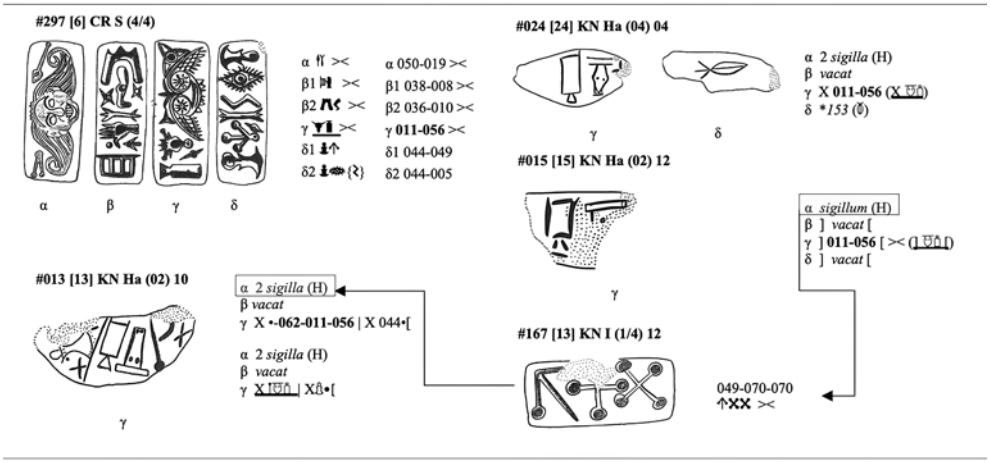


Figure 5.2 Attestations of sequence 011-056

that the same seal was used to stamp side α of another crescent-shaped seal from Knossos, #013. On face γ, this nodule is inscribed with the sequence X •-062-011-056 (X •), followed by one of the two 'formulae' 044-049 or 044-005. If •-062-011-056 (•) could be interpreted as the same word present in #015.γ ( ) – but here attested with a 'prefix' – it may be possible to recognise a precise motivation for stamping the sign group 049-070-70 on crescents on which the sequences 011-056/•-062-011-056 are incised; in other words, this repetition has to be somehow meaningful, although impossible to define, based on our current knowledge.

Another four Cretan Hieroglyphic sequences recur on seals, on bars and on medallions. The first is /] (006-057-092), attested on #243.β (3-sided prism, 2/3 inscribed, from central Crete), in association with a *hapax* (057-023 ><), and on #063.a1 (4-sided bar from Knossos), in association with the 'formula' 044-049 and four *hapax*:]041-006[67],]*o*57-053 ><, [ ]049-061 >< and]053-006[><. /(056-047-031), in turn, is attested as an impression from a 4-sided prism (#166) on a crescent inscribed on face γ with the sequence 049-049⟦*028*⟧, *hapax*, and bearing a second impression (#156) with the 'formula'] (044-005). On the medallion #032.a, from Knossos, it is followed by the sequence 050-016, seemingly a *hapax* (but see]050-016 >? on crescent #002.δ from Knossos), and, on line *b*, by a *hapax*. Finally, /(057-023) is inscribed on face γ of a 3-sided prism from Crete (#243) in association with the (006-057-092) just mentioned. On

[67] But see 049-041-006-025 on #316 and 049-041-006-*057* on #327.

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the 4-sided bar #049, where it is attested on line *b*, it recurs with the 'formula' 𐄁𐄐 (044-049), attested twice, and seven *hapax*. Lastly, its possible 'inflected' form 𐄇𐄉𐄂 (057-023-051) is written on a medallion from Knossos (#039.b) in association with three *hapax* (names of products, toponyms, *alia*?) and with a sequence (043-070) recurrent on another medallion from the same site (#042.a).

Aside from these sequences, the best attested (and most interesting) non-formulaic sequence among those listed in Table 5.5 is 𐄈𐄃𐄎/𐄈𐄅𐄎 (031-021-061) (see Figure 5.3). It recurs on different seal typologies: a half-ovoid seal (#197); a 4-sided prism – in association with three *hapax legomena* – (P.TSK05/291); and an impression on a crescent-shaped nodule from a 3-sided prism (#149). This evidence seems to prove that on 1-face seals, in addition to anthroponyms and alongside rare 'formulae', terms pertaining to administrative/accounting vocabulary could have been written as well. In fact, 𐄈𐄅𐄎 recurs, along with 'formulae' and other sequences, on a very interesting 4-sided bar from Knossos, #059.cB, where it is followed by the 'formula' 𐄁𐄐, 044-049. The importance of this bar lies in the fact that it is inscribed with four terms (044-005, 031-021-061, 044-049, 072-049) attested on other document formats as well. But, more significantly, it bears three of the four sequences attested in a very interesting 4-sided prism from the Minoan peak sanctuary at Vrysinas,[68] namely 'formulae' 044-049 (on *cB* and *dA*, where it is followed by the numeral 6̣) and 044-005 (in *aA*, followed by 40[). Moreover, as remarked by Del Freo (2017, 8–9), on line *dA* the sequence 072-049 (followed by the numeral 11 and immediately preceding 044-049) can match the sequence 049-072 >< (thus readable as 072-049) carved on face γ of this same seal. This word is attested, in addition, on a medallion (#034.b, followed by the numeral 10) and on two 4-sided bars (#059, followed by the numeral 11 and #065.d, followed by 1), all coming from Knossos. Finally, on face δ of this Vrysinas prism recurs the less frequent 'formula' 𐄆𐄆𐄋 (042-038), attested as an impression on a flat-based nodule ('document sealings') from a 3- or 4-sided prism (#154) from Malia; on a 3-sided prism from Pinakiano, along with a *hapax* term (031-006-034) and the two 'formulae' 044-049 and 044-005 (sharing one sign); on one 4-sided prism from Sitia, in association with two 'formulae' (𐄌𐄁 on face α and 𐄏𐄁 on face γ); and, on face β, with a sequence (𐄀 ><, *017*-050 ><) in turn attested on a 3-sided prism from Malia (#234.α), as well as on another 4-sided prism from Sitia (#310.β).

This 4-sided prism from Vrisynas is thus a very important document, because for the first time we have a seal inscribed on all faces with

[68] Hallager, Papadopoulou and Tzachili 2011: 65–70, figs. 4–5.

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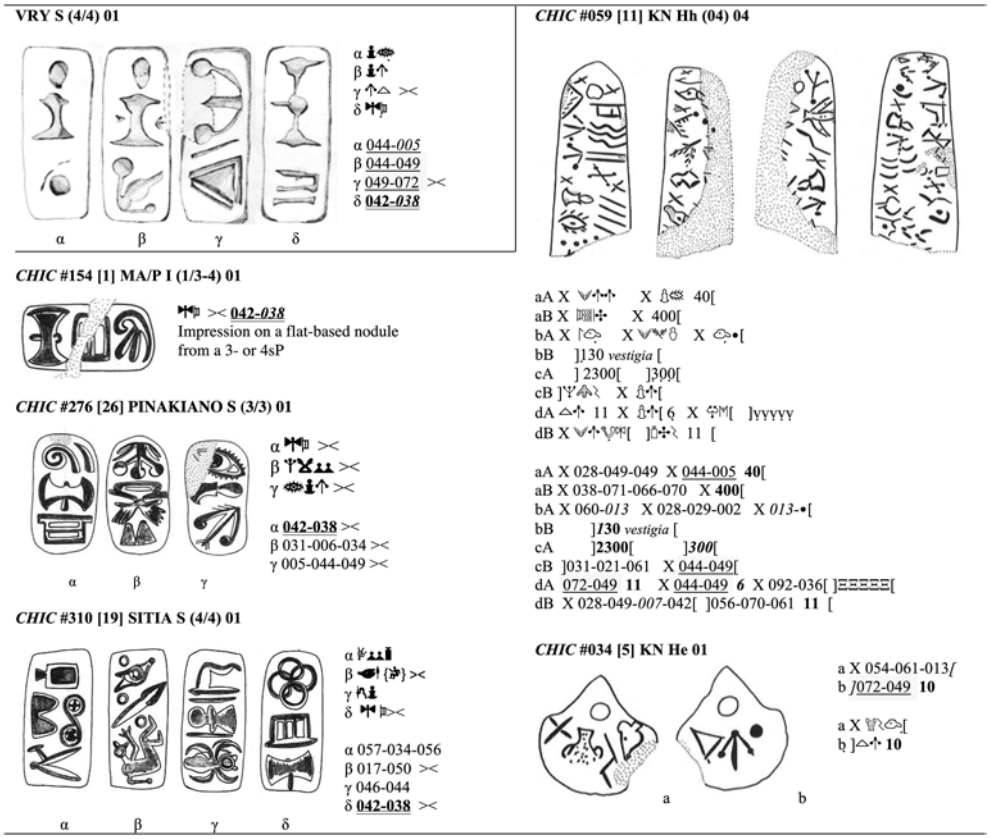


Figure 5.3 Sequence cross-links between different Cretan Hieroglyphic document formats

sequences *all* recurring on clay documents: three have a precise correspondence with a Knossian bar (#059) and the last (042-038) is recurrent at Malia, Pinakiano and Sitia, marking the notable *koine* of the vocabulary (and the associated practices) in use in 'Cretan Hieroglyphic' Crete. Moreover, its find context confirms the use of writing for administrative purposes (aside from palatial and palatial annexed archives and bureaux) in religious contexts, as the 2-face lame from Kato Syme and, more recently, the Bougada Metochi[69] seal had already proven.

In our opinion, the use of these sequences on seals, sealings and clay documents demonstrates that the words they expressed were somehow connected to each other, tentatively belonging to a shared transactional/bureaucratic vocabulary and, as such, to be put in the semantic field

[69] Kanta 2018 cat. 305; Kanta, Palaima and Perna 2023.

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of administration or countability: they could have been incised on a clay document with administrative use (perhaps along with toponyms, anthroponyms, product names, trade names, etc.), written on crescent-shaped nodules (where, we can assume, transactions with administrative/accounting scope were registered) or impressed on them using (in the absolute majority of the cases) prismatic seals, where they may have been accompanied by anthroponyms, titles and other administrative terms. Thus, even if these sequences that link different document formats are limited, the association of them with other sign groups in their attestation context can, in our opinion, be meaningful, showing a complex web of cross-links between different typologies of Cretan Hieroglyphic documents.

Other sequences possibly attested on different document formats, but in a form that we would call generically 'inflected' (or being prefixed or suffixed), are listed in Table 5.6. These terms, along with a good number of less doubtful ones,[70] need to be studied more systematically and will find more suitable space in another publication.

These sequences confirm and reinforce the relationships already detected between different formats of clay documents and between

Table 5.6 *Sequences attested on seals/sealings and on clay documents with a different 'inflected' form*

1		056-070	#118.a (4sB from Malia)
		056-070-**040**	#298.α (4sP from Crete)
		056-070-**070**	#061.e (4sB from Knossos)
2		008-019-**036**	#282.α (4sP from Pyrgos)
		008-019-**013**	#120 v.A (tablet from Malia)
3		008-056-**070**	#132 (impression from 1fS from Malia)
		008-056-**013**	#076.a (medallion from Malia)
4		019-040-**013**	#192 (*Petschaft* from Neapolis)
		019-040-**061**	#049.c (4sB from Knossos)
5		047-070[71]	#286.β (4sP from Malia)
		047-070-**031**	#058.b (4sB from Knossos)
6		049-041-006-025[72]	#316 (Chamaizi vase from Malia)
		049-041-006-*057*	#327 (Chamaizi vase from Malia)
7		076-013[73]	#312.δ (4sP from Xida)
		076-013-**031** ><	#304.δ (4sP from Crete?)
8		**054**-005-050	#273.α (3sP from Mirabello)
		**070**-005-050	#273.γ (3sP from Mirabello)

[70] Olivier 2000. [71] Ibid.: 167, n. 31. [72] Ibid.: 152, who thinks, in this case, 'à des doublets'. [73] Ibid.: 167, n. 31.

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them and seals. Two cases merit special attention. The repetition on two vases of possibly the same word in an 'inflected' form (049-041-006-025/*057*, no. 6) could be a very interesting clue regarding the relatedness of inscriptions recurring on these special objects, the Chamaizi juglets, that were possibly involved in ritual and collective performances.[74] Therefore, we can tentatively hypothesise that the inscriptions on their shoulders may include personal names, dedicatory inscriptions to a deity or even theonyms. As for no. 7, we would merely point out, as a further possible link between Cretan Hieroglyphic sequences recurrent on different document formats, that syllabogram 031 (𐄳) is attested as the third sign of five pairs of sequences[75], which would thus be 'inflected' or suffixed: 036-092/036-092-031, 𐄁𐄴/𐄁𐄴𐄳; 038-10/038-010-031, 𐄇𐄵/𐄇𐄵𐄳; 042-019/042-019-031, 𐄉𐄰/𐄉𐄰𐄳; 047-070 ><⁄047-070-031, 𐄀𐄂 ><⁄𐄃𐄶𐄳; 076-013/076-013-03 ><, 𐄆𐄷/𐄆𐄷𐄳 ><; for all, cf. Civitillo, Appendix, this volume.

But what, finally, about 4-sided prisms inscribed on all faces with sequences *different* from 'formulae' (cf. Index IV)? Among 3-sided prisms, only two bear non-formulaic sequences written on all their sides: #271 and #272. The first, made of green steatite (an infrequent case of the use of a soft stone for prisms with all inscribed sides), bears three *hapax* sequences and the second, in green jasper, is inscribed with a *hapax* sequence and two possibly related words (054-005-050/070-005-050, 𐄀#𐄁 >< and 𐄂#𐄁 ><) on sides α and γ (Table 5.6, no. 8). This would be the only instance of a term written in two forms ('inflected', prefixed or suffixed depending on the direction of writing) on two different sides of the same seal. What their 'meaning' may have been is difficult to establish. Among 4-sided prisms, four have all faces inscribed with sequences different from 'formulae': *CHIC* #304, #306, #307 and P.TSK05/291. #307 is made of soft stone (black steatite), while #304 is made of green jasper; P.TSK05/291 is made of unusual mottled jasper, claret-red and yellow; and #306 is made of gold. Even if our evidence is very scanty, it is very interesting that the only golden prism we have, to date, is inscribed only with sequences different from 'formulae' (anthroponyms? titles?). Moreover, we wonder if it could be mere chance that this seal was engraved with two different *hapax* sequences which used two of the four 'potential' syllabograms (*014* {𐄅} and *076* {𐄷}) detected by the *CHIC* author.[76] Are they just a testimony of more conservative graphic variants in use on the glyptic surface or could they have been consciously chosen as precise graphic variants, perhaps

[74] Poursat 2009: 76. [75] See, for example, Karnava 2000: 68; Olivier 2000; Facchetti 2005; 2008.
[76] *CHIC*: 13–14; cf. Civitillo, Appendix, this volume.

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considered more prestigious and, thus, more suited for a high-culture artefact and for the content of the inscription engraved on it?

Turning to the amount and typology of textual information on clay documents (Index I.3 and Index II.1), they register 270 sequences in total but 248 different sign groups (each counted *once*), with only eleven words repeated two or more times (Table 5.7). The word more frequently repeated is, again, 𐄁•𐄀• (044-049), recurring twelve times at Knossos (two on medallions and ten on 4-sided bars).

In general terms, these sequences reiterate the connections observed already between bars and medallions; if 022-056-070-061, attested on 4-sided bar #059.*dB** from Knossos, is incised on cone #071 from Malia as well, that would establish a further connection between bars and the very peculiar documents that the cones are. Finally, it is interesting to observe that two of the listed sequences (nos 6 and 10) are both incised on the two tablets from Malia, #119 and #120. Therefore, based

Table 5.7 *Sequences attested two or more times on clay documents (identical sequences only)*

1	] 𐄇 𐄉	]*042*-054-061[77]	#062.cB, #062.*dB* In #062.*bB* a reading]•𐄉 (]•-054-61) is possible as well	4sB	KN
2	𐄌𐄂	022-056-070-061	#071	cone	MA/M
	Possibly attested in #059.*dB**: [ ] 𐄂	[ ]056-070-061	#059.*dB**	4sB	KN
3	𐄇𐄉	042-054-061	#037.a	medallion	KN
			#050.a, #058.a	4sB	KN
4	𐄈	043-070	#039.a, #042.a **(5)**	medallions	KN
5	𐄁•𐄀•	044-049	#040.b1, #042.b1 #049.a, #049.b, #050.c, #056.aA, #056.<aB>*, #056.b-e, #056.dB, #059.dA;	medallions 4sB	KN KN
	𐄁•𐄀•[	044-049[	#059.cB, #063.a2 (15)		
6	𐄀𐄃	050-057-056	#119.*r*., #120.*v*.B	tablets	MA/P
7	𐄃𐄐•𐄀•	057-013-049	#038.b	medallion	KN
			#054.a	4sB	KN
8	𐄂𐄅	070-031-019	#054.e, #056.aA	4sB	KN
9	𐄐•𐄀•	072-049	#034.b	medallion	KN
			#059.dA, #065.d	4sB	KN
10	𐄋•𐄀•𐄐	073-049-013	#119.*r*., #120.*r*.A	tablets	MA/P
11	𐄈𐄅	092-031	#065.b, #067.c	4sB	KN

[77] Cf. *009*-054-061-•[and 042-054-061 as well.

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on the picture outlined above, it seems persuasive to identify a first level in the administration in which information was approved through the impression of prisms on crescent-shaped nodules; a second level, in which crescent-shaped nodules and medallions worked as kinds of provisional documents; and a third level in which the written information from these two classes of documents would have been included on (recapitulating?) clay bars (and tablets).

5.4 Concluding Remarks

In conclusion, the evidence we have from seals and sealings, jointly evaluating glyptic forms, the amount and typology ('formulae' or other sequences) of textual information and materials chosen for seal manufacture, seems to fit – with the necessary caution – a general picture in which *Petschafte* and other 1-face seals, often made of hard stone and exquisitely engraved, would have been the format *par excellence* generally intended to be inscribed with one sequence, predominantly (except the rare cases in which a 'formula' is written on their surface) *hapax* and, thus, probably with anthroponyms – or titles. It seems possible that *Petschafte* inherited their uses and their ideological connotations from the Prepalatial period, when they were probably designed as emblematic devices meant to enhance the social *status* (or the clan, the family, the affiliation) of their owners, being 'signs' of social rank in themselves.[78] Two-sided seals in (mainly) soft stone would have been the support *par excellence* of the so-called 'Archanes formula', playing a special and apparently codified role in an administrative sphere different from that in which other 'formulae' played their role. During MM II, with the rise of more complex administrative procedures mainly based on hieroglyphic texts, new seal-forms were invented. Three- and 4-sided prisms, in fact, were used by the new bureaucracies and were closely tied to the running of the administration, as demonstrated by their sphragistic use principally on crescent-shaped prisms, themselves inscribed. With their plain and rectangular faces, prisms (no longer concerned with recording unique non-formulaic sequences) were functional for bearing as many inscriptions as possible, or as necessary, with texts written with a horizontal alignment, so that they were easy to read when impressed on clay.[79] The number of inscribed sequences on their surface was generally (with some exceptions that do not prevent us from identifying recurring trends) proportional to progressively more

[78] Ferrara and Jasink 2017. [79] Flouda 2013: 155.

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prestigious materials, possibly reflecting the *status* of seal-owners. In fact, they were (with few exceptions) inscribed with at least one 'formula', completed by other 'formulae' or with sequences interpretable as less frequent economic/administrative terms (when they are not *hapax* and are attested on clay documents as well), anthroponyms (*hapax*) or titles (more difficult to identify). Within this general framework, the few 4-sided prisms made of semi-precious stones or even gold we have to date, inscribed with sequences different from 'formulae', could have been associated with the highest levels of Minoan society. In fact, if the basic administrative operation would have been performed using 'formula'  (044-049) – for this reason written on less valuable seals – tasks of major responsibility for seal-owners would have corresponded to the use, by them, of a greater number of 'formulae' (up to five in 'super-seal' #314). At the top of Minoan society, we could imagine seal-owners with their names and/or titles inscribed on particularly prestigious artefacts, just like the above-mentioned golden prisms, once this format had spread and, with its many faces, had proved more advantageous than *Petschafte* for longer written texts. However, there is no reason to exclude the possibility that Minoan administrators could have possessed more than one seal of different shapes, to perform different functions: namely, running administrative operations and/or stamping their names or titles on different sealed supports intended for different purposes.

Clay documents (most of all, 4-sided bars), for their part, were conceived as tools for recording ephemeral but more complex, recapitulatory administrative information, being written with the highest number of Cretan Hieroglyphic sequences we are aware of (most of all, again, 4-sided bars), along with logograms and numerals, following the different steps of the Minoan administrative machine. More fragile but re-usable, with very different claims in terms of durability, ideological implications and prestige than seals, some (unfortunately quite few) sequences they are inscribed with reveal an intricate web of connections between them *and* seals and sealings, in the complex running of Cretan Hieroglyphic administration. These links (to be further explored) could shed some light on the – difficult – reconstruction of the bureaucratic chain of Middle Minoan Crete; but, primarily, they reveal a precisely codified set of written documents ('messengers' of the written words)[80] in which textual contents, formats and materials were consistently selected by the users of Cretan Hieroglyphic script.

[80] According to Krämer (2008: 9–19), the medium of a message transforms the content and, for this reason, can be compared to the role of the messenger.

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