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AEGEAN SEALS: AN INTRODUCTION

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AEGEAN SEALS
AN INTRODUCTION

OLGA KRZYSZKOWSKA

INSTITUTE OF CLASSICAL STUDIES
SCHOOL OF ADVANCED STUDY
UNIVERSITY OF LONDON

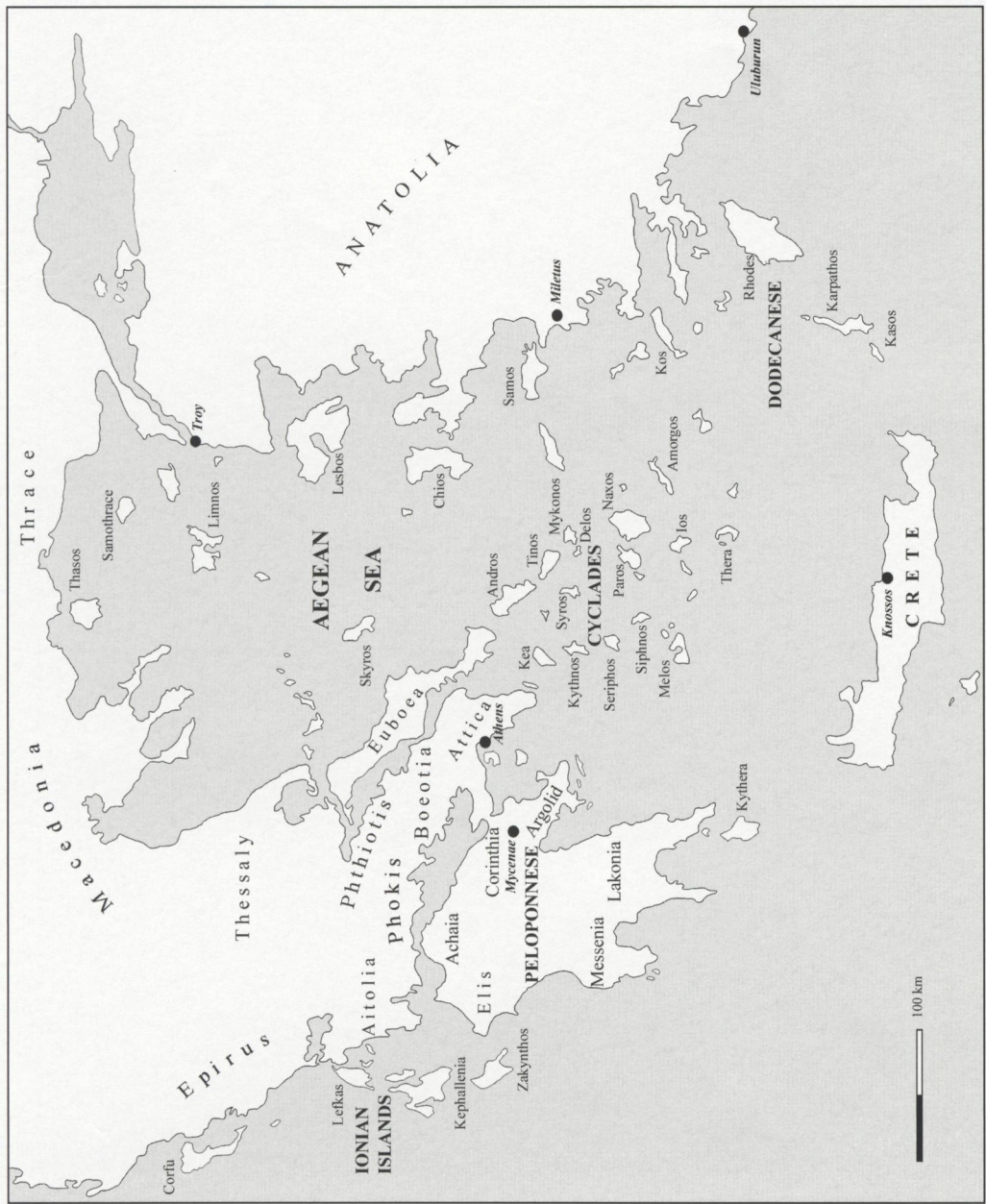
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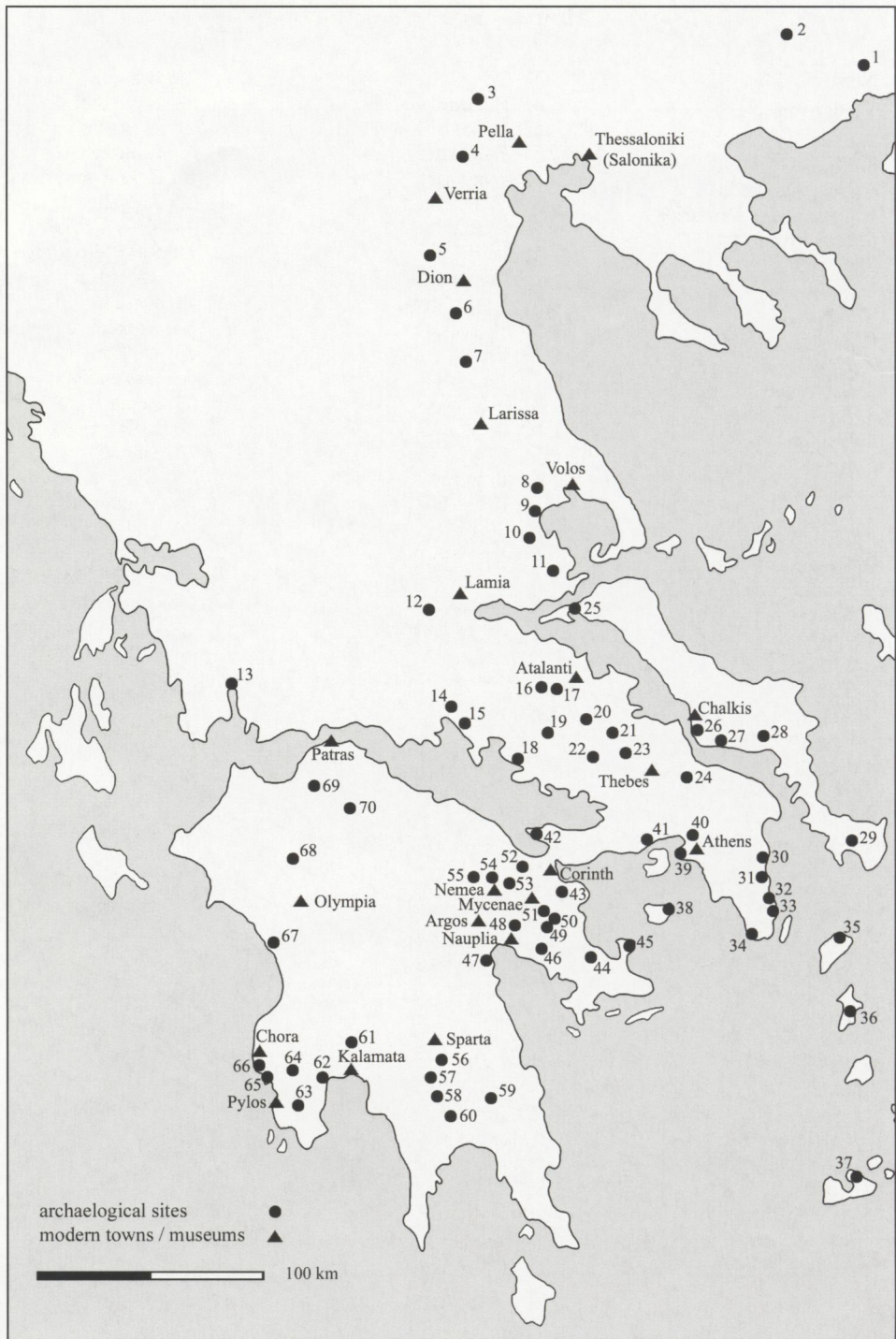
FRONTISPIECE. Carnelian amygdaloid acquired at 'Gnossus, Krete' by A. W. Franks and presented to the British Museum in 1880.

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MAP 1 General map of the Aegean.



MAP 2 Mainland Greece, showing principal sites mentioned in the text (see facing page for key).

Map 2 – The Greek mainland

Numerical list

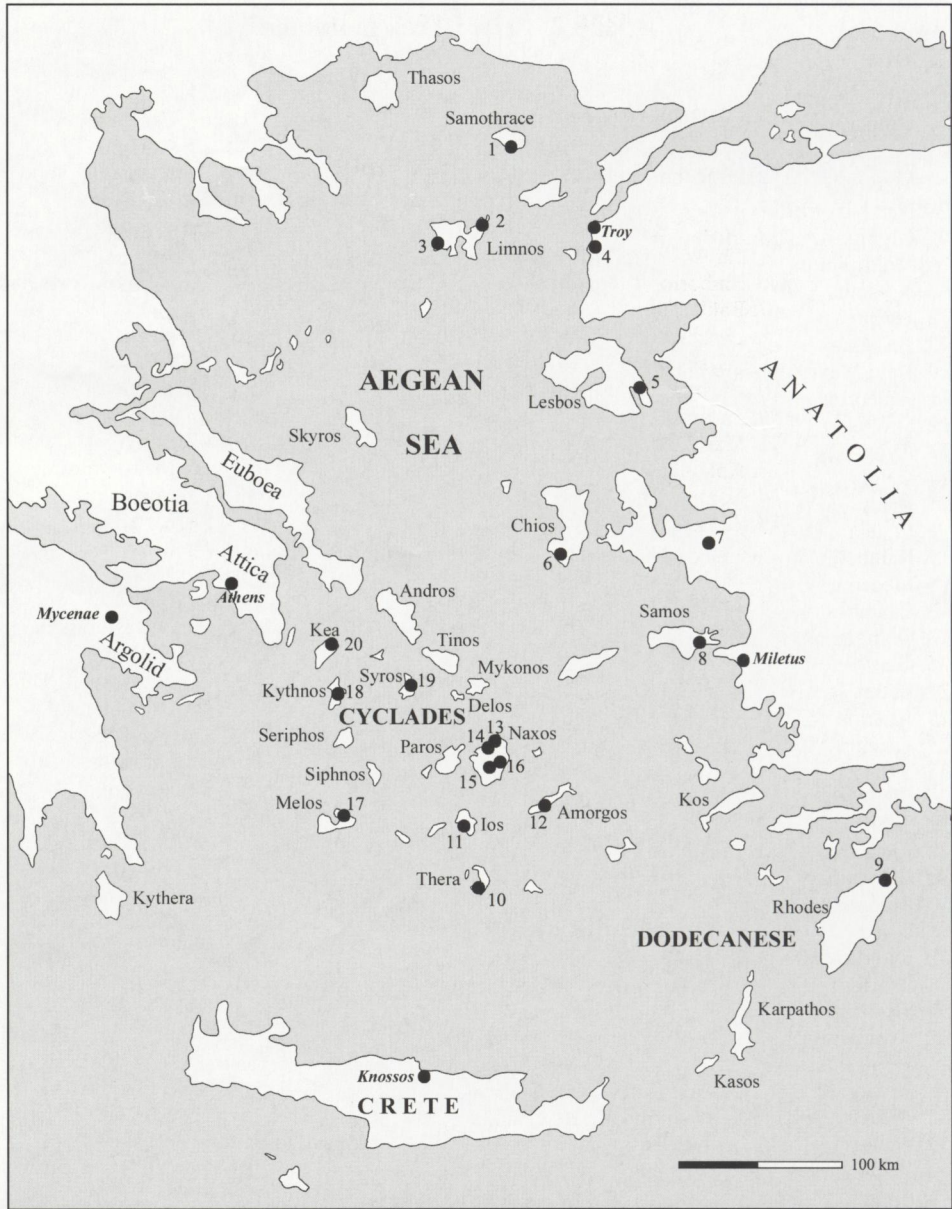
1. Dikili Tash
2. Sitagri
3. Mandalo
4. Nea Nikomedia
5. Olympos-A.Dimitrios
6. Makriyalos
7. Nessonis
8. Sesklo
9. Pefkasia
10. Kato Mavrolophos
11. Pteleon
12. Stavros
13. Ayios Ilias
14. Delphi
15. Krisa
16. Elateia
17. Kalapodi
18. Medeon
19. Exarchos
20. Orchomenos
21. Gla
22. Eutresis
23. Aliartos
24. Tanagra
25. Yialtra
26. Chalkis
27. Lefkandi
28. Amarynthos
29. Karystos
30. Brauron
31. Perati
32. Thorikos
33. Lavrion
34. Sounion
35. Ayia Irini
36. Vryokastro
37. Phylakopi
38. Aphaia
39. Piraeus
40. Menidi
41. Eleusis
42. Perachora
43. Kato Almyri
44. Epidauros
45. Ayios Konstantinos
46. Kazarma
47. Lerna

48. Tiryns
49. Dendra
50. Midea
51. Prosymna
52. Zygouries
53. Tzoungiza
54. Aidonia
55. Petri
56. Menalaion
57. Amyklaion
58. Vapheio
59. Geraki
60. Krokeai
61. Anthia
62. Akovitika
63. Gouvalari
64. Routsis
65. Pylos-Englianos
66. Tragana
67. Kakovatos
68. Ayia Triada
69. Kallithea
70. Ano Mazarakis

Alphabetical list

54. Aidonia
62. Akovitika
23. Aliartos
28. Amarynthos
57. Amyklaion
70. Ano Mazarakis
61. Anthia
38. Aphaia
35. Ayia Irini
68. Ayia Triada
13. Ayios Ilias
45. Ayios Konstantinos
30. Brauron
26. Chalkis
14. Delphi
1. Dikili Tash
49. Dendra
16. Elateia
41. Eleusis
44. Epidauros
22. Eutresis
19. Exarchos
59. Geraki

21. Gla
63. Gouvalari
17. Kalapodi
69. Kallithea
67. Kakovatos
29. Karystos
43. Kato Almyri
10. Kato Mavrolophos
46. Kazarma
15. Krisa
60. Krokeai
33. Lavrion
27. Lefkandi
47. Lerna
6. Makriyalos
3. Mandalo
18. Medeon
56. Menalaion
40. Menidi
50. Midea
4. Nea Nikomedia
7. Nessonis
5. Olympos-A. Dimitrios
20. Orchomenos
9. Pefkasia
42. Perachora
31. Perati
55. Petri
37. Phylakopi
39. Piraeus
51. Prosymna
11. Pteleon
65. Pylos-Englianos
64. Routsis
8. Sesklo
2. Sitagri
34. Sounion
12. Stavros
24. Tanagra
32. Thorikos
48. Tiryns
66. Tragana
53. Tzoungiza
58. Vapheio
36. Vryokastro
25. Yialtra
52. Zygouries



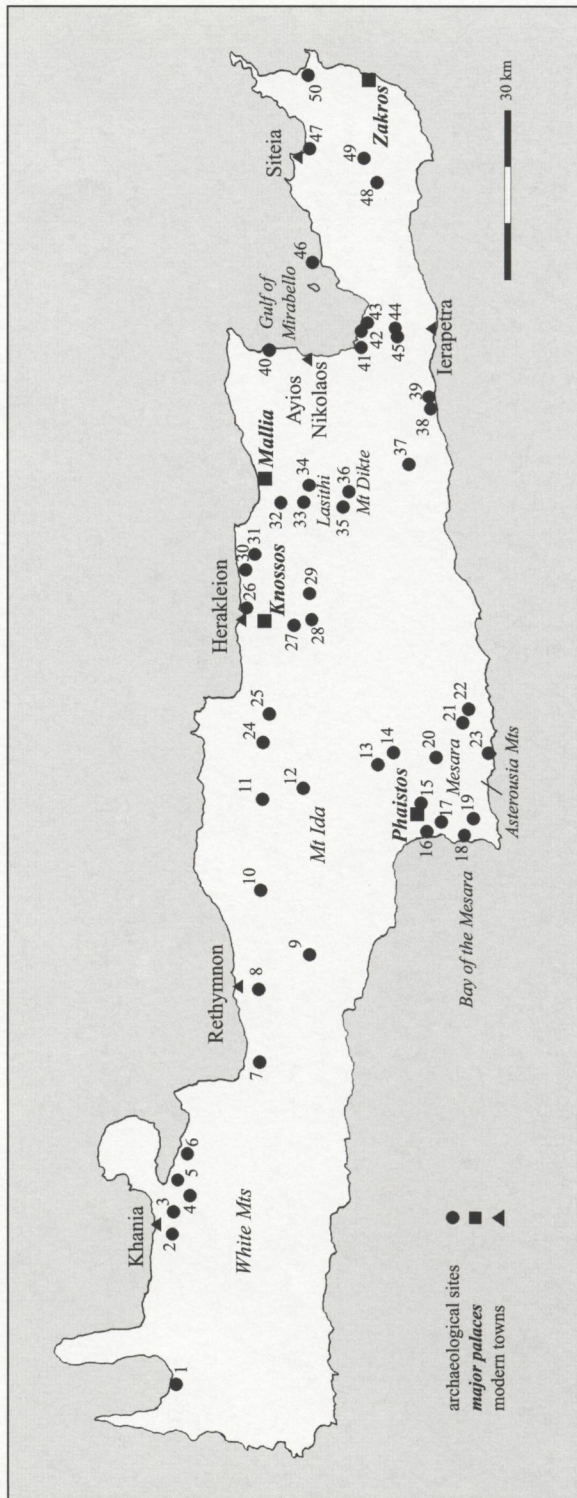
MAP 3 The central Aegean, showing principal sites mentioned in the text (see facing page for key; for Euboea see MAP 2).

Map 3 – The Central Aegean**Numerical list**

1. Mikro Vouni
2. Poliochni
3. Myrina
4. Beşik Tepe
5. Thermi
6. Emborio
7. Bakla Tepe
8. Heraion
9. Ialysos
10. Akrotiri
11. Skarkos
12. Markiani
13. Aplomata
14. Kamini
15. Zas Cave
16. Chimarros
17. Phylakopi
18. Vryokastro
19. Kastri
20. Ayia Irini

Alphabetical list

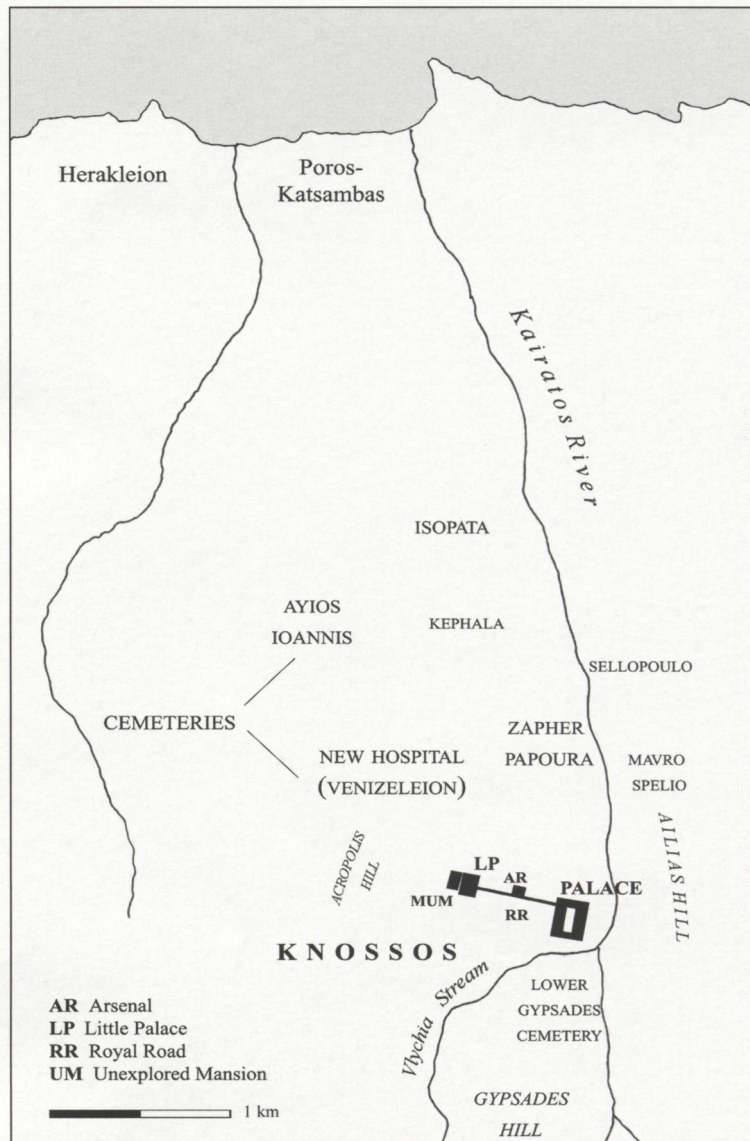
10. Akrotiri
13. Aplomata
20. Ayia Irini
7. Bakla Tepe
4. Beşik Tepe
16. Chimarros
6. Emborio
8. Heraion
9. Ialysos
14. Kamini
19. Kastri
12. Markiani
1. Mikro Vouni
3. Myrina
17. Phylakopi
2. Poliochni
11. Skarkos
5. Thermi
18. Vryokastro
15. Zas Cave



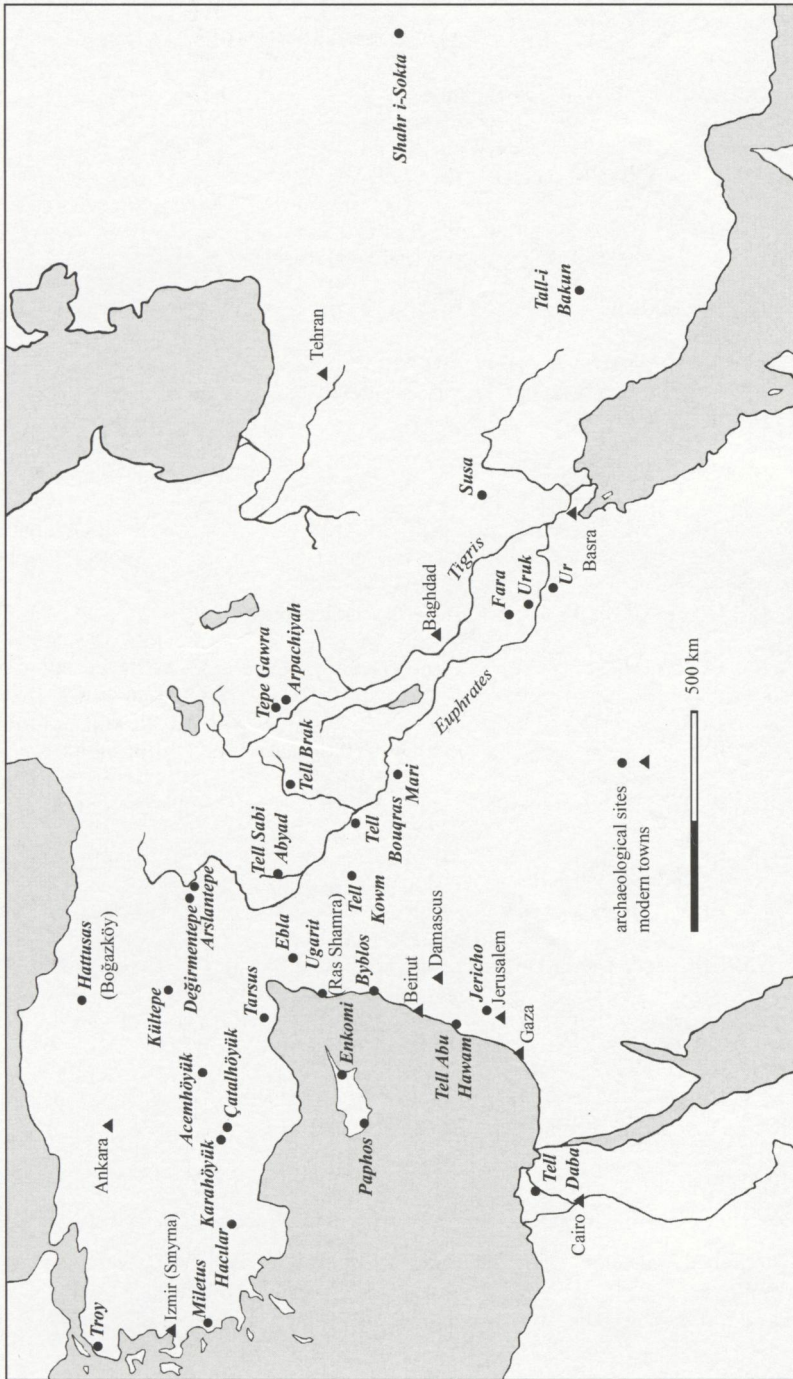
MAP 4 Crete, showing principal sites mentioned in the text (see facing page for key).

Map 4 – Crete

Numerical list	Alphabetical list
1. Kastelli Kissamou	49. Adromyli
2. Psathi	6. Apta
3. Nerokourou	28. Archanes
4. Samonas	8. Armeni
5. Platyvola Cave	29. Astraki
6. Apta	33. Avdou
7. Phylaki Apokoronou	16. Ayia Triada
8. Armeni	35. Ayios Charalambos (Gerondomouri Cave)
9. Monastiraki	11. Axos
10. Eleutherna	36. Dictaeon Cave
11. Axos	10. Eleutherna
12. Idaean Cave	40. Elounda (Olous)
13. Marathokephalo	34. Gonies
14. Kalathiana	30. Gourmes
15. Kalyvia	43. Gournia
16. Ayia Triada	31. Gouves
17. Kamilari	12. Idaean Cave
18. Kommos	27. Juktas
19. Moni Odigitria	14. Kalathiana
20. Platanos	15. Kalyvia
21. Porti	17. Kamilari
22. Koumasa	1. Kastelli Kissamou
23. Lenda (Lebena)	37. Kato Syme
24. Sklavokambos	45. Kephala Vasiliki
25. Tyliisos	45. Kephala Vasiliki
	26. Poros
	27. Juktas
	28. Archanes
	29. Astraki
	30. Gourmes
	31. Gouves
	32. Mochos
	33. Avdou
	34. Gonies
	35. Ayios Charalambos (Gerondomouri Cave)
	36. Dictaeon Cave
	37. Kato Syme
	38. Pyrgos (Myrtos-Pyrgos)
	39. Myrtos- <i>Fournou-Korifi</i>
	40. Elounda (Olous)
	41. Vrokastro
	42. Sphoungaras
	43. Gournia
	44. Vasiliki
	45. Kephala Vasiliki
	46. Mochlos
	47. Petras
	48. Praisos
	49. Adromyli
	50. Palaikastro
	18. Kommos
	22. Koumasa
	23. Lenda (Lebena)
	24. Sklavokambos
	25. Tyliisos
	18. Kommos
	22. Koumasa
	23. Lenda (Lebena)
	13. Marathokephalo
	46. Mochlos
	32. Mochos
	9. Monastiraki
	19. Moni Odigitria
	39. Myrtos- <i>Fournou-Korifi</i>
	3. Nerokourou
	50. Palaikastro
	47. Petras
	7. Phylaki Apokoronou
	20. Platanos
	5. Platyvola Cave
	26. Poros
	21. Porti
	48. Praisos
	2. Psathi
	38. Pyrgos (Myrtos-Pyrgos)
	4. Samonas
	24. Sklavokambos
	42. Sphoungaras
	25. Tyliisos
	44. Vasiliki
	41. Vrokastro



MAP 5 The Knossos area.



MAP 6 The Near East and Eastern Mediterranean.

yrs BC	CRETE	MAINLAND / ISLANDS	EGYPT
7000	NEOLITHIC		
	BRONZE AGE		
3000	EM I PRE-PALATIAL	EH I / EC I	OLD KINGDOM DYNASTIES I-VI
2500	EM II Mesara tholoi	EH II / EC II mainland corridor houses	
2200	EM III / MM IA	EH III / EC III	1 ST INTERMEDIATE PERIOD
1950	MM IB PROTO-PALATIAL 1 st palaces built	MH / MC Minoan influence in Aegean islands	MIDDLE KINGDOM DYNASTIES XI (LATE) XII – XIII (EARLY)
1700	MM IIB destructions MM III NEO-PALATIAL 2 nd palaces built	Mycenae Circle B LH I / LC I	2 ND INTERMEDIATE PERIOD (HYKSOS)
1600 / 1575	MM IIIB / LM IA earthquake	Thera: Seismic Destruction Mycenae Circle A	NEW KINGDOM DYNASTY XVIII (MINOAN-STYLE FRESCOES AT DAB'A)
1525	LM IA MATURE	Thera: Volcanic Destruction	HATSHEPSUT
1500	LM IB	LH IIA: Vapheio tholos	
1450	destructions		
1425	LM II KN SOLE PALACE	LH IIB	TUTMOSIS III
1375	LM IIIA1	LH IIIA1 1 st mainland palaces built	AMENHOTEP III
1350	LM IIIA2 KN destroyed (?)	LH IIIA2 Uluburun (Kaš) shipwreck	AMARNA
1300	LM IIIB POST-PALATIAL	LH IIIB final mainland palaces built	DYNASTY XIX RAMESES II
1250		LH IIIB1: destructions	
1200		LH IIIB2: final destructions	DYNASTY XX
	LM IIIC	LH IIIC post-palatial	RAMESES III
1100/1050	SUB-MINOAN	SUB-MYCENAEAN	
1050/1000	EARLY IRON AGE		3 RD INTERMEDIATE

TABLE 1. Simplified chronology of the Aegean Bronze Age with Egyptian synchronisms. Absolute dates are approximate and follow the traditional 'low' Aegean chronology. Key: E = Early, M = Middle, L = Late; C = Cycladic, H = Helladic, M = Minoan; KN = Knossos.

ABBREVIATIONS OF LITERATURE

Journals and series

AA	<i>Archäologischer Anzeiger</i>
AAA	<i>Αρχαιολογικά ανάλεκτα εξ Αθηνών. Athens Annals of Archaeology</i>
AD	<i>Αρχαιολογικόν Δελτίον</i>
AE	<i>Αρχαιολογική Εφημερίς</i>
Aegaeum	<i>Annales d'archéologie égéenne de l'Université de Liège</i>
AJA	<i>American Journal of Archaeology</i>
AR	<i>Archaeological Reports</i>
ASOR	American School(s) of Oriental Research
ASAtene	<i>Annuario della Scuola archeologica di Atene e delle Missioni italiane in Oriente</i>
AM	<i>Mitteilungen des Deutschen Archäologischen Instituts, Athenische Abteilung</i>
BAR-IS	British Archaeological Reports – International Series
BICS	<i>Bulletin of the Institute of Classical Studies</i>
BCH	<i>Bulletin de correspondance hellénique</i>
BSA	<i>Annual of the British School at Athens</i>
Ét. Crét.	<i>Études crétoises</i>
JdI	<i>Jahrbuch des Deutschen Archäologischen Instituts</i>
JFA	<i>Journal of Field Archaeology</i>
JRGZM	<i>Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz</i>
OJA	<i>Oxford Journal of Archaeology</i>
OpAth	<i>Opuscula Atheniensiensia</i>
PAE	<i>Πρακτικά της εν Αθήναις Αρχαιολογικής Εταιρείας</i>
PODIA	<i>Proceedings of the Danish Institute at Athens</i>
PZ	<i>Prähistorische Zeitschrift</i>
RA	<i>Revue archéologique</i>
SIMA	Studies in Mediterranean Archaeology
TUAS	<i>Temple University Aegean Symposium</i>

Short titles

ABAC	P. Warren and V. Hankey, <i>Aegean Bronze Age Chronology</i> (Bristol 1989)
<i>Administrative Documents</i>	M. Perna (ed.), <i>Administrative Documents in the Aegean and their Near Eastern Counterparts</i> (Turin 2000)
<i>Aegean – East</i>	J. L. Crowley, <i>The Aegean and the East: An Investigation into the Transference of Artistic Motifs between the Aegean, Egypt, and the Near East in the Bronze Age</i> . SIMA Pocket-book 51 (Jonsered 1989)
<i>Aegean – Orient</i>	E. H. Cline and D. Harris-Cline (eds.), <i>The Aegean and the Orient in the Second Millennium</i> . Aegaeum 18 (Liège and Austin 1998)
<i>Aegean Painting</i>	S. A. Immerwahr, <i>Aegean Painting in the Bronze Age</i> (University Park and London 1990)
AEMT	P. Nicholson and I. Shaw (eds.), <i>Ancient Egyptian Materials and Technology</i> (Cambridge 2000)

- AG** A. Furtwängler, *Die antiken Gemmen: Geschichte der Steinschneidekunst im klassischen Altertum I-III* (Leipzig and Berlin 1900)
- AMMI** P. R. S. Moorey, *Ancient Mesopotamian Materials and Industries: The Archaeological Evidence* (Oxford 1994)
- APG** S. Hood, *The Arts in Prehistoric Greece* (Harmondsworth 1978)
- Archanes** Y. and E. Sakellarakis, *Archanes: Minoan Crete in a New Light* (Athens 1997)
- Archives** P. Ferioli, E. Fiandra, G. G. Fissore and M. Frangipane (eds.), *Archives before Writing* (Turin 1994)
- ASSA** T. G. Palaima (ed.), *Aegean Seals, Sealings and Administration*. *Aegaeum* 5 (Liège 1990)
- Atti del II° congresso di micenologia** E. De Miro, L. Godart and A. Sacconi (eds.), *Atti e memorie del secondo congresso internazionale di micenologia* (Rome 1996)
- Aux origines de l'hellénisme** *Aux origines de l'hellénisme: la Crète et la Grèce. Hommage à Henri van Effenterre* (Paris 1984)
- BA Trade** N. H. Gale (ed.), *Bronze Age Trade in the Mediterranean*. SIMA 90 (Jonsered 1991)
- Cemetery – Society** K. Branigan (ed.), *Cemetery and Society in the Aegean Bronze Age* (Sheffield 1998)
- CHIC** J.-P. Olivier and L. Godart, *Corpus Hieroglyphicarum Inscriptionum Cretae*. Ét. Crét. 31 (Athens and Rome 1996)
- CM** A. Xénaki-Sakellariou, *Cachets minoens de la collection Giamalakis*. Ét. Crét. 10 (Paris 1958)
- CMS** *Corpus der minoischen und mykenischen Siegel* (Berlin 1964–2000; Mainz 2002 –)
- CMS Beiheft 0** F. Matz (ed.), *Die kretisch-mykenische Glyptik und ihre gegenwärtigen Probleme*. Deutsche Forschungsgemeinschaft (Boppard 1974)
- CMS Beiheft 1** I. Pini (ed.), *Studien zur minoischen und helladischen Glyptik*. CMS Beiheft 1 (Berlin 1981)
- CMS Beiheft 3** I. Pini (ed.), *Fragen und Probleme der bronzzeitlichen ägäischen Glyptik*. CMS Beiheft 3 (Berlin 1989)
- CMS Beiheft 5** I. Pini (ed.), *Sceaux minoens et mycéniens*. CMS Beiheft 5 (Berlin 1995)
- CMS Beiheft 6** I. Pini (ed.), *Minoisch-mykenische Glyptik: Stil, Iconographie, Funktion*. CMS Beiheft 5 (Berlin 2000)
- CoMIK** J. Chadwick, L. Godart, J. T. Killen, J.-P. Olivier, A. Sacconi and I. A. Sakellarakis, *Corpus of Mycenaean Inscriptions from Knossos*. I-IV *Incunabula Graeca* 88. (Cambridge and Rome 1986–1998)
- CPSK** M. Panagiotaki, *The Central Palace Sanctuary at Knossos*. BSA Suppl. 31 (London 1999)
- Crete – Egypt Catalogue** A. Karetsou, M. Andreadaki-Vlazaki, N. Papadakis (eds.), *Κρήτη – Αίγυπτος. Πολιτισμικοί δεσμοί τριών χιλιετιών. Κατάλογος* (Herakleion 2000)
Crete – Egypt. Three Thousand Years of Cultural Links. Catalogue (Herakleion and Cairo 2001). Same pagination and numbering as Greek version.
- Crete – Egypt Studies** A. Karetsou (ed.), *Κρήτη – Αίγυπτος. Πολιτισμικοί δεσμοί τριών χιλιετιών. Μελέτες* (Athens 2000)

- Crète mycénienne* J. Driessen and A. Farnoux (eds.), *La Crète mycénienne*. BCH Suppl. 30 (Athens and Paris 1997)
- CS V. E. G. Kenna, *Cretan Seals with a Catalogue of the Minoan Gems in the Ashmolean Museum* (Oxford 1960)
- Dickers A. Dickers, *Die spätmykenischen Siegel aus weichem Stein: Untersuchungen zur spätbronzezeitlichen Glyptik auf dem griechischen Festland und in der Ägäis*. Internationale Archäologie 33 (Rahden, Westf. 2001)
- Docs*² M. Ventris and J. Chadwick, *Documents in Mycenaean Greek* (2nd edition, Cambridge 1973)
- DtS A. Onassoglou, *Die »talismanischen« Siegel*. CMS Beiheft 2 (Berlin 1985)
- ECS P. Yule, *Early Cretan Seals: A Study in Chronology*. Marburger Studien zur Vor- und Frühgeschichte 4 (Mainz 1980)
- EDK J. Driessen, *An Early Destruction in the Mycenaean Palace at Knossos: A New Interpretation of the Excavation Field-Notes of the South-East Area of the West Wing*. Acta Archaeologica Lovaniensia Monographiae 2 (Leuven 1990)
- EIKΩN R. Laffineur and J. L. Crowley (eds.), *EIKΩN. Aegean Bronze Age Iconography: Shaping a Methodology*. Aegaeum 8 (Liège 1992)
- Emporia* R. Laffineur (ed.), *Emporia. Aegeans in the Central and Eastern Mediterranean*. Aegaeum (forthcoming)
- FkS K. Sbonias, *Frühkretische Siegel: Ansätze für eine Interpretation der sozial-politischen Entwicklung auf Kreta während der Frühbronzezeit*. BAR-IS 620 (Oxford 1995)
- GGFR² J. Boardman, *Greek Gems and Finger Rings* (2nd edition, London 2001)
- GORILA L. Godart and J.-P. Olivier, *Recueil des inscriptions en Linéaire A* Vols 1-5. Ét. Crét. 21.1-5 (Paris 1976-85)
- L'iconographie minoenne* P. Darque and J.-C. Poursat (eds.), *L'iconographie minoenne*. BCH Suppl. 11 (Athens and Paris 1985)
- Iconography* J. G. Younger, *The Iconography of Late Minoan and Mycenaean Sealstones and Finger Rings* (Bristol 1988)
- Ivory Guide* O. Krzyszkowska, *Ivory and Related Materials: An Illustrated Guide*. BICS Suppl. 59 (London 1990)
- Knossos Labyrinth* D. Evely, H. Hughes-Brock, N. Momigliano (eds.), *Knossos: A Labyrinth of History. Papers presented in honour of Sinclair Hood* (Oxford 1994)
- KSPI M. A. V. Gill, 'The Knossos sealings: provenance and identification', *BSA* 60 (1965) 58-98
- Latest Sealings* M. R. Popham and M. A. V. Gill, *The Latest Sealings from the Palace and Houses at Knossos*. BSA Studies 1 (London 1995)
- Lerna IV* M.H. Wiencke, *Lerna: A Preclassical Site in the Argolid. Results of Excavations Conducted by the American School of Classical Studies at Athens IV. The Architecture, Stratification and Pottery of Lerna III* (Princeton 2000)
- Meletemata* P. P. Betancourt, V. Karageorghis, R. Laffineur and W.-D. Niemeier (eds.), *Meletemata: Studies in Aegean Archaeology presented to Malcolm H. Wiener as he enters his 65th Year*. Aegaeum 20 (Liège and Austin 1999)

- Metron* K. P. Foster and R. Laffineur (eds.), *Metron: Measuring the Aegean Bronze Age*. Aegaeum 24 (Liège and Austin 2003)
- Middle Phase* J. G. Younger, *Bronze Age Aegean Seals in their Middle Phase (ca. 1700 – 1500 B.C.)*. SIMA 102 (Jonsered 1993)
- Minoan Crafts I* R. D. G. Evely, *Minoan Crafts: Tools and Techniques. An Introduction I*. SIMA 92.1 (Göteborg 1993)
- Minoan Crafts II* R. D. G. Evely, *Minoan Crafts: Tools and Techniques. An Introduction II*. SIMA 92.2 (Jonsered 2000)
- Minoan Pottery* P. P. Betancourt, *The History of Minoan Pottery* (Princeton 1985)
- Minoan Society* O. Krzyszkowska and L. Nixon (eds.), *Minoan Society: Proceedings of the Cambridge Colloquium 1981* (Bristol 1983)
- Minotaur – Centaur* D. Evely, I. S. Lemos, S. Sherratt, *Minotaur and Centaur: Studies in the Archaeology of Crete and Euboea presented to Mervyn Popham*. BAR-IS 638 (Oxford 1996)
- MMR²* M. P. Nilsson, *The Minoan-Mycenaean Religion and its Survival in Greek Religion* (2nd edition, Lund 1950)
- Monuments* J. Driessen, I. Schoep and R. Laffineur (eds.), *Monuments of Minos: Rethinking the Minoan Palaces*. Aegaeum 23 (Liège and Austin 2002)
- MPVP* E. Vermeule and V. Karageorghis, *Mycenaean Pictorial Vase Painting* (Cambridge, Mass. and London 1982)
- MSV* P. Warren, *Minoan Stone Vases* (Cambridge 1969)
- Mu I* J.-C. Poursat, L. Godart and J.-P. Olivier, *Fouilles exécutées à Mallia: Le Quartier Mu I. Introduction générale. Écriture Hiéroglyphique Crétoise*. Ét. Crét. 23 (Paris 1978)
- Mu II* B. Detournay, J.-C. Poursat and F. Vandennebe, *Fouilles exécutées à Mallia: Le Quartier Mu II. Vases de pierre et de métal, vannerie, figurines et reliefs d'applique, éléments de parure et de décoration, armes, sceaux et empreintes*. Ét. Crét. 26 (Paris 1980)
- Mu III* J.-C. Poursat, *Fouilles exécutées à Mallia: Le Quartier Mu III. Artisans minoens: Les Maisons-Ateliers du Quartier Mu*. Ét. Crét. 32 (Athens and Paris 1996)
- MUM* M. R. Popham et al., *The Minoan Unexplored Mansion at Knossos*. BSA Suppl. 17 (London 1984)
- Mycenaean Pottery* P. A. Mountjoy, *Mycenaean Pottery: An Introduction* (Oxford 1993)
- OKT* *On the Knossos Tablets* (Oxford 1963)
- Pepragmena 2* *Πεπραγμένα του Β' Διεθνούς Κρητολογικού Συνεδρίου* (Athens 1968)
- Pepragmena 3* *Πεπραγμένα του Γ' Διεθνούς Κρητολογικού Συνεδρίου* (Athens 1973)
- Pepragmena 6* *Πεπραγμένα του ΣΤ' Διεθνούς Κρητολογικού Συνεδρίου* (Chania 1990)
- Pepragmena 7* *Πεπραγμένα του Ζ' Διεθνούς Κρητολογικού Συνεδρίου* (Rethymnon 1995)
- Pepragmena 8* *Πεπραγμένα του Η' Διεθνούς Κρητολογικού Συνεδρίου* (Herakleion 2000)
- Pepragmena 9* *Πεπραγμένα του Θ' Διεθνούς Κρητολογικού Συνεδρίου* (forthcoming)
- Peripheria* Ph. Dakoronia (ed.), *Η περιφέρεια του μυκηναϊκού κόσμου* (Lamia 1999)
- Phillips Aegyptiaca* J. Phillips, *Research and Critical Review of Aegyptiaca in the Aegean in its Chronological Context I: Crete*. Contributions to the Chronology in the Eastern Mediterranean 3 (Vienna forthcoming)

<i>PM</i>	A. J. Evans, <i>The Palace of Minos at Knossos</i> (London 1921–35)
<i>PN I</i>	C. W. Blegen and M. Rawson, <i>The Palace of Nestor at Pylos in Western Messenia I: The Buildings and their Contents</i> (Princeton 1966)
<i>PN II</i>	M. Lang, <i>The Palace of Nestor at Pylos in Western Messenia II: The Frescoes</i> (Princeton 1969)
<i>PN III</i>	C. W. Blegen, M. Rawson, Lord William Taylour, W. P. Donovan, <i>The Palace of Nestor at Pylos in Western Messenia III: Acropolis and Lower Town. Tholoi, Grave Circle, and Chamber Tombs. Discoveries outside the Citadel</i> (Princeton 1973)
<i>Polemos</i>	R. Laffineur (ed.), <i>Polemos: Le contexte guerrier en Égée à l'âge du Bronze</i> . Aegaeum 19 (Liège and Austin 1999)
<i>Politeia</i>	R. Laffineur and W.-D. Niemeier (eds.), <i>Politeia: Society and State in the Aegean Bronze Age</i> . Aegaeum 12 (Liège and Austin 1995)
<i>Poros</i>	P. Muhly, <i>Μινωϊκός λαξευτός τάφος στον Πόρο Ηρακλείου</i> . Βιβλιοθήκη της εν Αθήναις Αρχαιολογικής Εταιρείας 129 (Athens 1992)
<i>Potnia</i>	R. Laffineur and R. Hägg (eds.), <i>Potnia: Dieties and Religion in the Aegean Bronze Age</i> . Aegaeum 22 (Liège and Austin 2001)
<i>Review</i>	T. Cullen (ed.), <i>Aegean Prehistory: A Review</i> . AJA Suppl. 1 (Boston 2001)
<i>Roundel</i>	E. Hallager, <i>The Minoan Roundel and other Sealed Documents in the Neopalatial Linear A Administration</i> . Aegaeum 14 (Liège and Austin 1996)
<i>SCABA</i>	R. Hägg and N. Marinatos, <i>Sanctuaries and Cults in the Aegean Bronze Age</i> (Stockholm 1981)
<i>SM I</i>	A. J. Evans, <i>Scripta Minoa I</i> (Oxford 1909)
<i>TEXNH</i>	R. Laffineur and P. P. Betancourt (eds.), <i>TEXNH: Craftsmen, Craftswomen and Craftsmanship in the Aegean Bronze Age</i> . Aegaeum 16 (Liège and Austin 1997)
<i>Tonplomben</i>	W. Müller, J.-P. Olivier, I. Pini and A. Sakellariou(†), <i>Die Tonplomben aus dem Nestorpalast von Pylos</i> (Mainz 1997)
<i>Troubled Island</i>	J. Driessen and C. F. Macdonald, <i>The Troubled Island: Minoan Crete before and after the Santorini Eruption</i> . Aegaeum 17 (Liège and Austin 1997)
<i>VTM</i>	S. Xanthoudides, <i>The Vaulted Tombs of Mesará</i> (London 1924)
<i>Zakro Master</i>	J. Weingarten, <i>The Zakro Master and his Place in Prehistory</i> . SIMA Pocket-book 26 (Göteborg 1983)

GENERAL ABBREVIATIONS

Archaeological periods

BA	Bronze Age	E	Early	C	Cycladic
IA	Iron Age	M	Middle	H	Helladic
Neo	Neolithic	L	Late	M	Minoan

Museums

AM	Ashmolean Museum
ANM	Athens, National Museum
BM	British Museum
BMFA	Boston Museum of Fine Arts
BM G&R	British Museum, Department of Greek and Roman Antiquities
HM	Herakleion Museum
HMpin	Herakleion Museum tablet inventory number
HMs	Herakleion Museum sealing inventory number
KSM	Knossos Stratigraphical Museum
NY MMA	New York, Metropolitan Museum of Art

Other

cm	centimetres
CT	chamber tomb
D.	diameter
FS	Furumark shape
exc. no.	excavation number
gr.	grammes
Gr.	grave
Ht.	height
inv. no.	inventory number
km	kilometres
L.	length
m	metres
mm	millimetres
no.	number
prov.	provenance
Rm	room
SH	string-hole
T.	tomb
Th.	thickness
ThT	tholos tomb
W.	width

PREFACE

Seals and sealings provide an extremely rich source of evidence touching on almost all aspects of Aegean culture. They are truly monuments in miniature, offering insights into art and iconography, craft and technology, social status, administration, and more besides. The sheer wealth of material is also astonishing, with roughly 10,000 motifs known from surviving seals or their ancient impressions. Thanks to the *Corpus der minoischen und mykenischen Siegel (CMS)* Aegean seals and sealings held in museums throughout the world are being documented in a systematic format. In addition, there is an ever-increasing body of specialist literature, largely written by experts for experts. But for others this fascinating subject is difficult to approach. A convenient summary appears in Sinclair Hood's *The Arts in Prehistoric Greece* (1978), while Sir John Boardman's monumental *Greek Gems and Finger Rings* (1970: reissued 2001) offers a superbly illustrated chapter on Aegean glyptic. But these short accounts scarcely touch on sealing practices, which have received much attention in recent years; important advances have also been made in dating and in understanding stylistic and technical developments. And new discoveries in the field add about 1000 pieces to the repertoire every 10–15 years.

Clearly, then, a need existed for a broad synthesis of Aegean glyptic, presenting recent discoveries and offering a critical analysis of specialist literature. But the challenge of writing such a book has proved immense. There is scarcely a single aspect of glyptic on which all experts will agree, save perhaps to admit that the subject is complex, not readily simplified or synthesized. This book is not written for them. It is expressly aimed at students of Aegean archaeology – in the broadest sense of the expression – who want or need an introduction to general developments in glyptic and to some of the many insights which this rich repertoire can provide. With this in mind, I have tried to emphasize the cultural framework in which seals and sealings were made and used. This may also prove helpful to readers whose main research interests lie outside the Aegean Bronze Age.

For detailed study of Aegean glyptic reference to the *CMS* series is essential. But the volumes are expensive and confined chiefly to major research institutions. Thus, at the outset, it became clear that the present book would have to be largely self-contained; in other words, any pieces discussed in the text would have to be illustrated (*comparanda* being confined to footnotes). However, with a repertoire of some 10,000 images, it has been no easy matter to provide a representation selection, balancing humdrum products and 'masterpieces'. Altogether I present over 900 individual images covering about 625 seals and sealings (see p. xxix and pp. 382–404). This level of coverage was only possible thanks to the generosity of Professor Dr Ingo Pini, general editor of the *CMS* series, who made available over 400 images from the *CMS* Archive. With a few exceptions, the remaining photographs are my own. Full details are given in the plate credits (p. 405).

Inevitably, in writing a book of this size, one incurs numerous debts. Indeed some date back many years, belonging to earlier research projects which have fed into the present one. If the passage of time has dulled my memory and I fail here to acknowledge help or advice received along the way, I trust I will be forgiven. Assistance has come in many forms: generous grants from funding bodies, access to museums and excavation storerooms or to welcoming libraries and research institutes, speedy replies to urgent requests for information or offprints, stimulating discussions with colleagues, searching questions from students, perceptive remarks by acquaintances, constant encouragement and support from many – all have played a part in bringing this book to fruition.

For financial support I am greatly indebted to the British Academy, the Institute for Aegean Prehistory, the University of London Institute of Classical Studies, and the University of London School of Advanced Study. A generous contribution from the University of London Henry Brown Fund supported work on the illustrations. A grant from the M. Aylwin Cotton Foundation helped to defray the cost of printing.

I also express my gratitude to the following institutions: the American School of Classical Studies (Athens), the Antikensammlung (Berlin), the Ashmolean Museum (Oxford), the British Museum (London), the British School at Athens, the *CMS* Archive (Marburg), the Deutsches Archäologisches Institut (Athens), the *École Française d'Athènes*, the INSTAP Study Centre (East Crete), the Institut für Altertumswissenschaften (Heidelberg), and the Institute of Archaeology (London). I gratefully acknowledge the Greek Ministry of Culture and museum personnel for facilitating access to the following collections: Argos Museum, Ayios Nikolaos Museum, Herakleion Museum, Khania Museum, Nauplion Museum, Mycenae Museum, Thebes Museum and the National Archaeological Museum (Athens).

At the University of London Institute of Classical Studies I am most grateful to: Directors past and present, R. R. K. Sorabji, G. B. Waywell, C. Carey, and T. J. Cornell; the Library Staff, especially C. Annis, P. Jackson and S. Willetts; the Managing Editor, R. Simpson; the Secretary, M. M. Packer; and C. M. Crabb.

My sincere thanks go to the following individuals: St. Alexiou, M. Anastasiadou, M. Andreadaki-Vlasaki, V. Aravantinos, R. G. Arnott, J. Aruz, J. P. Barron, C. Baxter, L. M. Bendall, J. Bennet, P. P. Betancourt, J. H. Betts, D. Blackman, Sir John Boardman, K. Branigan, T. Brogan, C. Broodbank, J. Burger, L. Burn, L. J. Bushnell, P. Butler, G. Cadogan, H. W. Catling, S. Chlouveraki, H. Clark, D. Collon, M. Comstock, H. Crawford, J. Crouwel, J. L. Crowley, J. Cutler, Ph. Dakoronia, A. Dakouri-Hild, J. L. Davis, S. Deger-Jalkotzy, K. Demakopoulou, O. Dickinson, N. Dimopoulou, N. Divari-Valakou, C. Dumas, D. Evely, F. Felten, H. Fields, J. L. Fitton, A. L. Foster, E. B. French, P. Gibbs, N. Ginn, A. Grammenos, R. Hägg, B. P. Hallager, E. Hallager, E. Hatzaki, S. Hiller, S. Hood, H. Hughes-Brock, Sp. Iakovidis, R. Janko, C. Joyce, A. Karetsou, K. Kilian†, J. T. Killen, C. Knappett, K. Kopaka, G. Kopke, M. Kostoula, R. Laffineur, S. Laidlaw, K. Lapatin, J. B. Layton†, C. Macdonald, J. A. MacGillivray, J. Maran, H. Martlew, N. Maslin, N. Momigliano, L. Morgan, P. Mountjoy, B. Niemeier, W.-D. Niemeier, L. Nixon, J.-P. Olivier, T. G. Palaima, E. Palaiologou, M. Panagiotaki, D. Panagiotopoulos, O. Pelon, J. Phillips, G. Platz, M. R. Popham†, J.-C. Poursat, L. Preston, E. Rawson†, P. Rehak†, C. Renfrew, G. Rethemiotakis, E. Ribeiro, J. Ribeiro, D. Ridgway, S. Sadler, I. Sakellarakis, M. Sax, E. V. Schofield, L. Schofield, C. W. Shelmerdine, A. Sherratt, E. S. Sherratt, M. S. Sobeh, E. Stavrianopoulou, D. Stein, H. Tomas, M. Tsipopoulou, I. Tzedakis, L. Vagnetti, M. Vickers, S. Voutsaki, C. Wagner, G. Walberg, P. M. Warren, H. Waterhouse†, M. Wedde, J. Weingarten, T. Whitelaw, M. H. Wiencke, M. Wiener, D. Williams, J. G. Younger, P. Yule.

Particular thanks are owed to Wolfgang Reich, who carried out much preliminary work on the illustrations used in this book. More importantly, he introduced me to the wonders of Photoshop, thereby ensuring that I had the necessary skills to finish the task.

Two further individuals deserve special mention. To Lesley Fitton go my heartfelt thanks for constant encouragement, good cheer, and steadfast support. Above all, she has maintained an unswerving belief that the project was worthwhile and that somehow I would see it through to the end. My husband, Anthony Vickery, has patiently endured my long absences on research trips and learnt to accept with forbearance my growing passion for Aegean glyptic. Without his support, this book would not have been completed.

My deepest thanks are reserved for the present editors of the *CMS* series, Ingo Pini and Walter Müller. During the 1980s and 1990s I had the good fortune to work with them in Greece and England and thereby gained much valuable first-hand experience in studying seals. Since 1999, for a month or more each year, they have granted me free-run of the Marburg Archive, with its priceless collection of casts drawn from museums around the world. They have also generously made available to me several *CMS* volumes prior to publication, ensuring that my own book would be as up-to-date as possible. As already indicated, I am deeply indebted for permission to reproduce here some 400 scanned images from the Archive. I have greatly benefited from discussions with Walter Müller on sealing practices and a host of technical issues relating to seals and signet rings. Ingo Pini kindly read an earlier version of the manuscript, making pertinent comments and criticisms along the way. Naturally, for any opinions expressed here and for all remaining errors I alone am responsible. Above all, Ingo Pini has freely shared his expertise and unparalleled knowledge of Aegean glyptic and instilled in me a deep love of the subject. For this I will always be grateful. It is no exaggeration to say that without the *CMS* project – and the cumulative efforts of contributors and editors over more than 40 years – the present book could not have been written. Thus, it is with deep appreciation that I dedicate this book to members of the *CMS* team – past and present – in the sincere hope that their work will now reach a wider audience.

London, September 2004

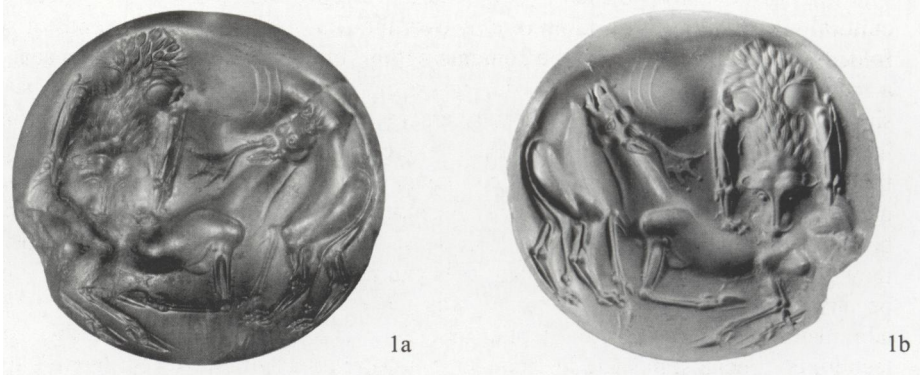
NOTE ON THE ILLUSTRATIONS

Black and white photographs and drawings of seals and sealings are numbered **1-625** (in bold). When more than one aspect of a particular seal or sealing is shown, these are indicated by letters **a-d**. Thus, on the page overleaf, **1a** illustrates the face of a carnelian lentoid in Berlin; **1b** shows an impression of the same seal face. Ordinarily the designation **PLATE** is omitted in the text. Brief captions accompany the composite plates. However, to ensure that the book is largely self-contained, full details appear in the List of Plates (pp. 382-403). This effectively serves as a catalogue, providing basic information on the items illustrated: *CMS* and museum numbers; shape and material; provenance; and what is actually illustrated (e.g. face and impression). Dimensions are not given, since all items are illustrated to scale, as indicated on the plate captions. Virtually all the seals and sealings included in the sequential numbering (**1-625**) are Aegean seals; the few exceptions are Neolithic stamps or *pintaderas* from northern Greece; foreign seals found in the Aegean; and a few *dubitandae*, which are no longer accepted as genuine.

The **COLOUR PLATES (C1-C50)** are located at the end of the book, with an explanatory note on selection and photography. The list of **COLOUR PLATES** appears on pp. 403-404, with appropriate cross-references to black-and-white plates illustrating impressions of the seal faces. Plate credits (for black-and-white and colour plates) are given on p. 405.

The **FIGURES** serve as supplementary illustrations, and are numbered by chapter. Thus **FIGURE 1.1** shows the Cupbearer Fresco at Knossos, which provides our best illustration of seal-wearing in the Aegean. Sites plans and diagrams are also designated as **FIGURES**. A full list, with sources, appears on p. 381.

MAPS 1-6 appear on pp. ix – xvii and cover the Aegean, the Greek mainland, the central Aegean islands, Crete, the Knossos area, and the eastern Mediterranean with the Near East; a chronological chart can be found on p. xviii.



1a-b Carnelian lentoid, now in Berlin, generally considered one of the finest examples of Aegean glyptic (date LB II). Seal face and impression. Scale ca 2:1.

CHAPTER 1 INTRODUCTION

The impulse to mark, to identify, to secure is deeply rooted and widespread in man's cultural history. Pressing a lump of clay over the rim of a container, the ends of string or folded parchment will secure the contents within. Impressing the clay with a seal, having a recognizable pattern or motif, will ensure that the contents remain intact. Out of this simple yet immensely practical activity emerged one of the most remarkable crafts ever invented by man – seal engraving. And by the standards of ancient glyptic, the gems of the Aegean Bronze Age are unrivalled, thanks to an astonishing combination of aesthetic quality and technical brilliance. For two centuries collectors, scholars and students alike have marvelled at the sheer beauty of these tiny works of art (1a-b). For this aspect alone they merit our attention. But Aegean seals and sealings are true monuments in miniature, because they can be read in so many ways. For our understanding of iconography and administrative practices the glyptic repertoire is crucial; it can also shed light on technology, social status and interconnexions within the Aegean and further afield.

SOURCES OF EVIDENCE

While decorative stamps, perhaps used on cloth or skin, occur in Greek Neolithic contexts, true seals and sealings are not attested in the Aegean until the third millennium BC. By Near Eastern standards this is very late indeed. There, stamp seals of soft stone were being made by the later seventh millennium and were used for sealing purposes; cylinder seals developed during the fourth millennium (Chapter 2). However, the need for seals seems closely bound up with evolution towards social complexity. In the Aegean that need apparently coincided with the growth of proto-urban settlements during EB II (2800–2300 BC). From this time onwards we can trace the development of seals and sealing practices for well over 1000 years, encompassing the great palace civilizations of Minoan Crete and Mycenaean Greece. The surviving corpus now comprises more than 10,000 examples, with new discoveries adding a further 1000 pieces every 10-15 years.¹ Only pottery provides us with a more extensive record.

Like pottery, seals are virtually indestructible, made in a variety of durable materials (see below). But unlike pottery the survival of seals owes much to chance. Indeed it seems likely that no more than 5% of the original output has survived. Most of our extant seals come from graves, but these have suffered from the attention of tomb robbers, ancient and modern. Building activities of later eras also account for losses, especially in Athens and large towns, such as Herakleion. Outside urban areas, Bronze Age graves are sometimes difficult to locate and those of neo-palatial Crete are notoriously elusive. Relatively few seals have been found on habitation sites, most were probably lost or misplaced by their owners. But settlements and palaces do sometimes yield deposits of clay sealings, an equally important form of evidence. The seal impressions which they bear offer important insights into the development of glyptic art; the actual lumps of clay provide crucial information about sealing practices. Yet here too chance plays a key role. Since unbaked sealings will eventually disintegrate through exposure to the elements,

¹ The figure 10,000 is a rough estimate of known seal-types, i.e. individual seal faces or their ancient impressions (below pp. 16-17). Cf. I. Pini, in *Atti del II° congresso di micenologia* 1092.

only a burnt destruction will ensure that they survive.² But fires can prove erratic; one part of a site may burn fiercely, another escape barely singed. If that area happened to contain the principal storerooms or archives, our evidence for seal use on the site would be lost forever. The fact that not a single clay sealing can be matched to a surviving seal should give us further pause for thought.³ As we shall see time and again, accidents of preservation are a major factor in our approach to Aegean glyptic.

For all the losses, the surviving repertoire is enormous; but this creates drawbacks as well as benefits. Few individuals can command a knowledge of the subject as a whole. And the many facets of glyptic studies encourage, indeed positively demand, detailed analysis by experts. But to non-experts – students in particular – the burgeoning specialist literature can prove daunting, more a barrier than an incentive to learning about this fascinating subject.⁴ This book aims to remedy the problem by providing a broad introduction to glyptic development and to some of the many insights which seals and sealings can offer. While some may choose to read this account from cover to cover, other readers will prefer to consult specific chapters or sections. But as we shall see, the many strands of glyptic studies are hard to unravel and to place in neat compartments. This will make for a certain amount of overlap and repetition from one section to the next. Here I provide background information on a range of topics which will recur throughout the book.

TERMINOLOGY

In this book ‘seals’ are defined as objects with designs engraved on one or more faces, which will produce relief images when pressed into a soft medium such as clay, wax or modern plasticine. The term ‘seal-stone’ (or ‘sealstone’) is altogether less suitable – albeit commonly encountered – because many Aegean seals were fashioned from clay, bone, ivory, glass and man-made substances, gold and other metals, as well as stones hard and soft (see below). Sometimes especially fine pieces made of semi-precious stones are described as ‘gems’, but the expression has no specific technical meaning. The terms used to describe particular seal shapes – e.g. *Petschafte* (stalk-handled signets) and lentoids (lens-shaped seals) – are explained at appropriate points in the text and are listed in the Glossary (Appendix 2). The same applies to the many types and sub-types of Aegean sealings. Here suffice it to say that the term ‘sealing’ is used generically, i.e. for any lump of clay bearing a seal impression. As we shall see, some Aegean sealings did indeed seal or secure objects, but many did not. Instead they merely labelled the commodities to which they were fastened. Still other ‘sealings’ were not attached to any support whatsoever and probably served to record transactions, whether debts or receipts (see below). Since there is no universally accepted typology for sealings, variant terms are explained in the notes and Glossary. The Glossary also presents selected foreign terms frequently encountered in specialist literature.

² There is no evidence that sealings were ever deliberately baked in the Aegean.

³ A LB I-II seal in Berlin, said to be from Elis, is close (but not identical) to the impression on a hanging nodule from LH IIIB Pylos (see **585-586** and Chapter 10).

⁴ General accounts include *GGFR*² 19-106 and *APG* 209-32; also J. H. Betts, in D. Collon (ed.), *7000 Years of Seals* (London 1997) 54-73. For specialist literature to 1989, see: J. G. Younger, *A Bibliography for Aegean Glyptic in the Bronze Age*. *CMS* Beiheft 4 (Berlin 1991). See also Chapter 11 for a brief history of glyptic studies.

THE CMS

The *Corpus der minoischen und mykenischen Siegel (CMS)* was founded in the late 1950s by Friedrich Matz with the aim of documenting systematically all known examples of Aegean glyptic. The first volume, devoted to seals and sealings in the Athens National Museum, appeared in 1964 (*CMS I*). Since then about 20 volumes have appeared, covering Greek museums and collections in England, Europe and North America; several more are in preparation.⁵ Over the years modifications and improvements have been made in the presentation of data and in standards of draughtsmanship, though the basic format has remained unchanged. This means that each and every seal or seal-type (see pp. 16-17 for definition) has its own *CMS* number, providing a simple and reliable means of reference.⁶ For instance, the seal shown here in **PLATE 1** is *CMS XI* no. 42, with the Roman numeral *XI* indicating the volume devoted to small European collections. For the huge collection of seals and sealings in the Herakleion Museum, eight separate volumes or fascicules have been compiled (*CMS II.1–II.8*). Thus *CMS II.2* no. 60 (here **2**) is published in the Herakleion volume dealing with seals of the proto-palatial period (*II.2*). For readers who do not have ready access to the *CMS* volumes, museum inventory numbers are given in the list of plates, together with basic information on materials and find-spots (pp. 382-404). One further feature of the *CMS* coverage must be explained at the outset. In the *CMS* volumes each seal (or seal-type) is illustrated with a half-tone drawing based on the impression, as well as photographs of the impression and original (see below). It is important to realize, however, that illustrations are reproduced in a standard 4 x 4 cm format (or 4 x 6 cm for oval faces) and not at a uniform scale (i.e. 1:1 or 2:1) relating to the size of the original. By contrast, in this book, I illustrate all seals and sealings to a specified scale, which is indicated in the plate captions.

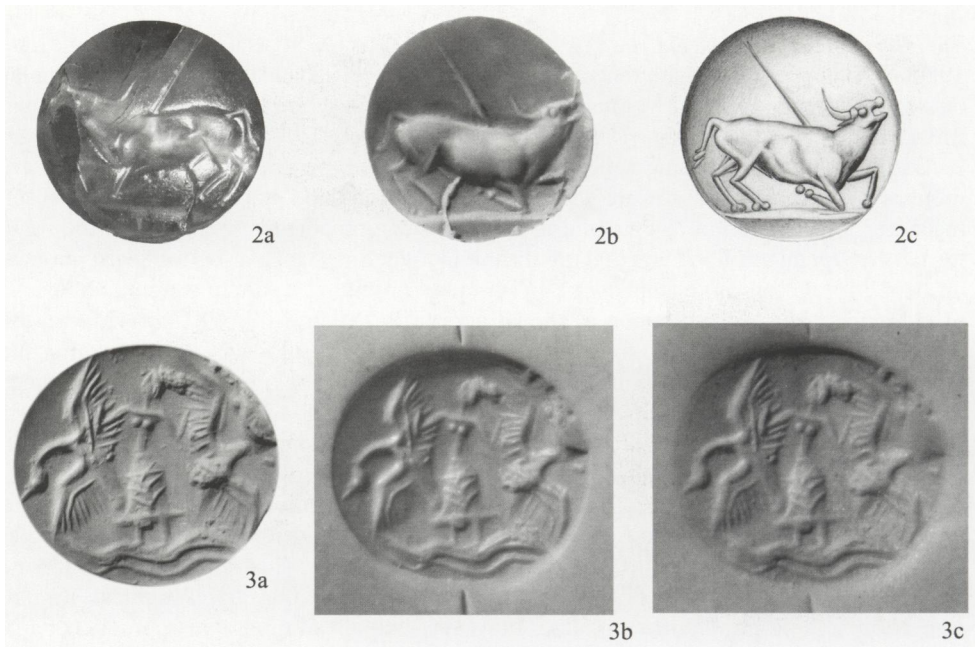
The *CMS* headquarters is currently located in Marburg, Germany, and contains an extensive photographic archive and, most crucially, impressions of seals and sealings held in museums around the world. This unparalleled resource permits detailed comparisons between pieces that are widely dispersed – a *sine qua non* for serious students of Aegean glyptic, especially when dealing with style. Further information on the *CMS* project and how to make best use of the volumes is presented in Appendix 1 (see also Chapter 11). An annotated list *CMS* volumes appears on pp. 344-48.

DESCRIPTIONS AND ILLUSTRATIONS

Designs are normally carved into the surface of the seal face in intaglio (i.e. ‘cut in’). ‘Engraving’ is a more common, though somewhat less accurate term, since it relates primarily to work in metal rather than stone. When impressed in soft clay – or in modern plasticine – the original intaglio designs become relief images, and this is the correct way to read seals. Thus descriptions always follow the design in impression; for instance in **2b** the bull faces *right*, not left as it appears on the original stone (**2a**). Drawings (**2c**) are also based on impressions and not the original seals, although this was not always true in the past (see below). There are other practical reasons for studying seals in impressions.

⁵ In addition six supplementary volumes (*CMS Beihefte 1-6*) have appeared to date, presenting scholarly monographs and the proceedings of symposia on Aegean glyptic. These should not be confused with the supplements to normal *CMS* volumes, which present newly discovered material (e.g. *CMS I Suppl.*, *CMS V Suppl. 1A–B* etc.). See also Appendix 1.

⁶ An exception to this rule occurs when impressions from the same seal or signet ring are found at different sites; these are assigned separate *CMS* numbers (see Chapter 7 and **368-371**).



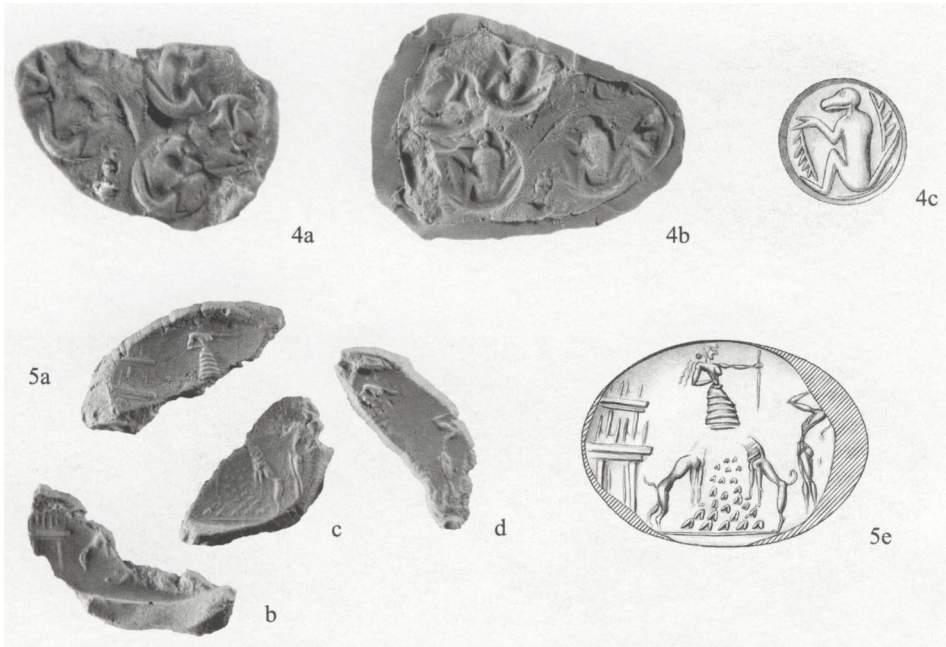
Descriptions should always follow the design as it appears in impression, not as on the original seal. **2a-c** show the seal face, impression and drawing of a biconvex discoid from Knossos, made of 'chalcedony' (MM III). Scale 2:1. **3a-c** illustrate modern impressions made with dental compound, plasticine and Fimo. There are advantages and drawbacks in every case. Casts made of dental compound or plaster of Paris are crisp, but the string-hole cannot be marked. Plasticine also gives good impressions, but they can be damaged by sharp objects or fingernails. Modern compounds, such as Fimo, can be oven-baked, but clarity is often lost (note here the fuzzy edge to the impression). The original seal is a green jasper lentoid, now in London (LB I-II). Scale ca 3:2.

The superb veining of many stones means that motifs are difficult if not impossible to see clearly in the original seal.⁷ Moreover, many of our seals are tiny: the largest Mycenaean gems do approach 4 cm in diameter, but these are exceptional. Enlarged photographs of the impressions therefore help us appreciate modelling and other technical details. Enlarged photographs of the seals themselves can also be revealing, although sometimes they produce an optical illusion whereby the design on the seal face *appears* to be carved in relief, whereas in reality it has been executed in intaglio.

The making of modern impressions requires considerable skill and various substances are used by specialists and museum conservation departments.⁸ Red sealing wax was favoured in the 19th century, but has long since been abandoned. Plaster casts, made with fine quality dental compound, can yield excellent results and are still sometimes produced today (**3a**). Plasticine is an excellent medium and has the added advantage that the direction of the string-hole can be marked (**3b**). This feature can help us orient motifs

⁷ See COLOUR PLATES, esp. C16-C19, C24, C33, C39, C41, C43-C47.

⁸ See *GGFR*² 469. Obviously the making of impressions should be left to experts.

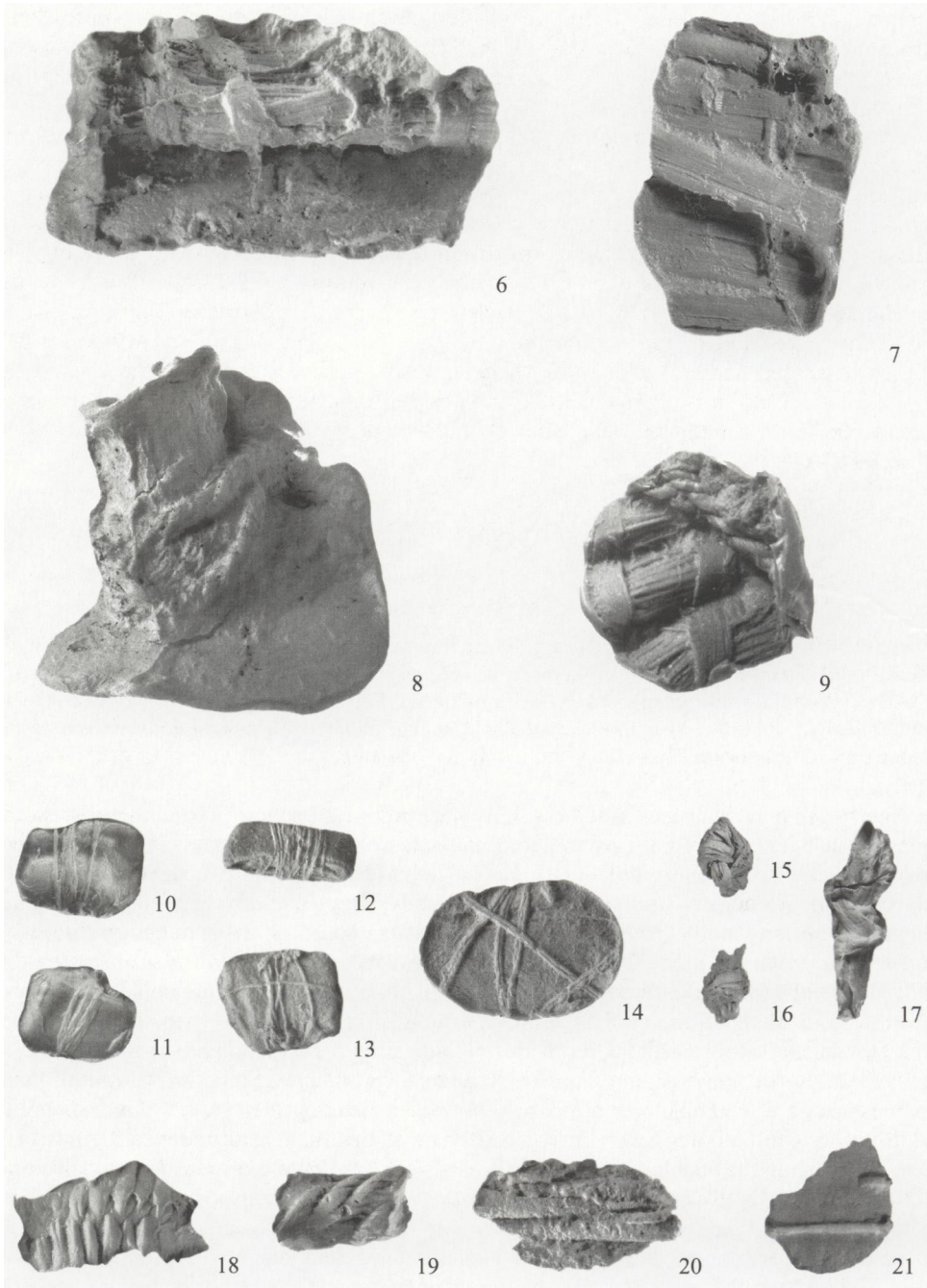


To retrieve the surface of ancient sealings, first an impression is taken (4a) and then a cast made in dental compound (4b, 5a-d). When impressions are incomplete, the drawing will be a composite (4c, 5e), presenting the original motif and shape of the seal face as accurately as possible. 4a-c Direct object sealing, Phaistos. 5a-e Irregular two-hole nodule fragments, Knossos. Silicone and casts shown at ca 1:1; drawings ca 3:2.

correctly and provides clues as to how seals were worn.⁹ Of course plasticine impressions must be handled with great care to avoid unwanted damage from sharp objects, or even from fingernails! Certain modelling clays, such as Fimo, can be baked in an oven and thus provide permanent impressions. Unfortunately, they generally lack clarity and fine details are often wholly lost (3c). Thus any drawings based on them might be seriously flawed. By contrast, modern silicone-based compounds yield superb results, though do not allow the string-hole to be marked. Since the photographs for this book were taken from various kinds of impressions, all have been trimmed to show only the seal face. The list of plates follows current *CMS* practice by indicating the direction of string-hole.

The study of clay sealings presents special problems. Sometimes the original impressions are incomplete or are poorly preserved; reading their motifs demands great skill. A series of photographs lit from different angles may help to reveal details. To avoid damaging the friable clay, modern impressions are now usually made with silicone-based compounds. Since silicone needs no pressure and dries in a few moments, it is altogether better than plasticine and is especially useful when the surface of the sealing is irregular (4a). Of course, the silicones will show a negative image, i.e. as on the original seal. To retrieve the positive relief of the ancient impression a further step is needed:

⁹ J. G. Younger, *Kadmos* 16 (1977) 153-58. Lentoids are often pierced vertically and were seemingly worn like modern wristwatches; certain outsized examples, pierced horizontally, may have been worn as pendants.



Impressions of the imprints on the reverses of sealings from Lerna (6-8), Phaistos (9), Knossos (10-11, 18), Zakros (12-13, 17), Ayia Triada (14-16), Pylos (19), Mycenae (20) and Thebes (21). Dates range from EH II to LM / LH III. 6-9 are shown at ca 3:4, the remainder at ca 1:1.

making casts in dental compound (4b). The casts, along with photographs, are used to prepare the drawings (4c). Where we possess several incomplete ancient impressions from the same seal, the finished drawing will be a composite, which attempts to present the original motif and shape of seal face as accurately as possible (5a-e). Conventions of drawing and pitfalls are discussed in the following section.

Our understanding of sealing practices is also greatly enhanced by modern impressions in plasticine or, better, silicone. These allow us to study how the lumps of clay were actually formed and used. For instance, when a lump of clay is pressed directly against wood, basketry or pottery, distinctive marks or imprints will be left on the underside of the sealing (6-9, 18, 21). The imprints of strings or cords which ran through lumps of clay known as hanging nodules can also sometimes be retrieved (15-17, 19-20). From the modern silicones, experts may be able to determine whether the original cord was made of gut or vegetal fibre. More exciting still are the imprints found on the undersides of so-called flat-based nodules, which offer conclusive proof that sealed messages written on parchment existed in neo-palatial Crete. The modern impressions clearly reveal how the small pieces of parchment were carefully folded into tiny ‘packets’ bound with fine thread (10-14).

DRAWINGS OLD AND NEW

Every drawing is an interpretation. In the best cases, they help us to read motifs that are complicated or that exist only on damaged or incomplete sealings. But drawings can also misrepresent motifs so badly that any interpretations based on them are incorrect.¹⁰ Cult scenes present special problems, since every minor detail of pose and gesture is potentially significant (see below). Poor drawings have also clouded our judgement on authenticity (Chapter 11). For studying stylistic development, drawings are of little value, since they do not normally convey the subtleties of technique and modelling which play a critical role in glyptic style.

Yet for all their faults, drawings play a major role in the study of Aegean glyptic. Even the layout of the *CMS* volumes encourages us to rely first and foremost on drawings, when in reality they should serve chiefly as convenient *aides memoires* for the appearance of motifs. Drawing conventions have changed dramatically in the past hundred years or so and even within the *CMS* series there is marked variation in style and manner of execution (see Appendix 1). It is also worth remembering that drawings are always based on impressions and these too vary a good deal in quality.¹¹

Sealings present enormous difficulties, owing to imperfect or incomplete impressions on clay which may itself be friable or poorly preserved. Even so, many published drawings, especially those prepared in the early 20th century, count as little more than sketches. Our first example comes from Zakros and was initially published in a drawing by Émile Gilliéron (22a), on which D. G. Hogarth based his description: ‘Two draped figures both apparently to the right. Between them a *labrys* suspended in air. Before the right-hand figure is an object such as that which Furtwängler calls a *Fischreuse*

¹⁰ For problems of drawing seals and sealings, see G. Burgfeld, in *CMS Beiheft* 1 (1981) 37-58. Cf. L. Morgan, *CMS Beiheft* 3 (1989) 146-48; I. Pini, in *EIKON* 11-19, esp. 16-18.

¹¹ See above. Sometimes signet rings are wrongly drawn from the original, e.g. M. R. Popham et al., *BSA* 69 (1974) 218, fig. 14D-E and pl. 37a-b, f; by contrast the seals from Sellopoulo T. 4 are correctly drawn from impressions (ibid. fig. 14 A-C, pl. 38a-f).

(“lobster-pot”) . . .¹² M. P. Nilsson used the drawing published by Sir Arthur Evans in *The Palace of Minos* (22b) and introduced new errors: ‘two men or women, one adoring a double axe, the other cuirass in hand’.¹³ Now the *CMS* (22c) makes plain that this is a procession involving two male figures wearing hide skirts: one carries a double-axe, the other a tassled object (‘sacral knot?’). We also learn that the impression was made by an oval signet ring, probably of soft stone. The style of the drawing reflects the material, while the hatched oval helps us appreciate what portion of the motif actually survives.¹⁴

Our next example has been illustrated in two versions (23a-b). The drawing commissioned by Evans led him to see a male god and a ‘pard’ or lioness.¹⁵ In reality the animal is a collared hound and the male figure is probably a huntsman. The original seal was a cushion made of hard stone, which was impressed on the edge of a roundel found in the Eastern Temple Repository at Knossos.¹⁶ Other sealings from this group have also been subject to misinterpretation based on drawings published by Evans. The ‘goddess and lion’ (319) proves to be a male figure clad in a long robe and peaked cap (similar to that worn by the huntsman). The fragment famously showing a boxer in three-quarter back view is not nearly as life-like as the original drawing leads us to suppose.¹⁷

Sometimes, however good the draughtsman, motifs will remain enigmatic, as demonstrated by three renderings of the so-called ‘Young Minotaur’, a motif found among the late sealings from Knossos. The first drawing (24a) was published in Evans’s preliminary report for 1900-01.¹⁸ He believed that the motif showed a man clad in a kind of cuirass leaning toward a monster or minotaur ‘with the legs of a man, but the head, fore-legs and upper part of the body, including the tail, of an animal resembling a calf’. In 1922 he commissioned Piet de Jong to prepare a ‘revised delineation’ executed under his own supervision (24b).¹⁹ Evans again saw the ‘Young Minotaur’ as having bovine forefeet and head (though without the usual horns). At the feet of the ‘monster’ was a couchant ram. Here the shape of the drawing suggests the oval bezel of a ring. The new *CMS* drawing (24c) reveals not only that the original seal was a lentoid of soft stone, but more crucially that the ‘Young Minotaur’ is actually a seated ape!²⁰ Moreover, the original drawing published by Evans proves to be more accurate than the ‘revised delineation’. Even so, the meaning of the scene remains obscure.

These few examples should serve as a salutary warning of the difficulties we face when using drawings as the basis for iconographical studies. But the pitfalls are not confined to the figural scenes of the LBA. On the contrary, our perception of the Lerna sealings owes much to de Jong’s original drawings, where motifs were ‘clarified’ or improved, thus imbuing some with a degree of precision at variance with reality.²¹ Yet not all failings

¹² D. G. Hogarth, *JHS* 22 (1902) 77-78, fig. 5 no. 6. Hogarth saw their garments as a kind of ‘knickerbocker gathered in below the knee and very full in the thigh, or else an apron-like prolongation of the bodice . . .’

¹³ *MMR*² 157, fig. 64; cf. *PM* I 434-35, fig. 312b.

¹⁴ *CMS* II.7 no. 7; cf. *AJA* 105 (2001) 118-19. Though it is now standard *CMS* practice to restore the original shape of the seal face, this is not always possible (e.g. here 317, 324).

¹⁵ *PM* II 831-32, fig. 547. Cf. *PM Index* for further references.

¹⁶ *CMS* II.8 no. 236; cf. *Roundel* II 161 (KN Wc 25).

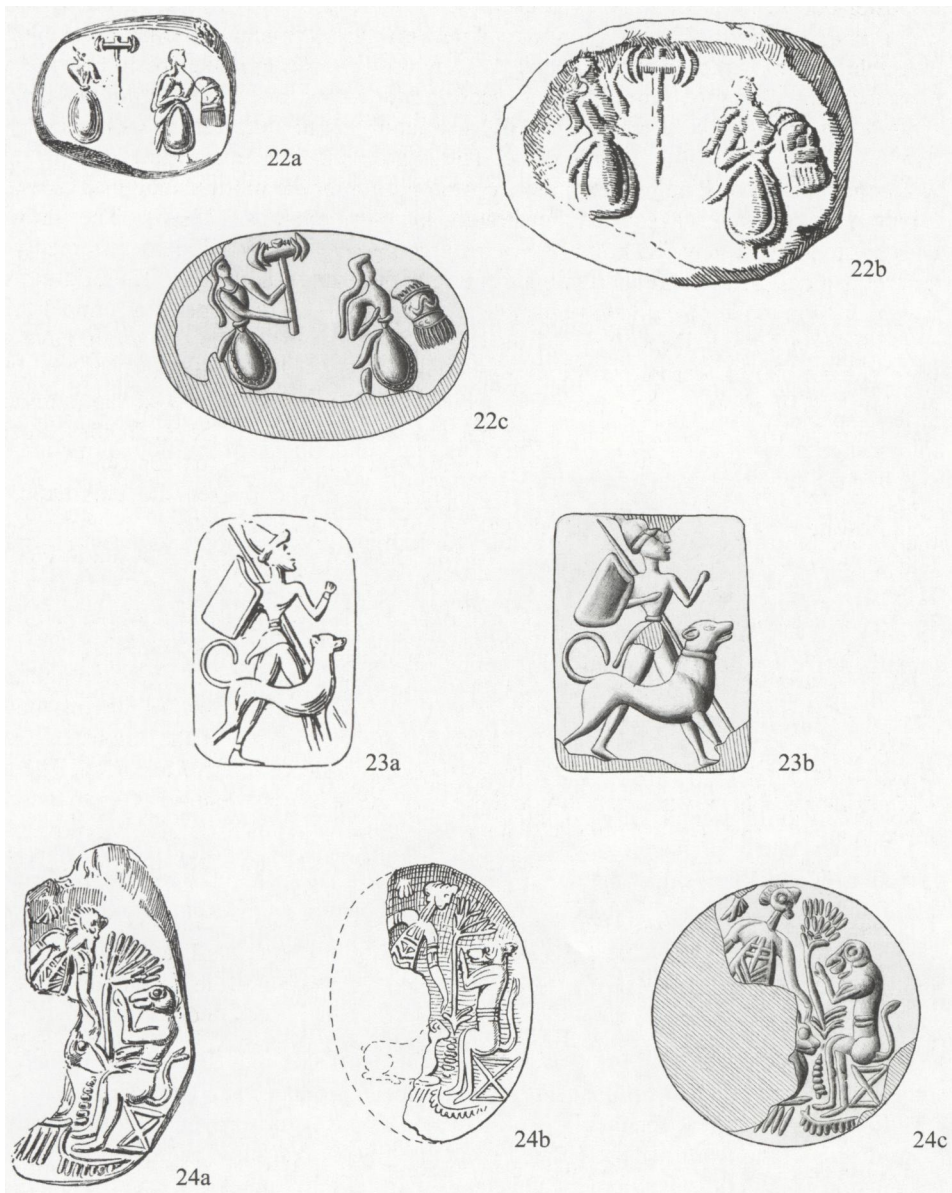
¹⁷ Compare *CMS* II.8 no. 280 (here 321) and *PM* I 689, fig. 509.

¹⁸ A. J. Evans, *BSA* 7 (1900-01) 18, fig. 7a.

¹⁹ First published in 1928: *PM* II 763, fig. 491; *PM* IV 387, fig. 321.

²⁰ *CMS* II.8 no. 262

²¹ See Chapter 3; 63, 69, 71 are by de Jong. Similar objections apply to his drawings of certain pre-palatial seals (*CMS* II.1) and impressions from Phaistos (*CMS* II.5).



Drawings old and new. **22a-c** Zakros, House A. **23a-b** Knossos, Eastern Temple Repository. **24a-c** Knossos, Room of the Egyptian Beans. Scales vary (*CMS* drawings **22c**, **23b**, **24c** at 2:1).

can be laid at the hands of particular draughtsman or woman. Guidance from glyptic experts is crucial and nowadays the *CMS* team provides their very experienced draughtswoman with information on the shape of the original seal (e.g. amygdaloid, cushion, lentoid or ring) and the type of material from which it was made (e.g. bone / ivory, soft or hard stone, metal). These features are now regularly reflected in drawing style. In some cases, drawings have to be returned to the draughtswoman two or three times for corrections. Even so, in the case of sealings, the general editor of the *CMS* series reckons that the drawings are only 80% accurate.²²

DATING AND CHRONOLOGY

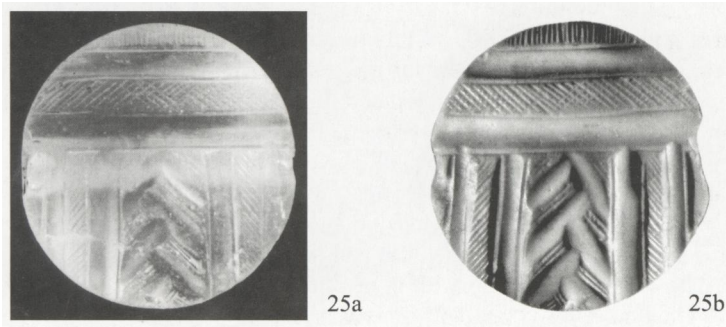
Glyptic chronology is a complicated subject best left to experts. But readers ought to have some idea of the approaches which specialists adopt and the problems which they must overcome. A brief introduction to the main issues here will make using this book easier, especially in Chapters 3-10 where we will be concerned with the development of both seal engraving and sealing practices. There are undoubted difficulties in treating the two themes together. Seal engraving is, after all, a craft. Material, technique, motif, composition – and the dynamic interplay between them, style – these are some of the many strands to be considered. And while not immune to developments in other crafts, seal engraving does have its own momentum. This does not coincide neatly with our standard ceramic chronologies or archaeological periods. Meanwhile sealing practices develop at *their* own pace, undoubtedly linked to growing social complexity and administrative needs. As a result, the lumps of clay impressed with seals, serving to control, guarantee, label and authorize, exist in a bewildering range of types. In many ways they form a discrete subject (see p. 21). Yet administrative demands and social factors surely had an impact on seal production: engravers did not operate in a vacuum. ‘Art for art’s sake’ is not an appropriate concept for the Aegean Bronze Age.

Absolutely fundamental for reconstructing glyptic chronology is material from secure and closely dated archaeological contexts. Destruction deposits in settlements are particularly valuable, since they can be dated to a specific chronological horizon. Important evidence also comes from graves which contain a single burial or which were used for only a limited period of time. The aim is to isolate the earliest appearance of particular types; determining how long they remained in production or in use can prove more problematic (see below). The fact is that a narrowly datable find-spot merely provides us with a *terminus post quem non*. In other words, a given seal cannot be any later than the context in which it was found. Of course, it may have been made at a somewhat earlier date and similar seals may have been produced at a later date.

Unfortunately, a great many seals are lost souls having no provenance at all; many more do not come from narrowly dated contexts.²³ Most can now be related to a broad framework of glyptic development thanks to painstaking studies by experts, entailing comparisons with datable seals and taking account of material, technique, motif, composition and style. But many difficulties remain. Local and regional variations complicate the picture; conservative and innovative workshops certainly co-existed at the same time.

²² I. Pini, in *CMS* II.6 p. xx. The superb drawings in *CMS* II.6–II.8 were mostly executed by Susanne Lieberknecht; the same is also true for *CMS* V Suppl. 3 (2004).

²³ At a rough estimate over 50% of the repertoire is unprovenanced (Chapter 11). In addition, many seals come from sites that are inadequately published, with information limited to preliminary reports or brief notices in *CMS* volumes. Finally the circulation of seals, especially in the LBA, means that often seals are considerably older than their context (Chapter 10).



25a-b Biconvex discoid of rock crystal with 'tectonic' motif (MM II-III). Avgos, stray find. Seal face and impression. Scale ca 2:1.

These factors mean that only rarely can we date seals to single ceramic periods; more often we must allow for a longer *floruit* – at least on present evidence. For instance, the fine rock crystal discoid bearing a 'tectonic' design shown in **25a-b** should be dated broadly to MM II-III. Seals of this type were certainly being made before the end of MM IIB (ca 1700 BC), since impressions from them occur in the Phaistos sealing deposit (Chapter 5). But production probably continued for some time longer, thus spanning the artificial divide between MM II and MM III and also crossing the boundary between the proto-palatial and neo-palatial periods.²⁴ As we shall see sometimes glyptic developments cannot even be contained precisely within the very broad, but equally artificial divisions of the Bronze Age into Early, Middle and Late.

Attempts have been made to wrest glyptic chronology from the stranglehold of ceramic phases and archaeological periods.²⁵ In time this may prove feasible, but for the present too many uncertainties remain and it seems especially unfair to burden readers with yet another system. Thus the *floruit* for types of seals and sealings will be given in conventional ceramic terms, as above. Insofar as possible glyptic developments will be related to broader cultural periods. Absolute dates remain a controversial issue in Aegean archaeology and it might be safer to avoid them altogether. Here the traditional low chronology is adopted;²⁶ correlations between ceramic phases, archaeological periods, and absolute dates are set out in TABLE 1 (p. xviii).

²⁴ Nowadays the MM IIB destructions are seen as marking the end of the proto-palatial period, though in some earlier accounts the break was put at the MM IIIB: e.g. *ECS* 6. See also Chapter 5. Difficulties in definition and dating make it well nigh impossible to offer precise figures for the extant seals from any given period. With some reluctance, I offer rough estimates in subsequent chapters, but these should be regarded as orders of magnitude only. An electronic data-base would certainly be advantageous, but would not necessarily yield definitive figures (see Chapter 11).

²⁵ For instance, J. G. Younger assigned absolute dates to his 'masters', 'workshops' and 'stylistic groups'; the attributions themselves are sometimes debatable: see Chapter 11 for discussion and references.

²⁶ Adapted from *ABAC* 169, table 3.1 and, for the third millennium, S. W. Manning, *The Absolute Chronology of the Aegean Early Bronze Age* (Sheffield 1995) 170-72, fig. 2.

MATERIALS, SHAPES, TECHNIQUES

Aegean seals were made in a wide variety of durable materials – bone and ivory, soft and hard stones, metals, and man-made substances such as glass. The selection and use of materials certainly changed over time and from one part of the Aegean to another, although it is sometimes difficult to discern the precise reasons why. Availability and technology, social status and fashion all played a part. For instance, locally available bone and imported ivory (both soft materials) were widely used in pre-palatial Crete (C3-C5), thereafter they occur very rarely. By contrast, Cretan workshops made considerable use of soft local stones (chlorite, steatite and serpentine) from EM II until LM III (C7-C8, C29). The soft stones, along with bone and ivory, register 2-4 on the Mohs scale of hardness.²⁷ They can be worked with knives and burins and slow hand-turned drills. As we will discover shortly, techniques have an important bearing on style.

By MM II Cretan engravers were beginning to work with a range of hard semi-precious stones (C9-C17). These include opaque jaspers and translucent quartzes, such as agate, carnelian, blue chalcedony, rock crystal and amethyst. Some of these stones (e.g. rock crystal and jasper) can be found in the Aegean and initially local sources may have been used. But others (e.g. amethyst, haematite, lapis lazuli) were certainly imported and, as demand for high quality stones increased, foreign supplies probably grew in importance. These hard semi-precious stones register 6-7 on the Mohs scale. To work them demanded a technical revolution, involving the use of new rotary tools – fast cutting wheels and drill bits mounted on a lapidary lathe and powered by a bow. It seems likely that the technology was imported from the Near East (Chapters 2, 5). In any case, the new tools and techniques had an immediate and lasting impact on production (below). However, even in the neo-palatial period hard stones never entirely supplanted local stones (Chapter 6). By contrast, on the Greek mainland Early Mycenaean workshops employed only hard stones, and soft local steatite (C50) was not used until sometime in LH IIIA (Chapter 9).

The first experiments using man-made substances, often erroneously described as frit or faience, date to the late pre-palatial period. These enigmatic ‘white pieces’, apparently inspired from abroad, are a short-lived fashion with no immediate successors (C6, 124-127; Chapter 4). But in the early LBA blue glass was introduced from the Near East. Rare at first and cut like stone, by LB III glass was widely used for jewellery and seals, made in moulds. Here too material and technique produce a highly distinctive style (533-541; Chapter 9). Most glass seals have lost their colour and are reduced to a dull greyish-white, but several notable exceptions do survive, allowing us to appreciate the attraction of this vibrant blue material in antiquity (C32; cf. C48).

From the EBA onwards seals of metal are also attested. But lead and silver do not survive especially well on Aegean sites, copper and bronze can corrode, and gold is particularly attractive to looters, ancient or modern. And since all metals may be recycled, our surviving repertoire is rather patchy. Best known are the fine gold signet rings of the LBA, their elongated oval bezels often engraved with complex multi-figured scenes (e.g. 215-217, 221, 379, 457, 464-465). Their subjects – bull-leaping, hunting, fighting and, above all, ritual activities – greatly enrich the iconographic repertoire. Although some early metal seals were cast, the motifs on our LBA signets were usually engraved and punched, techniques that can produce extremely fine details (C22, C25).

²⁷ The scale ranges from 1 (talc) to 10 (diamond). Emery, available from Naxos, registers 8 on the Mohs scale and may have provided the necessary abrasive for working hard semi-precious stones (Mohs 6-7). See *MSV* 160.

Some LBA signet rings, especially those from mainland Greece, have hoops which are elaborately decorated with granulation or cloisonné (e.g. 467-469). Sometimes hard stone seals were embellished with gold caps and granulation at the string-hole, while seals of soft stone might be sheathed in thin gold foil (e.g. 207, 372, 375, 449; C23, C42).

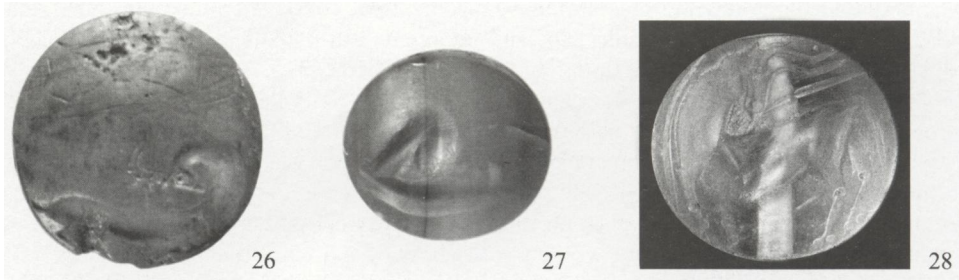
The shapes of Aegean seals are many and varied, especially those from pre-palatial and proto-palatial Crete. In these earlier periods shape, material and technique are often closely linked. For instance, many bone and ivory seals owe their shapes to naturally occurring forms, modified only slightly by simple sectioning (98-112). In the seal engraver's workshop at Mallia, dating to MM II, three-sided prisms predominate, almost invariably made of soft steatite worked with simple hand-held tools (150-152; cf. 153-158). After this period, steatite is used less frequently for Cretan seals and prisms all but disappear. The introduction of fast rotary tools also has an impact on seal shape. For a brief time extremely elaborate shapes are produced, most notably the stalk signets or *Petschafte*, their grips decorated with intricate groove and torus mouldings (143-144). Seal faces are also modified in response to the new tools; thus flat profiles give way gradually to convex ones. By the early LBA the standard shapes are few: lentoids, amygdaloids, cushions and signet rings with oval bezels (e.g. 206-207, 210, 215-218). Of these lentoids are far and away the most common, occurring in all types of stone and also glass. Signet rings are ordinarily made of metal, though some were produced in stone (e.g. 209). Cylinder seals – so prevalent in the contemporary Near East – barely make a mark in Aegean workshops (e.g. 208, 450; see Chapter 2).

Indirectly, clay sealings can also provide a surprising amount of information about the seals which impressed them. For instance, a circular impression that is slightly *concave* points to an original seal face which was circular in shape and *convex* in profile – perhaps a discoid or a lentoid. Sometimes we can also determine if an ancient impression was produced by a seal of soft or hard stone, or by one made of metal.²⁸ Generally speaking, a hard stone seal engraved with fast rotary tools will leave a much cleaner and sharper impression than a soft stone seal cut with hand-held tools. The extremely fine engraving on metal seals and signet rings is also quite distinctive (e.g. 5a-e). Other clues, which sometimes survive in impressions, are capped string-holes (cf. 558a, 570) and parts of ring hoops (203b).

For the most part, insights into manufacture methods and engraving techniques are based on direct observation of finished pieces and their modern impressions, studied under magnification.²⁹ But these usually fail to provide crucial information about initial stages of manufacture – the production of rough-outs and blanks, the drilling of the string-hole, the creation and refinement of the actual motif. For the steatite prisms popular in MM II, the seal engraver's workshop at Mallia provides invaluable evidence, but for LBA hard stone seals we are far less well endowed and we must rely on a few

²⁸ This information is now regularly provided in *CMS* volumes, e.g. II.6, II.7, II.8 and in new studies of sealings from Mycenae and Pylos published by the *CMS* team: W. Müller et al., *AA* (1998) 5-55 and *Tonplomben*. By contrast, *CMS* II.5 (1970) hazarded only a few suggestions regarding the originals that impressed the Phaistos sealings.

²⁹ The *CMS* team uses a Leitz Elvar stereoscopic binocular microscope (power x32). Electron microscopy and, for metal signet rings, X-ray photography and ultra-sound can add further insights, see: Chapters 2 (n. 31) and 6 (n. 33). It seems likely that seal engravers were recruited from the ranks of the short-sighted; certainly there is no evidence to support the notion that pieces of rock crystal might have served as magnifying lenses: L. Gorelick & A. J. Gwinnett, *Expedition* 23.2 (1981) 27-34; *Expedition* 23.4 (1981) 15-16.



26 Red jasper lentoid, now in Berlin, showing initial sketch of a goat in the upper part of the field. **27** Unfinished agate lentoid, without string-hole, from Mycenae. **28** Rock crystal lentoid, now in London, showing how string-holes were drilled from opposite sides of the seal to meet in the centre. Scale ca 3:2.

isolated examples.³⁰ For instance, a red jasper lentoid in Berlin was clearly meant to depict two wild goats around the periphery, but work may have been abandoned when the stone fractured near the lower edge; short faint strokes above mark the intended position of the second animal (**26**). Work was halted at an even earlier stage on an agate lentoid from Mycenae (**27**). Two deep furrows were possibly meant for the belly and neck of a quadruped, while a smoothed area in the centre might have been prepared for the head. Work may have been abandoned because of a flaw in the stone. Open to question is the stage at which the string-hole was ordinarily drilled. Since this carries with it the risk of fracture, arguably drilling would be undertaken at an early stage, perhaps after the motif had been sketched out, but before it was fully finished. Certainly some of the Mallia seals were pierced before completion and the same is also true of the Berlin lentoid. Seals made of clear rock crystal or translucent stones demonstrate that string-holes were drilled from opposite sides of the seal to meet in the centre (**28**; also **C40**). Since the drill was applied several times and at slightly different angles, the mouth of the hole is usually a trifle larger than the central channel and this is rarely perfectly straight.³¹

Materials and techniques will be treated in greater detail at appropriate points in the coming chapters. Here it is worth stressing that our present knowledge leaves much to be desired, notwithstanding important advances in recent years. For the sources of stones, educated guesswork prevails, since there are no scientific means for pin-pointing origin. Even the names given to stones can be more confusing than enlightening. What one scholar will call sard, another will designate as carnelian (or cornelian); the stone in question is a translucent 'chalcedony' (i.e. quartz) of orange, red or reddish-brown hue

³⁰ For the Mallia workshop, see Chapter 5. LM I workshop material has been recovered at Poros-Herakleion, but is not fully published (Chapter 6). Preliminary sketches which were unaccountably abandoned are sometimes found on finished seals, e.g. the kid beneath the belly of the mother goat on **401**. For further examples of sketches and unfinished seals, see: I. A. Sakellarakis, *AE* (1972) 233-44; J. G. Younger, *Expedition* 23.4 (1981) 31-38. For re-engraved seals, compensating for mistakes or miscalculations, see: I. Pini, in *Pepragmena* 8 (2000) A3, 41-49.

³¹ Younger (n. 30) 38; idem, in C. Renfrew, *The Archaeology of Cult. BSA Suppl.* 18 (London 1985) 286 (note that CS no. 351 is indeed pierced, horizontally).

(e.g. **FRONTISPIECE, C13, C30-C31**).³² The distinction between varieties of soft stone is, if anything, more problematic: the terms chlorite, schist, serpentine, steatite being used almost interchangeably (and often inaccurately). Similar problems used to bedevil ivory and related materials (see Chapter 4). Thus published identifications must always be treated with caution, including those which appear in the older *CMS* volumes (Appendix 1). To rectify earlier errors, the present *CMS* team has re-examined numerous seals and signet rings; their corrections are currently lodged in the Marburg archive.³³

MOTIF AND COMPOSITION

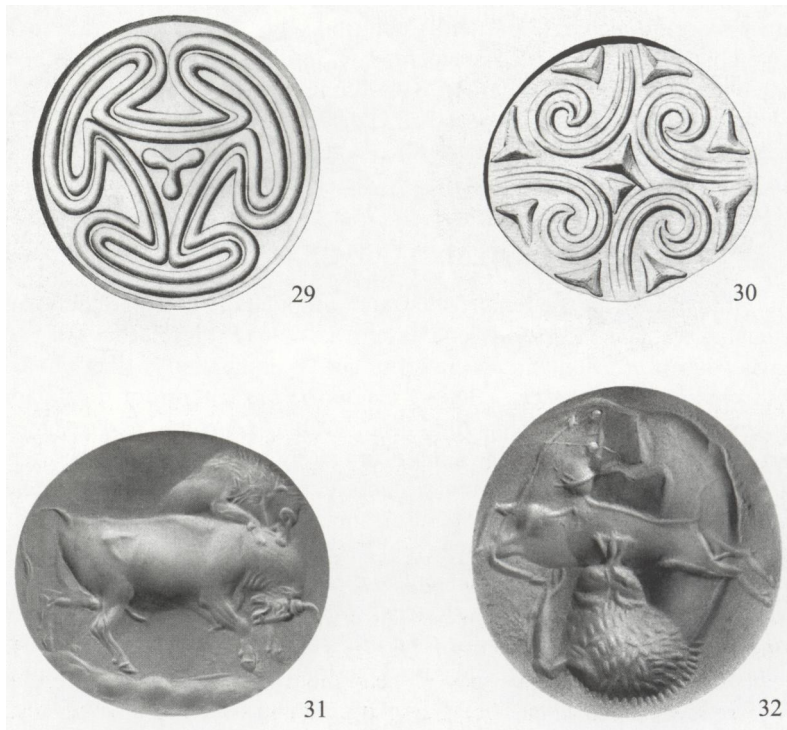
The term ‘motif’ is widely used in glyptic studies, though often it is not defined precisely. Perhaps having a rather loose and general term is no bad thing; usually it is clear from context what is meant. Sometimes the term ‘motif’ is applied to the whole design or image engraved on the seal face.³⁴ But we may also use the term for subsidiary elements of decoration (e.g. filling ornaments or motifs). Various geometric and ornamental motifs may also be called ‘designs’ (e.g. spiraliform designs or motifs). Representations of figures (human or divine), animals (real or fantastic), plants or objects are often known as ‘pictorial motifs’. Whatever terms we use, our aim must be to produce as clear and concise a description as possible. But herein lies the challenge: it is one thing to be able to see a motif (or its constituent elements), quite another to translate this into words. Moreover, we must guard against reading too much into what we see. Thus we must select words which are both precise and neutral. Scenes depicting the actions and interactions of figures demand special care. Over-enthusiastic readings of cult scenes are, unfortunately, all too common.

Pitfalls abound when we turn to composition, the way in which motifs are disposed on the seal face. Indeed even experts have stumbled in their attempts to define underlying ‘principles’ of composition and to characterize their effects. Here we may consider two simple examples, which illustrate the importance of composition and its effect on style. In the first we are dealing with abstract designs engraved on circular seal faces (**29-30**). On **29** the continuous wavy band which hugs much of the circumference makes for an ‘enclosed’ composition, the three radiating spokes resemble a stationary wheel and the overall effect is static. By contrast, on **30** there is no border line and the spiral hooks radiate outwards creating a sense of limitless movement. The first motif appears on clay sealings at Lerna dating to the mid-third millennium; the second occurs on an ivory stamp cylinder from southern Crete, probably a trifle later in date (EM III-MM IA). In the figural scenes and fine animal studies of the LBA, composition and use of space also

³² Note also that mineralogists, gemmologists and archaeologists rarely use the same terminology. For a mineralogist, ‘chalcedony’ describes a group of crypto-crystalline quartzes; here I follow current *CMS* practice in restricting the term to blue chalcedony, a hard semi-precious stone (Mohs 7), which is usually pale blue in colour, milky or translucent (**C14, C21, C26**). The Glossary (Appendix 2) defines terms used here, with variants. See also Chapter 5 for further information on stones and their possible sources. Excellent summaries appear in *AEMT* 5-77 and *AMMI* 74-102; see also *GGFR*² 374-79; *ECS* 192-205; J. H. Betts, in *CMS* X, pp. 16-21.

³³ In this book I have made extensive use of the new *CMS* data. Eventually the *CMS* team hopes to publish their corrections and new observations, perhaps in electronic format (Appendix 1).

³⁴ The *CMS* team uses the term *Motive* (sing. *Motiv*) to refer specifically to individual seal faces (or their impressions) nowadays often called ‘seal-types’ in English, see below and n. 35. We have no suitable equivalent for the German term *Bildthema*, a useful word which we can only render as ‘subject’ or perhaps as motif (in a general sense).



Composition - the way motifs are disposed on a seal face - has a direct bearing on style. **29** Seal-type from Lerna (EH II), drawing. **30** Ivory cylinder from Marathokephalo (EM III-MM IA), drawing of impression. **31-32** Agate lentoids from the floor cist in the Vapheio tholos tomb (LH IIA), impressions. Scale ca 3:2.

prove significant and constitute an important element in style (see below). As we shall see, engravers depicted their animals in a limited range of activities and, for the most part, deployed them in a series of conventional poses. None the less, within these constraints a huge number of different images were produced. Two agate lentoids depicting lion attacks will help to illustrate this point. In the first (**31**) the overall composition stems from the realistic pose of the animals, taken from nature; the rock work below hints at a natural setting. By contrast, the animals in **32** are arranged in a highly artificial chiastic composition, in other words shaped roughly like the Greek letter X. Here the pose is dictated purely by the desire to fill the circular seal face in a striking fashion. This pair of seals must be more or less contemporary in date. They were found within the floor cist of the Vapheio tholos, a valuable sealed deposit that contained pottery of LH IIA date, the famous gold cups with bull scenes and 29 seals (Chapter 9).

A specialist term, frequently encountered in glyptic studies, is 'seal-type'. This does not, as might be supposed, simply mean a particular kind of seal, e.g. a three-sided prism, a discoid or a lentoid. Rather, it relates to the designs on *individual seal faces* and



Seals with related motifs are common in ancient glyptic. **33-34** show the impressions of two carnelian lentoids depicting the *Potnia theron* (Mistress of Animals) flanked by lions from Mycenae Chamber Tomb 515. The size of the seals differs, as does the rendering of certain details (e.g. the lions' tails). Scale ca 2:1.

especially to the ancient impressions of them.³⁵ For example, among the many thousands of direct object sealings at Phaistos, we can isolate 325 seal-types – effectively the impressions of 325 individual seal faces. To use the term ‘seal impression’ would be ambiguous, since many of our MM II-III seals have two, three or even four faces. Moreover, most sealings in this period bear more than one impression. Usually at Phaistos these are the same seal face stamped over and over again; occasionally two or three different seal-types occur on the same sealing. This practice is normally called dual or multiple stamping. But clay sealings are unlovely things, often fragmentary and friable, preserving poor-quality impressions. To identify individual seal-types on these requires great expertise. Of course many seal-types are quite distinctive, differing in size or shape, motif or composition. But others are very similar, displaying only minor deviations in size, in the way details are rendered or in the placement of subsidiary ornament (**33-34**). These are sometimes called ‘look-alikes’. There is, however, no consensus on the degree of similarity needed for this expression to be used.³⁶ There is even less agreement on the significance of seals bearing similar or near-identical motifs. Indeed the whole question of how and why motifs came into being and who was entitled to use them is one of the most intriguing aspects of Aegean glyptic.

STYLE

How to define style? Is it possible to describe style objectively? What criteria do we use? These general issues arise in any study of arts or crafts, they are not peculiar to Aegean glyptic. Here we are concerned with factors which are specific to seal engraving. Material and technique, motif and composition certainly contribute to style. These elements can, to

³⁵ The term was used, somewhat haphazardly, by Evans and has gained popularity in recent years. It is not without its drawbacks, however, for in English ‘type’ usually implies a ‘class of things having common characteristics’ (*OED*). But ‘type’ can also mean ‘the device on either side of a medal or coin’ (*ibid.*) and, indeed, is derived from the Greek word *τύπος* meaning ‘the impress of a seal, the stamp of a coin ...’ (*Liddell & Scott*). The term *Motiv*, preferred by the *CMS* team for what here is called a ‘seal-type’, is not without ambiguity: see above and n. 34.

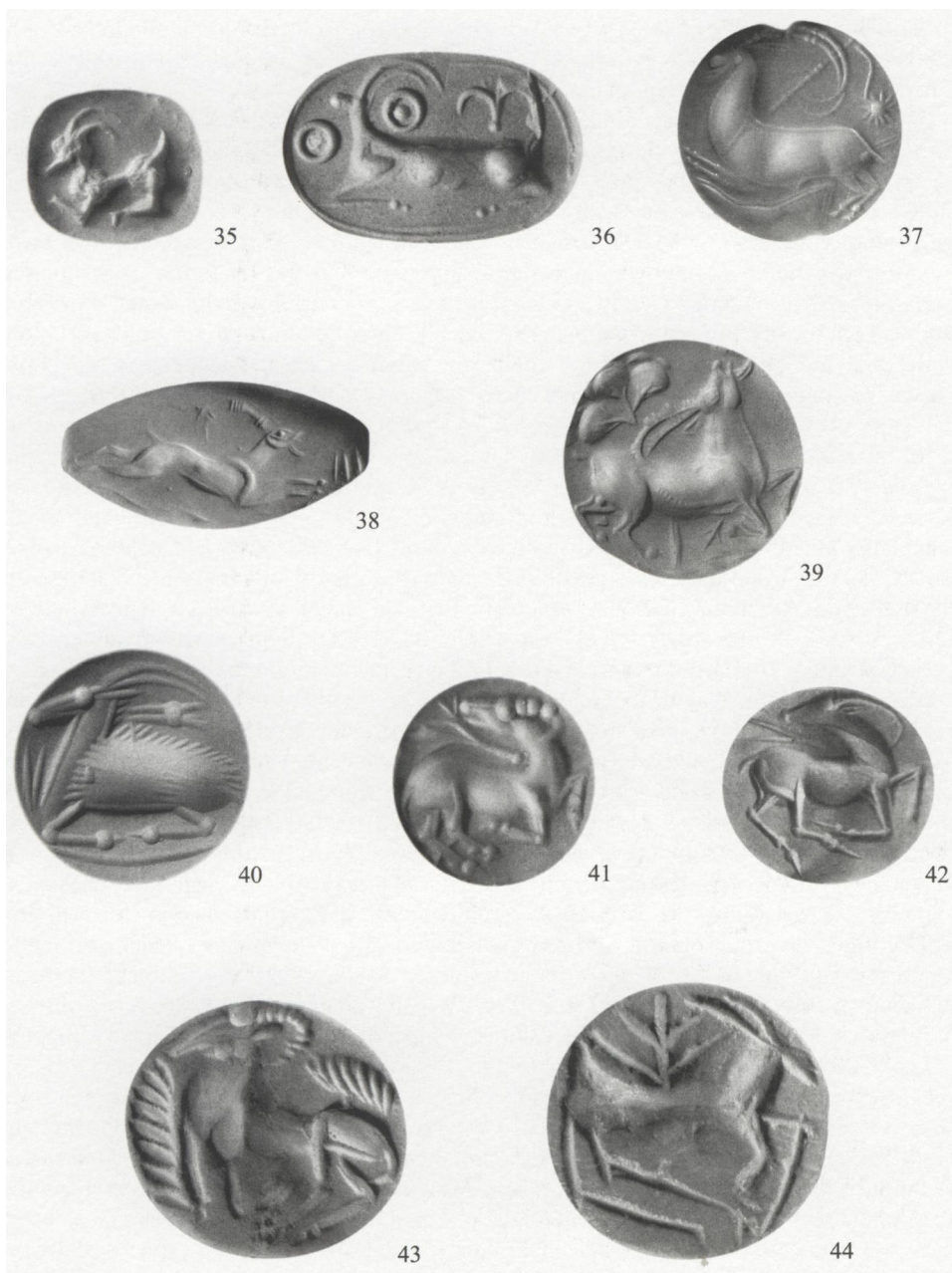
³⁶ For further examples, discussion and references see Chapter 7.

a certain extent, be described in objective terms. For instance, we can readily identify the materials from which seals are made; in turn some techniques are closely linked to particular materials. As already noted, soft materials (Mohs 2-4) can be worked with hand tools, hard semi-precious stones (Mohs 6-7) demand fast rotary tools. These different tools and techniques undoubtedly produce different effects, sometimes rather loosely regarded as different 'styles'. But as we shall see below, seals made in the same materials, with the same tools, bearing similar motifs can also display different styles.

The challenges of evaluating style will soon become apparent if we look at various seals depicting running goats, a common motif in Aegean glyptic (35-42). We may begin with a small three-sided prism made of steatite found at Mallia (35). The style of these MM II prisms is often dismissed as 'crude', the workmanship condemned as 'inferior'. Aesthetic judgements – negative or positive – can be hard to avoid when discussing style. Yet they can impede the kind of careful observation needed to understand how a style was achieved and why it spread. MM II steatite prisms were engraved exclusively with hand tools: the deep triangular gouges created by burins and blades, the circular sinkings (for heads and bodies) by the slow solid-bit drill. Our goat displays these features to be sure, but there is nothing inferior about its execution or style. Our next goat (36, C9) displays very different characteristics. Here we are dealing with a green jasper prism, dating to MM II-III, engraved with the fast rotary tools that were introduced in this period. A tubular drill created the filling ornaments, a solid drill shaped the body; but no attempt has been made to smooth away tool marks, to conceal technique. Is the engraver showing off his newly-acquired tools and expertise, or is he still unsure of how they may be best applied? And how do we *define* this style?

Whenever we attempt to describe style and stylistic development, comparisons are hard to avoid. But the pitfalls of this approach are demonstrated by the next two examples. For instance, the goat shown in 37 is less 'naturalistic' than the following example (38). Or it might be described as more 'stylized': a weasel-word, over-used. In truth, comparisons are often rather uninformative and we would do better to focus on particular features and the techniques used to render them. For instance, a contour line produced by the fast cutting wheel is clearly visible in 37 (C16). Drills of varying sizes have been used to render joints, eye, and details on the horns and spear. Within the body tool marks have been smoothed, but modelling remains limited. This seal, a discoid made of veined agate, should probably be dated to MM II?-III. The next seal (38), a three-sided prism of haematite, is somewhat later (MM III-LM I). Here the pronounced shoulder line is noteworthy, so too the rendering of legs and other details (e.g. lozenge-shaped eye) by the rapid application of the cutting wheel. Finally, the almond-shaped seal face favours the extended flying-gallop pose.

By the beginning of the LBA seal engravers had completely mastered their fast rotary tools and from now on variations in effect are linked to relatively small yet distinctive differences in the way tools were deployed. Sometimes bodies are strongly modelled with pronounced musculature and carefully rendered anatomical detail, as on a red jasper lentoid from Vapheio (39, cf. 31-32). By contrast, the 'Cut Style' relies on a rapid, almost impressionistic, application of rotary tools, to produce smooth-bodied animals with stick-like legs and, here, the bristly hairs on the goat's back (40). Surprising as it may seem this last pair is more or less contemporary (LB I-II). During LB III some engravers made emphatic use of drills to produce bulbous noses, swollen cheeks or bulging eyes (41), while others created lean and elegant creatures with a few deft applications of wheel and drill (42). Even within a single century, numerous styles were current, some certainly



Material and technique have an important bearing on style, even when pose and composition are similar, as shown by these impressions of seals depicting goats, running (35-42) and recumbent (43-44). Impressions. Scale ca 2:1. Materials vary: 35, 43-44 are made of soft stone; the remainder are hard stone. Dates range from MM II to LM / LH III.

reflecting the output of particular workshops or production centres, others perhaps linked to individual craftsmen. But attempts to ascribe specific examples to mainland or Cretan workshops and to isolate the work of individual ‘hands’ remain controversial (see Chapter 11: Attribution Studies).

Even after the introduction of hard stones and rotary tools, Cretan workshops continued to produce soft stone seals. In the LBA these were usually made of serpentine or chlorite schist, as was **43**. Hand tools and soft stones can never yield the same clarity of line and subtle modelling feasible in semi-precious stones, much less the precision of metal engraving (Chapter 6; **326**). But it is a mistake to regard soft stone seals as, *ipso facto*, crude or degenerate. Moreover, in composition, pose and the rendering of anatomical parts, soft stone engravers clearly emulated their cousins working in other materials. Thus during LM III we find that running goats become less common in hard and soft stone alike, and are largely replaced by standing creatures with swollen chests, elongated heads, pronounced cheeks and short beaded horns. A lentoid from the LM IIIA-B cemetery of Armeni near Rethymnon provides a good example (**43**). Our last piece comes from near Mount Olympos in northern Greece and belongs to the so-called Mainland Popular Group, produced during LH IIIA-B (**44**). Engraved in local black steatite, the style is very different from our Cretan soft stone seals, perhaps reflecting the svelte animals produced by the latest hard stone workshops (e.g. **526**, **608**). But steatite involves the use of burins and blades, here resulting in a thin, straggly creature. Indeed sometimes the rendering of these animals is so schematic that their species remains a mystery.³⁷

Superficially our ten goats, which span some 500 years of glyptic development, show a broad evolution from crude to stylized, naturalistic to impressionist, and finally back to crude again. But this way of looking at Aegean glyptic is not only too simplistic, it is also certainly misguided. We have ample evidence that stylistic development did not progress in a linear fashion. As already noted, conservative and innovative workshops certainly co-existed during the same period. Fine naturalistic animals, including goats, are to be found among the Phaistos sealings (Chapter 5; **182**), datable to the end of MM IIB, contemporary with the steatite prism, described above. Furthermore, it is a fallacy, born of our own artistic heritage, to assume that naturalism was the ultimate goal of Aegean craftsmen. Even during the early LBA naturalistic representations account for a limited proportion of the total output. Stylized goats on so-called ‘talismanic’ seals were being made during MM III-LM I, a period considered as the acme of Minoan naturalism (Chapter 6; **234**). And for a reminder of the stylistic diversity during this era, we need only glance at the fantastic hybrid creatures produced by engravers at Zakros (Chapters 6-7; **277-282**, **358-364**).

Our ten goats reveal that differences in technique can produce stark differences in style. But, as already noted, there are still more variables which can contribute to style, notably motif, composition and use of space. Although these aspects are sometimes less easy than technique to describe, they are nonetheless susceptible to reasonably objective assessment. In some cases, broad classes or groups can be defined by taking all these factors into account. However, it seems likely that certain elements of style will always defy analysis, will always remain elusive. In that sense, perhaps, style does exist in the eye of the engraver – and the modern beholder.

³⁷ This sometimes applies to LB III hard stone seals too. More diagnostic than horns are tails: short for goats, long for cattle.

SEAL USE

Seals have a variety of functions, which are not mutually exclusive. As we have seen, seal faces cut in intaglio will readily make impressions in soft clay. During the EBA the rims of fixed hearths and large pithoi were sometimes decorated with seal impressions – or more accurately with the impressions of stamps and large rollers (85, 88-92). While the intent does seem to be purely decorative, we cannot exclude this material from our enquiries, since some motifs are related to those attested in the surviving repertoire of seals and (true) sealings (Chapter 3). From EB II onwards, seals in the Aegean were being used sphragistically, i.e. for sealing purposes. Under this broad heading lurk more specific objectives, namely to control, guarantee, authorize, or label. These functions certainly changed over time, as social complexity increased and administrative demands grew. Today we can gain some clues regarding the purpose of sealings from their physical appearance. Thus, as already noted, direct object sealings are lumps of clay placed onto containers of wood, wicker or pottery (6-9, 18, 21).³⁸ In this case, the containers were actually sealed, the contents within secured. The same principal underlies the neo-palatial practice of sealing small pieces of folded parchment (10-14).³⁹ But in the second millennium there also existed many kinds of free-hanging nodules, lumps of clay formed round a piece of knotted string or cord, which apparently did not secure the objects to which they were attached (15-17).⁴⁰ Perhaps the chief purpose of these so-called sealings was to guarantee or to label. Still other kinds of ‘sealings’ were never attached to anything at all. Thus roundels and *noduli* were specially shaped pieces of clay with seal impressions, which may have served as receipts or tokens to confirm or validate particular kinds of transactions.⁴¹ But interpreting the evidence for function is challenging, and demands rigorous analysis of the actual sealing types, the impressions which they bear, and the archaeological contexts in which they were found. The relationship of sealings to tablet administration is also a crucial issue, but one which is even more difficult to assess. We will consider detailed evidence for sealing types and practices in our chronological survey (Chapters 3-10) and allude to the broader issue of the role played by sealings in administration. The Glossary (Appendix 2) provides a summary of sealing types and principal terms in use.

In addition to their sphragistic use, seals could and evidently did serve as items of personal adornment and symbols of status. It is worth noting that in the Aegean we have a wide variety of seal shapes in the EM II-MM II periods, far more than a purely sphragistic role demands. This is in stark contrast to the almost universal cylinder seal in contemporary Mesopotamia. Aegean seals are ordinarily provided with string-holes and could be worn as pendants. However, by the LBA the standard lentoids, amygdaloids and cushions were evidently worn on the wrist.⁴² In the Procession Fresco from Knossos, the Cupbearer wears a lentoid made of a banded stone, presumably agate, the string-holes decorated with granulation (FIGURE 1.1). Because the hoops of Minoan signet rings are often extremely small, some believe they served as pendants rather than finger-rings. However, most could have been worn by individuals of small stature and slim build; by contrast Mycenaean signets often have hoops large enough to fit comfortably on a modern hand (Chapters 6-7, 9).

³⁸ For further examples see Chapters 3-5, 8, 10.

³⁹ For further examples and discussion, see Chapter 7.

⁴⁰ For further examples see Chapters 5, 7-8, 10.

⁴¹ See Chapters 5 (170-172, 203-204) and 7 (306-309, 345-348).

⁴² See also above n. 9.

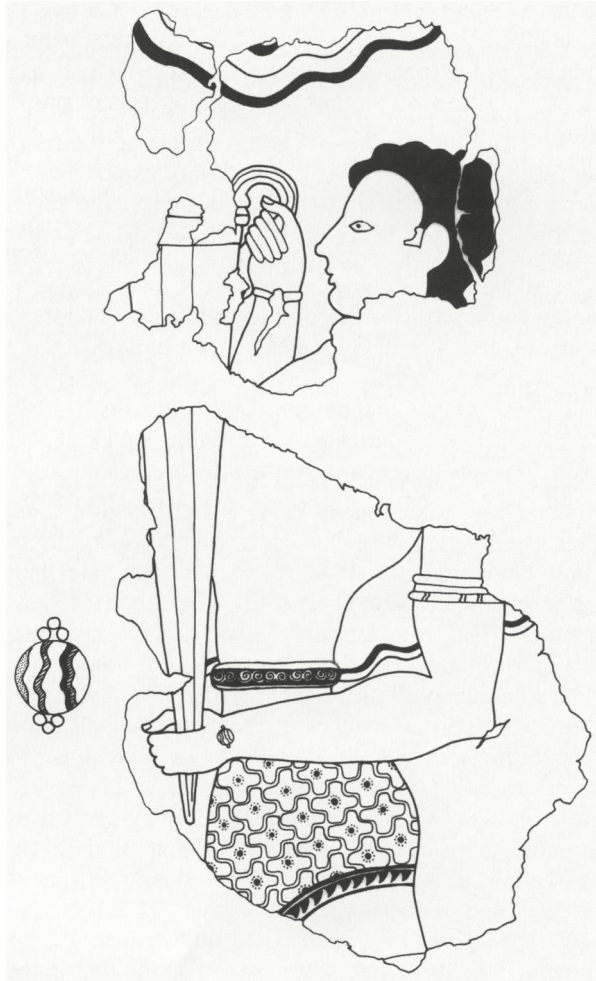


FIGURE 1.1 The Cupbearer Fresco from Knossos provides our most explicit pictorial evidence as to how seals were worn in the LBA. On his wrist the figure wears a lentoid of banded agate with granulation at the string-hole.

Some of the pieces that *we* class as seals were probably never used sphragistically. For instance, the mould-made glass seals of LB III produce impressions of poor quality and indeed their conical backs make the act of impressing uncomfortable (Chapter 9). Some seals of the so-called Mainland Popular Group, also dating to LB III, seem to have been made expressly as grave goods, for they are still in mint, ‘workshop-fresh’ condition. Had they been worn for any length of time before accompanying their owner to the grave, the motifs on these soft steatite seals would have been badly abraded. And it is surely no coincidence that few ancient impressions of Mainland Popular seals have been found (Chapters 9-10). Although seals are sometimes found in sanctuaries and shrines, it seems unlikely they were specifically made as offerings. On the contrary, some are damaged or abraded, heirlooms at the time of dedication (Chapter 10).

Assessing the extent of seal ownership in the Aegean Bronze Age is no easy matter. For some periods – notably neo-palatial Crete – we have a great many seal-types attested on sealings, which augment the repertoire of surviving seals. The presence of undeniably crude pieces made in soft local stones alongside fine gold signet rings suggests that seal ownership was not restricted to the elite in Minoan society (Chapters 6-7). The contrast with Early Mycenaean Greece is striking: there, only hard stone seals and gold signet rings are found, often elaborately embellished and confined exclusively to rich graves. An extreme example of this phenomenon is the collection of 29 seals and rings which accompanied the single burial in the Vapheio floor-cist (Chapter 9). But, as we shall see, all too often archaeological chance conspires against us, preventing accurate comparisons from one region to another, from one period to the next. And, as already observed, not a single surviving seal can be matched to an ancient impression, thus leaving us without secure means for correlating ownership and use. Indeed when we have good evidence from sealing deposits, we invariably lack contemporary graves and *vice versa*. All these factors, and more, frustrate our attempts to ascertain whether links existed between particular motifs and certain social groups or individuals, much less to trace their evolution through time. Yet as personal possessions – worn and broken, treasured and copied – seals bring us far closer to the individual than is ordinarily possible in the Aegean Bronze Age: herein lies one of the main attractions of glyptic studies, and a major challenge (Chapter 11).

CHAPTER 2 THE PRECURSORS

Seals and sealings had an immensely long history in the Near East, ante-dating their appearance in the Aegean by several thousand years.¹ There is then a very real possibility that some features of Aegean glyptic were inspired from the East or even derived directly through foreign contacts. However, the transfer of ideas, technology and iconography is never easy to chart and even in eras when the body of data is substantial, precise routes and mechanisms may be difficult to document. For the shadowy beginnings of Aegean glyptic in the third millennium BC, and its subsequent development in the second millennium, proof positive is often hard to find. Moreover, outside influence or inspiration need not account for all similarities between Eastern and Aegean practices. Some, on scrutiny, might prove to be false analogies. Other practices are so basic that they are universal phenomena and, for these, independent local invention cannot be excluded. The same may be said for iconography. While some images were undoubtedly borrowed by the Aegean from the East – griffins and sphinxes spring immediately to mind – others may simply reflect parallel, but essentially independent developments. In this chapter we will examine some of the Near Eastern background and then go on to consider evidence from Neolithic Greece.

THE EASTERN CONNEXION

The earliest evidence for the use of stamp seals in the Near East comes from two sites in northern Syria, west of the Euphrates, belonging to the aceramic Neolithic in the early seventh millennium BC.² At Tell Bouqras the Pre-Pottery Neolithic B (PPNB) phase yielded several pieces of gypsum plaster with impressions made by stamps bearing geometric designs and, in one case, a caprid. More than 200 fragments of plaster, often with impressed decoration, were at found at Tell el-Kowm. They evidently served as lids for containers and, conceivably, the impressions were a means of indicating ownership. At this stage, however, there is no clear evidence that the vessels were sealed and stamped to prevent anyone tampering with the contents.

Whether stamps of wood or stone were used to make the plaster impressions at Bouqras and Kowm remains an open question.³ But large clay stamps, bearing meander and cruciform designs, are attested at Çatalhöyük (FIGURE 2.1a-g) and other Anatolian sites from the mid-late seventh millennium BC onwards; similar objects occur in a wide

¹ For a brief introduction to Near Eastern seals and seal use, see: D. Collon, *Near Eastern Seals* (London 1990); eadem, in D. Collon (ed.), *7000 Years of Seals* (London 1997) 11-30, with references; also E. Klengel-Brandt (ed.), *Mit Sieben Siegeln versehen* (Berlin & Mainz 1997). R. Laurito, in *Administrative Documents* 367-429 gives useful lists and bibliography for sealings in antiquity. For principal Near Eastern sites mentioned in the present chapter see MAP 6.

² A. von Wickede, *Prähistorische Stempelglyptik in Vorderasien* (Munich 1990) provides a thorough account of early Near Eastern stamps; see esp. 42-51, pls. 4-14 for Bouqras and Kowm. See also K. Duistermaat, in *Administrative Documents* 18-19.

³ PPNB stone stamps are attested at Bouqras, Kowm, and also at Ras Shamra V, but do not provide close matches for the impressions: von Wickede (n. 2) 48-49

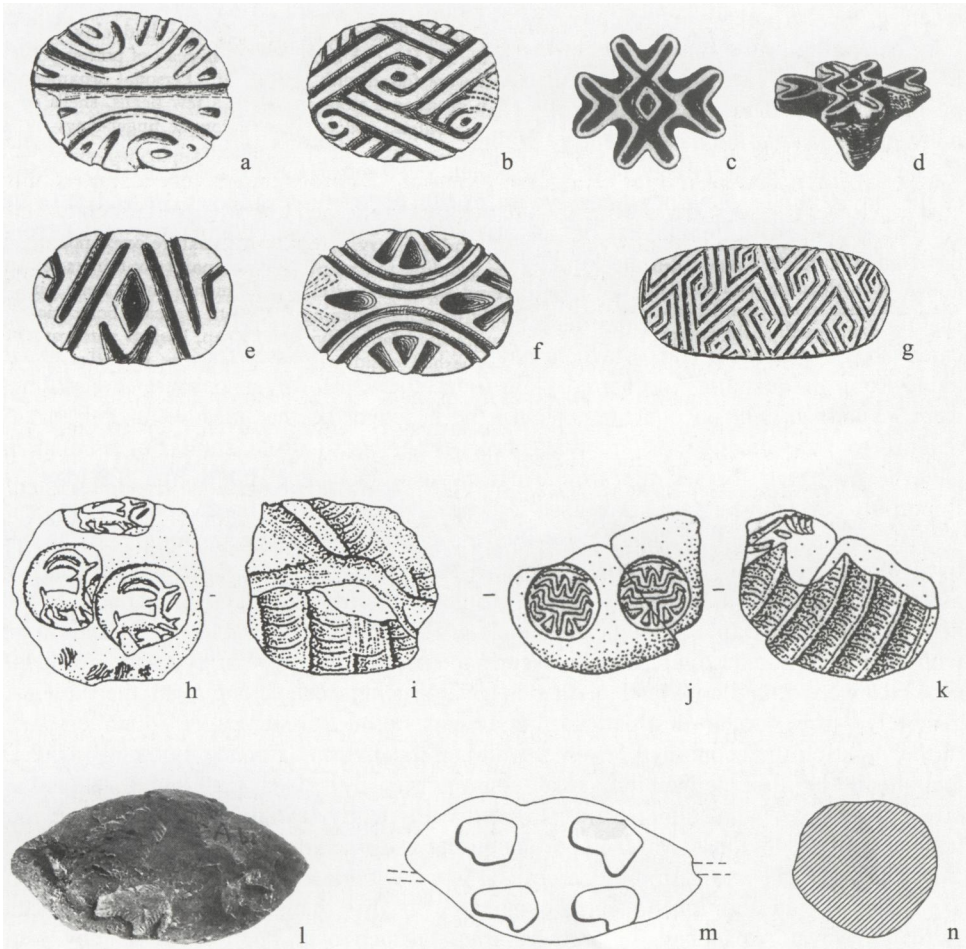


FIGURE 2.1 Selected decorative stamps or *pintaderas* from Çatalhöyük (a-g). Direct object sealings from Tell Sabi Abyad (h-k) and hanging nodule or *bulla* from Arpachiyah (l-n). Scale ca 2:3.

arc stretching into northern Greece, the Balkans and central Europe.⁴ Since there is scant evidence that these stamps were used for sealing purposes, they are frequently called *pintaderas* (from the Spanish *pintar*, to paint).⁵ It is thought that they may have been used to apply pigment to textiles, animal skins or even the human body, though it must be said that firm proof is lacking. Another suggested function is the stamping of bread.

⁴ von Wickede (n. 2) 61-63 for examples from Çatalhöyük levels II-VI; they persist into the Chalcolithic, e.g. at Hacilar (ibid. 63-64). For further examples from the Antalya region, see: G. Umurtak, *Adalya 4* (1999-2000) 1-19 (p. 13 English summary). Stamps from Anatolia and the Levant are also discussed by J. Makkay, *Early Stamp Seals in South-East Europe* (Budapest 1984) 72-84. For examples from the Greek Neolithic see below.

⁵ See von Wickede (n. 2) 6-7, 55-61 with references.

The use of stamps for sealing purposes is a somewhat later phenomenon. Until recently, the earliest evidence came from a few sites, such as Arpachiyah in northern Iraq, belonging to the final stages of the Halaf culture in the early-mid fifth millennium BC (see below). The striking new discovery of 300 sealings at Tell Sabi Abyad now pushes back the date of seal use in the Near East to ca 6000 BC.⁶ This site, located in northern Syria near the modern border with Turkey, is a Late Neolithic settlement. Level 6, known as the Burnt Village, suffered a violent destruction by fire about 6000 BC. Most of the clay sealings found here preserve traces of their original supports (FIGURE 2.1h-k). All had belonged to containers: baskets, plaited mats or lids, ceramic vessels, a stone bowl and a leather sack.⁷ Similar kinds of direct object sealings also occur in the Aegean, but not before the mid-third millennium (Chapter 3). There were no door or chest sealings at Sabi Abyad, nor were there any hanging nodules (see below). Most sealings came from Buildings II and V, which may have been storehouses for the community, to judge from the quantities of charred grain found there.⁸ However, because few sealings were actually *in situ* on containers, it has been suggested that they were deliberately retained for 'accountancy' or 'archival' purposes. As we shall see, similar interpretations have been offered for sealings from Aegean sites, such as EH II Lerna (Chapter 3). Important new clay analyses seem to indicate a local origin for the sealings at Sabi Abyad, countering earlier suggestions that the containers had been brought to the site from elsewhere.⁹ This makes the number of seal-types (67) and their diversity all the more intriguing. In addition to many geometric motifs (zig-zags, diamonds, cross-hatching), there is a fine series bearing male goats or gazelles (FIGURE 2.1h), and others with schematic human figures.¹⁰ For so early a date, the range is extraordinary. Although no seals were found in Level 6, this is unsurprising; seals along with their owners generally escape violent destructions. Future excavation and survey will doubtless shed further light on the economy of Sabi Abyad and its environs. For the moment it is clear that already by the Late Neolithic small communities in the Near East had developed an efficient means of controlling goods, marked with clearly recognizable seals to prevent tampering. This obviously raises important questions for us in the Aegean (see below).

During the early-mid fifth millennium BC more elaborate sealing practices evolved in the Near East. In addition to sealed containers, the first hanging nodules occur in the Burnt House at Arpachiyah in northern Iraq. Formed over knotted cords, they were apparently attached to containers or possibly bales of cloth (FIGURE 2.11-n).¹¹ Those at

⁶ K. Duistermaat, in P. M. M. G. Akkermans (ed.), *Tell Sabi Abyad: The Late Neolithic Settlement II* (Leiden 1996) 339-401; eadem, in *Administrative Documents* 13-27, esp. 13-17 (for convenient summary with calibrated C14 dates and revised interpretations). See also P. M. M. G. Akkermans & M. Verhoeven, *AJA* 99 (1995) 5-32 for the site generally.

⁷ Duistermaat 1996 (n. 6) 342-52, figs. 5.2, 5.7 – 5.22.

⁸ *ibid.* 365-70; Akkermans & Verhoeven (n. 6) 12-13, 15-16. Also noteworthy is the discovery of numerous unbaked clay 'tokens' in the same areas, which may have served as simple counting devices: *ibid.* 24, fig. 14 (see also below).

⁹ Duistermaat, in *Administrative Documents* 15; K. Duistermaat & G. Schneider, *Paléorient* 24 (1998) 89-106.

¹⁰ Duistermaat 1996 (n. 6) 353-64, figs. 5.3 – 5.6.

¹¹ For the Arpachiyah sealings: von Wickede (n. 2) 94-101; *idem*, *Bulletin of the Institute of Archaeology* 28 (1991) 153-96. Hanging nodules (including those at Arpachiyah) are sometimes termed *bullae* (sing. *bullā*), though the term is often applied to sealings generally. Also confusing is the fact that the large clay balls of the Uruk period with seal impressions, used to contain clay 'tokens', are sometimes called *bullae* (see below). The lack of consistent terminology is undoubtedly a major obstacle, particularly for non-specialists.

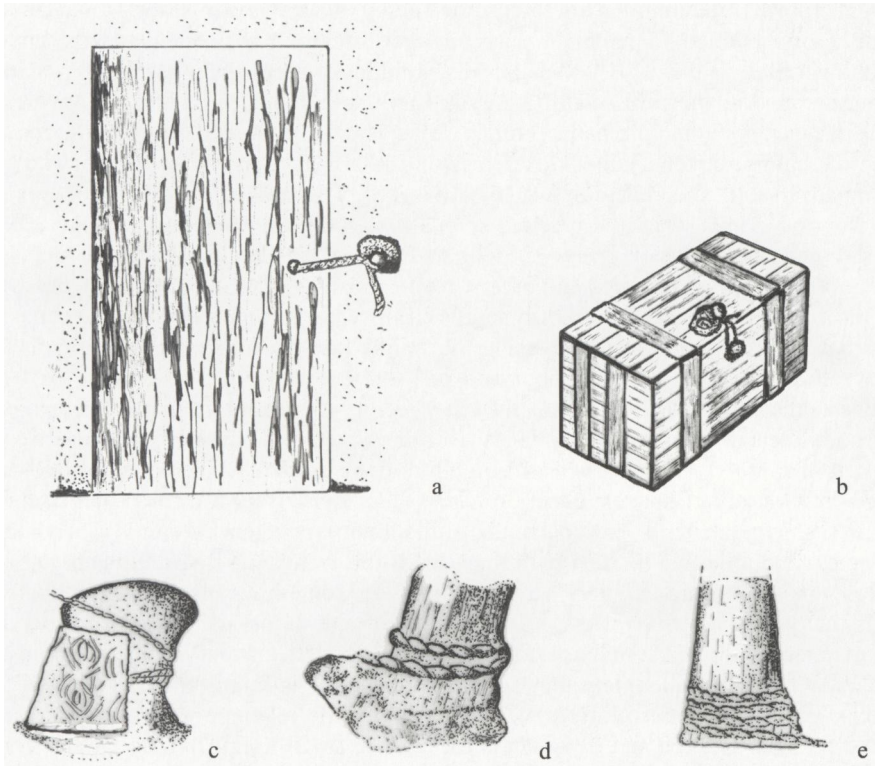


FIGURE 2.2 Door and chest sealings. Diagrams (a-b) and examples from Near Eastern sites: c) Susa; d) Shahr-i Sokhta; e) Mari. Scales vary.

Arpachiyah were mostly impressed with seals bearing simple lattice patterns; actual seals of stone were also found on the site, for the most part decorated with simple geometrical motifs.¹² The use of hanging nodules in various guises persisted in the Near East throughout the second millennium and perhaps those in the Aegean could be regarded as distant relatives, at least in concept if not in details of form and function.¹³

Chest and door sealings represent an extension of direct sealing, with lumps of clay placed over the pegs and cords used to secure box lids and entrances to storerooms (FIGURE 2.2). They are closely associated with the proto-literate phase (ca 3500 BC), which saw the rise of complex societies and urban centres. However, late prehistoric levels (i.e. late fifth / early fourth millennium BC) at several sites beyond the Sumerian heartland have now yielded peg sealings. These include Değirmentepe in eastern Turkey, Tall-i Bakun in southern Iran, Tepe Gawra XI and Susa, in northern and southern Iraq, respectively.¹⁴ Peg sealings are also represented at Arslantepe VIA, an important site of

¹² von Wickede (n. 2) 101ff, pls. 84-108.

¹³ See Chapters 5, 7, 8, 10 for various kinds of Aegean hanging nodules. Many evidently served as labels, not as sealings *per se*; this also seems to be true for some Near Eastern nodules.

¹⁴ A. Alizadeh, in *Archives* 35-54 (Bakun); U. Esin, *ibid.* 59-81, esp. 69 (Değirmentepe); M. S. Rothman, *ibid.* 97-119, esp. 116 (Gawra); P. Amiet, *Archaeologische Mitteilungen aus Iran* 21 (1988) 7-16 (Susa). See also von Wickede (n. 2) 33-34.

the late fourth millennium in south-eastern Turkey, where broken sealings may have been temporarily retained for archival purposes and discarded periodically at the end of an 'administrative cycle'.¹⁵ The spatial distribution of peg sealings is very wide and examples are known from Anatolia, Egypt, Iran, Iraq, Nubia, Syria and the Aegean.¹⁶ But once the general principle had been developed there seems to be little evolution in this type of sealing, beyond minor differences in the size and profile of the pegs and knobs (compare FIGURE 2.2c-e and 8, 84, 167, 184-188). This makes it well nigh impossible to say how or indeed when the practice spread to new areas. Thus, in the Aegean, we can merely note the existence of chest / door sealings on the Greek mainland at EH II Lerna (ca 2500 BC) and at Phaistos and other Cretan sites in MM II (ca 1700 BC), but we have no means of identifying the precise source of inspiration, much less the mechanisms for its transfer.¹⁷ It is also worth stressing that rarely can one make an accurate distinction between a peg sealing from a door and one that belonged to a chest. The first clearly indicates the control of storerooms, the other merely the sealing of movable containers.

Another early kind of accountancy is represented by counters or 'tokens', which existed in simple form as early as the eighth millennium BC.¹⁸ These small pieces of clay come in a variety of shapes: cones, spheres, discs and tetrahedons are most common on early sites. In the Uruk period (fourth millennium) counters seemingly become more complex, and are often marked with linear incisions or dots, perhaps indicating quantities or amounts. But plain counters persisted and were sometimes placed within hollow clay balls that were impressed with seals and marked with numerical signs, corresponding to the counters within. The practice continued even after the advent of tablet administration in the later fourth millennium, but nothing comparable is found in the Aegean. Counter-tokens should not be confused with seal-impressed 'tokens', which are occasionally found on Near Eastern and Egyptian sites.¹⁹ These small lumps of clay lack perforations and thus did not seal anything; in this respect they resemble the so-called *noduli* attested

¹⁵ P. Ferioli & E. Fiandra, *Origini* 12 (1983) 455-509, esp. 490, 496-502 for door sealings; eadem, in *Archives* 149-61.

¹⁶ P. Ferioli & E. Fiandra, in *ASSA* 221-29 with references. See also Ferioli, Fiandra & S. Tusa, in *South Asian Archaeology 1975* (Leiden 1979) 12-26 (Shahr-i Sokhta, Iran); D. Beyer, in D. Beyer & D. Charpin (eds.), *Mari: Annales de Recherches Interdisciplinaires* 4 (Paris 1985) 375-84 (Mari); R. J. Matthews, *Iraq* 53 (1991) 1-15 (Fara); J. Weingarten, in *Archives* 261-74, esp. 261, figs. 2-3 (Karahöyük); S. T. Smith, in P. Ferioli et al. (eds.), *Administration in Ancient Societies* (Turin 1996) 67-86 (Egypt - Nubia).

¹⁷ Pace Weingarten's oft-repeated claim (e.g. *ASSA* 56-58, 105-06, 117-18) that the sealing system used at Phaistos had been wholly introduced from the NE in the proto-palatial period, since the 'impulse to seal' (and with it chest / door sealings) had died out after EH II Lerna. See also Chapters 4-5.

¹⁸ D. Schmandt-Besserat, *Before Writing. Vol. I: From Counting to Cuneiform* (Austin 1992) presents a detailed account with references to her many earlier studies. Note, however, that many of her claims are controversial and rest on weak methodology; see review by P. Zimansky, *JFA* 20 (1993) 513-17. For new examples from Tell Sabi Abyad, see above n. 8.

¹⁹ D. Schmandt-Besserat, in *Archives* 22 notes that seal-impressed tokens are not common. However, a search for examples is impeded by the lack of any coherent typology or terminology. The 'Type A *bullae*' at third millennium BC Tell Brak are unperforated lumps of clay with impressions and sometimes dots or linear markings: J. Oates, in M. Frangipane et al. (eds.), *Between the Rivers and over the Mountains* (Rome 1993) 289-305. Seal-impressed 'tokens' were found at Saar (ca 2000 BC): H. Crawford, *Early Dilmun Seals from Saar: Art and Commerce in Bronze Age Bahrain* (Bahrain & London 2001) 35-38. Unperforated '*bullae*' are also reported from Lisht in Egypt (J. Aruz, in *Administrative Documents* 133, fig. 26) and *noduli* or 'sample-sealings' occur at Shalfak in Nubia (A. L. Foster, *ibid.* 173, fig. 3c).

in the Aegean from the beginning of the second millennium onwards. Although Aegean *noduli* seem to be closely bound up with palatial administration, their precise function(s) remain poorly understood; conceivably they entitled the bearer to materials, rations or even lodging. Whether the same was true in the Near East remains to be established.²⁰

The seals found at Arpachiyah, Tepe Gawra and other early Near Eastern sites are often circular or rectangular buttons, pierced for suspension.²¹ Also common were so-called ‘amulet seals’, essentially small zoomorphic or geometric pendants with linear decoration. To judge from Arpachiyah, these too could be used for sealing purposes (FIGURE 2.11-m). During the fourth millennium BC seal shapes and motifs become more elaborate, and display considerable variation from one locale to the next. Many are made from soft local stones, though hard semi-precious stones, including carnelian and rock crystal, were already used for beads as early as the sixth millennium.²² In the mid-fourth millennium, cylinder seals appear more or less contemporaneously across a wide geographical area: at Susa in south-western Iran, Tell Brak and Uruk in northern Syria and southern Iraq, respectively. Thereafter the cylinder reigned supreme in Mesopotamia and in time the fashion spread to adjacent lands.²³ Whatever their original inspiration, cylinders offered a clear advantage over stamp seals in that a much larger area of clay could be covered in a single motion. Initially used on clay balls and numerical tablets, cylinder seals remained closely bound up with tablet administration in the Near East during the third and second millennia. Sometimes they were used to seal the clay envelopes in which tablets were placed; sometimes they were rolled directly onto the tablets themselves.²⁴ This practice was never adopted in the Aegean, where clay tablets were purely short-term records and did not serve as contracts or legal documents. Indeed the cylinder itself has only limited impact on our area (see below).

In Anatolia cylinders were only adopted during the Assyrian Colony Period (ca 1900–1750 BC) and even then did not wholly replace stamp seals.²⁵ It seems likely that this deep-rooted Anatolian tradition lies behind the adoption of stamp seals in the Aegean during the EBA, even though precise parallels are sometimes hard to muster. Possible hints come in the form of simple conoids made of clay or metal and common to both areas, as well as more distinctive stalk-handled stamps.²⁶ Archaeological chance impedes further comparisons, as few EBA seals survive from the Greek mainland and fewer still come from the islands of the Aegean (Crete is another story altogether). As to motifs,

²⁰ What is clear is that items resembling *noduli* in shape if not function occur in many cultures, e.g. see: W. Müller, in H.-J. Weisshaar et al. (eds.), *Ancient Ruhuna: Sri Lankan-German Archaeological Project in the Southern Province I* (Mainz 2001) 243-52 for examples of the Hellenistic-Roman period in Sri Lanka.

²¹ von Wickede (n. 2) *passim* provides a detailed and well-illustrated account.

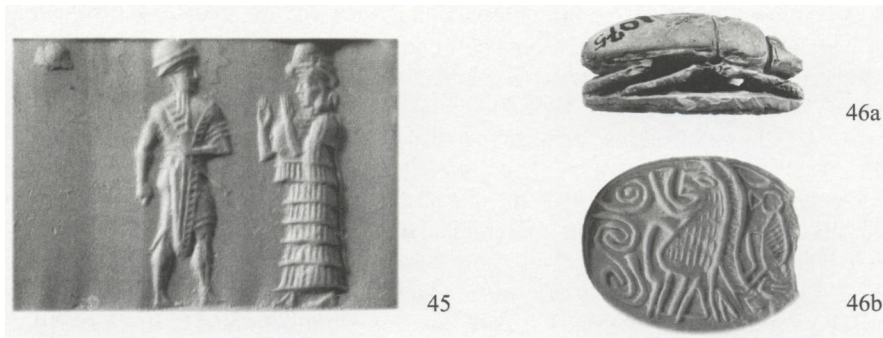
²² *AMMI* 74-103 provides an excellent account of materials used for Near Eastern beads and seals.

²³ D. Collon, *First Impressions: Cylinder Seals in the Ancient Near East* (London 1987) 13-19. For Egypt: *ibid.* 140-41; also T. G. H. James, in D. Collon (ed.), *7000 Years of Seals* (London 1997) 31-33 with references.

²⁴ Collon (n. 23) 113-19.

²⁵ Collon (n. 23) 41-44; S. Alp, *Zylinder- und Stempelsiegel aus Karahöyük bei Konya* (Ankara 1968); N. Özgüç, *Seals and Seal Impressions of Level Ib from Karum Kanish* (Ankara 1968); eadem, in E. Porada (ed.), *Ancient Art in Seals* (Princeton 1980) 61-86 (Acemhöyük); B. Teissier, *Sealing and Seals on Texts from Kültepe Kārum Level 2* (Leiden 1994); N. Özgüç & Ö. Tunca, *Kültepe-Kaniš: Sealed and Inscribed Clay Bullae* (Ankara 2001).

²⁶ J. Aruz, in *Aegean – Orient* 305; eadem, in *Meletemata* 9-10. But identifiable Anatolian imports are few and far between: e.g. the lead conoid from Tsoungiza (*CMS V Suppl.* 1B 128, here 59) could just as well be an Aegean product; see also Chapter 3.



Two imported seals found in Platanos Tomb B, southern Crete. **45** Old Babylonian cylinder seal of haematite; impression. **46a-b** Egyptian scarab; profile and impression. Scale ca 2:1.

similarities are often generic rather than specific. Simple geometric designs, such as lattice patterns and chevrons, are far too widespread to be diagnostic. And the swastika, angle-filled cross and perhaps back-to-back C-spirals, for which an Eastern origin has been claimed, form only a limited element in the Aegean repertoire.

A few Near Eastern cylinder seals strayed into the Aegean during the EBA, possibly triggering the brief fashion for decorative rollers found in the Argolid during EH II (**88-92**; cf. **93**). But Crete ignored these trends completely, and its own pre-palatial cylinders are in reality stamps with one or two engraved faces (**104-106**, **110-112**). In the second millennium Eastern cylinder seals continued to reach the Aegean, though never in great numbers (e.g. **45**; see also Chapter 10). On arrival some were no doubt treasured as exotic curios, some were re-engraved, some may have been cut down to yield lapis lazuli or other fine stones for seals and jewellery. During the LBA, Aegean engravers retained (or copied) the cylindrical shape only occasionally; stamp seals in the form of lentoids, amygdaloids and cushions were far better suited to Aegean needs.²⁷ The scarab, an Egyptian shape developed around 2000 BC, plays an equally limited role in the Aegean repertoire (e.g. **127**; cf. **46**, **128**). Thus, in seal shape, indigenous development far outweighs external inspiration.²⁸

In material and technique the connexions are more significant. During the third millennium BC most Eastern cylinder seals were still made in soft to medium-hard stones: lapis lazuli (Mohs 5-6) was especially common in the Royal Cemetery at Ur (ca 2500 BC). Rock crystal was also occasionally used in the third millennium, but the silicates (Mohs 7) and haematite (Mohs 6) were rare until the early second millennium.²⁹ In Mesopotamia proper haematite then predominated for the next 400 years, though seals made of carnelian, agate and chalcedony are also attested. Green jasper was favoured in

²⁷ Since LBA Aegean nodules are small, cylinders offered no functional advantage. An Akkadian cylinder used at Ayia Triada was stamped not rolled; the same is true of a LM I cylinder used at Khania: *CMS* II.6 no. 144 and V Suppl. 1A no. 130; cf. J. Aruz, in *CMS* Beiheft 5 (1995) 11, fig. 8a-b. However, a sealing from LM II-III Knossos preserves the partial *rolled* impression of a Cypriot or 'Cypro-Aegean' cylinder: *CMS* II.8 no. 719. See also Chapter 10. *In toto* about 40 Aegean-made cylinders exist: see here **208**, **384**, **450**, **605**.

²⁸ An Anatolian origin has been claimed for MM II *Petschafte* (stalk signets), but the resemblances are vague (*ECS* 85 n. 232) and perfectly convincing local antecedents exist.

²⁹ *AMMI* 74-76, 79-103 (for specific stones); also Collon (n. 23) 100-102.

Syro-Palestine during the 18th and 17th centuries.³⁰ Until recently it was widely assumed that the fixed lapidary lathe and fast cutting wheel were already known in the Near East by ca 3000 BC, but new research suggests these were not employed until the Old Babylonian Period (ca 1750–1595 BC).³¹ Indeed Scanning Electron Microscopy clearly reveals that some features previously attributed to rotary tools, were actually executed by micro-flaking and filing. As a result we may now posit a two-stage development for rotary tools in the Near East. During the third millennium bow-powered drills (tubular and solid) may have been used to shape the cylinder and to create the string-hole, but motifs were still largely executed with hand tools – files and burins treated with an abrasive such as crushed quartz.³² This might help to explain the extremely detailed, but often rather finicky workmanship. The invention of the fixed lathe and cutting wheels during the second millennium favoured the regular use of harder stones and, not surprisingly, also influenced style. If the new findings on the lapidary lathe are substantiated, it may also prove possible to isolate a likely area for its invention.³³ From an Aegean perspective the new research is of especial relevance, for it would seem that the Minoans acquired the lapidary lathe at roughly the same time as in the East. That is, the new technology and hard semi-precious stones appear in MM II, a time when Minoan contacts with the eastern Mediterranean were on the increase (see Chapter 5).

The brief fashion for inscribing seals during the proto-palatial period on Crete may also owe something to influence from overseas. Near Eastern cylinders with their large surface area were especially suitable for inscriptions, which could include the personal names and titles of the seal owner, as well as brief dedications to deities.³⁴ Sometimes the inscriptions can be related to the iconography of the seal, e.g. where a human figure (the seal owner) is presented to an enthroned ruler or deity. In Egypt, too, scarabs and other stamps are sometimes inscribed, with script often occupying the entire seal face. In some cases, the inscriptions allow us to distinguish between institutional seals (or their impressions) and those belonging to officials or private individuals, thus providing important insights into administration.³⁵ The same also holds true for the inscribed seals used in Anatolia from the Assyrian Colony Period down to the Late Hittite Empire.³⁶

³⁰ *AMMI* 98-99. For cylinder seals: D. Collon, in M. Kelly-Buccellati (ed.), *Insight through Images: Studies in Honor of Edith Porada* (Malibu 1986) 57-70. For scarabs: O. Keel, in O. Keel et al., *Studien zu den Stempelsiegeln aus Palästina / Israel* (Freiburg & Göttingen 1989) 209-42. See also Chapter 5 n. 14.

³¹ M. Sax et al., *Antiquity* 74 (2000) 380-87 with references (e.g. to accounts by Gorelick and Gwinnett, who had suggested a much earlier origin for the lapidary lathe). Moreover, while there is indeed evidence for wheel-cutting on Old Babylonian seals, Sax and her team conclude that its adoption was a gradual process lasting perhaps 200 years.

³² Sax et al. (n. 31) 381-82 confirming earlier observations by Gorelick and Gwinnett on the use of crushed quartz and (in the second millennium) emery.

³³ Collon (n. 23) 102 has suggested Syria.

³⁴ Collon (n. 23) 105-07. From inscriptions we learn that some individuals possessed more than one seal; the use of heirloom seals, sometimes re-cut or re-inscribed, is also attested (*ibid.* 120-22).

³⁵ The seal impressions from the Nubian forts are especially informative, see: S. T. Smith, in *ASSA* 197-219 (Uronarti and Askut); *idem* (n. 16) 67-86; A. L. Foster, in *CMS Beiheft* 6 (2000) 79-94.

³⁶ For a short overview, see: H. Güterbock, in K. DeVries (ed.), *From Athens to Gordion* (Philadelphia 1980) 51-63. For seal use at Kültepe, see: Teissier (n. 25). The Nişantepe Archive at Boğazköy (excavated 1990–91) now offers particularly exciting material for the Late Empire. The 3535 seal-types on the Nişantepe *bullae* (nodules) span about 150 years, and are inscribed with the names of great kings, princes and officials. For a convenient summary, see: S. Herboldt, in *Acts of the IIIrd International Congress of Hittitology* (Ankara 1998) 309-18.

By contrast, on Crete inscribed seals are only produced during MM II-III (ca 1750–1650 BC). Moreover, since Cretan Hieroglyphic remains undeciphered, the very purpose of these inscribed seals, on which decorative and pictorial motifs also occur, remains enigmatic.³⁷ Equally mysterious is why the practice was so short-lived.

Last, but perhaps not least, there is the debt owed by the Aegean to foreign iconography.³⁸ On Crete the process of adopting and adapting Eastern imagery to suit Minoan ends goes back to the pre-palatial period, when lions arrive and parade round the faces of ivory seals (110c, 111c, 116-117). On rare occasions imported seals may have served as the vehicles for transfer: this is perhaps the most likely explanation for some of the zoomorphic seals, such as seated apes, which were briefly fashionable in this era (Chapter 4; 116). But usually charting the routes taken by foreign images – and indeed identifying their precise origins – proves a thankless task. This is certainly true in the early second millennium when a new wave of foreign imagery reaches Minoan Crete (Chapter 5). The sphinx, the griffin and the ‘dragon’ all arrive during MM II-III and make their appearance on seals of this period (e.g. 146, 180). Yet as isolated images, these exotic hybrids offer only limited insights into the mechanisms of iconographic transfer. A happy exception is the Minoan ‘genius’, clearly derived from the Egyptian Taweret, who arrives complete with attributes in the form of vegetation and water-jugs (e.g. 181). Generally speaking, it is only in the LBA, when multi-figured scenes become prevalent, that we can discern the special role which hybrid creatures played in Aegean iconography, though by then – if not earlier – their original symbolism had been thoroughly transformed to meet Aegean needs (Chapter 6).

Whether we can expand on this narrow list of Eastern-inspired imagery is open to question. Procession and offering scenes are certainly common to both the East and the Aegean, but travelling seals were not necessarily the prime source of inspiration.³⁹ Moreover, any borrowing that did occur was obviously selective in nature. Whereas enthroned rulers and deities in the East are readily identifiable as such by attributes or inscriptions, the same (alas) is never true in the Aegean. Indeed we are hard pressed to decide whether the seated females in our cult scenes are human or divine (Chapters 6, 9). Seated male figures are conspicuous by their absence. Other popular subjects in LBA Aegean glyptic – animal studies, hunt and combat scenes – dimly echo themes found elsewhere in the ancient world. For the most part, we are probably dealing with nothing more than parallel, but essentially independent developments. Certainly in style and syntax there are few points of comparison. The so-called Cypro-Aegean cylinders of the 14th century BC represent a special case, for they display an eclectic mix of Eastern and Aegean imagery, style and syntax (589-591). But they are few in number and their place of manufacture remains a mystery (Chapter 10). Strange as it may seem – given the long history of contacts between the Aegean and the East and the fact that seals were small and readily portable – in style and iconography Aegean glyptic proves to be remarkably immune to external influences and its own impact on the East is similarly limited.⁴⁰

³⁷ See Chapter 5; 158-162. An indigenous origin for the practice of inscribing seals cannot be ruled out, since a few MM I seals bear brief inscriptions in the ‘Archanes Script’ (Chapter 4; 122-123).

³⁸ For a brief overview, see: J. Aruz, in *CMS Beiheft* 6 (2000) 1-13. Further references appear, as appropriate, in Chapters 3-6.

³⁹ The appearance of life-size figural frescoes (including procession scenes) in the Aegean during LB I, with figures displaying the same colour conventions as in Egypt, suggests that imported seals played a limited role in iconographic transfer.

⁴⁰ For possible Aegean influence on MB – early LB Syrian cylinder seals, see: Aruz (n. 27) 12-21.

NEOLITHIC GREECE

As we have seen, decorative stamps, also called *pintaderas*, are attested by the seventh millennium BC in the Near East, where they were used to make imprints on plaster and presumably to apply pigments to skins and textiles (see above). Similar items occur in a great arc stretching from Anatolia through the Balkans and into central Europe. They are known from Macedonia and Thessaly, but not from central and southern Greece or the islands. Their distribution and date – first appearing in Early Neolithic levels at Nea Nikomedia – strongly suggest that they formed part of the cultural package associated with the arrival of agriculture in northern Greece, probably from Anatolia, in the late seventh millennium.⁴¹ The earliest stamps in Greece, e.g. those from Nea Nikomedia, are made of clay, perhaps baked deliberately, and are invariably pierced for suspension (47). They bear very simple geometric designs on their faces, such as chevrons and wavy lines.

By the Middle Neolithic (roughly the fifth millennium) stamps are often made of soft stones, such as steatite, although some in clay exist. The shapes are generally much more elaborate than before and are carefully executed; the same can be said of the carved faces. Designs remain exclusively geometric: zig-zags, meanders and cruciform patterns are common (49-51); concentric circles are popular at Sesklo. An example from Nessonis in Thessaly is particularly large and fine (48). Here and on a stamp from Sesklo (51) deep drill holes were possibly made to facilitate carving and in turn form part of the design. On some examples the linear cuts are as much as 5 mm wide, clearly showing that these decorative stamps were not meant to be impressed on clay.⁴² In fact, no clay impressions made by stamps of this kind have ever been found; in this case, negative evidence does seem reliable. Their smooth flat surfaces would have been entirely suitable for carrying pigments, perhaps mixed with binding agents, to print designs on skins or textiles. Another possible use would be to apply wax (or a similar resistive agent) to textiles before overall dyeing to produce reserve patterns, as in modern batik.⁴³ The stamping of designs on the body is also suggested, though these items seem better suited to perfectly flat surfaces. Some examples, especially those with rather shallow-cut designs (e.g. 49), might have served as bread stamps.

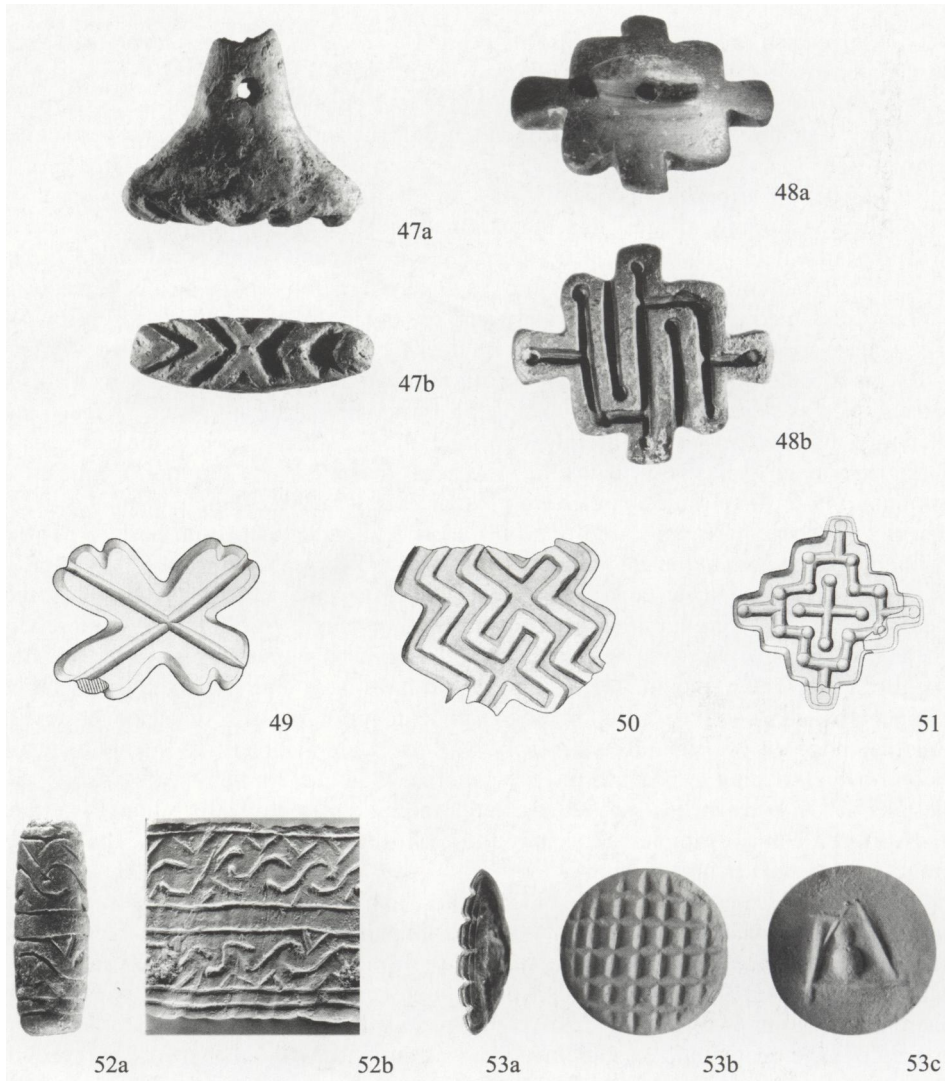
When not in use as stamps these objects may have been worn as pendants, since they are generally pierced for suspension. While personal ownership is a reasonable inference, there is no evidence that stamps were related to (or indicative of) communal authority, as has been proposed.⁴⁴ In other words, some stamps might have been prestige items, but there are no grounds for seeing them as overt symbols of rank or status. The few extant examples have been found on settlements or as stray finds without context. Few Neolithic graves are known; so far none has yielded a stamp of clay or stone.

⁴¹ I. Pini, in *CMS V Suppl.* 3 pp. 6-16 provides the latest discussion of Greek Neolithic stamps and publishes recent discoveries; other examples appear in *CMS I, V, V Suppl.* 1A-B. For an up-to-date overview of the Neolithic (and Bronze Age) in northern Greece, see: S. Andreou et al., in *Review* 259-319, 320-27; esp. 318-19 (for recent views on the earliest Neolithic in Greece). For sites mentioned in the present section see MAP 2.

⁴² It is often extremely difficult to take modern plasticine impressions from Neolithic stamps; for better results silicone is now often used.

⁴³ E. J. W. Barber, *Prehistoric Textiles* (Princeton 1991) 226.

⁴⁴ A. Pilali-Papasteriou, in E. Kypraiou (ed.), *Διεθνές Συνέδριο για την Αρχαία Θεσσαλία στη μνήμη του Δημήτρη Ρ. Θεοχάρη. Πρακτικά* (Athens 1992) 83-90; esp. 90. Note that in most Greek accounts Neolithic stamps are called *sphragides* ('seals'), a term that is best avoided. Cf. also A. Onassoglou, in G. A. Papathanassopoulos (ed.), *Neolithic Culture in Greece* (Athens 1996) 163-164; see also cat. nos. 271-84.



Selected stamps and 'seals' from Neolithic Greece. **47a-b** Clay stamp from Nea Nikomedia; profile and face. **48a-b** Stone stamp from Nessonis; reverse and face. **49-51** Drawings of stone stamp faces: unknown provenance, Serelia, Sesklo. **52a-b** Clay 'cylinder' from Sitagri; profile and impression. **53a-c** Stone 'lentoid' from Tsoungiza; profile and impressions. Scale ca 3:4.

Most Middle Neolithic stamps have been found on Thessalian sites, with very few from Macedonia, but this may be chance. In any case the tradition appears to be on the wane by the end of the fifth millennium; few have been found in secure Late Neolithic contexts.⁴⁵ Noteworthy is the dearth of stamps in southern Greece, even though several sites (including Lerna) have yielded good Neolithic deposits.⁴⁶ Thus, on present evidence, there is nothing to link the Neolithic stamps of the north to the decorative stamps found in southern Greece during the third millennium, much less to EB II seals (Chapter 3). Also uncertain is whether the few crudely incised clay cylinders known from Macedonia (e.g. 52) should be regarded as antecedents for the decorative rollers used in the Argolid in EB II.⁴⁷ It is, however, just possible that the impulse to seal may have arisen in Greece during the Neolithic. A few small ‘seals’ do exist, with faces carved in intaglio capable of making clear impressions. This is true of an unpierced stone lentoid (D. ca 3 cm) recovered from an Early Neolithic cave deposit at Tsoungiza near Nemea (53). One face bears a simple but carefully cut lattice pattern; the other has central dots enclosed by irregular lines. While no sealings have yet come to light on Neolithic sites, the example of Tell Sabi Abyad should prove a salutary reminder that new discoveries can overturn existing orthodoxies (above p. 26). For the Aegean it is widely assumed that only during EB II with increasing social complexity in southern Greece was there a need for administrative devices such as seals and sealings. It is further assumed that their advent was due to contacts with the East. These views may well be correct. None the less, Neolithic settlements in Greece, especially those in the north, were clearly involved in inter-site exchange networks and maintained storage capacity on a household, if not communal basis. Thus, we should not be surprised if they had also developed simple means for identifying ownership or for guarding against unauthorized access to produce. Future excavation may resolve the issue.

⁴⁵ This too may be chance; see now the sizeable group of clay stamps from Late Neolithic Makrigrigalos in Macedonia: *CMS V Suppl.* 3 nos. 408-422. For the site: Andreou et al. (n. 41) 294-295; also M. Pappa & M. Besios, in P. Halstead (ed.), *Neolithic Society in Greece* (Sheffield 1999) 108-120.

⁴⁶ *CMS V* no. 681 was found in a mixed Neolithic-EH context at Eutresis.

⁴⁷ The origin and purpose of the Macedonian cylinders is obscure, as is any connexion to cylinder seals in Mesopotamia. Examples include: *CMS V* nos. 633, 635, 636 (here 52) (Sitagroi II = Balkan Late Neolithic / Chalcolithic); no. 634 (Sitagroi Vb = EB II-III); *V Suppl.* 1B nos. 184-185 (Mandalo: Late Neolithic / Chalcolithic); C. Zervos, *Naissance de la civilisation en Grèce* (Paris 1962) 636, fig. 582 (Dikili Tash). See mostly recently: C. Renfrew, in E. S. Elster & C. Renfrew (eds.), *Prehistoric Sitagroi 2: The Final Report* (Los Angeles 2003) 403-19; also I. Pini, in *CMS V Suppl.* 3, pp. 14-15. For EB II rollers see Chapter 3.

CHAPTER 3 THE GREEK MAINLAND AND ISLANDS IN THE THIRD MILLENNIUM

The origins of Aegean glyptic are undeniably obscure. We have yet to find adequate proof that true seals, as opposed to decorative stamps, existed in the Greek Neolithic and, in view of the immensely long tradition of seal manufacture and use in the Near East, foreign inspiration may help to explain the advent of similar practices in the Aegean (Chapter 2). In any case, the use of seals and sealings in the Aegean is generally taken as a sign of growing social complexity associated with the rise of proto-urban settlements in the mid-third millennium.¹ During this era we detect growing diversity in a range of socio-economic activities. The domestication of the olive and vine served to broaden the economic base and together with the spread of metalworking fostered new exchange networks. Buildings of special function (e.g. corridor houses) and settlements that exploited key geographical locations (e.g. gateway communities) indicate the development of site hierarchies. Within communities, too, there are signs that social ranking was emerging, which in turn encouraged specialization in a range of crafts: pottery, metallurgy, and perhaps seal engraving too.

During the mid-third millennium, these socio-economic developments occur throughout the Aegean and hence are sometimes called the EB II *koine*. But despite many features held in common, regional diversity remains strong. This is certainly true of seals. Local needs and customs undoubtedly varied and these are reflected in the surviving repertoire. But we must also recognize that our primary evidence is unbalanced, rendering comparisons difficult. For pre-palatial Crete, the bulk of our evidence comes from graves, in which numerous seals have been found. The scarcity of material from excavated settlements, the infrequency of burnt destruction deposits, the extensive remodelling of sites later occupied by the palaces all conspire against the preservation of sealings. However, on Crete glyptic development is continuous from EM II until LM III. For the Greek mainland the tables are turned: burials are infrequent and settlements provide most finds. While actual seals are not common, archaeological chance has served us well by preserving several important groups of sealings, of which those from Lerna are best known. Decorative stamps and roller impressions on pottery further augment the repertoire. This wealth of material is preserved largely thanks to fire destructions, which occurred at the end of EH II.² Yet these destructions also seem to herald the decline, if not complete cessation, of seal engraving and use on the Greek mainland until the Shaft Grave era (Chapter 9). As for the islands – the Cyclades, Dodecanese and north-east

¹ For general background: C. Renfrew, *The Emergence of Civilisation* (London 1972); R. Hägg & D. Konsola (eds.), *Early Helladic Architecture and Urbanization*. SIMA 76 (Göteborg 1986); M. H. Wiencke, *AJA* 93 (1989) 495-509; J. B. Rutter, in *Review* 95-124; 148-51. For regions of the Aegean and principal sites mentioned in the present chapter see MAPS 1-3.

² For destructions and the EH II-III transition, see: Rutter (n. 1) 111-15 (with references); also J. Maran, *Kulturwandel auf dem griechischen Festland und den Kykladen im späten 3. Jahrtausend v. Chr* (Bonn 1998) 27-30, 114-35. For chronology: *ABAC* 34-42, 122-24, 169, table 3.1 (high dating); S. W. Manning, *The Absolute Chronology of the Aegean Early Bronze Age* (Sheffield 1995) 48-63, 170-72, figs. 1-2 (low dating).

Aegean – here evidence remains very patchy indeed.³ None the less, both in seal-types and in seal use, the islands generally show closer affinities to the Greek mainland than to Crete. We shall therefore begin our survey of Aegean glyptic with the mainland and islands and devote a separate chapter to pre-palatial Crete (Chapter 4)

SOURCES OF EVIDENCE AND DATING

At one time it was widely held that the mainland and islands lagged well behind Crete in glyptic development during the third millennium.⁴ Barely a dozen seals and sealings, mostly from the Argolid, constituted the bulk of the evidence. Received wisdom was dramatically overturned thanks to excavations by John L. Caskey at Lerna in the Argolid (1952–58) and at Ayia Irini on the island of Kea (1961–69).⁵ At Lerna more than 100 direct object sealings were preserved in the fires which destroyed the House of the Tiles at the end of EH II; a few smaller groups date to a slightly earlier phase within EH II. The actual lumps of clay shed considerable light on early Aegean sealing practices, while the 80 or so seal-types represented provide valuable evidence for glyptic development during this period. From Lerna we also have roller impressions on hearths and pithoi, a practice attested on other sites in the Argolid too. In recent years further sealings, usually in twos and threes, have come to light elsewhere on the Peloponnese – from Corinthia and the Argolid to southern Messenia.⁶ New excavations at Geraki in Lakonia have also produced a number of sealings.⁷ However, by far the most significant discovery since Lerna has come from Petri, in the Phlious Valley west of Nemea. Here, in 1995, some 250 direct object sealings, impressed by at least 26 different seal-types, were found in sealed EH II destruction deposits.⁸ This major find, made during the course of rescue excavations, also provides a salutary warning: our evidence is so patchy that we must exercise great caution in attempting to reconstruct seal use in EB II. Some parts of the mainland still remain almost blank – Boeotia with its important centre at Thebes is a prime example.⁹ As for actual seals, slowly but surely the number has increased over the years, though it still stands at barely 50 from the mainland as a whole. The scarcity of EH II burials may well militate against their survival (or retrieval), but one wonders if that is the full story (see below pp. 40-42).

³ For general background: J. L. Davis, in *Review* 19-76; J. L. Davis et al., in *Review* 77-94; C. Broodbank, *An Island Archaeology of the Cyclades* (Cambridge 2000).

⁴ Indeed long after the Lerna sealings were found, there was a deep-rooted belief that Cretan (or Cretan-inspired) seals were used in EH II, e.g. *APG* 213-14; *GGFR*² 21-22.

⁵ For the Lerna sealings, seals and roller impressions see: *CMS V* pp. 28-32, nos. 35-149; M. C. Heath, *Hesperia* 27 (1958) 81-121; M. H. Wiencke, *Hesperia* 38 (1969) 500-21; eadem, *Hesperia* 39 (1970) 94-110. For Ayia Irini: *CMS V* pp. 353-55, nos. 451-478, 480-482; J. Younger, in *CMS Beiheft 0* (1974) 164-72.

⁶ I. Pini, in *CMS V Suppl. 1B* pp. xxvii-viii provides a useful list of EB II seals and sealings, supplementing D. J. Pullen, *AJA* 98 (1994) 49, table 2, fig. 8. See now I. Pini, in *CMS V Suppl. 3* pp. 16-23, 73-74 for discussion and new examples.

⁷ *CMS V Suppl. 3* nos. 360-365; also J. Weingarten, in *CMS Beiheft 6* (2000) 317-29. See J. H. Crouwel et al., *Pharos* 9 (2001) 14-15, pl. 12 for new examples.

⁸ M. Kostoula, in *CMS Beiheft 6* (2000) 135-48; eadem, in E. Alram-Stern (ed.), *Die Ägäische Frühzeit* (Vienna 2004) 1135-57, esp. 1148-52 (for the sealings).

⁹ A simple conoid (*CMS V Suppl. 3* no. 374) is the only seal from a secure EH II context in Thebes; to date no sealings have been found.

In the islands seals are also very rare, with barely two dozen attested, scattered from Limnos and Lesbos in the north-east Aegean to Samos in the Dodecanese and across into the Cyclades. A few direct object sealings have been also found, while impressions on hearths and pottery are well represented at Ayia Irini on Kea. New excavations at the important EC II site of Skarkos on Ios have yielded impressed 'loom-weights',¹⁰ hitherto unknown in the islands, but occasionally found on the mainland and Crete (below and Chapter 5). Even more striking is the discovery of clay sealings in the Zas Cave, high up in the centre of Naxos. Of course, it may be that some communities in the islands and on the mainland had no use for seals, whether as bureaucratic tools, as decorative stamps, or as items of personal adornment. None the less, new discoveries are constantly enlarging the repertoire: seal manufacture and use was obviously a widespread phenomenon in the mid-third millennium.¹¹

SEALS AND SEAL-TYPES

In this section two main issues concern us: first the materials, shapes and techniques used to make seals in EB II and secondly the kinds of motifs and compositions that are found. Even at this early date the two issues are inextricably linked, as will become apparent in the following discussion. Nevertheless, EB II glyptic presents us with special challenges: a relatively small number of surviving seals, the bulk of our evidence derived from seal impressions and, last but not least, very little overlap between the two groups. This last point has led to the suggestion that the simpler stamps made of clay and stone (which survive today) were not intended for sealing. We will take up this point again below; here it suffices to say that arguments from silence are always risky, especially when the body of evidence is so patchy. One group of material is omitted here, namely the large roller impressions that decorated hearths and pithoi; these we defer until later in this chapter.

MATERIALS, SHAPES, TECHNIQUES

For the most part the surviving seals from the mainland and islands are simple stamps made of clay or soft stone. Irregular clay conoids, pierced for suspension are especially common (54-55). Their shapes and the skills needed to make them are so basic that searching for precise antecedents is a thankless task. Some Neolithic stamps are also made of clay, although we cannot prove a direct link; irregular conoids are found in Anatolian glyptic too (Chapter 2). The EB II Aegean conoids usually bear very simple geometric or abstract designs – some no more than rudimentary combinations of lines and dots. Often the execution seems crude, but this is a direct consequence of dragging or pushing a sharp instrument through the clay, no easy matter if curving lines are attempted (55). As we observed in Chapter 1, material and technique will inevitably have a bearing on style. A broken ring-shaped seal from Tiryns, made of soft schist-like stone, has a

¹⁰ Their purpose is unknown: *CMS V Suppl.* 3 nos. 169-174. For the site: M. Marthari, in C. G. Doumas and V. La Rosa (eds.), *Poliochni e l'antica età del Bronzo nel l'Egeo settentrionale* (Athens 1997) 362-82.

¹¹ New discoveries from the north-east Aegean, published in *CMS V Suppl.* 3, include two sealings from Myrina on Limnos (one from an EB I context), a limestone conoid and two pot stamps from EB II levels at Poliochni: nos. 209-213. Six or seven clay stamps from Samothrace resembling EB II types come from EBA, MBA and surface levels: *ibid.* nos. 334-340. Other new finds come from Amorgos and Manika on Euboea (*ibid.* nos. 43-48, 100-101). For previous discoveries see: *CMS V Suppl.* 1B pp. xxvii-viii.



EH II seals from Tiryns made of clay (54-55) and soft stone (56). Profiles and faces. Scale ca 1:1.

shallow but carefully executed design, probably produced with a burin having a slightly V-shaped section (56). Ring-shaped seals were popular in pre-palatial Crete, but we need not see any direct connexion. Moreover, there they were normally made of bone or ivory, materials which are conspicuous by their absence on the mainland and in the islands during EB II (see below).

The size of EB II seals varies considerably, ranging from ca 1–4 cm in diameter.¹² Although most have circular faces, there are several interesting exceptions to this rule. One is a very fine seal of light green steatite (57; C2), now in Berlin but said to be from the Kouphonisia, a pair of small islands between Naxos and Amorgos.¹³ The rectangular face – now somewhat abraded – bears an elaborate design of interlocking spirals surrounded by a border of deep triangular notches, known as *Kerbschnitt*. Both forms of decoration are popular in Early Cycladic pottery. An exceptionally elaborate multi-facial seal from Asine in the Argolid also bears spiral and *Kerbschnitt* decoration (58). Perhaps it originated in or, at any rate, was inspired from the islands. The same may also apply to a rectangular button from Lerna, made of attractive purple steatite and decorated with a simple zig-zag motif (C1).¹⁴

¹² This is reflected in the scales used for illustrations in this chapter. While the larger seals and seal-types can be shown at 1:1, others are illustrated at 3:2 or even 2:1.

¹³ A stray find from Chimarras on Naxos, also made of light green stone, offers a good parallel: *CMS V Suppl.* 3 no. 241.

¹⁴ *CMS V* no. 35 (Lerna phase IIIC). Rectangular buttons with *Kerbschnitt* decoration are also known from Lenda in southern Crete: *CMS II.1* nos. 202-203; cf. a low cylinder engraved on both faces with elaborate *Kerbschnitt* designs (*CMS II.1* no. 196, here 97). All are made of chlorite and come from the lower (i.e. EM I-II) levels of Tomb II. For further discussion see now: O. H. Krzyszkowska, in *Emporia* (forthcoming); also *ECS* 207-08; *FkS* 79-80.



EB II seals of soft stone from the 'Kouphonisia' (57) and Asine (58). Profiles and faces. Scale 1:1.

Noteworthy are the few examples of metal seals which have defied the odds to survive in the islands and on the Greek mainland. Two or three are irregular conoids with simple geometric designs comparable to those found in stone or clay (59), but a curious lead stamp from Aplomata on Naxos is a much more elaborate affair (60). It has an elongated handle with a spatulate end and a tiny face decorated with an overall network of trefoils. The design would have been cast and not engraved; a tell-tale sign is the raised border. Similar trefoil designs occur among the Lerna sealings (69) and, indeed, seal impressions provide considerable evidence – albeit indirect – for the use of metal seals during EB II.

The astonishing intricacy of many seal-types at Lerna (63-71; cf. 29) coupled with the lack of comparable seals has posed something of a dilemma for students of glyptic. What sort of seals *were* used at Lerna? Before we tackle this question, we must remember that drawings can be very deceptive. This is certainly true for Lerna, where some seal faces were drawn with a compass and designs were clarified or restored, imposing a uniformity of style on the group that is at variance with reality (see Chapter 1). In short, some of the Lerna sealings could have been impressed by seals of stone, if not clay. Perishable materials (that convenient escape for archaeologists in a tight corner) are sometimes mooted too. But in truth the suggestions carry little conviction; bone and ivory are *not* normally perishable and can even survive burnt destructions. As for wood, it is questionable whether this could yield such intricate designs or leave such crisp impressions. Metal does, however, meet these criteria and would further account for some of the unusual features on the Lerna sealings, e.g. the prevalence of sinuous ribbon-patterns with flat or rounded profiles (see below). Lead, in particular, offers several advantages for seal manufacture. Soft and easily worked, it was obtained from the silver-bearing galena ores which, during EB II, were mined on the island of Siphnos and at Lavrion in southern Attica. Ayia Irini was certainly involved in the processing of these metals and silver jewellery is well represented in contemporary Cycladic graves.¹⁵ Copper is another possibility, as it was used for pins and other jewellery during EB II: so far a simple conoid from Thermi on Lesbos and a ring-shaped seal from Poliochni on Limnos provide our sole examples.¹⁶ Gold cannot be ruled out entirely, although it is exceedingly rare in the Cyclades and on the mainland in the EBA.

¹⁵ Z. A. Stos-Gale & C. F. Macdonald, in *Bronze Age Trade* 249-88, esp. 255-60, 267-71; D. E. Wilson, *Keos IX. Ayia Irini: Periods I-III* (Mainx 1999) 236-37.

¹⁶ W. Lamb, *Excavations at Thermi in Lesbos* (Cambridge 1936) 172-73 no. 30.26, fig. 50, pl. 25. Poliochni: *CMS I Suppl.* no. 65.



Selected EB II metal seals and impressions from metal seals. **59a-b** Lead stamp from Tsoungiza. Profile and drawing of impression. Scale ca 3:2. **60a-b** Lead or silver stamp from Aplomata, Naxos. Profile (ca 3:4) and drawing of impression (ca 3:2). **61a-c** Hearth impression from Ayia Irini, Kea, made by a metal stamp. Drawing, ancient impression, silicone impression. Scale ca 3:2. **62a-b** Direct object sealing from Lerna, stamped with a metal seal. Sealing ca 1:2; detail ca 1:1.

Further support for metal seals comes from so-called negative impressions, a curious phenomenon occasionally found at Lerna and other EB II sites.¹⁷ Ordinarily, of course, the motif on a seal face is executed in intaglio (i.e. in the negative), thus producing a relief (or positive) image when impressed. But when the impression displays a negative image, the original motif must have been executed in relief. Frequently these 'negative impressions' reveal extremely complex designs. For instance, an impression on a hearth-rim from Ayia Irini shows an eight-spoked wheel surrounded by interlocking S-spirals set within a circular border (61). The diameter is only 1.7 cm. In other cases (e.g. 62 and 66 from Lerna), the surviving impressions reveal an odd ambiguity in positive and negative. In these cases metal was probably used, the faces probably being cast as on the lead stamp from Aplomata (60).

MOTIF AND COMPOSITION

Few of our surviving seals prepare us for the complex and finely-executed designs known from the House of the Tiles at Lerna. Many of the abstract motifs are composed of loop or ribbon-like elements, known as *Bandschlingen*, arranged around a central point real or imaginary (63-66; cf. 29). Pictorial motifs are very rare – the occasional spider or jug – and are subordinate to the overall abstract design (65, cf. below). Several seal-types have swastikas as their central motif (64, 67). Trefoils are much more common, deployed as the principal motif, as subsidiary fillers (29) or in overall networks (69). Indeed tripartite elements and schemes seem to have been greatly favoured at Lerna (63-65; cf. 29), whereas quadripartite designs are much less common, at least in the surviving repertoire. In any case, we can observe how the wavy bands, hugging the periphery of the circular seal faces, produce enclosed compositions, somewhat resembling stationary wheels with three or four spokes (see Chapter 1). It appears that the underlying syntactic principles at Lerna are balance and symmetry, even when individual elements are demonstrably asymmetrical (62, 66).¹⁸

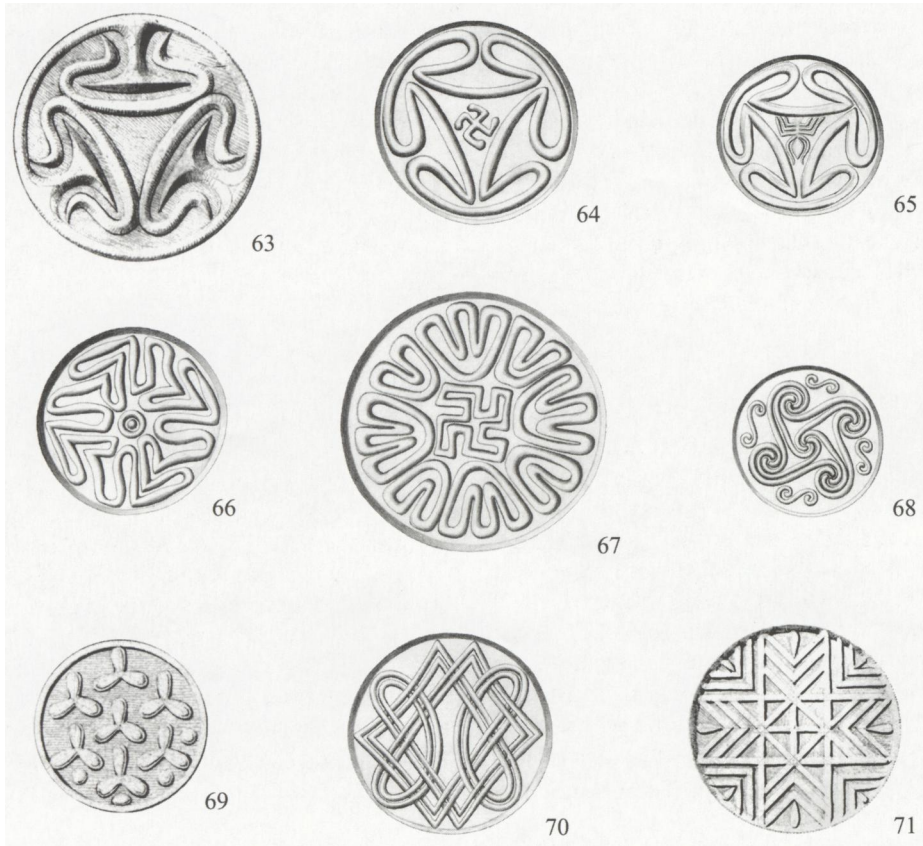
From a slightly earlier phase of the EH II period at Lerna (IIIC) we have about ten additional types.¹⁹ Though well executed, most are unadventurous, e.g. a simple rosette (77) and a hatched quadrant. The latter is ubiquitous throughout the Near East, but does little to illuminate the shadowy origins of Aegean glyptic (see Chapter 2). Although these seal-types from Lerna IIIC are among the earliest known, they do not necessarily represent the first seals to be made in the Aegean.²⁰ And among the types in Lerna IIIC, a few would be at home in the slightly later deposit from the House of the Tiles. This is true of the tripartite design of interlocking C-spirals (78). Since the sealings from Room XI in the House of the Tiles form a closed group, they provide evidence for seals which were all *in use* at the same time (below pp. 48-52). Whether all were *made* at the same time is an open question. In most later sealing deposits (e.g. Phaistos), we can usually

¹⁷ E.g. *CMS* V nos. 73-79, 89, 97 (Lerna); no. 423 (Lefkandi); V Suppl. 1A no. 381 (Akovitika). For Ayia Irini: Younger (n. 5) 164-72, esp. 168-69. See also *CMS* V p. xix.

¹⁸ The best account of the Lerna designs remains: M. H. Wiencke, in *CMS Beiheft* 0 (1974) 149-63.

¹⁹ *CMS* V nos. 43-51, 53. See also Wiencke 1969 (n. 5) 500-21.

²⁰ Some of the finds from the north-east Aegean and Thermi seem to antedate examples from the Greek mainland: see above nn. 11, 16. Note also a clay conoid with chevron design from Emborio on Chios (period IV or II, i.e. EB I or II early): S. Hood, *Excavations in Chios 1938-1955: Prehistoric Emporio and Ayio Gala* II. *BSA* Suppl. 16 (London 1982) 626-27, fig. 283 no. 6, pl. 130 (nos. 5 and 7 are uncertain). The lead seal from Tsoungiza (*CMS* V Suppl. 1B no. 128: here 59) possibly dates to early EH II, though it does not come from a closed context: Pullen (n. 6) 36-37.



63-71 Drawings of selected seal-types from the House of the Tiles, Lerna. Scale ca 1:1.

identify a range of types – from outright heirlooms and designs with an old-fashioned look to motifs which seem to herald future glyptic developments. Unfortunately, this is not really possible at Lerna: our knowledge of EB II glyptic is still too patchy. We can, however, observe that some seal-types are related, with basic designs being modified or elaborated by extra loops or filling ornaments (63-65; cf. 29). The significance of related motifs – a common enough phenomenon in ancient glyptic – is much debated but poorly understood. As to the complexity of the Lerna designs, this may well be linked to their bureaucratic function, but much simpler seal-types than these were used for sealing purposes, even at later palatial sites such as Phaistos (below and Chapter 5).

During the past 50 years Lerna has become a touchstone for EH II glyptic and this is bound to be true for some time to come. Familiarity casts a powerful spell. New discoveries, however, are beginning to broaden our vision and some of the singletons, known from older sites, no longer look so anomalous. There is, for instance, growing evidence that even unsophisticated seals were used for sealing purposes, which further counters the notion of a two-tier system, with the simpler stamps reserved for ‘non-administrative’ purposes, such as impressing pottery or hearths.²¹ Social differentiation

²¹ J.G. Younger, *Hydra* 8 (1991) 35-54, esp. 36, 46.



Drawings of selected seal-types from Geraki (72-73) and the Zas Cave, Naxos (74). Scale ca 1:1. Selected sealings from Petri near Nemea (75) and Tiryns (76). Scale ca 1:1.

and the emergence of site hierarchies could also account for some of the variations we are beginning to glimpse in EH II glyptic. The sealings found recently at Geraki in Lakonia have produced six new types, which, according to preliminary reports, are contemporary with Lerna IIIC.²² One shows a simple quadripartite design with short lines and dots placed rather unevenly in the quadrants (73); one wonders if the original seal was clay. On another, the field is divided into a series of small squares: the central square has a swastika inside, four have crosses, and the quadrants are filled with arrows (72). We find a more elaborate treatment of the design, with chevrons inside the squares, among the sealings from the House of the Tiles (71). Parallels for the intricate loop or ribbon designs, so prevalent at Lerna, are to be found on isolated examples from Akovitika in Messenia, Lefkandi on Euboea, and Ayia Irini on Kea. They also occur, in somewhat simpler guise, among the 26 types attested on the new sealings from Petri near Nemea, which seems to be contemporary with Lerna IIIC.²³

Petri also provides startling evidence for pictorial art in EB II: a finely rendered suckling scene of a mother animal and her young (75). Only one sealing fragment preserves this motif and it is our great good fortune that one impression is clear and complete. Other pictorial motifs are few and far between. A pair of quadrupeds race between rows of running spirals on a series of roller impressions at Lerna, Tiryns and Zygouries (89).

²² See above n. 7.

²³ See above n. 8.

Spiders occur as the principal motif on sealings at Tiryns (76) and Asine, while at Lerna they are subordinate to the abstract design (65). So far, pictorial motifs are confined to these few sites in the Argolid and Corinthia, but it may be premature to regard them as a distinctive regional style. In fact, it is rarely possible to judge where motifs originated, much less how they spread. While trefoils are very popular at Lerna, they also appear on the lead stamp from Aplomata: who can say where they were first devised? Occasionally, however, a decorative repertoire can be localized with some confidence. For instance, concentric circles and spirals generally seem more at home in the Cyclades and are well represented on the Kea hearth and pottery impressions. The few spiraliform designs on the Lerna sealings (e.g. 68) somehow look out of place and one wonders if the original seals had come from the Cyclades.²⁴ As already noted, the same could be true of the multi-facial seal at Asine, with its distinctive combination of spirals and *Kerbschnitt* (58). An unusual seal-type from the Zas Cave on Naxos (74) calls to mind the balanced asymmetry occasionally found on the mainland (above) and Kea, though no precise parallels yet exist. And while a pot stamp from Kastri on Syros is also hard to place (86), there is no good reason to see it as foreign.²⁵ By contrast, there are convincing Anatolian parallels for the impression on a pithos from Yialtra in northern Euboea.²⁶ This fits well enough with other east Aegean or Anatolian influences observed in the islands during EB II and also serves to remind us that the Aegean is the western-most extension of a glyptic *koine* stretching back through Anatolia to the Mesopotamian heartland. But the fact that so few seal-types in the Aegean can be isolated as foreign is a testament to the strides made by the end of EB II towards a purely local glyptic style.

SEAL USE

During EB II seals served a wide range of purposes: some obviously practical, some apparently decorative, others puzzling and hard to understand. Though our evidence is undeniably patchy, one wonders whether the diversity reflects a process of adopting new practices and adapting them to local needs. Virtually all the uses to which seals were put in the Aegean during the third millennium echo those attested in the East, usually at a much earlier date (Chapter 2). The most convincing antecedents are to be found in Anatolia and Syro-Palestine – peripheral to Mesopotamia proper – but closest to the Aegean. Even so, the routes and means of transmission remain obscure, so too the stages. It is worth recalling that most of our Aegean evidence dates to the later part of EB II (e.g. Lerna phases IIIC-D). Valuable though destruction horizons are, at best they provide snapshots of given points in time and we may well be lacking important clues for earlier stages in development.²⁷ This is an all too common problem in the study of seal use, more

²⁴ A pot stamp from Troy IIB (*CMS V Suppl.* 1B no. 479) is similar to a hearth impression at Ayia Irini, Kea (*CMS V* no. 462: here 61), but in this case the pot seems to be a Cycladic import: J. Aruz, *Kadmos* 25 (1986) 164-67.

²⁵ Regarded as Egyptian by E.-M. Bossert (*Jdl* 75 [1960] 14-15); seen as local by W. A. Ward, *Egypt and the Eastern Mediterranean World 2200-1900 B.C.* (Beirut 1971) 96-97. An Egyptian origin is also claimed for the stamp used to impress a pot at Poliochni (*CMS I Suppl.* no. 170): most recently by S. Hood, in J. Phillips (ed.), *Ancient Egypt, the Aegean and the Near East* (San Antonio 1997) 243-48. In neither case are the Egyptian parallels especially persuasive: *CMS V* xxii n. 30.

²⁶ Open to question is whether it was stamped with an *imported* seal. Cf. J. Aruz, in *Aegean – Orient* 302 pls. 31b-c. Another seal-type with a scalloped edge is attested on a hearth-rim at Kea: *CMS V* no. 464. For east Aegean and Anatolian features in late EB II: Broodbank (n. 3) 309-19.

²⁷ See above n. 20.

acute even than in the study of seal engraving. In any case, we should not assume that all features which we observe in EB II were inspired from the same source or were adopted at exactly the same time. In the following sections we will consider the primary evidence for function and some of the questions which it raises.

SEALING TYPES AND DEPOSITS

All of our EB II sealings belong to the direct object variety. There are no nodules formed around knotted cords, as attested on early sites in the Near East (e.g. Arpachiyah) or as occur – in somewhat different form – on Aegean sites in the second millennium. Direct object sealings are lumps of clay pressed directly onto the surface of another object, often a container of some kind, and then impressed with a seal or seals. The basic purpose of the sealing was to secure the means of closure and presumably to guarantee the integrity of the goods or products being stored. Sealings on the doors of storerooms are an extension of the same principle (see FIGURE 2.2). Fortunately, the simple act of pressing wet clay onto another object creates a distinctive imprint on the underside of the sealing and thus provides us with valuable clues as to what kind of object or material was originally sealed. These are sometimes called sealing supports. Since the sealings were judiciously placed over joints (e.g. covers and rims) or means of closure (e.g. cords and pegs) the imprints will reveal only a small part of the original support (80-84; cf. 6-9). Furthermore, the sealings themselves are often broken, either deliberately or accidentally (e.g. when a site is destroyed). Thus some imprints allow us to reconstruct the size and shape of the original object quite convincingly; in many other cases the nature of the support remains enigmatic.

Our direct object sealings from the EBA Aegean usually come from ceramic vessels or baskets which had been covered with reed matting. In this they compare well with the most ancient Near Eastern practices, for instance, those now attested at Tell Sabi Abyad in the seventh millennium (Chapter 2). The vessels range from medium-sized jars to large storage pithoi, best exemplified by those from Lerna IIIC (79). The sealings from Geraki in Lakonia, which appears to be contemporary with Lerna IIIC, belonged to medium-size storage jars covered with reed matting; textile imprints are also reported.²⁸ Unfortunately, at most sites sealings occur as singletons or as isolated finds without any significant contextual associations. However, the new site at Petri near Nemea, meticulously excavated and currently under study,²⁹ should offer major insights into sealing practices at the end of EH II (contemporary with Lerna IIID). Meanwhile, Lerna still offers the widest range of sealing types, covering two separate phases of the site's history.

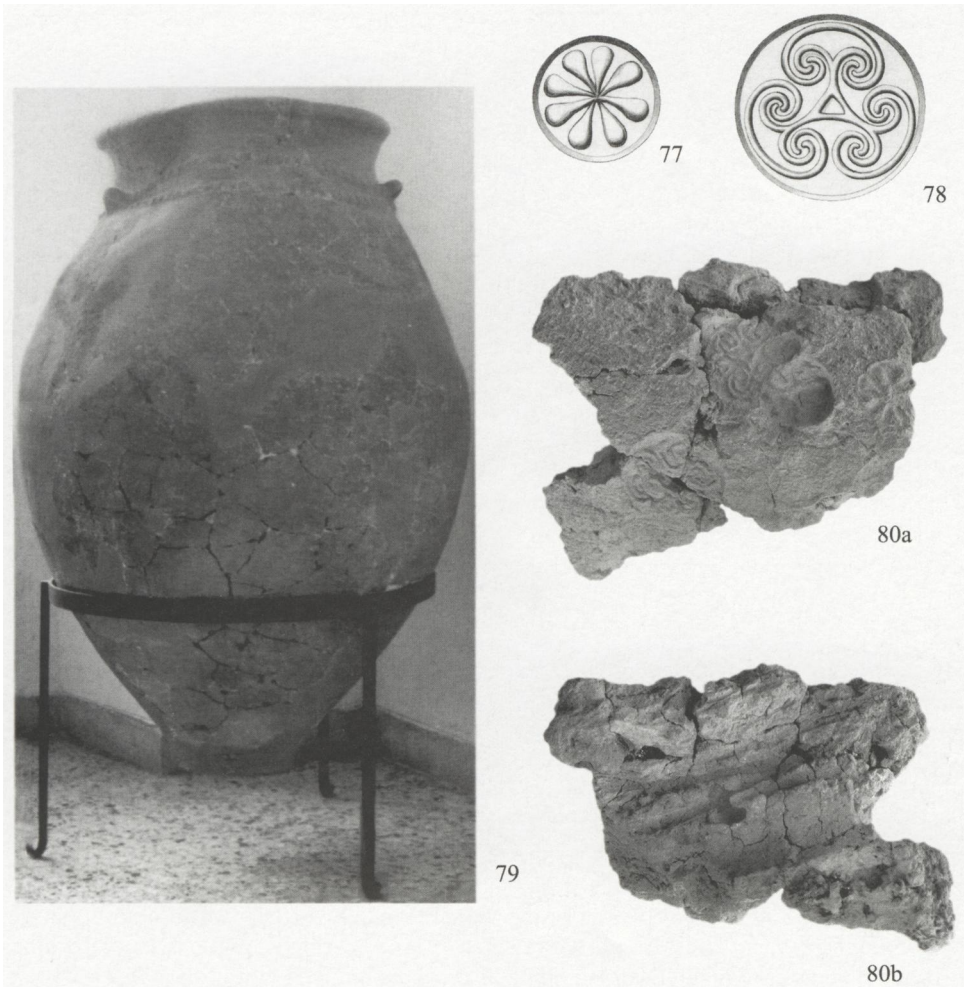
Lerna

The site of Lerna, excavated in the 1950s by the American School of Classical Studies, under the direction of J. L. Caskey, is located on the north-eastern shore of the Gulf of Argos. Although only one-seventh of the mound was uncovered, Lerna still provides our best evidence for the EH and MH periods in southern Greece.³⁰ Four main strata have been assigned to the EH II period, with phases Lerna IIIC and IIID producing the most

²⁸ Weingarten (n. 7) 322, fig. 8; J. Weingarten et al., *OJA* 18 (1999) 371-74, figs. 20-22. See also now W. Müller, in *CMS V Suppl.* 3 pp. 43-47, figs. 1-2.

²⁹ By the excavator, Maria Kostoula, as part of a doctoral dissertation for the University of Heidelberg; meanwhile see above n. 8.

³⁰ Preliminary reports in *Hesperia* 23-28 (1954-59); final reports in progress (n. 31).



Pithos sealings from House DM at Lerna. **77-78** Drawings of seal-types. Scale ca 1:1. **79** East Pithos. **80a-b** Sealing fragment, front and reverse. Scale ca. 1:2.

significant finds, including sealings. To phase IIIC dates the large corridor house BG, obviously a forerunner of the House of the Tiles, the fortification walls and several smaller buildings, including rooms CA and DM (FIGURE 3.1).³¹ Although BG contained a fine decorated hearth (91), no sealings were found. Fragments of a pithos sealing were recovered from a bothros or rubbish pit within the fortifications (Room B) and another fragment was found in CA (6). But most of our Lerna IIIC sealings come from DM, which contained two large pithoi set into the floor. The great East Pithos survives more or less complete (79), whereas the West Pithos had lost its upper portion during the phase

³¹ *Lerna* IV 131-45 (Rooms CA-DM), 646-53 (general summary of phases IIIC and D). For the sealings see: Wiencke 1969 (n. 5) 500-21.

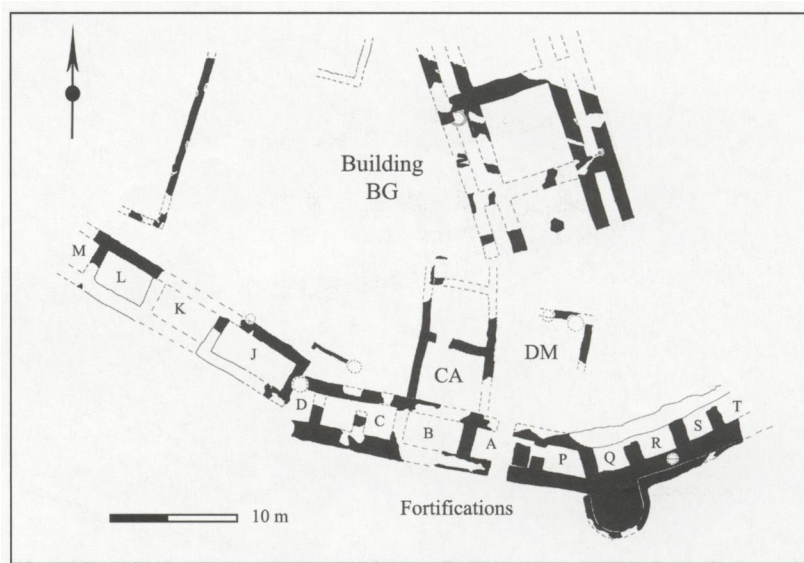


FIGURE 3.1 Plan of Lerna phase IIIC, showing find-spots mentioned in the text.

IIIC destruction or in later levelling. It seems that the mouth of each pithos was originally covered with matting, which was held in place by cords and secured with clay at the edges and rim. Once in place the clay was impressed with seals to prevent tampering. While some sealing fragments were actually found inside the West Pithos, most were widely scattered about the room. PLATE 80a-b gives a good idea of what we are up against. Reconstructed from scattered fragments, this is one of the most informative pieces, preserving imprints of the rim, reed impressions and cords. However, it is impossible to say whether it was broken as a result of the destruction, immediately before, or during an earlier opening of the vessel (see below). It is worth noting that the sealing on this pithos was stamped with two seals: one bearing a simple rosette, the other a spiralfirm motif (77-78). Dual-stamping also occurs in the House of the Tiles.

The House of the Tiles, a large corridor house, belongs to Lerna phase IIID, the latest EH II level at the site (FIGURE 3.2).³² Standards of construction were very high, with a series of well-designed central rooms, flanked by corridors and staircases leading to an upper floor, perhaps with sheltered verandas. The roof was covered with well-fired terracotta tiles, which have given their name to the structure. Although the building was certainly in use at the time of its destruction, aside from pottery and sealings, finds were few. The sealings were concentrated in Room XI, a small outer room scarcely bigger than a cupboard. There were very few strays: one found in the debris of Room VI (e.g. 29) and another some distance outside the house.

The sealings found in Room XI present a complex assemblage.³³ Here five or six different sealing supports can be identified. The Type A sealings, though relatively large (D. 10 cm), are extremely puzzling (81, 83). Their undersides preserve partial imprints of sizeable wooden poles (D. 6–8 cm) and sturdy cord or rope (D. 0.5 cm). But what kind

³² *Lerna* IV 213-304, 648-53.

³³ Meticulously described by Heath (n. 5) 81-121.

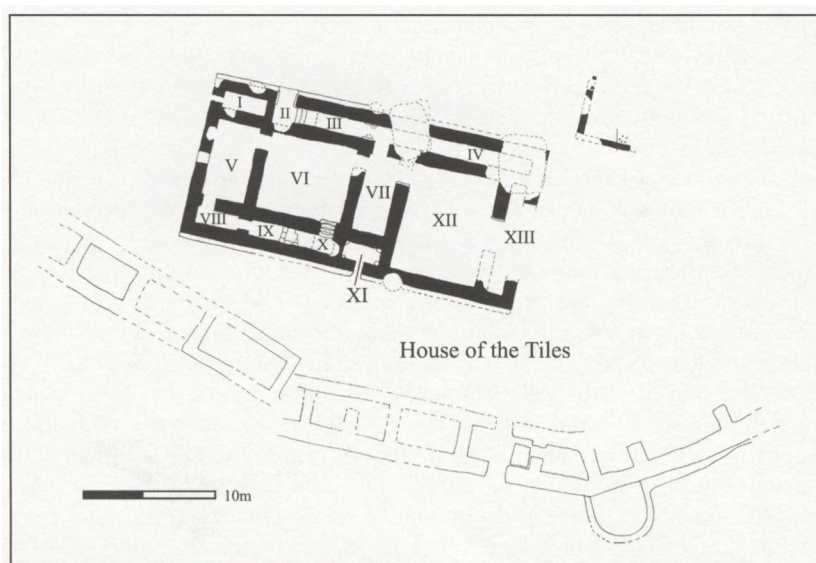


FIGURE 3.2 Plan of Lerna phase IIID, showing find-spots mentioned in the text.

of object are we dealing with? A box or chest of some kind is possible, but difficult to reconstruct: so too any kind of door closure. Even the most complete sealings preserve only the partial imprints of two poles, and the rope apparently does not bind them together (81b). So far, no convincing parallels for the Lerna Type A sealings have been found elsewhere in the Aegean or, it seems, in the Near East. Perhaps we are dealing with a local invention. The Type B sealings at Lerna are somewhat easier to reconstruct. These preserve the partial imprints of conical wooden supports, evidently pegs, around which a cord was tied (82, 84; cf. 8). In the Near East peg and cord sealings are often associated with storeroom closures, but moveable chests are also possible. Thus, the precise function of the Lerna Type B sealings is debatable (see below). The remaining sealings in the House of the Tiles are more straightforward and originally served to close the necks and mouths of jars (Types C and D) and wicker baskets (Type E: 7). In all 143 fragments of sealings were recovered in Room XI, probably representing about 120 original sealings.

The sealings at Lerna were stamped repeatedly, usually with a single seal, in order to cover the entire surface of the clay. This is normal practice with direct object sealings throughout the ancient world. Occasionally at Lerna we encounter the practice of dual-stamping, i.e. the use of two different seals on a given sealing (80, 84). But attempts to analyse the pattern of seal use founder on that perennial hazard, accidental preservation.³⁴ Simply counting the frequency of seal-types is a futile exercise, because we have no means of telling whether the sealings had been deliberately saved for tallying or were still attached to products that happened to be in store at the time of destruction. Sometimes a

³⁴ This does not deter J. Weingarten, *OJA* 16 (1997) 147-66; eadem, in *Administrative Documents* 103-23. Her notion that Siphnian silver ingots were stored in a strong-room on the upper storey, 'waiting for the Anatolian trade', is completely without foundation. No silver was found at Lerna and the 'mass' of lead measures (a) 10.45 x 3.8 x 0.6 cm and (b) 7.9 x 4.5 x 1 cm (*Lerna* IV 242).

seal-type is preserved on one sealing only, sometimes it recurs on several. There are even a few instances where one seal-type appears on two different supports (e.g. 66 on Types A and B: 83-84). In the case of dual-stamping we must avoid the assumption that each seal-type necessarily represents a single owner or user. In other words, an individual acting in two different capacities might have cause to employ two seals. Conversely, a single seal might be used by several individuals exercising the same authority.

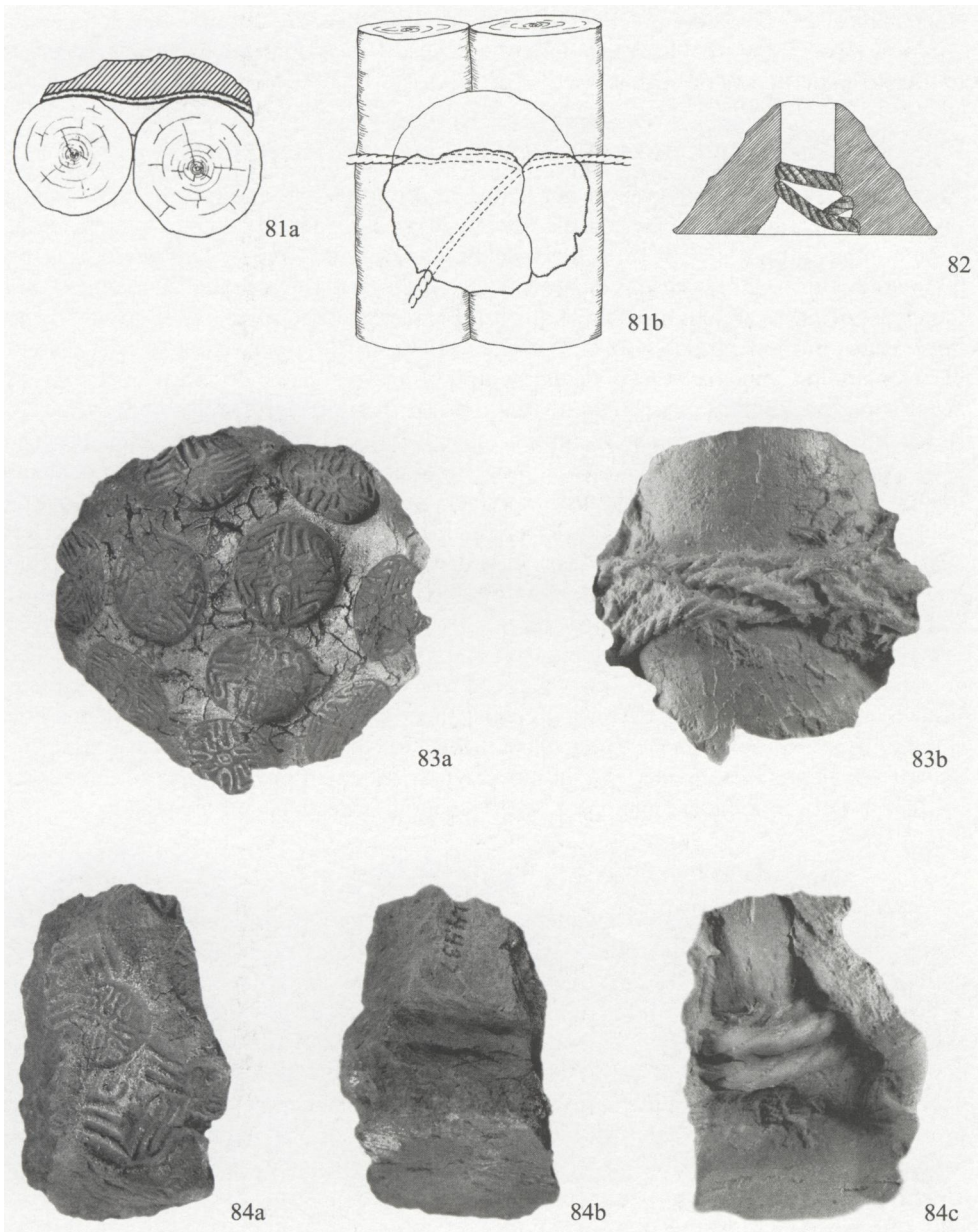
This brief summary of the Lerna sealings should give us pause for thought. While the basic method of sealing (direct object) is clear enough, great care is needed to read the imprints correctly and to reconstruct the original supports. Rarely is the evidence unequivocal. Further analysis is needed to reconstruct the sealing practices and their purpose. Even in the relatively simple case of Room DM, one needs to scrutinize the distribution of sealing fragments within the room, establish joins, and then consider what the seal-types might reveal. The size of the pithoi, the nature of other finds in the room, and the relationship of DM to contemporary structures – these too must be evaluated. Unfortunately, the same basic evidence can be read in various ways, a matter of interpretation, even speculation. Here, we may safely say that the DM sealings undoubtedly represent the control of stored produce, while the size of the pithoi suggests we could be dealing with something more than household management. But it remains unclear whether the sealing fragments in Room DM are merely the result of damage to the pithoi at the time of destruction, or whether they represent repeated openings of the vessels over time.³⁵ If the latter, then it is *possible* (though by no means certain) that the sealings had been temporarily retained for tallying.

More problematic still is the interpretation of the Room XI assemblage. Relevant factors include the nature and size of the original containers (if containers they be), the use of some seal-types on more than one type of sealing, the character and dimensions of the room itself. This was relatively small and could be entered only from the exterior of the House. Did it serve a storeroom or had the sealed containers been housed in the rooms above? For that matter were any of the sealings still *in situ* on their containers when the House was destroyed? Had they been prised off in haste by looters, eager to get at the commodities within? Or had the sealings been carefully removed at an earlier stage and been deliberately saved for ‘archival purposes’? All of these interpretations have been offered in the past, with greater or lesser conviction.³⁶ And what exactly was the original purpose of the Lerna sealings? Control of stored commodities certainly. But did they also guarantee quality or origin of goods; are they proof of personal or communal ownership? The sealings may be evidence for an incipient redistributive economy, but if so the way in which it worked is largely a matter for conjecture.³⁷ This may seem like an unduly minimalist view. But at this stage in our inquiries a cautious and dispassionate

³⁵ Compare Wiencke’s cautious interpretation (n. 5 [1969] 505) with E. Fiandra’s opinion (in *Archives* 237) that the DM fragments represented 19 separate sealing events (and, accordingly, had been saved for ‘archival purposes’). One cannot help wondering whether poor housekeeping might also account for the presence of discarded sealings on the floor, a phenomenon also known from LB III Knossos and Pylos (Chapters 8 and 10).

³⁶ Wiencke’s recent verdict (*Lerna* IV 234-36) is that the sealings did not fall from the upper storey but from wooden shelves in Room XI. In other words, the sealings (or some of them) had been removed from their supports. In turn this makes it likely that they had been retained for tallying (ibid. 301-04). For cogent remarks on hypothetical stages of ‘archiving’, see: J. Driessen, *Minos* 29-30 (1994–1995) 247-50.

³⁷ See Pullen (n. 6) 43-52; Maran (n. 2) 232-40; *Lerna* IV 302-04.



Selected sealings from the House of the Tiles at Lerna. Restored drawings of Type A (**81a-b**) and Type B (**82**) sealings. Not to scale. **83a-b** Type A sealing: upper surface and silicone of reverse. Scale ca 1:2. **84a-c** Type B sealing: upper surface, reverse and silicone of reverse. Scale ca 3:4.

approach is preferable to over-enthusiastic interpretation. Moreover, Lerna no longer stands alone. EB II sealing practices – and by extension socio-economic developments – will now have to be re-evaluated in light of new discoveries. Petri, in particular, is certain to transform our views on seal use in the EB II Aegean.

STAMPED HEARTHES, VESSELS AND ‘LOOM-WEIGHTS’

Another occasional use of seals in EB II was to stamp pottery and hearths. The designs on the Kea hearths range from simple concentric circles (85) to complex patterns comparable to seal-types known from Lerna and other mainland sites. Many were probably impressed with metal stamps, as suggested above (cf. 61). The repeated stamping around the rims of these fixed hearths seems to be purely decorative, akin to the roller impressions of the Argolid (see below). The same is also true of some Cycladic pottery, where stamping sometimes occurs along with incision to create a decorative pattern (86). Much more puzzling are the single impressions on shoulders or handles of vessels (87). Because the impressions occur so infrequently, it is impossible to guess their purpose. They could, perhaps, relate to ownership or origin of the vessel or the vessel’s contents, though our sample is too small to test these theories. It is, however, worth noting that the seal-types represented belong firmly in the mainstream of EB II glyptic. As on the Kea hearths and Lerna sealings, many pot stamps reveal intricate designs almost certainly indicating metal originals (87). More intriguing still are the stamped ‘loom-weights’, since here the function of the objects is not always certain. This applies particularly to those shaped like a rectangular block. A single example was recovered at Lerna, others are known from EM-MM sites on Crete (cf. 164). Perhaps the newly-found examples from Skarkos on Ios will help shed light on their function.³⁸ The practice of marking weights would certainly make good sense if they were used in a communal setting, i.e. outside the immediate environs of the household. But again our attempts to understand the purpose of stamping are hampered by the seeming infrequency of the practice.

ROLLER IMPRESSIONS

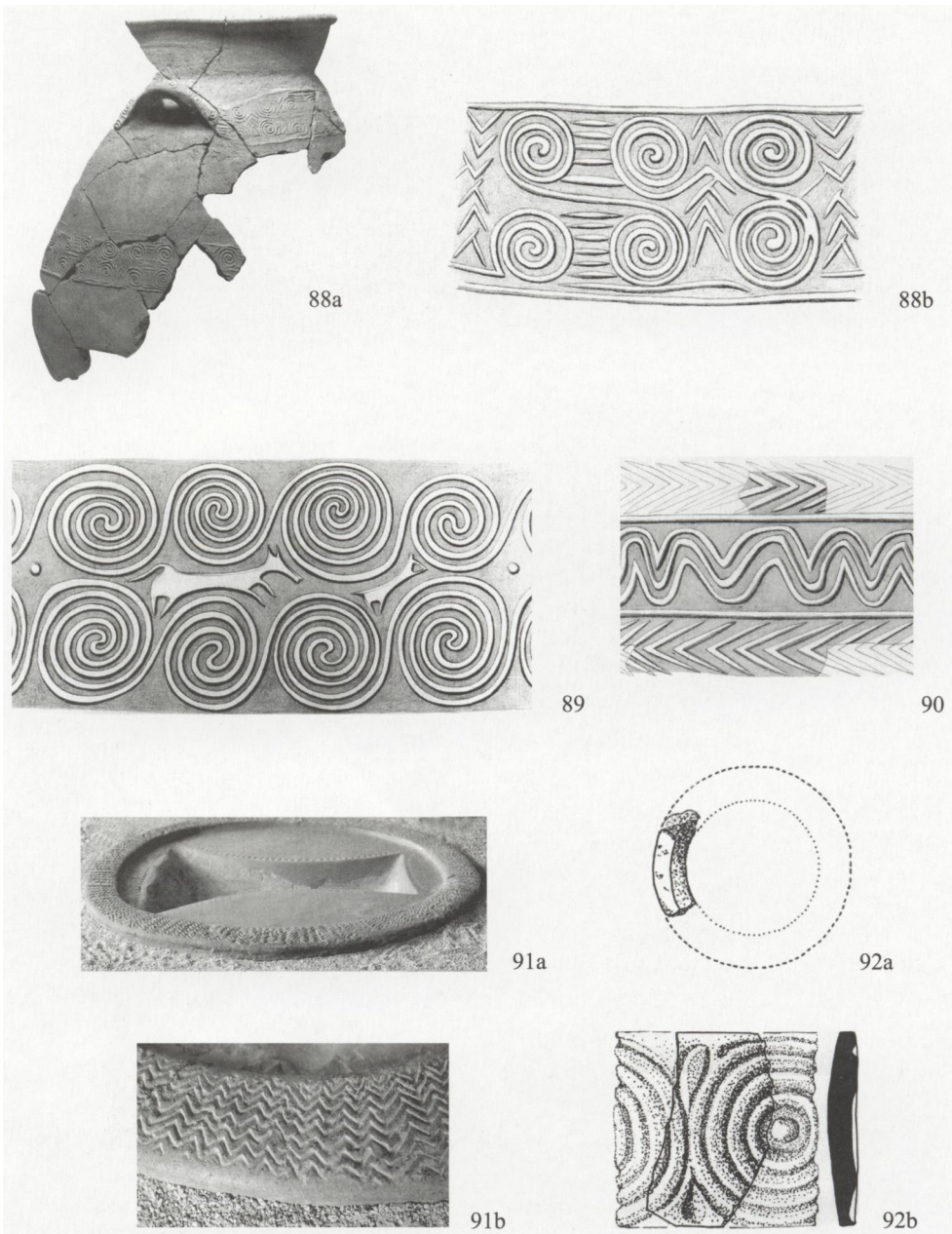
All of the examples we have considered so far are stamp seals or were impressed by stamps, but hearth-rims and pithos bands were sometimes decorated by rolling large cylindrical objects (Ht. 5–10 cm) over the surface of the clay. Since cylinders or rollers will produce a continuous frieze, running designs are favoured: spirals, wavy lines, zig-zags and chevrons (88–92). Sometimes panels are created by vertical dividers. But compared to the precision of the Lerna seal-types, many of the roller designs are poorly executed. That is, the original engraving was sometimes rather erratic and uneven, as an example from Tiryns reveals (90). Once again, some of the published drawings are deceptively regular (88–89). Until recently, no original rollers were known, prompting the view that they were made from wood. This is certainly possible and might account for their rather irregular quality. But some were certainly made from clay, as the discovery of a small roller fragment proves (92). Sadly, the piece has no provenance, but its decoration and dimensions (Ht. 5.4 cm) compare well with surviving impressions.³⁹

³⁸ Above n. 10. See now W. Müller, in *CMS V Suppl.* 3 pp. 58–59.

³⁹ It was found in the Nauplion Museum storerooms among material from Mycenae, Tiryns, Asine and Berbati: A. Dousougli-Zachos, in *CMS Beiheft 3* (1989) 19–25.



Selected EB II hearth and pottery impressions. **85** and **87** from Aya Irini, Kea; **86** from Chalandriani, Syros. Scales of objects vary. Details of impressions ca 2:1.



Selected EH II roller impressions on pithoi and hearths from Lerna (**88a-b**); Lerna, Tiryns and Zygouries (**89**); and Tiryns (**90**). **91a-b** Lerna, Building BG, hearth and detail. **92** Clay roller fragment, unknown provenance. Drawings at ca 1:2; **88** and **91** not to scale.



93a-c Stamp cylinder of green stone, allegedly from Kapros Grave D, Amorgos. Profile and impressions. Scale ca 1:1.

Hearths and large storage pithoi were made and fired on the site where they are found. Thus, the discovery of identical roller impressions at Lerna, Tiryns and Zygouries offers valuable evidence for itinerant craftsmen in EH II.⁴⁰ The design is very distinctive, with two schematic quadrupeds set amid running spirals (89). As we have noted, spiraliform designs seem at home in the Cycladic repertoire, but until recently roller impressions were confined to the Argolid. By contrast all of the pithoi and hearths at Ayia Irini are impressed with stamps. A stray find from Amorgos now provides the first indication of roller impressions in the islands and serves to underscore the patchy nature of our evidence.⁴¹ Still enigmatic is the link, if any, between the large rollers of the Aegean and the cylinder seals of the Near East. A tantalizing clue is offered by a stamp cylinder, said to be from Amorgos, now in the Ashmolean Museum.⁴² The cylindrical field bears false-spirals and chevrons, while a hatched quadrant decorates the circular face (93). Sadly, the seal does not come from a secure context and, to make matters worse, scholarly opinion is divided as to its origin. Some regard it as a genuine Near Eastern cylinder dating to the Jemdet Nasr period (ca 3000 BC), others believe it was made (or substantially re-cut) in the Aegean. More intriguing still are the cylinder impressions attested on pottery in Cilicia and Syro-Palestine during the third millennium, though these are made directly onto the walls of vases and not onto applied bands as in the Argolid.⁴³ They are generally

⁴⁰ CMS V nos. 120, 504, 529; see also Wiencke 1970 (n. 5) 94-110.

⁴¹ CMS V Suppl. 3 no. 48.

⁴² For an exhaustive account of the seal's history and conflicting views of its origin: S. Sherratt, *The Captive Spirit: Catalogue of Cycladic Antiquities in the Ashmolean Museum* (Oxford 2000) 25ff, 38-42, pls. 13-14.

⁴³ A. Ben-Tor, *Cylinder Seals of Third-Millennium Palestine*. ASOR Suppl. 22 (Cambridge, Mass. 1978) esp. 67-69, 89ff. A few are EB II; closer parallels for Aegean types date to EB III (e.g. Hazor) and EB IV (e.g. Hama). For EBA Cilicia see: H. Goldman, *Excavations at Gözülü Kule, Tarsus II* (Princeton 1956) 230, 240-41, pl. 397 esp. no. 14. Rolled and stamped decoration occurs on a large pithos from Troy: H. Schliemann, *Ilios* (London 1881) 412 nos. 492-493. At Poliochni a pithos is decorated with cylinder impressions, again directly onto the vase: A. G. Benvenuti, *ASAtene* N.S. 48-49 (1988-89) 373-78; the motif oddly combines a stylized human figure and crossed spirals. Finally, a jar from Samos is decorated with what seems to be an Eastern cylinder: H. P. Isler, *Archaeology* 26 (1973) 170-75. For an imported Early Dynastic ivory stamp-cylinder seal at Poliochni (Yellow) see: CMS I Suppl. no. 66 (with references).

smaller than our roller impressions; the same is true of cylinder seals. So whatever connexion existed between the cylinders of the East and the rollers of the Aegean, its exact nature remains obscure. Moreover, rollers in the Aegean seem to have served a purely decorative purpose; that is, their impressions have never been found on sealings. On this occasion, as on so many others, borrowing from overseas is eclectic in nature; foreign ideas are swiftly adapted to meet local Aegean needs.

* * *

The uses to which seals were put on the mainland do not survive the destructions which mark the end of EH II. Roller impressions on hearths and pithoi, pot stamps and, above all, clay sealings cease. A few simple seals have come to light in EH III contexts, but one cannot help feeling that these are merely strays from the preceding period.⁴⁴ The picture in the islands is much the same, albeit complicated by on-going debates about Cycladic chronology.⁴⁵ Thus the practice of stamping hearths and pottery and the manufacture of metal seals does not survive much (if at all) beyond the end of EB II. When seals and sealings re-appear in islands during the MBA, we can discern Minoan influences at work. On the mainland, the break was even more complete, the gap longer; we do not encounter seals again until the Shaft Grave era. By then the character of Aegean glyptic is well established, thanks to a millennium of development on Minoan Crete.

⁴⁴ E.g. from Lerna: *CMS* V nos. 36-39. Likewise few in number are seals from MH contexts: e.g. *CMS* V no. 668 (Thebes: MH cist grave?); V Suppl. 3 nos. 193 (Exarchos) and 380 (Aliartos, Boeotia: stamp cylinder).

⁴⁵ Preliminary reports attribute the sealings from the Zas Cave to EB III levels. For late EB II and EB III in the Cyclades, see: Broodbank (n. 3) 309-19, 331-35; Manning (n. 2) 66-72; Maran (n. 2) 139-50; Wilson (n. 15) 234-39.

CHAPTER 4 PRE-PALATIAL CRETE

Crete was always different. This truism applies as much to glyptic development as to the nature of Minoan society in the Bronze Age. Indeed the great island of Crete followed its own path from the very first, only acquiring human occupants in the late eighth or early seventh millennium.¹ These initial settlers apparently came from south-western Anatolia, with domesticated animals and bread-wheat, but no knowledge of decorative stamps or *pintaderas* (Chapter 2). At any rate none has yet been reported from Crete. Toward the end of the Neolithic (ca 3500 / 3100 BC), new settlers may have arrived from Anatolia,² but if so, they apparently did not bring seals. Rather, our first secure evidence for the use of seals and sealings dates to EM II (ca 2500 BC). And while inspiration from elsewhere in the Aegean and beyond is entirely likely, from the start Minoan glyptic seems a largely indigenous phenomenon. The same might well be said of Minoan society, though its nature in the mid-third millennium is hard to encapsulate.³ On the one hand we find a conservative and staunchly communal aspect, perhaps fostered by relative isolation and self-sufficiency in agricultural production. This face of Crete is best seen in the small hamlets and farming communities of the south, served by their monumental tholos tombs, which sometimes remained in use for 1000 years. At the same time, we discern another side to Minoan society, outward-looking and innovative. The need for imported metals perhaps proved crucial in shaping a receptiveness to foreign ideas, technology, and iconography. Unfortunately, at the sites which later became palaces – Knossos, Phaistos and Mallia – pre-palatial developments are exceptionally hard to trace. But we can say that by the late third millennium, Knossos was probably the largest community in the Aegean, with a population exceeding 6000.⁴ Crete was fertile ground indeed for the development of Aegean glyptic.

SOURCES OF EVIDENCE AND DATING

Hundreds of seals survive from pre-palatial Crete, but few are from closely datable contexts. Most come from communal tombs, which were used for successive burials over many centuries. Indeed some of the large tholos tombs in central and southern Crete were in use for 1000 years or so: in ceramic terms from EM I-II to MM I-II. Earlier burials and associated grave goods were periodically swept aside; fumigation and removal of bones to secondary chambers (*osteothekes*) was also practised. The great tholoi of the Mesara Plain and surrounding foothills of the Asterousia are also highly visible monuments: few have escaped the notice of grave robbers, ancient or modern. There are rare exceptions to

¹ C. Broodbank & T. Strasser, *Antiquity* 65 (1991) 233-45; J. D. Evans, in *Knossos Labyrinth* 1-20.

² L. Vagnetti & P. Belli, *SMEA* 19 (1978) 125-63; S. Hood, *Cretan Studies* 2 (1990) 151-58. For Final Neolithic / EM chronology: ABAC 12-13, 121, 169 table 3.1 (high dating); S. W. Manning, *The Absolute Chronology of the Aegean Early Bronze Age* (Sheffield 1995) 74-76, 143-53, 217, fig. 2 (low dating).

³ Recent accounts include: K. Branigan, *Pre-palatial: The Foundations of Palatial Crete* (Amsterdam 1988); idem, *Dancing with Death* (Amsterdam 1993); L. V. Watrous, in *Review* 157-161, 163-98, 216-23; also D. Wilson, in *Knossos Labyrinth* 23-44, esp. 39-44. For principal sites and geographical features mentioned in the present chapter see MAP 4.

⁴ T. Whitelaw, *BICS* 44 (2000) 223-26 and table 1.

this generally depressing picture. Some of the tholoi at Lenda (Lebena) on the south coast and at the important cemetery of Archanes-*Phourni* in north-central Crete contain pre-palatial burials associated with a single ceramic phase.⁵ At Mochlos in the east, the house tombs contain material from EM II-III.⁶ But three further *caveats* must be added. First, ceramic dating in the pre-palatial period lacks the precision of later eras and a single phase can represent several centuries.⁷ Secondly, seals can easily become displaced during the re-opening and later collapse of tombs, so every context needs to be evaluated with care.⁸ Last but not least: far too few tombs are adequately published.

While the site of Myrtos-*Fournou Korifi* on the south coast provides valuable material from EM II, good settlement evidence is rare for the pre-palatial period. Knossos, Phaistos and Mallia – our later palatial centres – pose special problems. Continuous occupation, levelling and re-building at these key settlements has deprived us of good domestic and funerary deposits from the pre-palatial era. For Crete we simply have no site comparable to Lerna, where an important proto-urban site was destroyed at the end of EB II and left largely undisturbed by later building. Moreover, unlike the mainland, cultural development is continuous from EM II to MM IA and beyond. From a glyptic standpoint, this means it is often hard to distinguish between seals made at the end of the pre-palatial period and those from the beginning of the proto-palatial era (ca 1950 BC).

The nature of our evidence has several consequences for the student of Aegean glyptic. First, dating by context often produces unacceptably long periods for individual seals or seal-types, e.g. EM II / III-MM IA / B. On a fairly conservative chronology, this could represent 700 years! Dating on stylistic grounds sometimes permits us to suggest narrower time spans for particular examples. But this approach, which depends ultimately on a framework of datable seals, is fraught with difficulties. Particularly disquieting is the realization that our evidence is horribly skewed, for among our 600-700 extant seals,⁹ some clusters (e.g. the parading lions group or the ‘white pieces’) must represent the

⁵ In Lenda Tomb IIA, a sand layer (Th. 10–15 cm) separated earlier (EM IIA-B) burials from subsequent ones (EM III-MM IA), though whether there was a genuine chronological hiatus is unclear, see now: St. Alexiou & P. Warren, *The Early Minoan Tombs of Lebena, Southern Crete*. SIMA 30 (Sävedalen 2004) 141-80, esp. 152, 180. For Tomb II, see below n. 8. The Lenda seals appear in *CMS* II.1. Stratification was also noted at Archanes-*Phourni*, Tombs Γ and E; certain Burial Buildings seem to belong to single periods (e.g. Building 6: MM IA). So far only Tomb E has been fully published: D. Panagiotopoulos, *Das Tholosgrab E von Phourni bei Archanes*. BAR-IS 1014 (Oxford 2002). *CMS* II.1 nos. 379-395 cover only a small proportion of the Archanes seals; see also *Archanes* II 670-91. *FkS* 165-81 has a useful catalogue of sites with pre-palatial seals, but all dates based on preliminary reports (e.g. Archanes) or older accounts (e.g. *VTM*) are open to question (cf. the complexities meticulously recorded in the Lenda tombs).

⁶ R. B. Seager, *Explorations in the Island of Mochlos* (Boston & New York 1912). J. S. Soles, *The Prepalatial Cemeteries at Mochlos and Gournia and the House Tombs of Bronze Age Crete*. *Hesperia* Suppl. 24 (Princeton 1992) 41-113. The seals appear in *CMS* II.1; also *CMS* V Suppl. 3 no. 345 (sealing).

⁷ Local and regional styles also complicate the picture, as does a scarcity of stratified material, see: *Minoan Pottery* 16-89.

⁸ For instance, an imported scarab (*CMS* II.1 no. 201) found in the EM I lower level at Lenda Tomb II is certainly intrusive: Alexiou & Warren (n. 5) 133-34. See also below n. 39.

⁹ Sbonias (*FkS* 128) puts the total at 702, though this should be regarded as an order of magnitude. Note that *CMS* II.1 devoted to pre-palatial seals in Herakleion contains pieces of later date; the volume only includes seals that entered the museum before ca 1965. Pre-palatial seals held in the smaller Cretan museums appear in *CMS* V, V Suppl. 1A, 1B and 3; also *CMS* X for seals formerly in the Erlenmeyer Collection. See Appendix 1.

output of a few workshops during a very short period of time (see below). To make matters worse, in some parts of the island we have seals aplenty, in others (so far) next to none. Last, but perhaps not least, sealings and seal impressions are extremely rare: less than two dozen exist *in toto* for the entire pre-palatial period. As we shall see below, this lamentable fact has raised doubts as to whether Crete actually used seals for sealing purposes in the third millennium.

SEALS AND SEAL-TYPES

While the scarcity of seals from stratified contexts continues to impair our understanding of pre-palatial glyptic, recent studies have clarified some major trends in the use of particular materials, shapes, techniques, motifs and compositions.¹⁰ These observations suggest that within the pre-palatial period there were three broad strands of stylistic development, most probably reflecting development through time. Certainly, among the earliest seals attested are those made of bone, boar's tusk and soft stone, decorated with simple linear patterns. The arrival of imported hippopotamus ivory provided a major boost to the craft, offering engravers a finely grained material and greater scope for executing complicated designs. In the later pre-palatial period, a new range of types appears in bone, 'white materials', and soft stone. But we need to be cautious in offering firm dates, in either ceramic or absolute terms, for the appearance and *floruit* of specific types of seals.¹¹ Several factors may complicate the picture. For instance, regionalism is a well-known phenomenon in pre-palatial Crete, exemplified by local pottery styles and funerary practices. There is no reason why seals should be immune. Socio-economic factors, as yet poorly understood, may also account for variations in materials and motifs and, in some cases, their longevity.

MATERIALS, SHAPES, TECHNIQUES

Pre-palatial seals were made exclusively from soft materials, registering about 2-3 on the Mohs scale. Chlorite, steatite and bone were readily available on the island and account for a substantial proportion of the output, augmented by imported hippopotamus ivory and the enigmatic substance used for 'white pieces'. Unfortunately, until the 1980s, our knowledge of ivory and related materials was rudimentary, and the literature is full of erroneous identifications.¹² Now that we have learnt to distinguish bone from ivory and have discovered that only hippopotamus tusk (not elephant ivory) reached Crete during the pre-palatial period, our understanding of glyptic development – especially the origin

¹⁰ *ECS*; O. H. Krzyszkowska, in *CMS* Beiheft 3 (1989) 111-26; I. Pini, in *Pepragmena* 6 (1990) A2 115-27; *FkS*. General accounts (now often unreliable) include: *APG* 210-12 (for fig. 210A, here 620, see Chapter 11) and *GGFR*² 22-28 (for 'Archaic Prisms' see Chapter 5 n. 36).

¹¹ Generally dates offered by Yule in *ECS* are too broad (e.g. EM I / II-MM IA / B), whereas Sbonias's attempt in *FkS* to refine Yule's dating, unfortunately, swings too far in the opposite direction. Indeed, throughout, this study suffers from over-precise dating of context and, by extension, of style-groups. Moreover Sbonias underestimates the possible impact of regionalism and economic factors on materials and motifs. Cf. Krzyszkowska (n. 10) 125-26 and n. 60

¹² Notably in *CMS* II.1 (see Appendix 1) and *ECS*, see Krzyszkowska (n. 10). My collaboration with the *CMS* team in 1986-87 led to accurate identifications of bone and ivory seals published in *CMS* V Suppl. 1A (especially the Mitsotakis Collection). Identifications in subsequent volumes are also trustworthy. In addition, the *CMS* team has re-examined many seals published in *CMS* II.1; new identifications are lodged in the *CMS* Archive.

of particular seal shapes – is much improved.¹³ And although the precise nature of ‘white piece’ material remains elusive, at least we no longer mistake it for bone or ivory.¹⁴ Far less attention has been devoted to the Cretan soft stones used for seals and published identifications are often unreliable.¹⁵ For individual pieces discussed below, I have drawn on up-to-date information available in the *CMS* Archive, as well as my own work on ivory and related materials. Finally, it is worth noting that, in contrast to the mainland, seals made of clay and lead are virtually unknown.¹⁶

Bone, ivory and the soft local stones could be shaped and engraved with simple blades and burins, while slow hand-turned drills were used to make string-holes or borings on seal faces and bodies (e.g. **130**; cf. FIGURE 4.1). Unfortunately, no workshop material survives from pre-palatial Crete and so inferences regarding the engraver’s tool-kit have to be made from finished seals. As a rule of thumb, the motifs on bone and ivory seals are more finely executed than those on stone.

MOTIF AND COMPOSITION

Now that our knowledge of materials and shapes has been put on a firmer footing, we are much better placed to appreciate how they relate to the use of certain motifs and compositions. Indeed, during the pre-palatial period, the links between the various facets of glyptic style seem closer than at any other time in the Aegean Bronze Age. To deal with them separately here would be to create false distinctions where there are none. Instead, we will integrate observations on motif and composition with our general survey of the main classes of pre-palatial seals, wherever possible drawing on examples from datable contexts. One final *caveat* is needed here: pre-palatial seals vary enormously in size, with seal faces ranging from well under 1 cm in diameter to nearly 4 cm on certain ivory conoids and cylinders. Indeed, while some groups of seals are shown here at life-size, others are enlarged to 2:1. These variations, closely connected to the materials used, in turn have a major impact on motif, composition and, therefore, style.

Simple stone and bone seals

Two sites on the south coast – Lenda and Myrtos-*Fournou Korifi* – provide important examples of simple stone and bone seals datable to EM II. Myrtos offers rare insights into seal manufacture and use in a small village, occupied by about 50 inhabitants.¹⁷ Four seals were found here, made of steatite and chlorite – soft stones which were easily worked and which could be acquired locally in the Sarakina Valley. Two more pieces are unfinished; for these, attractive beach pebbles were used (e.g. **96**). The absence of bone seals may be an accident of preservation, with erosion and sandy soils being to blame.

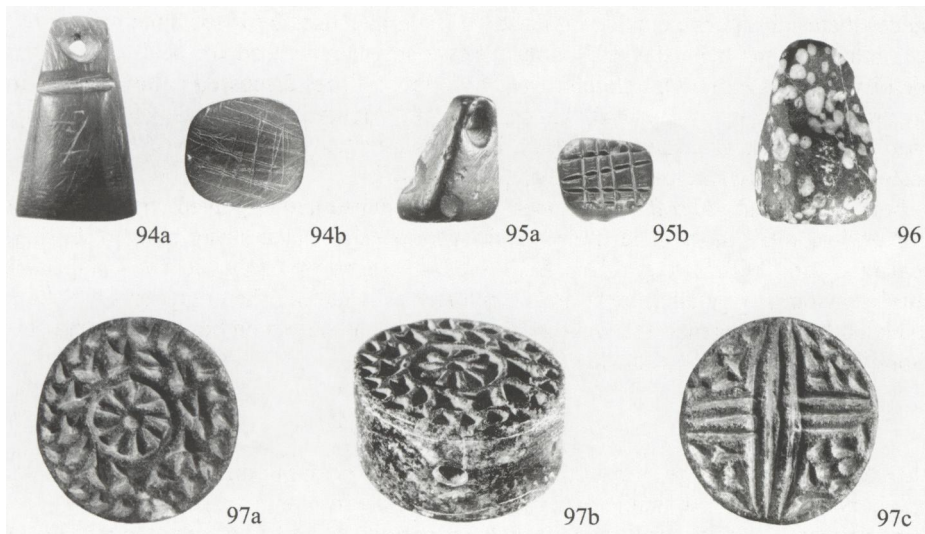
¹³ Krzyszkowska (n. 10); eadem, *BSA* 83 (1988) 209-34; *Ivory Guide*.

¹⁴ Pini (n. 10); Krzyszkowska (n. 10) 116; H. Hughes-Brock, in *CMS* Beiheft 3 (1989) 87-89. See also below pp. 72-74.

¹⁵ Especially in *CMS* II.1 (see Appendix 1). Imprecise data led Yule to describe all soft stone seals as ‘serpentine’ (in inverted commas): *ECS* 198. See also remarks by J. H. Betts, in *CMS* X pp. 19-20. For sources and properties of Cretan soft stones: *MSV* 129-30, 137-41; also M. J. Becker, *JFA* (1976) 361-74.

¹⁶ Clay: I. Pini, in *Aux origines de l'hellénisme* 73-81; add *CMS* V no. 299 (Platyvola Cave). Lead: *Archanes* I 201, II 675, fig. 749 (Burial Building 5: EM III-MM IA).

¹⁷ P. Warren, *Myrtos*. *BSA* Suppl. 7 (London 1972). Population estimates vary: 100-120 occupants (ibid. 267); 25-30 (T. Whitelaw, in *Minoan Society* 323-40, fig. 73); 50-75 (C. Tenwolde, *OJA* 11 [1992] 22-23). For the seals and sealing: *CMS* V nos. 14-20.



94-96 Seals of soft stone from EM II Myrtos-*Fournou Korifi* (**96** is unfinished). **97a-c** Low cylinder from Lenda Tomb IIA, with elaborate *Kerbschnitt* decoration, perhaps a Cycladic import. Profiles and faces. Scale ca 1:1.

The seal shapes at Myrtos are very simple, e.g. a conoid and an irregular pyramid (**94-95**). All, barring the unfinished examples, are pierced for suspension; in a few cases the string-holes show signs of wear. The seal faces are decorated in simple, even crude fashion, e.g. random scratching and lattice patterns. The single clay sealing from the site bears the impression of a seal decorated with an angle-filled cross (**133** and below).

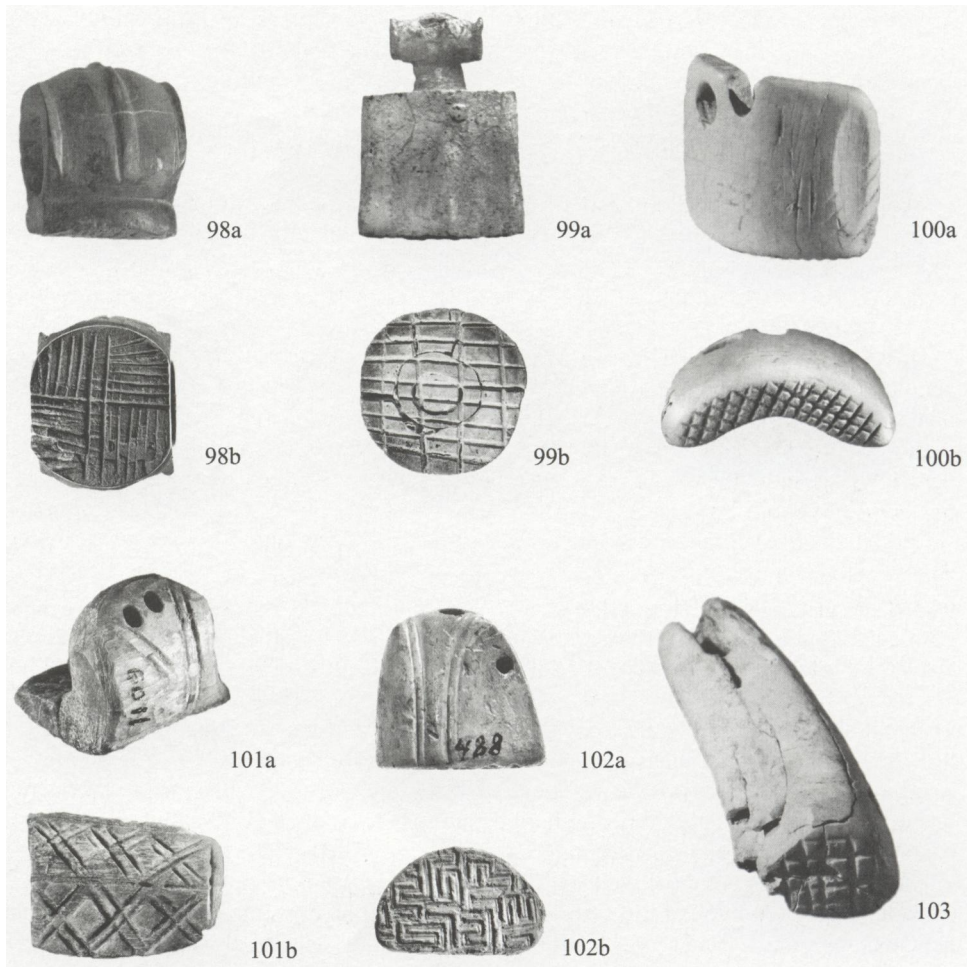
The Myrtos seals compare well with other examples from the tholos tombs near Lenda (Lebena). Here too most of the early stone seals are relatively simple affairs, conoids and irregular pyramids made of steatite or chlorite and decorated with simple lattice patterns.¹⁸ Among these a few stand out, being executed in an entirely different fashion. For instance, a low cylinder made of chlorite is decorated on both faces with sophisticated patterns of wedge-shaped cuttings (**97**). This decorative technique, known as *Kerbschnitt*, is popular in the Cyclades. It is chiefly found on pottery and stone vases, but some seals are decorated in this fashion too (**57-58**; Chapter 3). Whether the Lenda seal is an actual import or was made locally is hard to say.¹⁹

Lenda also provides us with good evidence for early seals in bone (e.g. **98-99**, **114**).²⁰ Their finished shapes are often based on the natural shapes of bones, slightly modified.

¹⁸ Convenient lists in *Fks* 80-81 (simple stone).

¹⁹ Two further seals with *Kerbschnitt* designs (though much simpler) were found in the lower level of Lenda II; both are rectangular buttons made of chlorite (*CMS* II.1 nos. 202-203). Seals of similar shape are known from the islands (e.g. here **57**; **C2**) and Lerna (**C1**). See Chapter 3 n. 14; also *ECS* 207-08 and *Fks* 79-80.

²⁰ Note that the term *Bein* (used in *CMS* II.1 for the Lenda seals) is generic and covers both bone and ivory. For natural shapes, seal shapes and manufacture methods see: Krzyszkowska (n. 10) and *Ivory Guide* 52-58, 72-73, pl. 23. For simple bone seals see lists in *Fks* 74-79, 81-83 (with the usual caveats about dating).



Pre-palatial seals made of bone from tombs at Lenda (**98-99**), Koumasa (**100**), Platanos (**101**) and Ayia Triada (**102**). Seal of boar's tusk from Ayia Triada (**103**). Profiles and faces. Scale ca 1:1.

For instance, cylindrical sections cut from long bones were used to make rings and hollow cylinders; by cutting the piece again, lengthwise, shoulder-shaped (*epomia*) and concavo-convex seals were easily produced (**100-101**). Bones of the hind-foot (metatarsals) are most versatile, since they have straight shafts, thick walls and a sub-circular section. A large ring-shaped seal from Lenda, made from a cattle metatarsal, exploits these features to good effect (**98**). The half-moon shaped sections of metacarpals (bones of the forefoot) make them especially suitable for *epomia*. Seals made of boar's tusk may preserve part of the triangular pulp cavity on the seal face (**103**).²¹

More elaborate shapes could also be made of bone. Sometimes several components were used to achieve the seal shape. One of the most complex is a hammer-headed seal

²¹ Krzyszkowska (n. 10) and *Ivory Guide* 47-49, pl. 19.

from the EM II level at Lenda Tholos IIA (99; C4). In this case four separate elements were used: the outer cylinder, the hammer-headed centre piece, and plugs for the base and top. Small pegs hold the outer cylinder and central piece together. But other examples have no pegs and perhaps some kind of glue or resin originally helped to secure the main components. Delightful zoomorphic seals are also found at an early date. Sometimes the tops of conoids are fashioned into heads of birds or animals (e.g. 113). A pair of animal heads set back-to-back decorates the top of a small bottle (114) from Lenda IIA, dated by context to EM II. Another seal from the same tomb takes the form of a tiny bird-like creature (C3). Seals in the shape of female figures are also attested. Indeed such seals may be compared to the small anthropomorphic and zoomorphic pendants, also found in pre-palatial tholoi. These pendants do not have engraved faces and are generally seen as amulets.

Most of the simple bone seals are decorated in equally simple fashion, their linear or geometrical designs incised with a blade. Lattice patterns are especially common and occur on seal faces of every shape. Hatched quadrants and angle-filled crosses are also found on circular faces, while the rectangular faces of *epomia* are often decorated with herringbone patterns. Even the more complex hammer-headed and zoomorphic seals bear the same range of simple linear motifs. By contrast, the bone conoid from Ayia Triada (102) with its overall meander design finds good parallels among ivory seals (see below). Based on examples from dated contexts a *floruit* in the early part of the pre-palatial period (EM II-III) seems likely for the simple seals of soft stone and bone. But it is worth stressing that barely two dozen seals come from secure EM II contexts. Most are from Lenda and Myrtos on the south coast and only two or three come from north-central and eastern Crete. The size and distribution of the 'sample' does not inspire confidence.

Ivory seals

Ivory is first attested on Crete in an EM IIA context at Knossos. The piece in question is a small segment of hippopotamus tusk, which is clearly workers' waste.²² The ultimate source of hippopotamus ivory in this period was probably Egypt, where hippopotamus harpooning appears on tomb reliefs and the tusks were used for many early Egyptian ivories. Elephant ivory apparently did not reach the Aegean until the neo-palatial era. For making seals and other small objects, hippopotamus ivory is far more versatile than bone. Even relatively small tusks offer the craftsman a greater volume of solid material. As a result, seals and seal faces are usually larger than before. This offered scope for more elaborate decoration and the finely grained material further encouraged intricate motifs. And yet, for all these advantages, hippopotamus ivory is no harder than bone, registering about 2-3 on the Mohs scale. And the natural shapes of the tusks lent themselves – as readily as bones – to convenient seal shapes, such as cylinders and conoids. There is little doubt that the availability of this material in pre-palatial Crete provided a major boost to the craft of seal engraving. Although dating is difficult, the earliest examples may belong to EM II, with the *floruit* of the ivory group lying within EM III-MM IA.²³

²² O. H. Krzyszkowska, *Antiquity* 58 (1984) 123-25, pl. 13a. For sources and patterns of use: eadem (n. 13) 226-33; *Ivory Guide* 20-21; also *AEMT* 320-31, esp. 326-27.

²³ Stratified deposits of EM III occur at Knossos and in east Crete; but for much of central Crete the EM III and MM IA *styles* cannot be defined chronologically, hence the convention of bracketing them together. See *Minoan Pottery* 53-63; also Watrous (n. 3) 179-82, 223 though the idea of an EM III 'gap' is debatable and his assertion that foreign contacts are absent is even more doubtful. See also n. 30 below.

Although pre-palatial engravers now enjoyed the benefits of an imported material, foreign influence on seal shape is very limited indeed. Most striking of all is the fact that pre-palatial ivory cylinders have no connexion whatsoever with the Near Eastern variety engraved around the barrel and rolled to make impressions. Instead Crete continues to follow the Aegean tradition of stamp seals, and uses the flat ends of the cylinders as seal faces. While many of our cylinders are bi-facial – decorated on both ends – some are only engraved on one face only (**104-106**). The reasons for this remain obscure (see below). The decision to stamp rather than to roll is all the more curious, inasmuch as large rollers were used for hearth and pithos bands on the mainland in EB II (Chapter 3) and one or two Eastern cylinders reached Crete in the pre-palatial period.²⁴ Moreover, hippopotamus incisors are naturally cylindrical in shape.

Two kinds of tusks were used for pre-palatial seals. Lower canines presented the carver with some obstacles, notably hard ridged enamel (Mohs 7) on the outside and a natural fracture line within. Nevertheless, with ingenuity, convenient blanks for seals could be obtained by sectioning the tusk horizontally, and if necessary, again vertically.²⁵ Among the shapes made from lower canines are stamp cylinders, pyramid and wedge-shaped seals, and some zoomorphs. The cylindrical incisors have no enamel or other natural flaws. Simple sectioning readily yielded blanks for cylinders; one seal face is usually somewhat smaller than the other reflecting the natural taper of the tusk. Tusk tips with little or no modification were used for conoids and hemispheroids (**107-109; C5**). Even more elaborate shapes may deliberately exploit natural forms. The fine dove and its young from Koumasa retains the tapering and somewhat flattened tip of an incisor (**115**).

This close link between natural forms and seal shapes means that, for the most part, ivory seals are not simply copies or adaptations of types which had been devised in bone. Moreover, the ivory seals generally display a distinctive range of motifs – much more complex than the linear designs found on the simple bone seals. None the less, exceptions to this rule do occur and are potentially rather instructive. A few ivory seals retain the ‘old-fashioned’ linear patterns or designs derived from them, such as meanders (cf. the bone conoid **102** from Ayia Triada). In other cases, seals made of bone are decorated with motifs that we would ordinarily associate with ivory seals (e.g. **117**). Sometimes engravers even went to considerable lengths to imitate ivory shapes, by plugging or covering the marrow cavities of long bones. These cases of substitution suggest that ivory did not wholly supplant the use of local bone, nor did the elaborate new motifs entirely replace simpler geometric designs. Aegean glyptic did not develop in a straight line from crude to complex: this we know from later periods when dated examples are readily available. There is no reason to suppose that the pre-palatial period was any different.

Among our ivory seals, we can isolate several decorative traditions.²⁶ Some bear geometric designs such as meanders or hatched quadrants, not far removed from the lattice or herringbone patterns found on the simple bone seals. In other cases, the motifs consist of wavy lines or ribbons (*Wellenbände*), often disposed across the seal face in what is termed unending *rapport* (**104b**). These *rapport* designs form an important element in the decorative syntax of early Minoan glyptic art, conveying a sense of endless motion beyond the confines of the seal face. As such they stand in striking contrast to the enclosed and symmetrical designs prevalent at Lerna (e.g. **29, 63-66**).

²⁴ Notably an EB II-III silver cylinder from Syro-Palestine in Mochlos Tomb II (EM II): I. Pini, *AA* (1982) 599-603; J. Aruz, *Kadmos* 23 (1984) 186-88; *ABAC* 127, pl. 3.

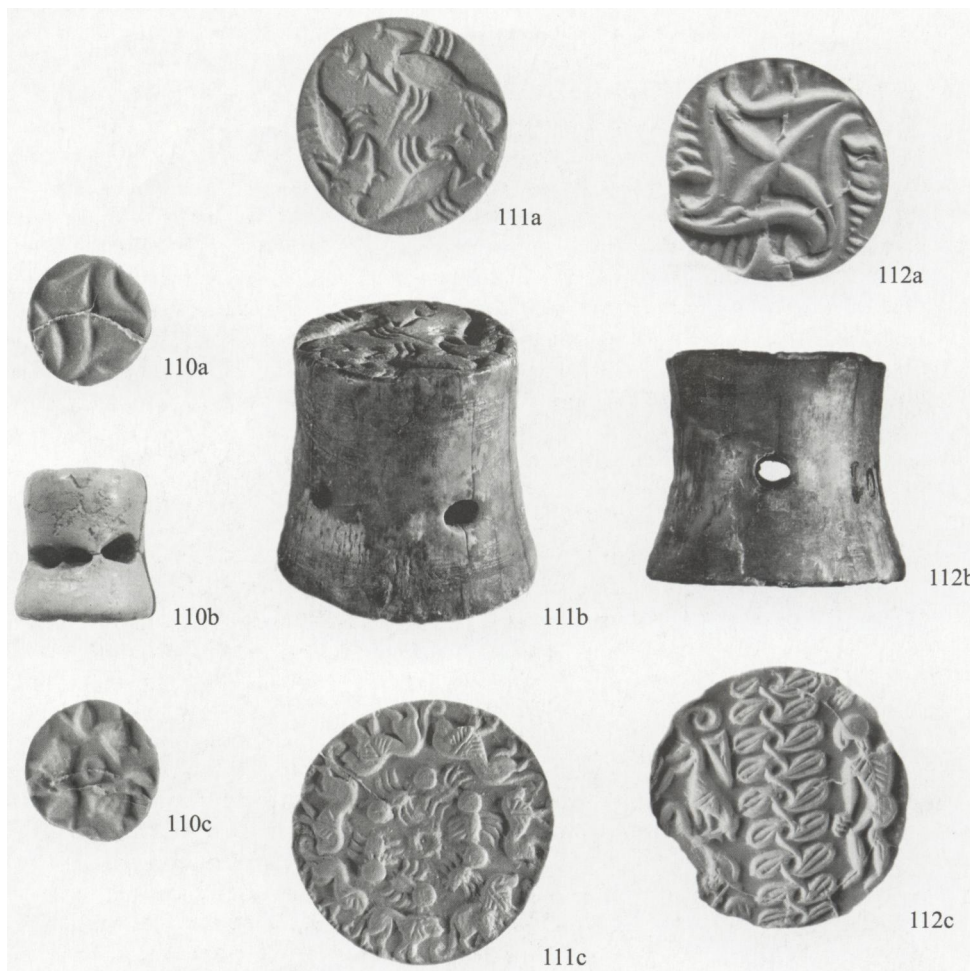
²⁵ Krzyszkowska (n. 10); eadem (n. 13) 215-16; *Ivory Guide* 38-47, 76-77, pl. 14.

²⁶ Useful lists in *F&S* 84-102.



Pre-palatial seals made of hippopotamus ivory from tombs at Ayia Triada (**104**, **107**), Platanos (**105**, **109**) and Marathokephalo (**106**, **108**). Profiles and impressions of faces. Scale ca 1:1.

Various kinds of spiraliform motifs are also popular on pre-palatial ivory seals. For instance, a low cylinder from Platanos (**105**) is decorated with C-spirals in a manner reminiscent of certain designs known from Lerna and Ayia Irini, Kea (e.g. **78**, **87b**). But the J-spirals on a low cylinder from Marathokephalo (**106b**; also **30**) radiate outwards, scarcely confined by the triangular wedges arranged round the periphery. The same can be said for the exuberant spiraliform design on a fine conoid from Ayia Triada (**107b**).



Pre-palatial bi-facial cylinder seals made of hippopotamus ivory from tombs at Ayia Triada (**110**), Platanos (**111**) and Marathokephalo (**112**). Profiles and impressions of faces. Scale ca 1:1.

A similar design is found among the Lerna sealings, but looks subdued by comparison (**68**). Likewise the Lerna swastikas seem very staid affairs when set against our lively Minoan examples (e.g. **110a**). In fact, direct parallels between the Lerna seal-types and the designs on pre-palatial seals are few and far between.

Ivory seals are also decorated with a variety of floral, vegetal and pictorial motifs. Sometimes we find an overall network of tiny leaves or twig-like elements disposed across the seal face (e.g. **109**, a tusk tip from Platanos Tholos A). On a conoid from Marathokephalo a pattern of paired leaves encircles an 8-petalled rosette (**108b**). Here the engraving is extremely fine, the individual leaves and petals rendered with astonishing intricacy. The same is certainly true of many bi-facial cylinders belonging to the so-called parading lions and spirals group. The lions that file around the edge of a cylinder from Platanos are barely 1 cm long, yet their eyes are marked by minute dots, manes are carefully indicated by fine hatching and the paws shown with three tiny claws (**111c**).

These seven lions surround a circle of six spiders: their bodies seem to be rendered with a slow solid-bit drill. Three large scorpions, ready to sting, stalk around the upper seal face (111a). In common with most cylinders made from tusk sections, the two seal faces differ somewhat in size: the lower face is the larger (here D. 3 cm). Large seal faces obviously permit more elaborate designs than do smaller ones. For instance, only three small lions manage to crowd onto the face of a cylinder from Ayia Triada, measuring 1.75 cm in diameter; a simple swastika decorates the upper face (110a-c).

Parading lions and spirals are not confined to bi-facial cylinders: two attractive zoomorphs from Platanos Tholos A clearly belong to the same group. The recumbent calf (117) seems to be made from bone,²⁷ an interesting case of substitution (see above), but the seated ape (116) is hippopotamus ivory. The origin of the form is ultimately Egyptian, perhaps transmitted via Syro-Palestine.²⁸ Lions, like apes, are not native to Crete, but here the source of inspiration is less certain. The arrival of these foreign images goes hand-in-hand with other evidence for overseas contacts in the pre-palatial period. Moreover, they mark the beginning of a long tradition of adopting and adapting foreign iconography on Minoan Crete (cf. Chapter 5).

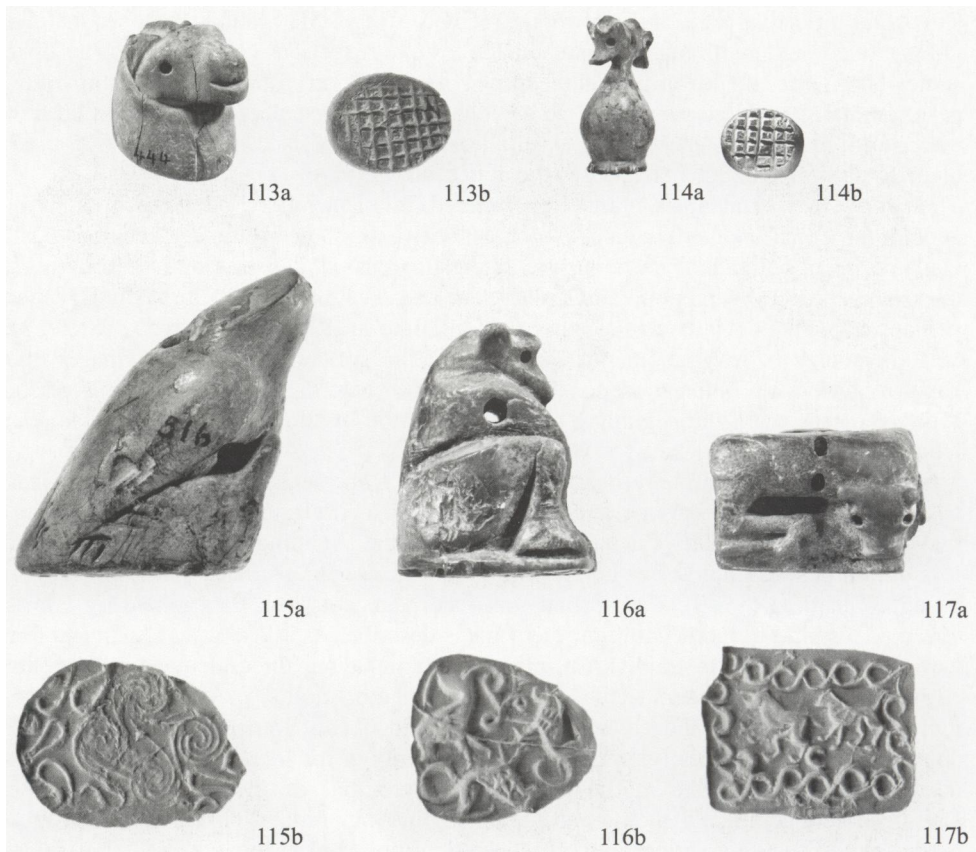
Human figures appear only occasionally on our ivory seals. A magnificent cylinder from Marathokephalo bears an unusual scene with a male figure and animals separated by what looks to be a leafy chain (112c). It may be that a hunting scene is intended; if so, it is our earliest example of a subject which becomes popular in later phases of Aegean glyptic (Chapters 6, 8-9). The second seal face bears four S-spirals joined by a cross (112a). This kind of motif with four elements is described as a *Vierpass*, a technical term hard to render neatly in English (cf. also *Dreipass*, having three elements, e.g. 138b). Although bi-facial cylinders draw on a limited range of motifs, they are combined in a great variety of ways. Indeed no two seals are identical. Sometimes pictorial motifs appear on both seal faces (e.g. 111), sometimes only decorative motifs are used. More often, we find decorative motifs on one face, pictorial on the other. Although the significance of individual motifs and their combinations remain obscure, we can make some interesting observations regarding distribution. For instance, there is a striking concentration of parading lions and spirals at Platanos, although seals of this group do occasionally occur elsewhere, including the north and east of the island. Yet strangely, at some sites nearby in the Mesara and the Asterousia, lions are rare or altogether absent. And how do seals with single faces fit into this complex pattern? Is the diversity a sign of local workshop traditions, a hallmark of increasing social complexity, evidence for emergent site hierarchies, or – as seems probable – a combination of all these factors and more, only dimly perceived at present. Unfortunately, since we have no means of dating individual seals with any precision, our ability to test these hypotheses remains limited.²⁹

Further hints regarding social status may come from the size of seals. It is reasonable to suppose that ivory, being imported, was a valuable material. And yet, far from cutting up tusks into small blanks of uniform size and shape, engravers deliberately preserved natural features of tusks whenever possible (e.g. 109a; C5). Sometimes they are refined – as in the case of concave-sided cylinders – but the section of tusk still remains visible.

²⁷ Identified by the CMS team in 1988 (cf. n. 12); wrongly classed as ivory in *FkS* 53 n. 139 (certain other identifications given by Sbonias are also inaccurate).

²⁸ See J. Aruz, in *CMS Beiheft* 6 (2000) 3-4, fig. 3.

²⁹ Distribution patterns provide fewer insights than we might like and do not allow us to link 'stylistic workshops' to specific sites. Cf. K. Sbonias, in *CMS Beiheft* 6 (2000) 277-93. See also Chapter 11.



Pre-palatial zoomorphic seals of bone and ivory from tombs at Ayia Triada (113), Lenda (114), Koumasa (115) and Platanos (116-117). Profiles and faces (113b-114b) or impressions (115b-117b). Scale ca 1:1.

This seems to be a clear example of conspicuous display, an unequivocal statement that the seal was made of ivory and not bone or boar's tusk, which were available locally. Of course, as we have already noted, engravers – presumably at the behest of their clientele – sometimes attempted to reproduce ivory shapes and types in bone (102, 117). To an expert eye, the substitutions are not convincing, though they certainly deceived earlier generations of archaeologists (see above). As for the Minoans, attempts to emulate high status products and behaviour are only to be expected against the backdrop of increasing social diversity.

Late pre-palatial seals in bone, 'white materials' and soft stone

Spirals, leaves and animals also decorate a large and somewhat heterogeneous group of seals made in stone, bone and 'white materials'. Some of these may well overlap with our fine ivory seals, but the *floruit* of this group must belong to the later part of the pre-palatial period. Assigning a ceramic date to these developments is no easy matter,



Late pre-palatial seals made of bone from tombs at Ayia Triada (**118**), Gouves (**120**) and Platanos (**121**). Seal made of boar's tusk from Koumasa (**119**). Profiles and impressions. Scale ca 2:1.

especially since a clear distinction cannot be made between EM III and MM IA in central Crete.³⁰ The fact that MM IA pottery continues to be made even after the main palatial centres had adopted MM IB wheel-made wares further compounds our chronological difficulties. It is nevertheless clear that this transitional phase in Minoan culture is accompanied by unbroken development in seal engraving.

³⁰ See above n. 23. For MM IA / B see *Minoan Pottery* 71-89. Sbonias dates his ivory group to EM III-MM IA *early* and the later bone / soft stone seals to MM IA *late* – MM IB (my italics) largely on the strength of stratification allegedly observed at Archanes-Phourni (*FkS* 67-70, 102ff, 173-77). The usual objections regarding over-precise dating and inadequately published contexts apply. Irritating though it may be, it is safer to date the 'later' bone seals to EM III-MM IA and acknowledge a genuine chronological overlap with the fine ivory seals. See also below n. 42.

Late pre-palatial bone seals

Why seals cease to be made in ivory is hard to understand, although disruption to supplies is a possible explanation. In any case, bone seals in the later pre-palatial differ markedly from the examples that we considered earlier. There are few attempts to emulate ivory shapes (see above); nor do seal shapes reflect naturally occurring features, as found on our earliest examples. Rather, they are usually carved from small pieces of solid bone.³¹ This has a dramatic effect on the size of seals and seal faces. Many are now tiny, for instance, the faces of two conoids from Ayia Triada and Koumasa (**118-119**) measure ca 1.5 x 0.5 cm (they are illustrated here at 2:1). In consequence, there are marked changes in decoration. The elaborate designs of the large ivory cylinders and conoids are impossible. Instead, compositions are much simpler, albeit drawing on a similar repertoire of motifs.³² The conoids from Ayia Triada and Koumasa illustrate this point admirably. On the first a single S-spiral occupies most of the face, with tiny leaf and twig motifs as filling ornaments (**118b**). Two pairs of leaf motifs decorate the second conoid, which is made from boar's tusk (**119b**). Sometimes seal faces are sub-divided into segments and are further provided with border lines. On a small hemi-cylinder from Gouves, the field is quartered and then filled with the usual leaf and twig motifs (**120b**). Oval or sub-circular seal faces are sometimes divided into three segments, as seen on a bordered disc from Platanos (**121c**). A wild goat is engraved on the other seal face, with wavy lines and hatched triangles serving as filling ornaments (**121a**). Goats are occasionally found on ivory cylinders and become more common on late bone seals. Scorpions and spiders also recur, but lions are infrequent. As we might expect, these small seal faces mean that animals and insects generally appear alone or occasionally in pairs. This is a trend which continues into the proto-palatial period.

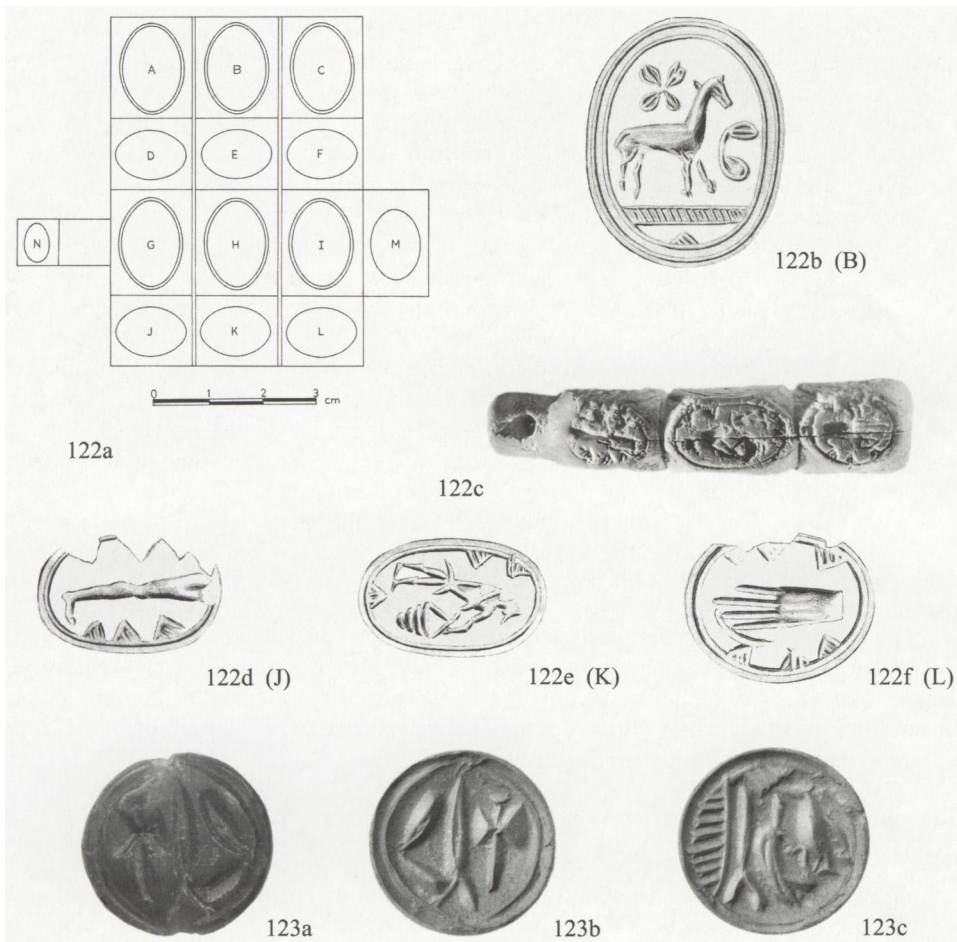
The 'Archanes Script'

That the pictorial character of Cretan glyptic in the late pre-palatial period may have led to a form of writing seems to be borne out by a small group of seals made of bone or steatite and related to the bordered disc from Platanos, just described (**121**). The group includes bordered discs, gable-shaped seals with three faces, and cubes with four or six engraved faces.³³ Most astonishing of all is a bone bar or baton, from a MM IA funerary building at Archanes-Phourni, which has 14 separate faces set within oval borders (**122**). Several depict quadrupeds, possibly goats (A-C, E, N; **122b**), one is decorated with hatched segments (F), another with a rosette (M). In one row we find a human leg in profile, a male figure holding what might be a basket, and finally a human hand (J-K-L; **122d-f**). While most of the motifs seem perfectly at home in the late pre-palatial pictorial repertoire, the leg and hand seem decidedly odd. In fact, they turn up again in the proto-palatial period as signs in the Cretan Hieroglyphic script (see below and Chapter 5). Our interest in the Archanes baton is whetted further by five symbols or signs disposed across faces H and I. Since the piece is badly abraded, they are almost illegible here. But the very same group of signs – effectively a formula – recurs on a handful of other pre-palatial seals. One of the best examples is a bordered disc of olive-green steatite acquired by Evans at Knossos and now in the Ashmolean Museum (**123; C7**).

³¹ Krzyszkowska (n. 10) 124-25; cf. *FkS* 49-50, 55-59.

³² *FkS* 102-07 for examples; also bone are several seals in his leaf/ivory group (*FkS* 99-102), e.g. *CMS* II.1 nos. 255, 281, ?380, 381.

³³ *ECS* 170; *FkS* 107-113.



The 'Archanes Script'. **122a-f** Bone 'baton' from Archanes-*Phourni*, Burial Building 6. Diagram showing arrangement of faces, profile (shown at ca 1:2), and drawings of selected impressions (at ca 2:1). **123a-c** Bi-facial disc made of steatite from 'Hellenika' (Knossos). Face a and impressions of faces a-b. Scale ca 2:1.

Whether the 'Archanes Script' or Formula, as it is known, is a direct ancestor of Cretan Hieroglyphic is far from clear.³⁴ Nor can we state, with any confidence, that we are dealing with a true script, i.e. capable of expressing a range of words and ideas. Likewise obscure is the nature and significance of individual symbols (e.g. the leg and hand) that later recur as syllabic signs in the Hieroglyphic script. More questionable still is whether motifs which are ostensibly pictorial or decorative (e.g. goats and rosettes) also had any lexical value. That said, it is conceivable that the emergence of multi-facial seals in the late pre-palatial did represent an attempt to convey meaning through a series of images.

³⁴ *CHIC* 18 n. 59; I. Schoep, *OJA* 18 (1999) 265-66; L. Godart, in *Meletemata* 299-302 (for links to Linear A).



MM I 'white pieces' from tombs at Porti (124-125) and Gourmes (126). Scale ca 2:1.

We will encounter multi-facial seals – mostly three and four-sided prisms – again in the proto-palatial period (Chapter 5). But, notwithstanding a large body of data, we have yet to make much progress in understanding the significance of motifs and their combination, far less their precise relationship to Cretan Hieroglyphic. For the late pre-palatial, sadly, we simply have far too little material to work with.

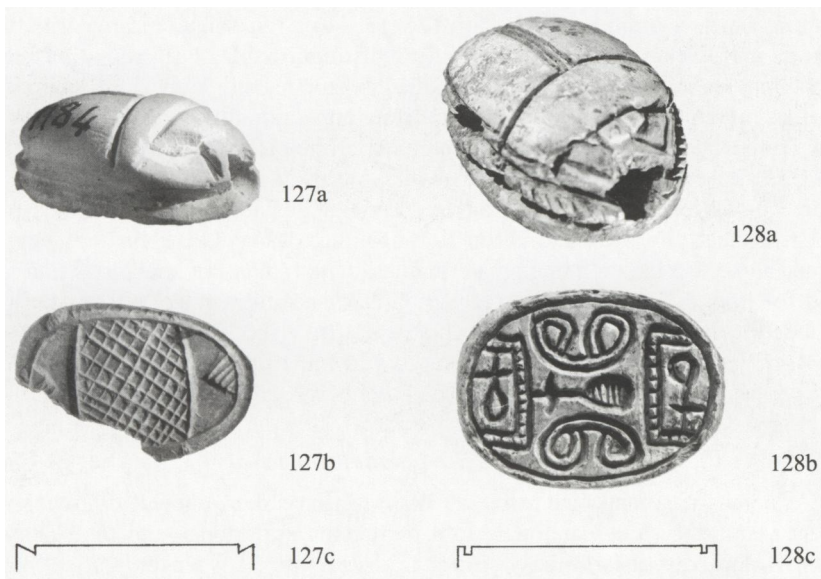
'White pieces'

The border lines and segmented fields seen on late pre-palatial bone seals are also common on 'white pieces'. This fascinating group, comprising more than 100 examples, is still imperfectly understood.³⁵ The seals themselves come in an astonishing range of shapes, though buttons, reels and zoomorphs are most common (124-126; C6).³⁶ All are exceptionally small. None the less, great detail is lavished on the bodies of these seals. For instance, the top of a hemispherical button from Porti is a chequer-board of minute squares: some cut away and hatched, others standing proud but undecorated (124a). The seal face bears an angle-filled cross, executed with great precision (124b). Indeed, the intricacy of the engraving on these 'white pieces' is remarkable, involving blades less than 1 mm thick (less than the width of a fine ballpoint pen).

As we have noted, technique and material are closely linked; yet the material from which these seals are made remains enigmatic. In the past some were wrongly regarded as ivory or bone; other suggestions included 'white steatite' and 'frit'. While it is now obvious that they are not made of bone or ivory, visual inspection alone cannot identify the material with accuracy. And since we can only employ non-destructive analyses,

³⁵ Lists and discussion in Pini (n. 10); the Mitsotakis seals now appear in *CMS V Suppl. 1A* and *V Suppl. 3*. Most examples with a known provenance come from the Mesara or Asterousia.

³⁶ Especially interesting are four cylinders made of 'white piece' material, engraved around the barrel as are Near Eastern examples, but decorated with typically Cretan motifs: *CMS IV nos. 101-102, V Suppl. 3 nos. 137-138*.



Minoan 'white piece' scarab from Gournes (**127**) and imported Egyptian scarab from Lenda T. I (**128**). Profiles, faces and diagrams to show the engraving techniques. Scale ca 2:1.

scientific data are limited. However, these suggest that the chemical composition is akin to talc, a very soft form of steatite.³⁷ But the very sharpness of the engraving may argue against talc pure and simple. The use of pulverized talc together with a binding agent hardened through exposure to heat might yield the typical features of 'white piece' material. Very fine cracking sometimes appears on the outer surface; where this is lost, pockmarks appear, as if bubbles had burst. All in all, the material displays the hallmarks of a man-made composition. This view is further strengthened by the fact that some pieces were certainly glazed. An iridescent patch, greenish in colour, appears on the side of the tiny animal from Porti (**125a**).

Clues regarding the origin of our 'white pieces' come from a small group of scarabs, made from the same material and bearing similar motifs (**127**).³⁸ Here we are dealing with a seal shape that was clearly inspired from abroad. Scarabs first appear in Egypt and Syro-Palestine around 2000 BC and a few reached Crete in the late pre-palatial period. One example from Lenda occurs in the upper level of Tomb IIA, which is dated EM III-MM IA; another was found with an EM III-MM IA amphoriskos in Lenda Tomb I (**128**). Both find parallels in the Egyptian early Middle Kingdom.³⁹ Several more

³⁷ I. Pini, in *Crete – Egypt Studies* 107-13, esp. 111-12; also Hughes-Brock (n. 14).

³⁸ Pini (n. 37). Glaze survives on one example (ibid. 110-12, no. 11 = *CMS V Suppl.* 3 no. 135).

³⁹ *CMS II.1* nos. 180 from Tomb I, here **128**) and 204 (from Tomb IIA upper level). See now Alexiou & Warren (n. 5) 36-37, 152-53; dated early 12th and late 11th Dynasties, respectively (cf. *ABAC* 129 for FIP dating). A third scarab from Lenda (*CMS II.1* no. 201) was found in the lower (EM I) level of Tomb II, but is certainly intrusive (op. cit. 133-34; and above n. 8). This too was originally dated within the FIP (*ABAC* 129), but is now assigned to the late 11th Dynasty (i.e. early Middle Kingdom). For good illustrations see: *Crete – Egypt Catalogue* nos. 300-302.

imported scarabs come from mixed contexts, including a famous piece from Tholos B at Platanos bearing a representation of Taweret (46).⁴⁰ In shape and material, the genuine imports and Cretan scarabs are virtually indistinguishable. The crucial difference lies in engraving technique. Straight perpendicular grooves are typical of imported scarabs, whereas on our Cretan imitations grooves are angular and V-shaped (Cf. 128c and 127c). The very same technique can be observed on ‘white pieces’.

While the exact composition of ‘white piece’ material remains obscure, the main sequence of events can be reconstructed. The new fashion for scarabs in Egypt and Syro-Palestine clearly inspired the production of imitations on Crete. Not content to copy the shapes alone, Cretan craftsmen experimented with a man-made composition, akin to that used for imported scarabs. Only eleven Cretan scarabs survive, but the technology was extended to a range of purely Minoan seal shapes – the ‘white pieces’. The fashion was apparently short-lived and does not survive into the proto-palatial period. Nevertheless, here we have an early and striking case of technological transfer.

Late pre-palatial stone seals

While bone, ivory and ‘white piece’ material have been subject of intensive study in recent years, the same cannot be said for Cretan soft stones and the seals made from them. Admittedly, it is no easy matter to distinguish between the various kinds of soft local stones, which in older publications were invariably dubbed ‘steatite’ (see above). Steatite was certainly used for some of the crude EM II conoids and irregular pyramids decorated with random scratching or lattice patterns (e.g. 94-95). Others are chlorite, another soft Cretan stone, which seems to become popular in EM III-MM IA. At the very end of the pre-palatial period, steatite again appears and becomes *de rigueur* for making three-sided prisms in the proto-palatial period (see Chapter 5). But these trends – if correctly observed – need to be confirmed by further appraisal of shapes, motifs and above all by seals from closely dated contexts.

Among our later stone seals are some that compare well with those made of ivory and bone, as well as to ‘white pieces’. For instance, carefully worked conoids of chlorite are common, their shapes perhaps ultimately inspired by those in ivory (129-130). An example from Platanos bears a neatly executed abstract design consisting of arc-shaped incisions surrounded by a notched border line (129b). A similar border occurs on a small conoid from the upper levels of Tomb IIA at Lenda, datable to EM III-MM IA. Here the border encloses a simple S-spiral flanked by a pair of wedge-shaped cuts (130b). Other shapes made of stone include hemispherical buttons (131), discs (123), gables and a few three-sided prisms, perhaps forerunners of the popular MM II seal shape (132). In decoration we see clear links to the repertoire used on seals made of bone (e.g. compare 118b and 130b).⁴¹ The differences in effect or style are created by the use of different materials, tools and techniques. As already noted, finely-grained ivory and ‘white piece’ material allow greater precision than possible in soft stone.

Whereas bone is rare after MM IA and ‘white piece’ material vanishes without a trace, the use of local Cretan soft stones persists into the proto-palatial period and beyond. This continuum in material, technique, shape and motif has unfortunate consequences for modern students intent on assigning seals to specific ceramic periods or phases in Minoan cultural history. More often than not we are simply unable to decide if subtle variations in

⁴⁰ CMS II.1 no. 283. For further examples see Aruz (n. 28) 2-3; and J. Phillips, *Aegyptiaca* (forthcoming) for an exhaustive discussion of imports and local copies.

⁴¹ See *FkS* 104-07, fig. 3.16; 118-21.



MM I seals of soft stone from tombs at Platanos (129), Lenda (130), Koumasa (131) and Ayia Triada (132). Profiles and faces. Scale ca 2:1.

style have any true chronological significance.⁴² However, it is worth remembering that Minoan cultural development was itself continuous, the palaces built on the foundations of a long pre-palatial period. If a quantum leap did occur toward the end of the pre-palatial period,⁴³ it is hard to discern this in the glyptic record.

SEAL USE

Although the surviving number of pre-palatial seals is substantial, our direct evidence for seal use is unsatisfactory. However, some cautious inferences are possible. Pre-palatial seals are invariably provided with a means of suspension and were probably worn round the neck. Small bone rings could be suspended from their hoops; other shapes were provided with drilled string-holes. Conoids and cylinders – some of which are rather large and heavy – are provided with a sturdy and elaborate means of suspension: the string-holes join form a Greek Δ (FIGURE 4.1). Seals could, then, serve as items of jewellery, as lucky charms (cf. the zoomorphic amulets), and also as signs of status. But the development of seals as social markers is difficult to unravel, owing to the practice of communal burial and the many uncertainties associated with stylistic dating (see above). We can, of course, observe that simple bone seals with lattice patterns could be made with rudimentary skills and tools, within the competence of many. By contrast, the seals made from imported ivory, with finely engraved seal faces, were surely produced by specialist craftsmen.⁴⁴ The same must be true for ‘white pieces’, using a man-made composition. The acquisition and display of exotic materials is a common sign of growing social diversity. We might also expect greater social complexity to be reflected in a wider or more elaborate range of motifs. This may well hold good for our fine ivory seals with parading lions, spirals and vegetal motifs. But how, then, are we to explain the sharp decline in seal size toward the end of the pre-palatial period and the corresponding trend to less intricate designs? Indeed even simple lattice patterns persist through the proto-palatial period and occur in the Phaistos sealing deposit (Chapter 5).

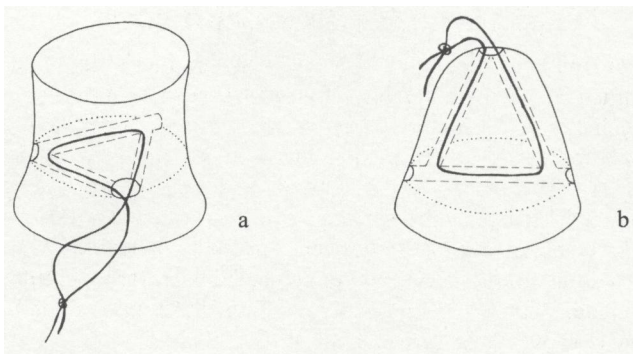
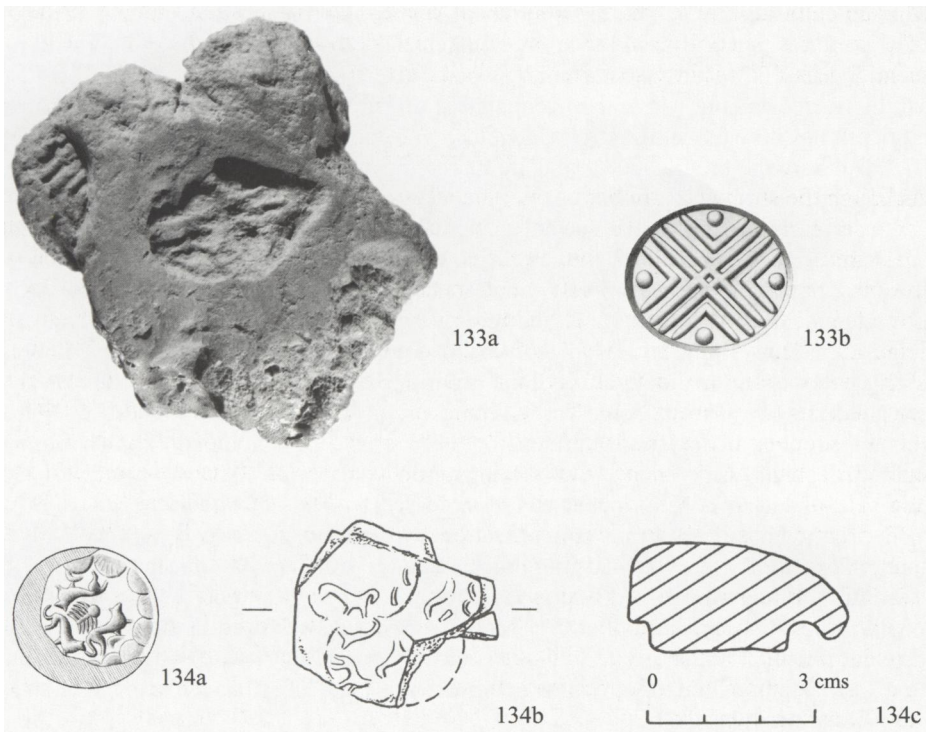


FIGURE 4.1 Diagrams showing Δ string-holes on (a) cylinder and (b) conoid.

⁴² This is true of the three-sided prisms (e.g. *CMS* II.1 no. 85, here **132**) dated to MM IA by J.-C. Poursat, in *CMS Beiheft* 5 (1995) 209–13. Evidence for dating is not as secure as one might like.

⁴³ J. F. Cherry, in *Minoan Society* 33–45.

⁴⁴ O. H. Krzyszkowska, in *Minoan Society* 163–69; Sbonias (n. 29) 280–88.



Direct object sealings from EM II Myrtos-*Fournou Korifi* (133) and EM III Knossos (134). Scales ca 1:1 (133a-b, 134a) and ca 2:3 (134b-c).

SEALINGS AND IMPRESSED OBJECTS

Perhaps the most troublesome aspect of pre-palatial glyptic is the extent to which seals were used sphragistically, i.e. for sealing purposes. At best we have fewer than two dozen impressions which can be attributed to this period with varying degrees of confidence.⁴⁵ About half of the impressions were used to mark objects such as vases (e.g. jar handles) and 'loom-weights'. The remainder are found on direct object sealings. These rarely reveal much, if anything, about the sealing support – in a few cases, wood or basketry seems likely. The evidence is so exiguous that doubts have been expressed regarding the use of seals for 'administrative purposes' in pre-palatial Crete.⁴⁶ Comparisons with Lerna are frequently made, with Crete invariably looking like a poor relation or a backward child. But are these views really justified?

First we must remember that Myrtos remains the only pre-palatial settlement which has been completely excavated using modern methods. This site – far from major centres of population – nevertheless yielded a direct object sealing: the context is EM II (133).

⁴⁵ See M. Vlasaki & E. Hallager, in *CMS Beiheft 5* (1995) 251-70. Most examples in their list (p. 253) now appear in *CMS II.6, II.8* and *V Suppl. 3*. Two sealings from the West Court, Knossos, should be deleted, see below n. 50.

⁴⁶ See discussion in *ASSA* 55-60.

Another example has been found on an even smaller and more remote site west of Khania, called Psathi.⁴⁷ The distribution of sealings and impressed objects now covers most of the island and a wide variety of sites. The absence of sealings at Vasiliki may seem a trifle disconcerting, inasmuch as parts of the site were burnt in EM II. But fires can be fickle, striking where the occupants of the site (or we) least want them. A sealing fragment has now come to light at Mochlos, an important gateway community in EM II-III.⁴⁸ But here the pre-palatial levels are largely covered by later structures, so we should not expect finds to be dramatic.

We have already noted the special difficulties at our later palatial centres. In fact, at later and equally critical phases in Minoan history, Mallia, Phaistos and above all Knossos have proved notoriously unreliable in preserving sealings (Chapters 5, 7). Continuous occupation, levelling, and rebuilding all militate against the survival of pre-palatial material. From an EM III context at Knossos we have a jar stopper, impressed with an ivory seal of the parading lions group (134). But other sealings impressed with pre-palatial seals do not come from secure pre-palatial contexts.⁴⁹ These could, conceivably, represent the use of antiques or 'heirlooms', a phenomenon known from later sealing deposits. Conversely, two sealings from excavations beneath the West Court, originally dated to EM II, appear to be impressed by seals of later date. Re-assessment of their context suggests that contamination was indeed possible.⁵⁰ However, a recent sounding at Mallia has yielded important evidence from the late pre-palatial period. A small lump of clay impressed with a seal, but unattached to another object, was found in a MM IA level.⁵¹ This kind of sealing, called a *nodulus*, was used in the Aegean until the very end of the Mycenaean period and is closely bound up with palatial administration. Here, at last, is a hint of growing complexity in seal use that we expect of the late pre-palatial period.

Arguments from silence are always risky and when it comes to pre-palatial sealings the archaeological record is singularly uncommunicative. Nevertheless, the notion that pre-palatial Crete used sealings infrequently and then only on a household basis seems absurd. Still more fanciful is the notion that the 'impulse' to seal faded, only to be revived under (renewed) Eastern influence in the proto-palatial period.⁵² Fifty years ago we had scarcely a handful of sealings from the mainland, evidently a backwater in terms of glyptic development (Chapter 3). That orthodoxy was swiftly overturned when the Lerna sealings came to light. And only a year later, an equally surprising and no less dramatic discovery revealed the Phaistos sealings (Chapter 5). The hazards of preservation and recovery play a crucial role in our ability to evaluate sealing practices. For their character in pre-palatial Crete we should keep an open mind.

⁴⁷ CMS V Suppl. 3 no. 119; E. Hallager, in CMS Beiheft 6 (2000) 97-99.

⁴⁸ CMS V Suppl. 3 no. 345.

⁴⁹ I. Pini, in ASSA 34-37 (see now list in CMS II.8 p. 145); cf. J. Weingarten, in *Knossos Labyrinth* 176-77.

⁵⁰ I. Pini, in CMS II.8 p. 5, nos. Add. 1 and 2.

⁵¹ M. Hue & O. Pelon, *BCH* 116 (1992) 31-33, figs. 33-34. Unfortunately the section drawing is misleading and the reverse was not illustrated, hence there is confusion in some accounts (e.g. Hallager [n. 47] 99) as to whether it was a direct object sealing. I cordially thank the excavator for allowing me to examine it in May 2001, together with J.-C. Poursat, who remarked that it closely resembles the *boules* (i.e. *noduli*) from Quartier Mu (e.g. 170-171). See also Chapter 5.

⁵² Thus J. Weingarten, in discussions published in ASSA 56, 117-18. For the opposite view see Schoep (n. 34) 268-73, though her use of the term 'administrative documents' for simple direct object sealings is misguided.

CHAPTER 5 CRETE AND THE ISLANDS OF THE AEGEAN IN THE MBA

Shortly after 2000 BC a complex palace-based society emerged on Crete. Whether this should be attributed to long steady evolution throughout the third millennium or to a marked quickening of pace in the later pre-palatial is hard to say. But continuity was surely a crucial factor; the island had escaped the kind of disruption and dislocation experienced on the mainland and in the islands during EB II-III. The inherently conservative nature of Minoan society, so amply documented by the communal tombs, seems to have ensured stability, while overseas contacts may have provided a critical impetus for change. These two forces – conservatism and innovation – persist into the proto-palatial period, which spans some 250 to 300 years (ca 1950–1700/1650 BC).¹ The earlier practice of communal burial continued: old tholoi in the Mesara were re-used and new ones constructed. The palaces themselves – at Knossos, Mallia, and Phaistos – were long in the building; the canonical features of central court and monumental ashlar facades seem to have been relatively late developments. However, ceremonial and religious functions are attested from the outset, so too their economic role as centres for storage, redistribution and manufacture. Thanks to increasing overseas contacts fostered by the palaces, new technology, iconography and raw materials reached the island. All had an impact on proto-palatial glyptic. To control and account for the movement of agricultural produce and its conversion into finished goods new administrative mechanisms were needed. The scripts that developed during the proto-palatial period were valuable tools in palace bureaucracies; but seals and sealings also played an increasingly important role.

In the islands of the central and eastern Aegean, contacts with Crete are attested from the beginning of the MBA. At first limited to small quantities of imported pottery, Cretan influence soon had an impact on local socio-economic developments. As for glyptic, the appearance of Minoan seals in the islands should cause no great surprise. Nevertheless, the spread of Minoan sealing practices as far as Samothrace in the north Aegean and Miletus on the Anatolian coast – this is striking indeed (see pp. 116-18).

SOURCES OF EVIDENCE AND DATING

Several factors impede our understanding of glyptic in the early proto-palatial period. First and foremost we have to contend with unbroken development from the preceding period and the absence of helpful destruction deposits, which might provide us with securely dated material. The persistence of communal burial is another impediment. Some of the old Mesara tholoi (e.g. at Aya Triada and Platanos) continue to be used throughout MM I-II. The fact that pottery of the MM IA style is made in non-palatial centres after the appearance of fast wheel-made MM IB pottery (Early Kamares) merely compounds our problems.² Other communal tombs, first constructed in MM II, remain in

¹ Recent accounts include: L.V. Watrous, in *Review* 198-213, 219-20, table 2; J. A. MacGillivray, in *Knossos Labyrinth* 45-55; G. Cadogan, *ibid.* 57-68; also I. Schoep, in *Monuments* 19-21. For dating see below. For principal sites mentioned in the present chapter see MAP 4.

² *Minoan Pottery* 71-89, esp. 77-79; *ABAC* 50-51.

use well into the neo-palatial period. This applies to the tholos at Kamilari near Phaistos and to some of the chamber tombs in the Knossos area.

Our best evidence for proto-palatial glyptic dates to late in the period (MM IIB), when the first palaces were destroyed.³ Deposits of sealings have been recovered at most major sites. Those from Phaistos and Monastiraki are substantial, while smaller groups have been found at Mallia (Quartier Mu) and Petras. At Mallia a seal engraver's workshop, also destroyed in MM IIB, further augments our evidence. These deposits offer a remarkable series of snap-shots which reveal key developments in both seal engraving and sealing practices toward the end of the proto-palatial period. They document the introduction of hard semi-precious stones and the use of fast rotary tools, which had important consequences for glyptic style. Striking changes also appear in sealing practices, with the invention of new types of nodules, apparently in response to increasing bureaucratic demands and the growth of written administration.

While the main features of proto-palatial glyptic can be outlined with some confidence, uncertainties inevitably remain. As we shall see, the co-existence of conservative and progressive workshops in MM IIB provides a challenge. The question of regionalism also needs to be kept in mind. It is now clear that the north and east of the island employed the so-called Hieroglyphic script, attested not only on tablets, but also on seals and sealings in MM II-III.⁴ This is in stark contrast to the south (and apparently the west) where inscribed seals are not found and administrative practices differ markedly. There are special complications at Knossos, where only a few sealings can be firmly attributed to MM II and the so-called Hieroglyphic 'Deposit' cannot be dated precisely, not least because no pottery was found with it. Moreover, it is far from clear whether all of the material attributed to this 'Deposit' really belongs together. While most of the material finds good parallels in MM II, some is certainly later. Thus the 'Deposit' as a whole – if deposit it be – probably belongs sometime in MM III, perhaps even as late as the Great Destruction of MM IIIB / LM IA Transitional. The so-called *Dépôt hiéroglyphique* at Mallia presents similar problems. None the less, I have decided (with some misgivings) to include both the Knossos and Mallia 'deposits' in the present chapter. Crescent-shaped nodules and Hieroglyphic seals were undoubtedly proto-palatial inventions, even if they were still used in what *we* have come to designate the early neo-palatial period. Here it is worth observing that while nowadays MM III tends to be assigned to the neo-palatial period, in truth it is difficult to place – a time of transition and transformation in Minoan society and glyptic alike.⁵ In any case, seals and sealing practices evolve at their own pace (or paces), sometimes at variance with the major horizons of Aegean cultural development. If this makes for a somewhat untidy account, it is merely a reflection of glyptic reality (see Chapter 1).

³ For MM IIB destruction deposits: ABAC 51-54. See below (n. 5) for MM IIIA.

⁴ I. Schoep, *OJA* 18 (1999) 265-68. *CHIC* now provides a complete catalogue; see also below.

⁵ For MM III generally see: ABAC 54-60; *Minoan Pottery* 103-114. Some scholars dispute the existence of an identifiable MM IIIA phase, others place 'MM IIB-III A' within the proto-palatial period, e.g. *Archanes* II 415-26 (Anemospilia). C. F. Macdonald (in *Monuments* 36-37) persuasively places the beginning of the neo-palatial period at *Knossos* in MM IIIB. Yule, following Levi, put the close of the proto-palatial period at the end of MM IIIB (*ECS* 6-7) and included material from the Temple Repositories (cf. Chapters 6-7). J. G. Younger's *Middle Phase* deals with glyptic from 'ca. 1700-1550 B.C.', thus excluding much MM II material and including some seals generally seen as MM III-LM I or later. For a good introduction to MM II-III glyptic, see: J. H. Betts, in *CMS Beiheft* 3 (1989) 1-17. General accounts include: *APG* 215-19; *GGFR*² 28-36, 406-08.

SEALS AND SEAL-TYPES

After grappling with the problems of the third millennium – the mismatch between sealings and seals on the mainland and the lack of securely dated material from Crete – it is with some relief that we turn to the proto-palatial period, with its good array of stratified material from MM IIB. This, in turn, allows us to date and bring into consideration many extant seals which lack a secure context or provenance. Naturally, these usually have to be assigned broad stylistic dates, e.g. MM I-II and MM II-III. Putting figures on the surviving repertoire is a tricky business, since many seals in this period are multi-facial, but at a very rough guess we may have over 2800 seal-types to work with.⁶ As usual we begin our survey with brief comments on materials, shapes and techniques, followed by general observations on motif and composition, as exemplified by the Phaistos deposit and related seals. Since steatite prisms and Hieroglyphic seals fall naturally into discrete groups, these are discussed separately.

MATERIALS, SHAPES, TECHNIQUES

During the early part of the proto-palatial period seals were still made exclusively in soft materials. But bone soon went out of favour and the short-lived fashion for ‘white pieces’ came to an end (see Chapter 4). Although a few ivory seals were used to impress sealings at Knossos, Mallia and Phaistos, these were certainly heirlooms (pp. 85, 104-05). As for soft stones, precise identification is not always easy and published descriptions are often demonstrably erroneous, making it hard for us to assess changing patterns of use. That said, chlorite, much favoured in the later pre-palatial, now seems to be somewhat less common. Instead engravers increasingly employed steatite: sometimes shiny black, sometimes mottled green, brown or yellow (C8; cf. C7). Although this material was *de rigueur* for making three and four-sided prisms at Mallia and elsewhere in north-central and eastern Crete, the precise source has yet to be identified.⁷

Toward the end of the proto-palatial period, hard semi-precious stones (Mohs 6-7) came to be used. Most belong to the silica (SiO₂) group, which comprises two broad classes of minerals: macro- and micro-crystalline quartzes.⁸ Macro-crystalline quartzes

⁶ We have about 600 steatite prisms with three or occasionally four faces (i.e. ca 1800 seal-types); hard stone prisms account for a further 250 types. To these one must add over 100 discoids (some bi-facial) and ca 250 seals with a single face (i.e. buttons, *Petschafte* etc.). In addition the Phaistos deposit accounts for 325 seal-types; Mallia and Knossos together add about another 100. Figures for Monastiraki and Petras are not yet known. The published examples are widely dispersed: *CMS* I, I Suppl., II.1, II.2, II.3, II.5, II.6, II.7, II.8, V, V Suppl. 1A–B, V Suppl. 3, VII–XIII, the Giamalakis Collection (*CM*), and the Ashmolean Museum (*CS*).

⁷ For Cretan soft stones: *MSV* 129-30, 137-41; M. J. Becker, *JFA* (1976) 361-74; J. H. Betts, in *CMS X* p. 19.

⁸ To the uninitiated, the various terms for stones used by mineralogists, gemmologists and archaeologists can seem more bewildering than enlightening. Moreover, within volumes of the *CMS* series, there are marked discrepancies in the way stones are described. While some identifications are patently wrong, other designations have simply fallen out of favour because they lack precision. Thus the terms ‘sard’ and ‘sardonyx’ are now avoided by the *CMS* team, who prefer to describe the hue and opacity of a particular stone in more detail (e.g. translucent brownish-red carnelian with several darker inclusions; brownish agate with light grey banding; and so on). For the reliability of *CMS* volumes, see Appendix 1. For stones used for Aegean seals, the most lucid English-language account is J. H. Betts, in *CMS X* pp. 16-20; also *GGFR*² 374-79; *ECS* 192-98. See below for stones used in Egypt and the Near East. For properties and colours, a good mineralogical handbook may be consulted (accepting the *caveats* expressed above): e.g. C. A. Sorrell & G. F. Sandstrom, *The Rocks and Minerals of the World* (London 1973).

include rock crystal, a clear colourless stone (cf. **C40**) and amethyst, which ranges from pale lilac to deep violet. Sometimes pieces of amethyst are completely translucent, more often they are somewhat cloudy (**C12**; cf. **C20**). Other coloured varieties of quartz (e.g. rose, smoky) are rarely used for Aegean seals. Jasper (a variety of chert) is a micro- or crypto-crystalline quartz, impregnated with impurities that give it an opaque appearance and dense coloration. Most commonly represented among Aegean seals are green and red jaspers, with yellow, black and mottled varieties being much rarer (**C9-C10**; cf. also **C27-C28**).⁹ A second family of micro- or crypto-crystalline quartzes are the fibrous chalcedonies. The mineralogical designation is potentially confusing, because it covers carnelian and agate, as well as blue chalcedony. Here I follow current *CMS* practice is limiting 'chalcedony' to the pale blue or bluish-grey variety, sometimes translucent, sometimes milky (**C14**; cf. **C21**, **C26**). Carnelian is a normally a translucent stone, ranging in colour from yellowish-orange to blood-red or brownish (**C13**; cf. **C30-C31**).¹⁰ Agate displays the widest variety of hue and opacity, created by admixtures of different materials. Thus greys, blues, yellows, oranges, reds, browns, blacks are all found, often enlivened with alternating translucent and opaque veins or bands (**C15-C17**; cf. **C19**, **C24**, **C33-C34**, **C36**, **C39**, **C41**, **C43-C47**). The range of effects could be further extended and enhanced by choosing to cut with the layers or across them. Exposure to heat could also produce variation in hue and opacity, though whether this was practised deliberately in the Aegean Bronze Age is hard to decide.¹¹

When it comes to sources of stones we generally have to fall back on educated guesswork, since no scientific methods exist for pinpointing origin. Rock crystal and jasper do occur on Crete, and perhaps elsewhere in the Aegean, but we have no reliable data.¹² While initially local sources may have sufficed, imports probably soon became necessary. Sometimes the use of semi-precious stones in the Aegean seems to reflect fashions in the Near East or Egypt. For instance, amethyst – quarried in the Eastern Desert – was much favoured for beads and scarabs in Middle Kingdom Egypt and small quantities reach the Aegean in MM II-III.¹³ Green jasper was popular for cylinder seals in MBA Syria; one wonders whether some of our exceptionally small Hieroglyphic prisms

⁹ In older literature (including volumes of the *CMS*) the term green jasper was often applied indiscriminately to any hard green stone, irrespective of its true nature; conchoidal fracturing is diagnostic. See also below n. 12.

¹⁰ Brownish carnelian is sometimes designated 'sard' (above n. 8). The popular spelling 'carnelian' used here (cf. German *Karneol*) is based on a false etymology from the Latin *carnis* (flesh). More accurate is cornelian, from *cornum* (red berry).

¹¹ **C11**, **C16**, **C18**, **C41**, **C46** seem to have been exposed to heat. P. Yule, *CMS Beiheft 1* (1981) 278-82 doubts whether this practice was deliberate; chance heating might have occurred, say, during the fumigation of tombs.

¹² For rock crystal: *MSV* 136-37. An unworked lump of red jasper from the Ayiofarango in southern Crete is displayed in the Museum of Natural History, Herakleion. J. G. Younger, *Archaeological News* 8 (1979) 40 wrongly equates red jasper with the purplish red marble *antico rosso*, found near Cape Tenairon in the southern Peloponnese (cf. *MSV* 126), and green jasper with *verde antico* (a mixture of serpentine and other minerals), found near Larissa in Thessaly. In *Middle Phase* 183 he adds to the confusion by stating that red and green jaspers 'derive from the single quarry on Cape Tenairon'. Jasper (of whatever colour) is a micro-crystalline quartz (see above).

¹³ *AEMT* 5-77 provides an excellent survey of stones used in Egypt; 50-52 for amethyst. Altogether only about 50 Aegean seals are made of amethyst. Some, including several MM II-III examples, are fashioned from beads or scarabs (e.g. *CS* no. 126 and, possibly, the foliate back *CS* no. 133, here **C12**). A detailed account is in preparation.

could be re-worked cylinders.¹⁴ The source of other stones is more obscure and this, in turn, can foster unwarranted assumptions. The common claim that carnelian came from the Indian sub-continent is a case in point. This was certainly one of the sources of carnelian used in Mesopotamia during the third and second millennia BC; Iran was another. Carnelian is also reported from Egypt and Anatolia: whether these sources were exploited in our period remains to be established.¹⁵ Likewise uncertain is how much unworked carnelian (if any) reached the Aegean at this time (see Chapter 6). Another puzzle is how and where the Minoans acquired pale blue chalcedony, which was occasionally used for seals (though rarely beads) in the proto-palatial period. Rarer still is lapis lazuli – altogether only 20 Aegean seals are made of this material; one or two date to the proto-palatial period.¹⁶ The ultimate source of the stone lies in modern Afghanistan and again one suspects that many of our lapis seals were made from re-cycled imports. Last but not least, metals – notably gold, silver and bronze – were also used for seals and signet rings in the proto-palatial period. Unfortunately, few examples have survived, though others are attested by their impressions on clay sealings (e.g. **181-183**).

Materials and techniques continue to have an important bearing on seal shape in the proto-palatial period. The abandonment of bone, ivory and ‘white materials’ helped bring about a noticeable reduction in the range of shapes; the advent of new technology further encouraged this trend. Blanks for stone seals could be obtained from cylindrical cores produced by a tubular drill driven by a bow, a technique possibly inspired by stone vase manufacture.¹⁷ In any case, this would readily yield shapes with circular faces, such as discoids, pierced buttons, bottles and stalk-signets or *Petschafte*. The faces of these seals normally range from 1.0–1.5 cm in diameter and indeed most proto-palatial seals are small in size, continuing a trend already observed in the preceding period. Illustrations in this chapter are mostly at 2:1. Other shapes include three-sided prisms with round or oval faces and four-sided prisms with rectangular faces. Some of these are so tiny, measuring no more than 1.5 x 0.5 cm, that they test our dexterity to the limit when making impressions (e.g. **162**). The Minoans were obviously more nimble-fingered. The shapes mentioned here occur in both hard and soft stone,¹⁸ though it stands to reason that the latter will be less regular, since they were made with hand-held tools. This is especially true of the steatite prisms. Rare shapes, which occur chiefly in hard stone, are pieces with fine torsional grooving, known as ‘foliate backs’, and zoomorphic seals (e.g. **C12, C14**).

By far the most significant technical advance of the proto-palatial period was the introduction of the fixed lapidary lathe. We do not know where the invention was originally made, although in Mesopotamia the lathe was apparently first used during the Old Babylonian Period (see Chapter 2). This is roughly contemporary with the proto-palatial era, a time when contacts between Minoan Crete and the eastern Mediterranean

¹⁴ The string-holes of certain prisms are suspiciously large (e.g. *CMS* VII no. 40 and XI no. 12; cf. here **162, 159**). At least one cylinder seal of the ‘Green Jasper Workshop’, produced in or near Byblos during the 18–17th centuries BC, reached Crete and was deposited in Poros tomb Π 1967: D. Collon, in P. Muhly, *Poros* 176–77. Syro-Palestinian scarabs were also made of green jasper: *Crete – Egypt Catalogue* no. 334 (Knossos: Ailias T. 7). For further references see Chapter 2 n. 30.

¹⁵ For an exhaustive account of stones used in the Near East, see: *AMMI* 74–110; 97–98 for carnelian; also *AEMT* 26–27.

¹⁶ E.g. *CMS* II.2 no. 286 (here **142**). For list see: O. H. Krzyszkowska, in P. A. Mountjoy, *Knossos: The South House*. *BSA Suppl.* 34 (London 2003) 201 n. 18. For sources: *AMMI* 85–92.

¹⁷ *MSV* 158–65; *Minoan Crafts I* 177–78.

¹⁸ *ECS* provides clear drawings and convenient lists under Shape Classes (e.g. nos. 1, 3–4, 8, 11, 13, 17, 19, 21–22, 26, 28d, 29–30, 31h–l, 33–34).

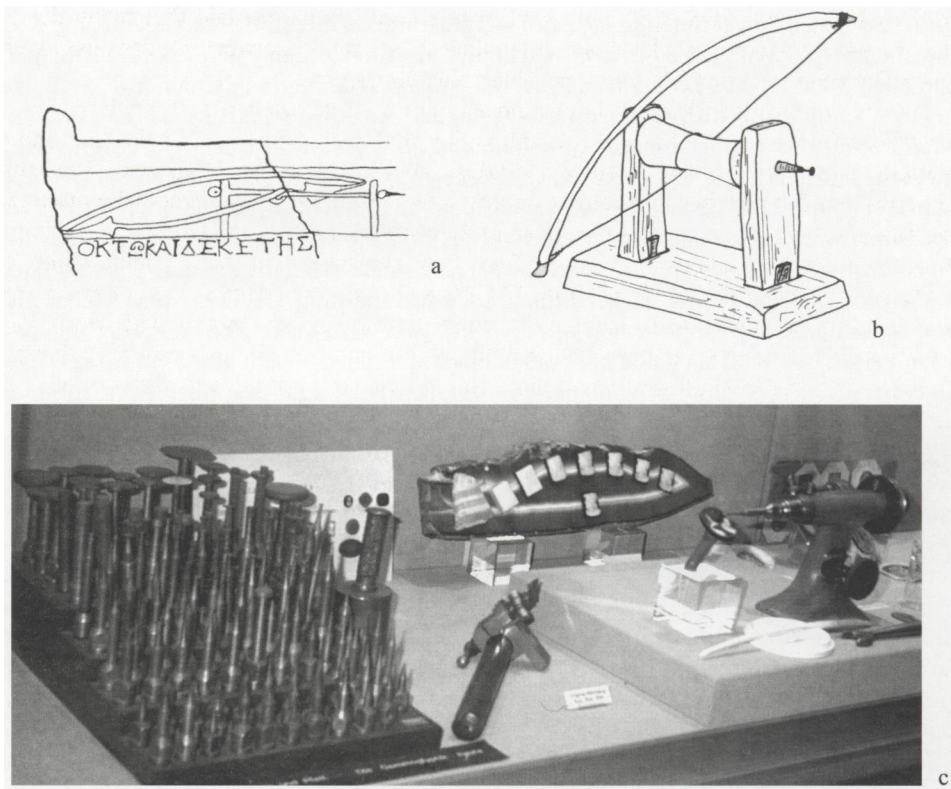


FIGURE 5.1 The lapidary lathe. A broken grave marker belonging to a young gem-engraver from Lydia (second century AD) is our sole pictorial evidence from antiquity for the lapidary lathe (a). Traditional craftsmen in India still employ versions of the lathe, powered by a bow (b). Modern equipment, powered by electricity, operates on much the same principle, with detachable drill bits, as displayed in the Deutsches Edelsteinmuseum at Idar-Oberstein, Germany (c).

were growing apace. Unfortunately, no ancient examples of the lapidary lathe have survived, and our sole pictorial representation dating to the second century AD is fragmentary (FIGURE 5.1a). But traditional workshops in Asia still employ versions of the fixed lathe, and we can reconstruct the basic features of the apparatus (FIGURE 5.1b). Two vertical uprights would be needed to support the horizontal free-turning spindle, powered by a bow. One end of the spindle probably protruded beyond the supports to allow for the attachment of cutting wheels and drill bits.¹⁹ The ancient craftsman – like his modern counterpart – would attach the blank for the seal to a stick or ‘dop’ with resin; he could then bring the stone into contact with the wheel or drill at the desired angle. To leave the engraver free to concentrate on the design, an apprentice probably operated the bow. Regular applications of oil would be needed to lubricate the stone; water would prevent overheating. Also essential was an abrasive, probably emery from Naxos. This, as much

¹⁹ J. Ogden, *Jewellery of the Ancient World* (London 1982) 148; *Minoan Crafts I* 158-60; W. Müller, in *CMS Beiheft 6* (2000) 195-98, figs. 1-2.

as the rotary power, was crucial for cutting hard stones. But while the general principles of the lapidary lathe are reasonably well understood, it must be said that many details remain obscure. Experimental work, involving collaboration between modern engravers and archaeologists, would certainly provide valuable insights.²⁰

The rotary tools had a marked impact on all stages of seal production.²¹ With the aid of different attachments – cutting wheels and various drill bits – they could be used to shape blanks, create string-holes, engrave intaglios. To facilitate engraving, seal faces that hitherto were flat now became convex in profile (e.g. **148b**). The engravers who mastered the new tools sometimes created virtuoso products: *Petschafte* with elaborate mouldings, elegant foliate backs, tectonic designs finer than cut-glass, exuberant combinations of solid and tubular drilling (e.g. **25**, **136**, **144**). But the fast rotary tools were only suitable for hard semi-precious stones: soft stones continued to be worked largely with hand tools. As we shall see, some engravers – notably those producing steatite prisms – seem largely unaffected by the technological revolution. But others may well have worked in both soft and hard stones. In any case, it is evident that they drew on a common decorative repertoire, adapted to suit whatever material and tools they had to hand. Later in this chapter we shall see how this applies to two special groups of proto-palatial seals – the steatite prisms and Hieroglyphic seals. First we need to survey general developments in motif, composition and style in proto-palatial glyptic.

MOTIF, COMPOSITION, STYLE

Our best guide to glyptic development in the proto-palatial period is the Phaistos sealing deposit, with over 300 seal-types securely dated to the end of MM IIB (see pp. 104-08). The mixture of ornamental and pictorial motifs – all *in use* at the same time – is truly fascinating. But we must not make the mistake of assuming that all the seals were *made* at the same time. While many types fit comfortably within MM I-II, others were probably made shortly before the destruction and indeed display features of MM II-III glyptic.²² A few seem so naturalistic that we might be forgiven for thinking they are later still, were it not for their well-dated context. A few more are veritable antiques: pre-palatial ivory seals pressed into service again, centuries after they were originally created (pp. 104-05). The general picture may be clear enough, but assigning more precise dates to individual seals and seal-types remains a distant goal. In broad terms, though, it is probably fair to say that ornamental motifs predominate in MM I-II while pictorial motifs become increasingly prominent during MM II-III.

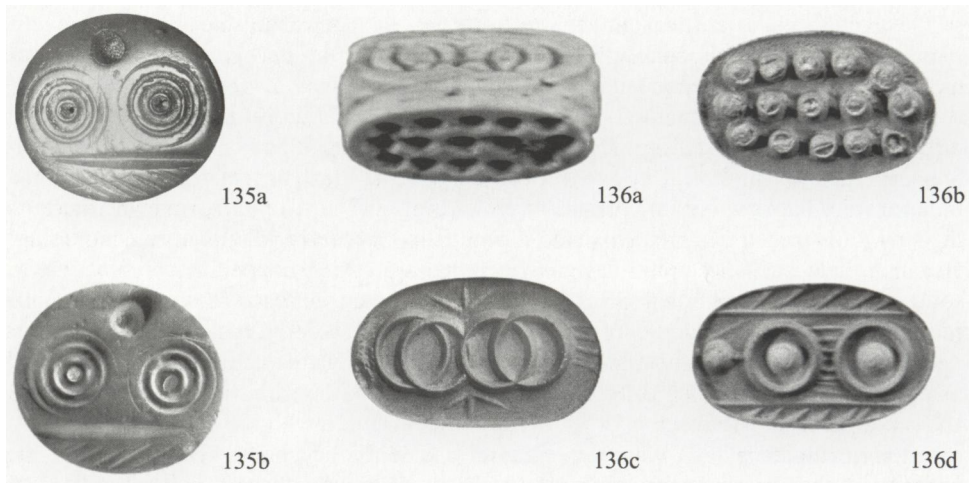
Ornamental motifs

At Phaistos the presence of advanced naturalistic motifs tends to overshadow the fact that most seal-types carried ornamental designs that were non-pictorial (**173-178**; pp. 104-08). Some are essentially geometric, making use of linear patterns or circles, frequently in combination. Others have a vaguely floral or vegetal character, but are basically abstract

²⁰ See Yule (n. 11) 273-78; *Minoan Crafts I* 156-60 (with references); Müller (n. 19) 195-98 (lathe), 199-202 (bow drill for string-holes).

²¹ Betts (n. 5) 12-14; *Middle Phase* xxi-xxiv. But the British Museum Department of Scientific Research has demonstrated that some Near Eastern cylinders hitherto thought to be engraved with rotary tools were actually worked with files charged with a suitable abrasive, e.g. quartz: M. Sax et al., *Antiquity* 74 (2000) 380-87; cf. Chapter 2. A pilot scheme, investigating selected Aegean seals, is now planned.

²² Betts (n. 5) 3-4. *CMS II.5* (1970) provides full coverage of the seal-types.



Selected MM II-III seals with centred circles and other drilled motifs. **135a-b** Bi-facial discoid of steatite from Knossos; face a and impression. **136a-d** Three-sided prism of agate from 'Papouda near Lyttos'; profile and impressions. Scale ca 2:1.

designs, such as spirals, with added details. While most ornamental motifs have their roots in the preceding period, changes in technique and composition now give them a fresh lease on life.²³

This is certainly true of centred circles, an exceptionally popular motif in proto-palatial glyptic. On earlier bone seals we occasionally find small single circles with a central dot, but new tools and techniques now made it possible to decorate seals with large multiple centred circles (**135**, **165**, **173-174**). Exactly how they were executed remains a mystery. We can, however, rule out ordinary tubular and solid drills used in combination, since the circles are always *perfectly* centred. The tool apparently had a central spike – to prevent it slipping – and was applied to the seal face vertically and powered by hand. These features would make the tool unsuitable for use on hard stones, and indeed most 'true' centred circles occur on soft stone seals.²⁴ A steatite discoid from Knossos shows how the spike created a sinking deeper than the surrounding circles (**135**). For semi-precious stones, the rotary tools allowed engravers to create elaborate designs with various drill bits, as a three-sided prism in Oxford famously shows (**136**). Cup-sinkings (raised hemispheres in impressions) were produced with a solid bit, hollow circles with a tubular drill, 'false' centred circles when the two were used in combination. On the Oxford seal, the interlocking circles are rather unevenly spaced, but often they are neatly disposed in patterns resembling the logos for the Olympic Games or Audi cars.

Linear patterns have an extremely long tradition in Minoan glyptic, beginning with simple lattice designs in EM II (Chapter 4). A surprising number of lattice motifs, or minor variations thereon, occur in the Phaistos deposit – a salutary warning to those who assume that increasing social complexity inevitably brings with it ever more sophisticated seal-types. Also attested at Phaistos are a few so-called tectonic motifs, linear designs

²³ ECS Motif nos. 19-26, 28, 32, 36, 38, 44-51 (examples range from pre-palatial to MM III-LM I); see also lists in *Middle Phase* 61-99 (MM II prisms are excluded).

²⁴ Betts (n. 5) 10-11.

that were surely meant to show off the potential of the new cutting wheels and the skill of the engravers in operating them. The term tectonic is something of a misnomer, since these designs do not emphasize the shape or structure of the seal, as do tectonic designs on vases, though the elaborate patterns of vertical, horizontal and diagonal lines can create the impression of registers. In any case, tectonic is a marginal improvement on older terminology ('architectural' or 'architectonic') applied to these motifs. And whatever we choose to call them, it is the technical virtuosity of the designs that really matters. Engraved on the rock crystal discoid from Avgos (25) are four parallel lines per square millimetre, a feat that demanded the steadiest of hands and utmost concentration.²⁵ But seals of this quality are rare and simpler tectonic designs also appear on soft stone seals (137b). Here it may be a case of soft stone engravers emulating fashions established in hard stone. Centred circles, by contrast, essentially seem a soft stone phenomenon, occasionally copied in hard stones. Although seals bearing geometric designs were still produced during MM III-LM I, pictorial motifs eventually came to dominate the neo-palatial repertoire (Chapter 6).

The circular faces of discoids, buttons and *Petschafte* also favoured radiating compositions such as star patterns (140-141, 178). The jasper button from Knossos (141) was obviously engraved with rotary tools, but similar designs also occur in soft stone and metal. A fine silver *Petschaft* from Mochlos (140), engraved with a radiating pattern, helps to illustrate how abstract designs can be enlivened by minor additions and be subtly transformed into motifs that are vaguely pictorial in character. Instead of simple linear spokes, the Mochlos seal has slender petals (or leaves?) alternating with twig-like elements. Motifs of this kind are sometimes called 'pictorializing' – a rather ugly but undeniably useful term, for the outcome is never purely 'pictorial' and the inspiration is invariably abstract.²⁶ Once we understand the basic principle, we can see it at work on countless proto-palatial seals. Pictorializing motifs are not confined to the Phaistos deposit and related seals, but are freely used on steatite prisms and Hieroglyphic seals too (see below). This is especially interesting since other faces of the same seals often carry purely pictorial motifs. For instance, a prism from the Mallia workshop bears a twig-like cross filled with solid dots on one face, a whirling motif on another, and a male figure holding an arrow on the third (154a-c). The last may be crude, but is undoubtedly pictorial in character; first two are pictorializing.

Spiraliform designs, ever popular in Minoan art, play an important role in proto-palatial glyptic. They seem capable of almost infinite variation – sometimes disposed in rotating patterns, as the S-spirals on a steatite bottle from Kamilari (138; cf. 190); sometimes transformed into delightful floral motifs, as the C-spiral on a button from the same site (139).²⁷ Especially charming is the combination of S-spirals and *fleurs de lys* on a rectangular bar made of lapis lazuli from Palaikastro and on a *nodulus* at Quartier Mu (142c, 189). J-spirals lend themselves to the creation of petaloid loops – sometimes known as 'paisleys' – an ideal ornament for oval seal faces (e.g. 175). Petaloid loops and other spiraliform designs find good parallels in contemporary Kamares Ware and the same

²⁵ *CMS* II.2 p. xvii; cf. Yule (n. 11) 274-76. Yule rightly leaves open the possibility that some tectonic motifs were engraved with files charged with an abrasive. This may be true of the simple tectonic design on a rock crystal discoid BM G&R 1999.9-3.1 (for which: O. Krzyszkowska, in *CMS* Beiheft 6 [2000] 162 n. 50, fig. 4). More elaborate tectonic motifs might have involved a mixture of wheel-cutting and hand-filing; cf. Sax et al. (n. 21).

²⁶ G. Walberg, *Tradition and Innovation: Essays in Minoan Art* (Mainz 1986) 6ff. The principle is already evident in pre-palatial glyptic, e.g. here 108-109, 118-121.

²⁷ Not jasper as described in *CMS* II.2 no. 6, but a soft to medium-hard stone.



Selected MM II-III seals with decorative motifs from Kamilari (137-138 soft stone; 139 medium-hard stone), Mochlos (140 silver), Knossos (141 jasper) and Palaikastro (142 lapis lazuli). Profiles, impressions and faces (140b, 142a). Scale ca 2:1.

can be said of the underlying principles of composition, such as rotation, radiation and *rapport* (cf. Chapter 4). While some similarities may reflect contemporary borrowings, others probably stem from a shared artistic language. Indeed most of the motifs described here – be they purely abstract or pictorializing – can be traced well back into the pre-palatial period, long before they appear on pottery.²⁸ But by MM III the ornamental repertoire was on the wane and seals bearing pictorial motifs became the norm.

Pictorial motifs

In the pre-palatial period animals and insects had played a limited role in the glyptic repertoire and human figures occurred infrequently (Chapter 4). Pictorial representations become much more common in MM II and the trend continues apace in the neo-palatial period (Chapter 6). While Phaistos again provides many excellent examples, and allows us to bring unprovenanced seals into play, pictorial motifs are also found on steatite prisms and Hieroglyphic seals (see below). And not only do pictorial motifs occur on seals of soft and hard stone, there are – or rather were – some exceptionally fine examples on metal signet rings, known to us from the Phaistos deposit. The Phaistos sealings also introduce us to ambitious new poses and compositions, such as the flying gallop, animal attacks and landscape settings, not to mention a wealth of new imagery drawn from the natural and the supernatural worlds.

Before we tackle the vexed question of style, let us consider the remarkably rich iconographic repertoire attested on our MM II-III pictorial seals.²⁹ Almost every creature of the land, sea and sky seems to be represented. Goats or wild goats occupy pride of place (**36-37**, **144b**, **149a**, **153c**, **155b**, **160a**, **164b**, **182**). They are followed by other native species, such as bulls (**158b**), dogs or wolves (**149a**, **179**) and occasionally boar. Deer, perhaps first brought to Crete during this period, appear only rarely.³⁰ Felines were not indigenous to the island either. Cats were surely introduced; lions are another matter and so one might imagine that the lions on our seals would be based on borrowed images and not inspired from nature. Some MM II-III lions are certainly stylized and, curiously, so too are ordinary cats (**143b**, **161a**, **197**). Yet two or three lions at Phaistos are remarkably life-like (**183**; cf. **203**) and anticipate the naturalistic renderings of LB I.

The poses adopted by our terrestrial beasts are equally varied and many remain firm favourites until LB III, when Aegean glyptic comes to an end.³¹ To a large extent pose and composition are linked to the shape of the seal face. For this reason, seated or running animals – with their legs bent beneath their bellies – are admirably suited to circular fields (e.g. **37** and Chapter 1). The running or flying gallop is ideal for the oval faces of prisms or signet rings, as demonstrated by several impressions at Phaistos (**182**). On an agate cushion in London a wild goat and an attacking dog are both shown in flying gallop (**149a**; **C17**). Here the strong diagonals are balanced by the curving horns of the goat and stylized rock-work (created with a tubular drill) in the corners. Engraved on the reverse is the so-called ‘Archanes Formula’ (**149b**; see also Chapter 4 and below p. 96).

²⁸ Walberg (n. 26) 39-56.

²⁹ See *ECS Motif nos. 1-18* (examples range in date from pre-palatial to MM III-LM I); *Middle Phase 5-37* also provides useful lists, but note that MM II steatite prisms are excluded and seals assigned to MM III-LM I (or later) are included.

³⁰ *Ivory Guide* 25-26, 30 nn. 32, 34. For a convenient account of Cretan fauna (extinct, wild and domesticated) see: O. Rackham and J. Moody, *The Making of the Cretan Landscape* (Manchester and New York 1996) 46-59, 74-76. L. Morgan, *The Miniature Wall Paintings of Thera* (Cambridge 1988) 41-49, 54-67 surveys animals and birds in Aegean art, especially during LB I.

³¹ Compare the schematic pose types in *Middle Phase* 1-3 and *Iconography* 1-3.

Other attack scenes are more artificial, with the predator set above the back of its prey: only in LB I do we find truly convincing animal attacks, observed from nature (e.g. 31). But given that MM II-III engravers were still grappling with new materials and techniques, their animals are remarkably effective. Sometimes goats rear up on their hind-legs, as on a Hieroglyphic prism in the Metaxas Collection (160a) or, more realistically, stand poised atop a rocky outcrop on a *Petschaft* in Oxford (144b). An agate discoid, also in Oxford, has a similar rocky outcrop (created with a solid drill) topped with palm fronds (148a; C15). These motifs are of especial interest, since they show that symmetrical (or near symmetrical) compositions have a long history in Aegean glyptic and were not first invented in the LBA (Chapter 6).

Creatures of the sea and sky, largely ignored in pre-palatial glyptic, enrich the pictorial repertoire during MM II-III. There are octopods or cuttlefish, a few crabs and triton-shells. Fish are well represented among the steatite prisms (e.g. 156a, 157c) and a fine pair of dolphins swims round the circular face of a yellow jasper *Petschaft* in Berlin (145b; C10). We also have a pair of magnificent owls – one on a *Petschaft* in Oxford (147) and a near match at Phaistos. There are a few doves (159a) and several long-necked water-birds, heads *regardant* (155b). Insects, however, play a limited role in proto-palatial glyptic: spiders are mostly found on steatite prisms (153d, 191) and a few bees or wasps occur at Phaistos. So far, we have no antecedents for the fine butterflies and dragonflies of the neo-palatial period (e.g. 260).

Last, but perhaps not least, comes a diverse group of creatures – some real, others purely imaginary, all foreign to the Aegean. Each and every one comes to play a special role in Minoan religious iconography in the LBA: the monkey (4c), the griffin, the sphinx (146, 180), the Minoan genius (181), and the Minoan ‘dragon’. All make their first appearance at Phaistos or on contemporary seals. But for the moment, they appear only as isolated images, exotic creatures in search of a role. Only the Minoan genius – swiftly transformed from the Egyptian hippopotamus goddess, Taweret – brings her native attributes in the form of jugs and vegetation.³² For most others, we cannot even be sure of their homeland, much less the routes they travelled to Crete.³³ For the present is it enough to heed their arrival, when Minoan contacts with the eastern Mediterranean were growing apace. In later chapters we will investigate their symbolism further and see how they fared in their new Aegean home (Chapters 6, 8-9)

Against this world of almost infinite promise, it is all the more surprising to find that human figures are exceedingly rare on the Phaistos sealings and related types. Perhaps this is mere chance, for humans play an active role on the steatite prisms. On these they seem to be engaged in everyday activities; there is nothing to prepare us for the enigmatic cult scenes found in the neo-palatial period. The so-called ‘portrait’ heads from the Hieroglyphic ‘Deposit’ at Knossos are discussed below and in Chapter 6.

³² J. Weingarten, *The Transformation of Egyptian Taweret into the Minoan Genius*. SIMA 88 (Partille 1991); eadem, in *Crete – Egypt Studies* 114-19; also earlier accounts by M. A. V. Gill, *AM* 79 (1964) 1-21; eadem, *AJA* 74 (1970) 404-06.

³³ Useful accounts include: Phillips *Aegyptiaca* (monkeys); *Aegean – East* 40-53 and Morgan (n. 30) 49-54 (sphinxes, griffins: mostly LBA). Ivories from Acmehöyük offer good parallels for MM II sphinxes: R. D. Barnett, *Ancient Ivories in the Middle East*. Qedem 14 (Jerusalem 1982) pl. 26a, d-e; see also J. Aruz, in M. J. Mellink et al. (eds.), *Aspects of Art and Iconography: Anatolia and its Neighbors. Studies in Honor of Nimet Özgüç* (Ankara 1993) 37-38. The Minoan ‘dragon’ appears on a MM II-III discoid, *CMS* XI no. 291; whether *CMS* IV no. 29D represents a ‘dragon’ or a crocodile is uncertain. For LBA representations see J.-C. Poursat, *BCH* 100 (1976) 461-74; J. Phillips, in C. J. Eyre (ed.), *Proceedings of the Seventh International Congress of Egyptologists*. *Orientalia Lovaniensia Analecta* 82 (Leuven 1998) 849-62.



Selected MM II-III hard stone seals with pictorial motifs from 'Axos' (143), 'Kedri' (144), 'Crete' (145), 'Archanes' (146), 'Central Crete' (148) and unknown provenance (147, 149). Profiles and impressions (143-145, 148); impressions only (146-147, 149a-b). Scale ca 2:1.

As stressed from the outset, material and technique have an important bearing on style. This is especially true for hard stone seals in MM II-III, when engravers were still coming to terms with the benefits (and drawbacks) of rotary-powered tools. Indeed undisguised tool marks are a defining feature of this period and modelling is at best rudimentary (36, 149a). But we should not criticize these pioneers for failing to achieve 'naturalistic' renderings. What could be more striking than the cat's head on 143b, achieved with a few deliberate applications of drills and wheels? The seal face is under 1 cm in diameter and many MM II-III seals are equally small. This too has a bearing on style. Engravers also had to think in reverse, no mean feat when manipulating tiny stones against rotary tools, and a particular challenge when rendering depth. Yet on the little Berlin prism, the dove's front wing is correctly shown in higher relief than the neck and breast, while the back wing and tail are treated in a more summary fashion (159a).

The distinctive drill work and wheel cutting that help to define style in MM II-III hard stone seals are absent from contemporary pieces engraved in soft stone. For these, rotary tools were unsuitable and engravers relied on slow hand-turned drills and blades of various kinds. Working by hand, directly onto the surface of the seal, the craftsman had greater control; smoothing and modelling of engraved surfaces was also easier. In consequence, motifs sometimes seem less 'stylized' than on MM II-III seals made of hard stone. The benefits of working on gold or silver were greater still, for these are relatively soft materials, which could be engraved by hand with extremely fine tools.³⁴ It comes as no surprise that our most advanced seal-types at Phaistos are impressions of metal signet rings (e.g. 181-183). This trend continues apace in the neo-palatial period, when signet rings stood in the very forefront of glyptic development (see Chapter 6).

Steatite prisms

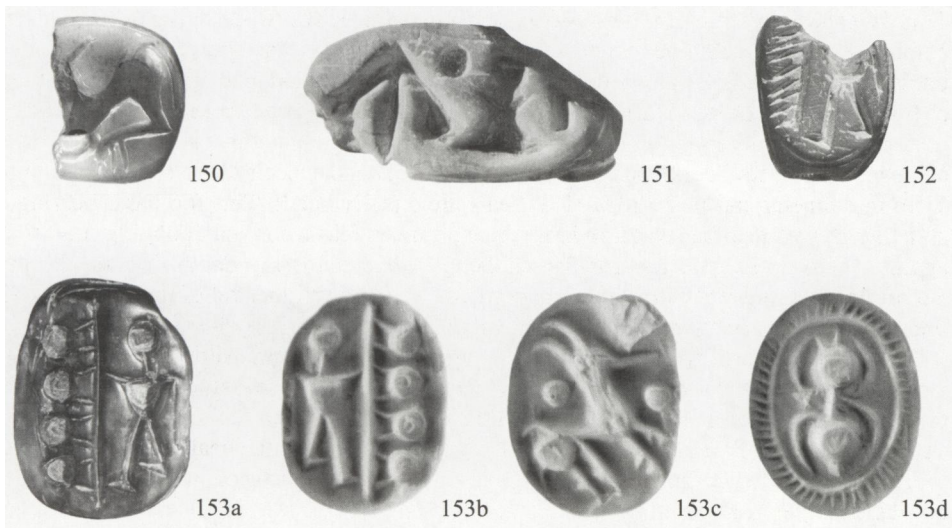
With around 600 examples, the steatite prisms represent our largest surviving group of proto-palatial seals.³⁵ Most are three-sided with round or oval faces; but some have four rectangular faces. Steatite was evidently the material of choice for these seals; none is made in chlorite, though versions do occur in hard stones (see below). In the past there was considerable confusion regarding the steatite prisms: function, relationship to Cretan Hieroglyphic and chronology all being poorly understood. The crudest examples were regarded as EM II products, with the bulk dating to EM III or MM I.³⁶ This seemed to tally with their occurrence in certain Mesara tholoi. But, as we now realize, some of these communal tombs were used into the proto-palatial period and, in reality, few three-sided prisms have been found there. A recent count reduced the number of possible early prisms to around a dozen, including examples made of bone.³⁷

³⁴ As is apparent from the ancient impressions. Contrary to popular belief, Aegean signet rings were *not* normally cast, but were made of gold sheet on which the motifs were engraved and punched by hand: see Chapter 6. Some MM II-III metal *seals* were, however, cast to shape, e.g. the silver *Petschaft* from Mochlos (*CMS* II.2 no. 252, here 140) or the gold stamp in the Ashmolean, *CS* no. 137: I. Pini (unpublished paper 1996).

³⁵ No convenient list exists and examples appear in most *CMS* volumes, as well as *CM* (for the Giamalakis Collection) and *CS* (for the Ashmolean Museum).

³⁶ Thus *PM* I 68-69, 123-25 followed by Kenna (*CS* 20-23 and *CMS* IV, VII-VIII, XII) and Boardman (*GGFR*² 26-31, 406-07); cf. *CMS* IX. The supposed distinction between 'Archaic Prisms I and II', based on the shape (round or oval) of seal face, is false: the two varieties are contemporary. Yule dated his 'Malia Workshop Complex' to MM IB-II: *ECS* 212-13. Betts (n. 5) 4-6 provides a useful summary and dating.

³⁷ J.-C. Poursat, in *CMS* Beiheft 5 (1995) 209-13; see here 132 and Chapter 4.



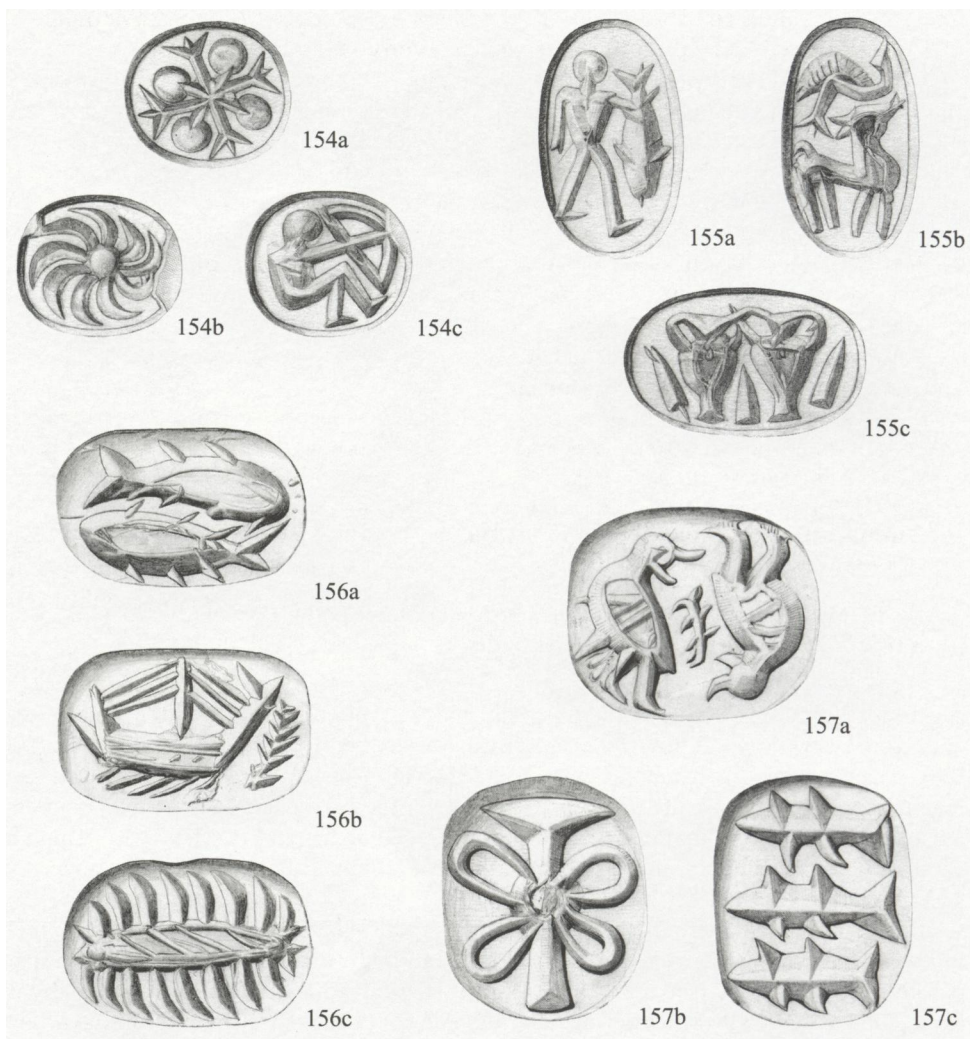
Selected MM II steatite prisms from Mallia *Atelier des sceaux* (150-152) and Gonies (153). Seal faces (150-153a) and impressions (153b-d). Scale ca 2:1.

Most steatite prisms come from the north and east of the island.³⁸ At Mallia a seal engraver's workshop (*Atelier des sceaux*) was discovered in 1956, containing over 100 broken and unfinished examples (e.g. 150-152). The site not only sheds light on seal manufacture, but it has also resolved the chronological debate: the Atelier and the adjacent buildings of Quartier Mu were all destroyed at the end of MM IIB.³⁹ Thus, in ceramic if not absolute terms, the destructions at Mallia and Phaistos are contemporary. The discoveries at Mallia also help to clarify several other issues, including the relationship between Hieroglyphic seals and the prisms which bear decorative or pictorial motifs. The latter were once regarded as an early form of 'picture writing', the forerunner of Cretan Hieroglyphic (see pp. 95-98). In fact, Hieroglyphic and non-Hieroglyphic seals exist side-by-side in the Quartier Mu and the Atelier (151 is inscribed). Moreover, both varieties were used to impress sealings in the Quartier (see pp. 109-11). Thus the steatite prisms with decorative and pictorial motifs were not merely amulets, as once supposed, but were indeed used for sealing purposes.⁴⁰ Moreover, the discoveries at Mallia indicate that even after hard semi-precious stones worked with rotary tools had been introduced, rather crude seals fashioned by hand were still being made and used (see also Chapter 6). While such clear proof that glyptic development was not linear is immensely valuable, it also raises intriguing questions regarding the link between seals and social status in proto-palatial Crete.

³⁸ Distribution map: J.-C. Poursat & E. Papatsarouha, in *CMS Beiheft* 6 (2000) 260.

³⁹ *Mu I* 11-27 (excavation and dating); *Mu II* 157-229 (seals and sealings from Bâtiments A and B); *Mu III* 7-21, 103-10 (for the Atelier). The seals from the Atelier appear in *CMS II.2* nos. 86-198, with a further 26 now published in *Mu III* 104-05, pls. 58-67. For the sealings, now re-published in *CMS II.6*, see below pp. 109-11. See FIGURES 5.3-5.4 (p. 110) for map of Mallia area and site plan.

⁴⁰ For prisms as amulets: CS 21-23; cf. 'talismanic' seals (Chapter 6).



Selected MM II steatite prisms from Mallia *Atelier des sceaux* (**154a-c** and **155a-c**), Adromyli (**156a-c**) and Mochos (**157a-c**). Drawings of impressions. Scale ca 2:1.

The steatite prisms at Mallia and elsewhere are undeniably crude in style. But we should not confuse this with poor quality or careless execution; rather the effect is directly linked to the material itself and to technique. The tool-kit was extremely simple, consisting of knives, V-shaped burins or gouges, and hand-turned solid drills.⁴¹ The drills were not only used for string-holes, but also to render circular features, such as heads (**153**). Abrasives – very likely sand – would also be needed; so too some kind of polisher to eradicate tool marks, which appear on the broken and unfinished examples in the Atelier (**150-152**). Sometimes seals found elsewhere are also ‘workshop fresh’, their engraved surfaces appearing milky-white against the darker colours of the stone.

⁴¹ *Minoan Crafts I* 149-52; *Mu III* 106-110.

Notwithstanding their simple tool-kit, the engravers produced a remarkable range of images, often striking in appearance. Decorative motifs include radiating patterns, such as whirls (154b) and *croix pommetées* (154a), S-spirals and petaloid loops. Most are found on other MM II-III seals and also occur in the Phaistos sealing deposit; in other words, these motifs are not exclusive to steatite prisms. Pictorial motifs are very varied: humans and animals, insects, fish, birds, vases and ships (150, 152-153, 154c, 155-156, 157a, c; C8). The humans, usually male, are often engaged in some kind of activity, e.g. holding a bow and arrow (154c), a fish (155a), or working at what may be a loom (153a-b).⁴² But what kind of message, if any, do the seals convey? Could some motifs relate to the occupation of the seal owner? The idea is tempting, but impossible to prove. Indeed the very purpose of these three-sided prisms remains enigmatic and we are left wondering if the combinations of motifs had any significance other than the purely decorative.⁴³

Among the steatite prisms several stylistic trends can be discerned, albeit with difficulty. In the Atelier itself, all examples seem to be executed in much the same style and should be regarded as the products of a single craftsman, perhaps assisted by an apprentice.⁴⁴ Prisms found elsewhere – even those from the town and palace at Mallia – display different features. For instance, human figures on seals from the Atelier are ordinarily rendered with simple drilled heads, wedge-shaped bodies and stick-like legs (e.g. 152, 154c, 155a). The figures on the prism from Mochos (157a) are very different, with hatched leaf-shaped bodies (to indicate garments?) and short strokes at their heads, perhaps indicating noses and chins. In turn we might compare the rendering of the fish on the Mochos prism (157c) to those on a seal from Adromyli (156a), or indeed to the one held by a fisherman in the Atelier (155a). Perhaps in time it may prove possible to define stylistic variations with greater accuracy.⁴⁵ In the meantime, it is enough to recognize that our steatite prisms were certainly made in a number of production centres, some contemporary with the Atelier, others perhaps somewhat earlier in MM II. But there is scant evidence that any were made after the end of the proto-palatial period.

Hieroglyphic seals

It was a seal inscribed with Hieroglyphic signs which first drew Sir Arthur Evans to Crete, eventually leading to excavations at Knossos and the discovery of Minoan culture (Chapter 11). Although Evans continued to be fascinated by Cretan ‘pictograms’, he was unable to make much progress in understanding this early writing system. Indeed the script remains undeciphered; and since the surviving body of material is so small, decipherment seems unlikely.⁴⁶ Nevertheless, in recent years our understanding of the script has improved and the publication of the *Corpus Hieroglyphicarum Inscriptionum Cretae* (CHIC) provides us with systematic documentation for all Hieroglyphic material,

⁴² Usually the spherical objects attached to a pole are regarded as pots; plausibly re-interpreted as loom-weights by B. Burke, in *TEXNH* 418-19, 421.

⁴³ J. G. Younger (*Meletemata* 953-54) notes that only two prisms bear the same combination of motifs, which might suggest that personal identity was a prime concern. Against this we must set the fact that only in rare instances were sealings *perhaps* impressed by more than one face of the same seal. These exceptions are four-sided Hieroglyphic prisms: see below and n. 90.

⁴⁴ *Mu III* 110; Poursat & Papatsarouha (n. 38) 263-65, 268.

⁴⁵ Poursat & Papatsarouha (n. 38) 267-68 note possible distinctions between products of the Atelier and local variants of the ‘Style de Malia’. See also Chapter 11.

⁴⁶ J.-P. Olivier, in Y. Duhoux et al. (eds.), *Problems in Decipherment* (Louvain 1989) 42-43, fig. 4 shows that the total corpus of 1500 signs set in 9 point type amounts to a single printed A-5 page (*versus* 7 pages for Linear A and more than 30 for Linear B).

whether on seals and sealings or inscribed on clay documents. It is, for instance, now clear that the script is not pictographic but syllabic in nature; the table of signs has also been firmly established. Certain 'pictograms' identified by Evans are excluded, as they are simply pictorial or decorative elements found on prisms and other MM II-III seals.⁴⁷

Since all our datable examples of Cretan Hieroglyphic belong to MM II or MM III, the origins of the script are obscure. It is far from clear that the 'Archanes Formula' found on a handful of MM IA seals represents a direct ancestor, although some kind of connexion seems likely (Chapter 4). The formula also occurs on several seals of MM II-III date (e.g. **149b**, **204b**).⁴⁸ About 200 seals and seal impressions carry Hieroglyphic signs, roughly 10% of the surviving MM II-III glyptic repertoire (see p. 81). The few examples from known find-spots are concentrated in north-central and eastern parts of the island; only one seal-type at Phaistos bears Hieroglyphic signs. This distribution corresponds closely to the occurrence of clay administrative documents written in Hieroglyphic script at the palatial centres of Mallia, Petras and Knossos (see below). It is also remarkably close to the distribution of the steatite prisms considered earlier.⁴⁹

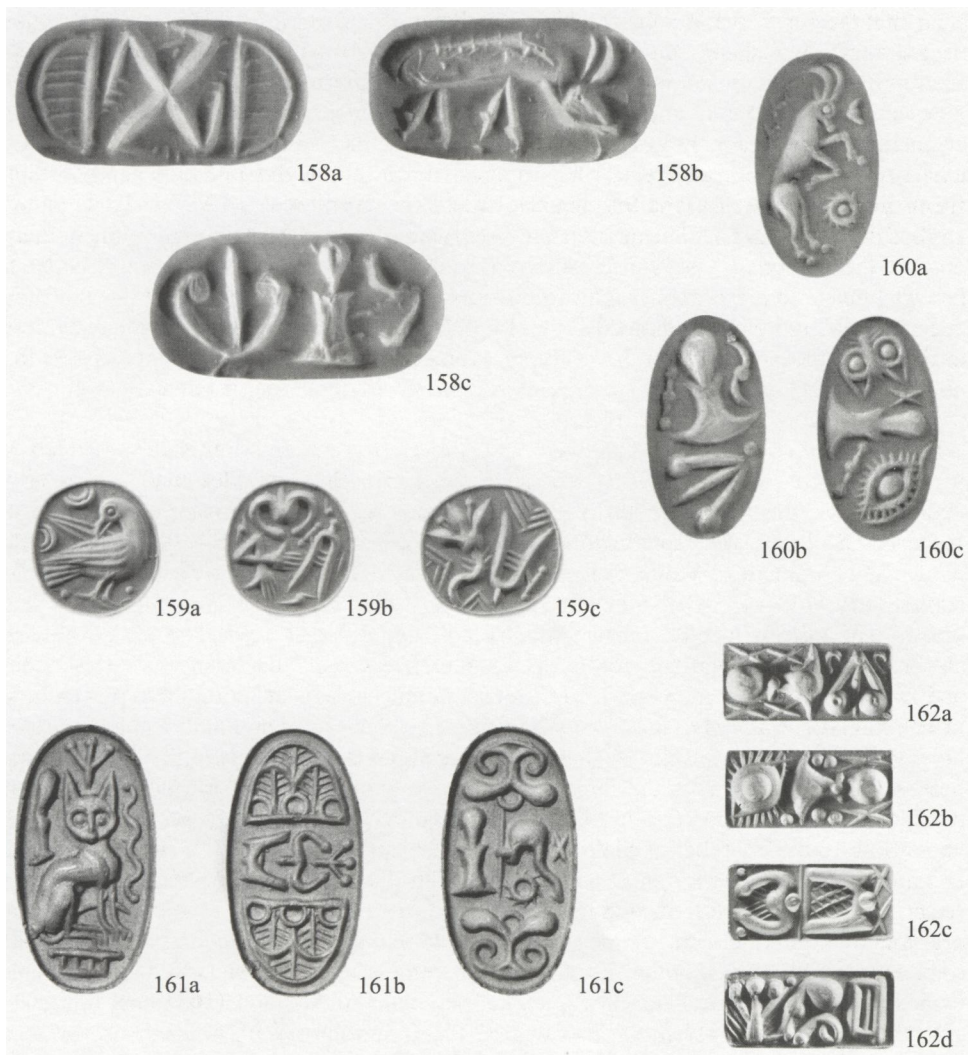
Hieroglyphic seals come in various shapes, but most common are prisms with three or four faces made in both steatite and hard stones. On the examples made of steatite, Hieroglyphic signs are often confined to one or two faces. For instance, on a seal from Avdou (**158**) the 'trowel and arrow' sign-group (*CHIC* 044-049) occurs on one seal face, while the others bear a bull and a swastika, motifs that might be found on any MM II steatite prism. Similarly a damaged prism from the Mallia Atelier has the 'trowel and arrow' signs on one face (**151**) and pictorial motifs (a ship and a goat) on the others. We also find decorative and pictorial motifs on hard stone prisms; their style obviously differs, but the iconographic repertoire is comparable. However, hard stone prisms tend to have Hieroglyphic signs on more than one face; indeed it is not uncommon for all faces to be inscribed (e.g. **161-162**). A green jasper prism in the Metaxas Collection (**160**) has a wild goat on one face, the 'trowel and arrow' sign-group on the second face, and the 'trowel and eye' (*CHIC* 044-005) on the third. Here we also note a tiny X and a cat's face (**160c**). The X, or initial cross, is a diacritical mark, apparently used to indicate the beginning of an inscription; but the cat's face is not now accepted as an element in the script, since it is not attested on clay documents.⁵⁰ The motif occurs on both Hieroglyphic and non-Hieroglyphic seals in MM II (e.g. **143b**, **197**). Most of our hard stone prisms are tiny, and it is difficult to comprehend how engravers were able to place so many elements on a single seal face. For instance, a four-sided prism in London (**162**) measures only 1.1 x 0.5 cm, while the faces of a three-sided prism in Berlin (**159**) are less than 1 cm in diameter. Here, not content to execute complicated Hieroglyphic signs on faces b and c, the engraver has also included several small filling ornaments. In some cases, however, the decorative and pictorial motifs seem to overpower the Hieroglyphic signs. A famous prism in the Ashmolean Museum illustrates this point admirably (**161**; **C13**). On one face a cat, with an outsized but undeniably striking head, occupies centre field, while the three Hieroglyphic signs are relegated to the periphery, almost as if subordinate fillers (**161a**). On the other two faces the signs are placed in the centre, but these zones are crowded by the flanking floral and vegetal motifs (**161b-c**).

⁴⁷ Note also that the supposed distinction between 'Hieroglyphic A and B' on 'early' / steatite prisms and 'later' / hard stone prisms (*ECS* 169-71, following *PM* I 195-96, 272-73) is false.

⁴⁸ *CHIC* 18 n. 59 provides a complete list; cf. also *ECS* 170. For links to Linear A see now: L. Godart, in *Meletemata* 299-302.

⁴⁹ Compare distribution maps: *CHIC* 20 and Poursat & Papatsarouha (n. 38) 260.

⁵⁰ *CHIC* 12-17; also J.-P. Olivier, in *CMS* Beiheft 5 (1995) 169-81, esp. 170 n. 5.



Selected MM II-III prisms with Hieroglyphic inscriptions from Avdou (**158**), 'Crete' (**159**), 'Mallia' (**160**), 'Lasithi' (**161**) and unknown provenance (**162**). All are hard stone, except **158** (steatite). Impressions. Scale ca 2:1.

What was the purpose of these inscribed seals? Did their function differ from seals that bore purely decorative or pictorial motifs? Our clues are contradictory. The 'inscriptions' are often very short, sometimes consisting of no more than two or three signs. A few sign-groups and diacritical marks are common to both seals and clay documents, where presumably they were 'readable' in the ordinary sense. These include the 'trowel and arrow', the 'trowel and eye' and the initial cross. When they appear on seals, were these sign-groups meant to be read as words? Did they spell out a title or the name of an office? Or did they convey meaning in some other way? As symbols or emblems they are easily recognizable, but so too are many pictorial and decorative motifs. The florid style –

in which ornamental aspects are emphasized and Hieroglyphic signs embellished – also raises suspicions.⁵¹ Could it be that the possession of an inscribed seal was as important as any meaning that the ‘inscription’ might hold?⁵² Also intriguing is the fact that so many Hieroglyphic seals are multi-facial. We can identify a few instances where two sides of the same prism may have been impressed on a single nodule, but these are exceedingly rare (see p. 114). Did it matter which face or faces were impressed? Until we can read the inscriptions, there is no way of telling. In any case, notwithstanding their tiny size, the prisms offered three, four or even eight faces for inscribing and decorating. Could it be that the fashion for inscribing seals was inspired by imported cylinder seals and scarabs, which also bore inscriptions? Certainly, during MM II-III overseas contacts brought much foreign iconography to Minoan Crete; the transfer of ideas – and their rapid adaptation to suit local needs – is essentially the same phenomenon (Chapter 2). In any case, with the demise of Hieroglyphic, the practice of inscribing seals was swiftly abandoned on Crete; multi-facial seals also declined rapidly.

SEAL USE

As in the preceding period, seals were invariably pierced for suspension, allowing them to be worn as items of personal adornment when not being used to seal. *Petschafte* would have made attractive pendants, especially those created in metal or the new semi-precious stones (140, 143-145; C10-C11). It seems likely that access to imported stones and metals was limited to elite members of proto-palatial society, who were also able to patronize progressive craftsmen – or so we judge from seals displaying new techniques and motifs. But our attempts to make further inferences founder on the Minoan tradition of communal burial, depriving us of secure links between seals and individuals. There is, however, good reason to suppose that seal ownership was fairly wide in the proto-palatial period. At any rate, this is the impression that we gain from the large number of seals which were in circulation during MM II. More than 600 steatite prisms survive, including about 100 from the Atelier at Mallia, which were clearly produced by a single craftsman and apprentice over a very short period. And from Phaistos we have a further 300 or so seal-types, all in use at the same time. That said, we must be careful not to equate one seal to a single individual. It is perfectly possible that several individuals exercising the same responsibility or function made use of a single seal and conversely there is ample evidence from later periods to show that one individual might possess a number of seals.

With our MM IIB assemblages we gain the first substantial evidence for Minoan sealing practices and for the use of seals in administration. As we noted earlier, sealings of pre-palatial date were rare, since few settlements of the period have been excavated. Moreover, levelling and construction in the centres which later became palaces has surely deprived us of crucial evidence. Unfortunately, the same difficulties dog our attempts to

⁵¹ For the ornamental or decorative character of the script, see: J.-P. Olivier, in *CMS Beiheft 1* (1981) 105-15, esp. 113-15; idem, in *ASSA 11-23*, esp. 13. However, he proposes that the two common sign-groups (‘trowel and arrow’ *CHIC* 044-049 and ‘trowel and eye’ 044-005) might represent two ‘entities’ or ‘institutions’, such as ‘palace’ and ‘temple’ (ibid. 18). Such a distinction between secular and sacred seems inappropriate for Minoan Crete. Also perplexing is why the two sign-groups should appear on the same seal, e.g. here **160b-c**, **162a-b**.

⁵² Some scarabs, especially those produced outside Egypt, bore ‘a meaningless collocation of signs used without understanding, for simple decorative purposes, to produce the appearance of an authentic Egyptian inscription’: T. G. H. James, in C. Renfrew, *The Archaeology of Cult. BSA Suppl.* 18 (London 1985) 300-01.

trace the development of sealing practices in the early proto-palatial period. From that phase only a few stray sealings have survived. Against this backdrop, the wealth of material and variety of sealing practices in MM IIB is staggering. We will begin by surveying the principle types of sealings and sealing supports, and then go on to consider their use at specific sites. It is important to realize that there is no universally accepted typology for sealing types and, moreover, that there is no standardized terminology.⁵³

SEALING TYPES

Stamped pottery and 'loom-weights'

In the proto-palatial period seal impressions are sometimes found on pottery, especially amphora handles, and 'loom-weights' (163-165).⁵⁴ The practice is familiar to us from the EBA, and on Crete is occasionally attested from the late pre-palatial period onwards (Chapters 3-4). Once again, the purpose of the stamping is obscure, inasmuch as it seems to occur too infrequently to reflect systematic control of ownership or production. The practice seems to be a distinctly north and east Cretan phenomenon and occurs in both palatial and non-palatial centres. An interesting series of impressed 'weights' has been found at Palaikastro, though few are closely datable to the proto-palatial period. Others occur at Zakros, Petras and Sphoungaras. Excavations at Mallia Quartier Mu (see pp. 109-11) have also yielded several impressed 'weights', but provide little insight into their function (e.g. 165). While we have good evidence that discoid weights were indeed used in weaving, the purpose of the hemispherical, cuboid and pyramidal objects is debatable.⁵⁵ At Mallia 'weights' and pottery alike are impressed with the same kinds of seals as were used on crescents and *noduli* (i.e. for administrative purposes). For instance, an example from House Theta at Mallia (164) bears the impression of a seal similar to those produced in the Atelier and used on sealings in Quartier Mu. Several pot stamps were found in Quartier Mu and a few more occur at Pyrgos (163), a settlement on the south coast which has important links with Mallia in the proto-palatial period.⁵⁶ As at Mallia, some of the Pyrgos pots were stamped with Hieroglyphic seals.

Direct object sealings

The basic principle of object sealing is already familiar to us from the EBA (Chapter 3). Lumps of clay were pressed onto jars and pithoi covered with cloth or reed mats (9, 166), containers of wicker or wood, and occasionally leather sacks (205b).⁵⁷ The sealings were stamped repeatedly, usually with the same seal, though dual-stamping was also practised. Sealings of this type occur in all our major MM IIB sealing deposits, e.g. Phaistos and Monastiraki, Mallia (Quartier Mu) and Petras. A few object sealings were also found in MM IB-II contexts at Knossos, such as the Vat Room Deposit and the Room of the Olive Press, but their reverses rarely tell us much about the kind of object that was sealed.⁵⁸

⁵³ In general I have followed the typologies established by W. Müller for *CMS* II.6 and II.8, with German terms replaced by their nearest English equivalent: below and the Glossary (Appendix 2).

⁵⁴ *CMS* II.6 pp. 380-91.

⁵⁵ *CMS* II.6 pp. 380-89; Burke (n. 42) 417-18. J. Weingarten believes that pyramidal 'weights' were used for closing sacks: *Pepragmena* 8 (2000) A3 485-95.

⁵⁶ C. Knappett, *AJA* 103 (1999) 615-39. Pyrgos pot stamps: *CMS* II.6 nos. 223-31, but only no. 228 (here 163) comes from a clear MM II level; no. 231 was stamped with a Hieroglyphic prism. Note that the site is also sometimes called Myrtos-Pyrgos.

⁵⁷ *CMS* II.6 pp. 368-72.

⁵⁸ For location see FIGURE 5.5. For contexts and dating: *CPSK* 8-43 (Vat Room); M. Panagiotaki, *BSA* 88 (1993) 29-47 (Room of the Olive Press). For the sealings see now *CMS* II.8 pp. 115, 123.



Selected MM II impressed objects and sealings. Stamped handle from Pyrgos (**163**). Impressed 'weights' from Mallia (**164-165**). Silicones of imprints on the reverse of sealings from Mallia (**166-167**). Drawings of seal-types at ca 2:1; silicones and objects (except **163b**) at ca 1:1.

Direct sealings were also applied to pegs or knobs on boxes or storeroom doors. Although examples are known from EH II Lerna, none has so far been found in pre-palatial contexts on Crete, leading to the suggestion that the practice was imported to the island at the beginning of the proto-palatial era.⁵⁹ But negative evidence is always unreliable, especially so in the case of pre-palatial Crete where sealings of any kind were few and far between (Chapter 4). We can, however, observe that peg sealings only became prevalent in the Near East during the proto-literate period, when increasing social complexity demanded a more efficient means of controlling goods than simple object sealing would permit (Chapter 2). And so the extensive use of peg sealings during an era of state formation on Crete should come as no surprise. At Phaistos pegs and knobs account for the bulk of our sealings (e.g. 184-188), but we also have a few at Quartier Mu (e.g. 167) and Knossos.⁶⁰ As we noted at Lerna, the distinction between chest or storeroom closure is crucial, though impossible to make with certainty (Chapter 3). The first indicates the control of movable goods, the second control of centralized storage.

Crescent-shaped nodules

In shape these lumps of clay resemble small *croissants* or crescents with three or four faces (168-169). They were invariably fashioned around a knotted string or cord and impressed with a seal or seals. The knot merely served to prevent the clay from slipping and did not join two ends (or pieces) of cord.⁶¹ This surprising fact means that the nodules did not really secure (seal) anything. It may be that they were tied onto objects and served as tags or labels, but we cannot say anything about the products involved. Another possibility is that they were not attached to commodities *per se*, but simply served as primary records of a delivery or transaction, as perhaps were certain inscribed nodules in the Mycenaean period (see Chapters 8, 10). Most crescents carry inscriptions in the Hieroglyphic script on one or more faces, the other(s) being impressed with seals. Often the seals themselves bore Hieroglyphic signs, but sometimes non-Hieroglyphic seals were used on crescents. Crescents are found only in north-central and eastern Crete: Knossos, Mallia, and now Petras. We can say nothing about the origin or evolution of crescents, since our only securely dated examples come from MM IIB destruction horizons. Foreign inspiration cannot be entirely ruled out, but similarities to Near Eastern hanging nodules seem generic rather than specific (Chapter 2). The use of crescents apparently persisted throughout MM III, although the so-called Hieroglyphic ‘deposits’ at Mallia and Knossos are impossible to date with certainty (see below).

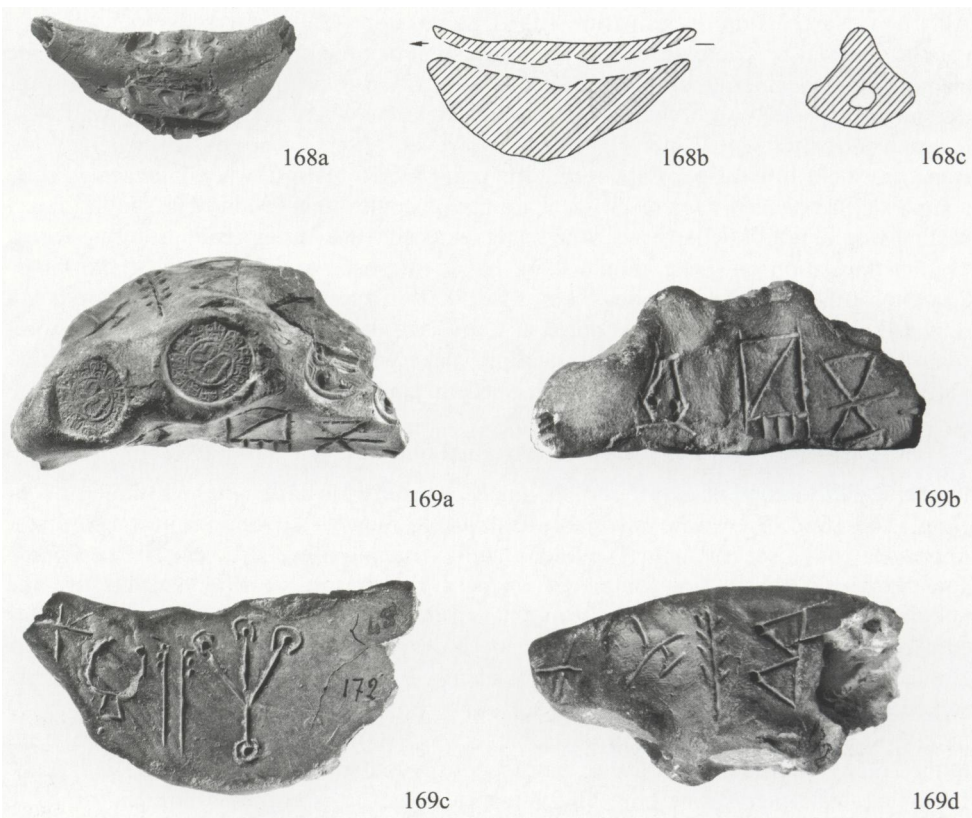
Noduli

A small lump of clay bearing one or two seal impressions, but without any means of attachment, is known as a *nodulus*. Although widely used, the term is an unhappy one and liable to cause confusion. Ostensibly *nodulus* is simply the Latin for ‘nodule’, but the words are *not* interchangeable. As defined, *noduli* differ significantly from most nodules

⁵⁹ J. Weingarten, in ASSA 105-07; also response by Pini and discussion, *ibid.* 115 ff; Aruz (n. 33) 44-46, 49-50. Cf. Chapter 2 (pp. 27-28).

⁶⁰ For Phaistos: E. Fiandra, in *Pepragmena* 2 (1968) A' 383-97. See also CMS II.6 pp. 374-76, fig. 24 (examples from Lerna, Mallia, Phaistos) and CMS II.8 pp. 29-32, fig. 4 for Knossos. The CMS term *Stöpselplomben* (lit. = ‘stopper sealings’) is confusing. Genuine stopper sealings (i.e. for vessels, termed *Stopper* by the CMS team) are entirely different in concept: see here 447a, 564-565, 568, FIGURE 10.1; Chapters 8, 10.

⁶¹ CMS II.6 pp. 366-67, fig. 19; II.8 pp. 44-49, figs. 12 and 13 (silicones of knots); termed *Hörnchenplomben*.

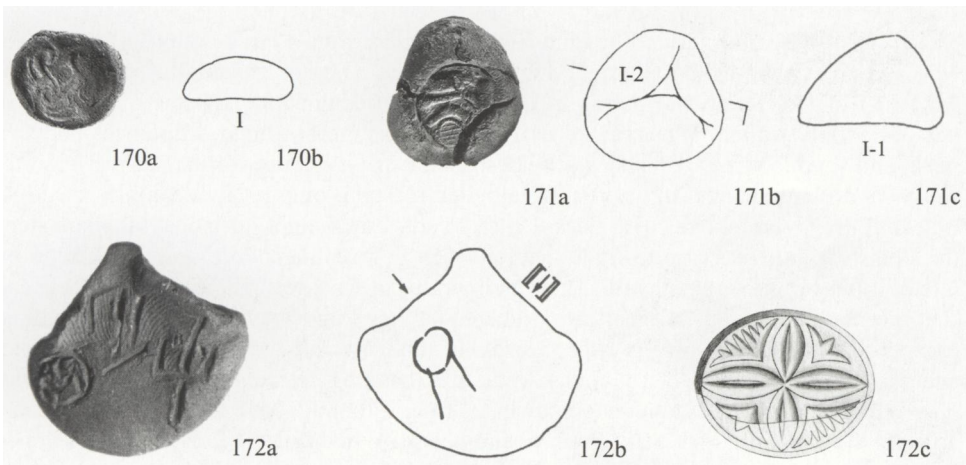


Selected MM II-III crescents. **168a-c** uninscribed example from Mallia Quartier Mu (MM IIB) impressed with two different seals (see 192-193). **169a-d** Knossos Hieroglyphic 'Deposit', inscribed on three faces, bearing two impressions of a Hieroglyphic seal and two more of a non-Hieroglyphic seal (see 197). Scale ca 1:1.

in form and function.⁶² It is thought that they served as 'tokens' of some kind, perhaps entitling the bearer to rights or rations. *Noduli* are first attested in a MM IA context at Mallia (Chapter 4) and persist until the end of the Mycenaean period (e.g. LH IIIB Pylos). Since most extant examples come from neo-palatial sites, we will examine their typology and use more closely in Chapter 7. In all we have about two dozen *noduli* from proto-palatial sites, including an especially good series from Quartier Mu at Mallia, dating to MM IIB (170-171).⁶³ Recent excavations at Knossos have yielded several good examples from early proto-palatial contexts. Three *noduli* from the SW Palace Angle, dating to MM IB, were all impressed with the same seal, foreshadowing the groups we

⁶² The term was coined by J. Weingarten, *Kadmos* 25 (1986) 1-21, who describes them as 'sealings that do not seal' (ibid. 4). In fact many types of Aegean 'sealings' never sealed or secured. In *CHIC* 62 the term *boulette* is preferred (cf. *boule* in *Mu II* 193-96). Since the *CMS* has retained *nodulus* (there being no scope for confusion in German) I have reluctantly followed suit, placing the word in italics (for which suggestion I thank Erik Hallager).

⁶³ *Mu II* 193-96; *CMS* II.6 pp. 376-77, fig. 25.



Selected MM II *noduli* and roundel. **170a-b** Dome-shaped *nodulus* from Mallia Quartier Mu; underside and drawing of side-view. Scale ca 1:1. See **190** for seal-type. **171a-c** Pyramidal *nodulus* from Quartier Mu, with two impressions of the same seal; underside and drawings of reverse and side-view. Scale ca 1:1. See **194** for seal-type. **172a-c** Inscribed roundel from Phaistos; face a, drawing of face b and drawing of seal-type (roundel shown at 1:1; seal-type at ca 2:1).

encounter in the neo-palatial period (Chapter 7). Another *nodulus* from the same vicinity dates to MM IIA, although it was impressed with an EM III-MM IA bone seal. Found in the same context was a small fragment of a clay tablet – apparently written in Linear A and not in Hieroglyphic as we would expect in north-central Crete.⁶⁴ New finds like these merely serve to emphasize how poor our understanding of Aegean administration really is, built upon the shaky foundations of chance destructions and haphazard discoveries.

Roundels

These are roughly disc-shaped pieces of clay, ranging from ca 2–7 cm in diameter, with a series of seal impressions around the edge.⁶⁵ Like *noduli*, roundels were not attached to other objects. On their flat surfaces, roundels often bear short Linear A inscriptions – a single ideogram, a ligature, or several signs. These probably indicated a commodity, while the number of seal impressions indicated the quantity involved. It appears that roundels served as receipts of some kind, confirming a transaction. Although originally regarded as purely Linear A administrative documents, one has now been found at Petras with Hieroglyphic material (p. 112). About a dozen have been found in MM IIB Phaistos (e.g. **172**). Particularly striking are the discoveries of roundels at Ayia Irini on Kea and Mikro Vouni on Samothrace (**204**), indicating the spread of Minoan administrative practices to the islands of the Aegean during MM II-III (pp. 116-18). But the heyday of the roundel is undoubtedly the neo-palatial period and so we shall consider them in more detail in Chapter 7. Roundels do not occur in LM II-III Crete or Mycenaean Greece.

⁶⁴ C. Macdonald, in D. Huxley (ed.), *Cretan Quests* (London 2000) 62-63, figs. 34, 35 (= *CMS* II.8 no. 15). For the matching *noduli*: *CMS* II.8 no. 374.

⁶⁵ For an exhaustive account, see: *Roundel* I 79-120; 88 (size); II (catalogue).

SEALING DEPOSITS

The groups of sealings found at Phaistos, Monastiraki and Petras dating to the end of MM IIB and the so-called Hieroglyphic ‘deposits’ at Knossos and Mallia (both perhaps MM III-LM I) offer an intriguing set of snap-shots documenting aspects of seal use in palatial administration. What strikes us first of all are the profound differences between north and south. Whereas Phaistos provides remarkable evidence for the sealing of store-rooms and commodities, our north Cretan sites preserve only a few examples of direct object sealings (see above). But does this fact carry any weight? It is just 50 years since the Phaistos sealings came to light – before then peg sealings were scarcely known on Crete. It may well be that a similar system operated at Knossos and Mallia in MM II and that the magazines and adjacent areas where sealings might have been kept and tallied escaped destruction by fire. In other words, in this case the absence of evidence is not necessarily significant. When it comes to the free-hanging crescents, often inscribed with Hieroglyphic signs, we are on somewhat firmer ground, since the *script* genuinely appears to be a north and east Cretan phenomenon. Whether MM II Phaistos developed its own variety of hanging nodules remains to be seen.⁶⁶

Phaistos

One of our most important sources of information for proto-palatial sealing practices is the so-called *archivio di cretule* (sealing ‘archive’) at Phaistos.⁶⁷ The deposit came to light in 1955 in *vano* 25, which was situated beneath a neo-palatial floor near the later western magazines (FIGURE 5.2). More than 6500 direct object sealings were found in the southern part of the room, along with a number of Linear A tablets, roundels and *noduli*. Quantities of Classical Kamares ware – chiefly small juglets – were also recovered. Sealing this deposit was the *calcestruzzo* (concrete) layer associated with the MM IIB destruction at Phaistos. Although the context of the sealings is clear enough, the circumstances of their deposition – and hence the nature of the deposit – are open to debate. This in turn affects our ability to interpret the precise role which the sealings played in palace administration. Aside from the main deposit in *vano* 25, a few more sealings were found elsewhere in the west wing. Those from *vano* LI may be somewhat earlier than the sealings of *vano* 25; a few more found under the floors of rooms 10 and 11 perhaps date to MM III (see Chapter 7).

More than 300 seal-types are represented among the material from *vano* 25 and provide a fascinating insight into the range and quality of seals in contemporary use.⁶⁸ Phaistos is justly famous for its advanced naturalistic motifs – some engraved on hard stone, others on metal rings – but these occur side-by-side with old-fashioned lattice patterns and other simple geometric designs (e.g. 173-174). A few sealings were even impressed with ivory seals that must have been made in EM III-MM IA. It is hard to imagine ivory cylinders or conoids remaining in continuous use for several hundred years; perhaps they were found

⁶⁶ *Roundel* I 65 lists ‘two (possibly four) hanging nodules’, of which one is inscribed: PH Wa 52 (HM 689; *CMS* II.5 no. 300); also E. Hallager, *PODIA* 1 (1995) 9-19, figs. 5-7.

⁶⁷ *Roundel* I 64-68 provides a convenient English summary with references.

⁶⁸ See also above. *CMS* II.5 (1970) provides complete coverage of the seal-types. Note that when this volume was compiled, Pini hazarded identifications of original materials (soft, hard, metal) and seal shapes in only a few cases (*ibid.* p. xiii). Younger (*Middle Phase* xxii) claims that the majority of the Phaistos sealings were impressed with hard stone seals. To judge from the casts in the *CMS* Archive, this statement is certainly erroneous; detailed study would be needed to provide an accurate figure.

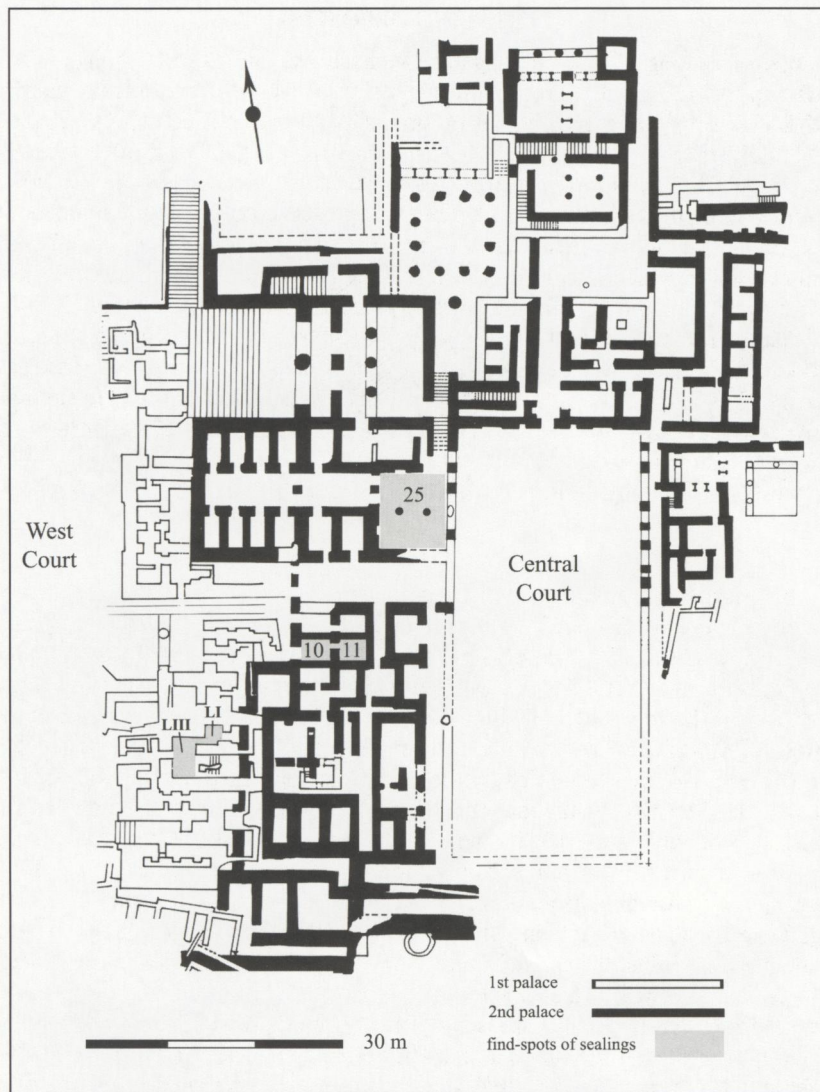
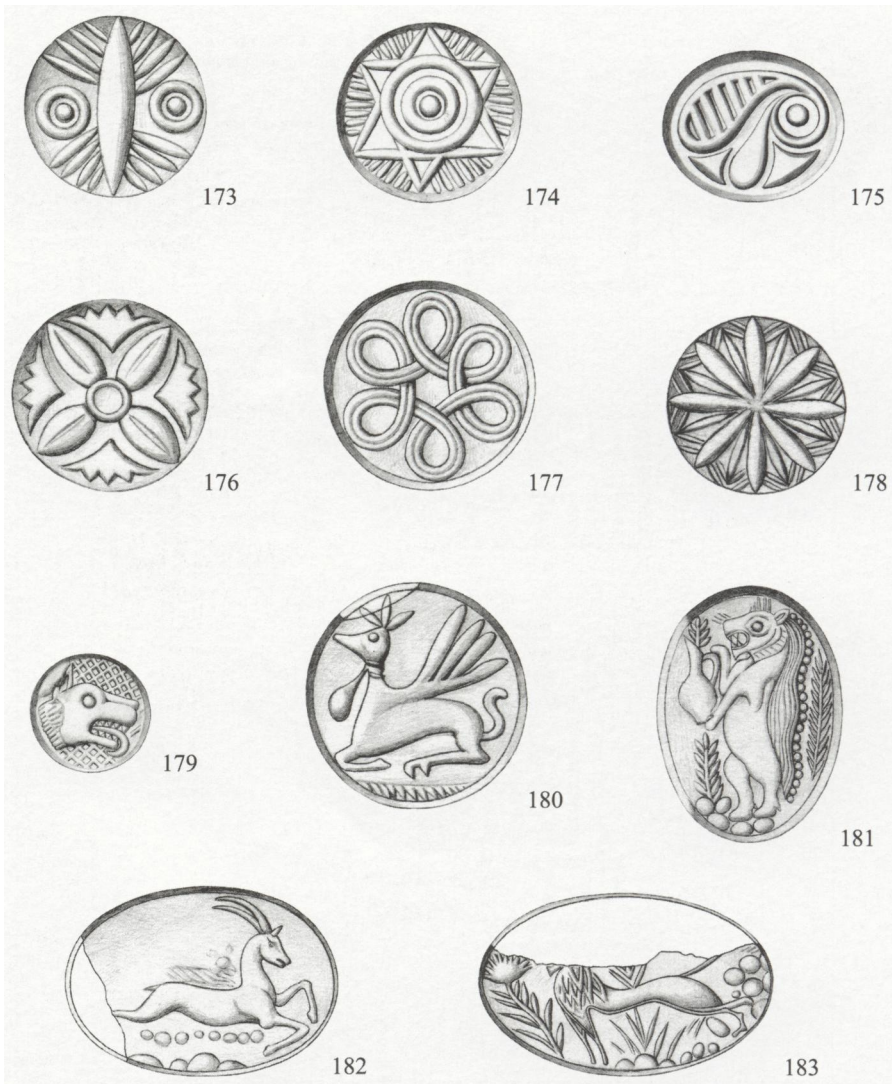


FIGURE 5.2 The palace of Phaistos, showing find-spots mentioned in the text.

when clearing out nearby tholoi and occasionally pressed into service again. It is likely that lurking among the ‘old-fashioned’ types were seals made early in the proto-palatial period and passed down as heirlooms. But sometimes motifs were also very long-lived, as the interlace pattern shows (177). First attested in the pre-palatial period, the design was still being engraved on seals of proto-palatial date. There are several variations at Phaistos (below) and others occur at MM II Monastiraki and at sites in eastern Crete.⁶⁹

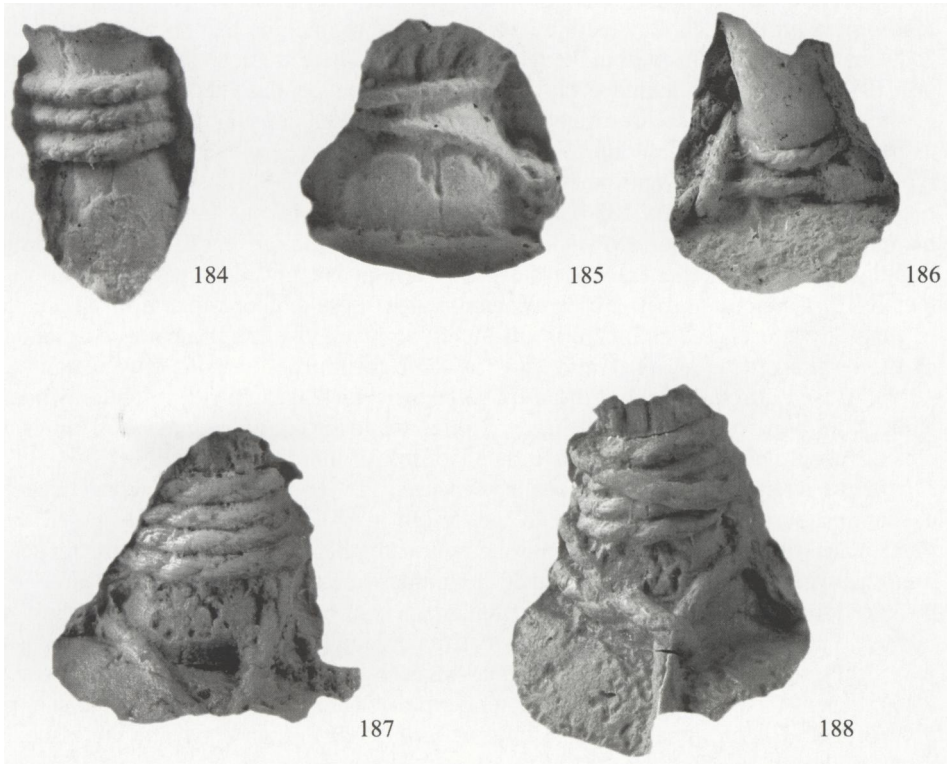
⁶⁹ Although similar interlace designs also occur in contemporary central Anatolian glyptic (e.g. Acemhöyük and Karahöyük) it is hard to see any direct connexion and Cretan antecedents go back to EM III-MM IA, e.g. *CMS* II.1 no. 313, an ivory conoid. *ECS* 152-53 provides further examples. For a useful summary, with references, see: Aruz (n. 33) 41-42, 50.



173-183 Drawings of selected seal-types from Phaistos, *vano* 25. Scale ca 2:1.

The material in *vano* 25 included a great many damaged or misshapen sealings, others with illegible sealing impressions, and also pieces of clay prepared for use. Only 1500 sealings bore sufficiently legible seal impressions and preserved clear imprints on their undersides. From these imprints sixteen different kinds of sealing supports could be identified.⁷⁰ A few represented vessel closures, but most were varieties associated with

⁷⁰ The study and typology of sealing supports by Fiandra (n. 60) remains basic. See also her article in *Bollettino d'Arte* (1975) 1-25. Unfortunately, she often fails to identify illustrated casts by inventory number, making it difficult to check her observations against the silicones housed in the CMS Archive.



Selected MM II peg / pommel sealings from Phaistos, *vano* 25. Fiandra Types A (**184**), B (**185**), D (**186**) and E (**187-188**). Silicones of reverses. Scale ca 1:1.

door or chest sealings – that is, pegs or ‘pommels’ bound with cord or rope (**184-188**). The ‘pommels’ are rather like modern door-knobs, with cylindrical necks and slightly flaring tops. This shape is much more practical than a straight peg and would help prevent the cord from slipping off, thereby breaking the seal. We must suppose that the other end of the cord or rope was permanently fixed, either to a door-post or to the side of a chest (FIGURE 2.2a-b). The basic principle is easy enough to understand and similar peg sealings have been found throughout the ancient world (Chapter 2). But several crucial questions remain. First and foremost do the sixteen *kinds* of sealing supports really represent sixteen individual items which had been sealed and re-sealed on numerous occasions? Or are we simply dealing with sixteen generic types? The answer might have a bearing on the second question. What was actually being sealed at Phaistos? Did some (or all) belong to portable chests and small boxes? Or did the pegs belong to the doors of storerooms and large immovable cupboards? For peg type A we have a useful clue, since the imprints consistently showed the same crack in the wood (e.g. **184**). In other words, the same item was sealed over and over again, presumably within the confines of the palace. The same also seems true of peg type E (e.g. **187-188**). Moreover, the enormous number of sealings argues for repeated access to internal stores.

The picture becomes even more complex when we recall that about 300 seal-types are represented on the *vano 25* sealings. Are we really to imagine that so many individuals had access to storerooms within the palace? Of course here we need to avoid the common trap of assuming that behind each seal-type lies a single individual. A palace official might well have cause to use three or four different seals depending on the specific task to be performed or commodity to be controlled. Equally perplexing is why some seal-types occur infrequently and others are extremely common. For instance, **182** occurs on only two sealings; **181** and **183** occur only once. Is it significant that these are advanced naturalistic motifs? Other seal-types are extremely common, e.g. **177** occurs on 175 sealings. Moreover, other interlace designs – similar but not identical – are also rather ‘active’. But are any of these observations of value? Less than one-quarter of the sealings in *vano 25* were legible and there is absolutely no guarantee that these are representative of the original material. That said, it is possible to think of reasons why certain seals might be used infrequently. For instance, some officials (supervisors?) might only need to audit storeroom contents from time to time, while ordinary everyday openings and closings would be conducted by seal-holders of low or middle rank.

It seems likely that the broken sealings in *vano 25* had been deliberately retained for accounting purposes. But how would the system work? We have already noted that a great many of the sealings were squashed and illegible, apparently because they were removed while the clay was still wet. If the lumps were to be tallied, they would need to be carefully collected in designated containers each time a storeroom or chest was opened. However, it is hard to see how officials could distinguish between occasions when the storeroom had been opened to receive deliveries as opposed to those for disbursements, e.g. of rations or raw materials. Could the practice of dual-stamping provide a clue? Unfortunately the sealings in *vano 25* do not really resolve this issue. Nor do we have any clear idea of the kinds of produce or products in store; in this respect peg or ‘pommel’ sealings are especially uninformative. And further questions remain concerning the nature of the deposit. Are we dealing with archival material discarded normally at the end of an ‘administrative cycle’? Or had it been dumped into the room as fill after the MM IIB destructions? The latter seems more likely, given the many hundreds of juglets found in the room. But, in truth, the Phaistos assemblage is difficult to read and will benefit from further analysis.⁷¹

Monastiraki

Sealing practices akin to those at Phaistos are also found at the site of Monastiraki in the Amari Valley in west-central Crete. Located on an important route leading from the Mesara to the north coast, Monastiraki seems to be a ‘second-order’ centre, with important storage facilities but lacking the full complement of palatial functions.⁷² The sealings certainly support this view. Virtually all belong to the direct object variety, with more sophisticated forms of accountancy, namely roundels and tablets, being absent.

⁷¹ Meanwhile see J. Weingarten, in *Archives* 274-90. Unfortunately, as Poursat notes in his response (ibid. 297-98), her claim that the sealings may have accumulated over 15 years or 45 ‘administrative cycles’ rests on a series of doubtful or erroneous assumptions regarding context, condition of sealings and iconography. A serious objection to Weingarten’s ‘statistical’ analysis is that less than one-quarter of the sealings were well enough preserved for study (see above and remarks by Fiandra, ibid. 300-02). Also pertinent are Fiandra’s most recent comments on the nature of the *calcestruzzo*: *Administrative Documents* 365-66. A. L. Foster, in *CMS Beiheft* 6 (2000) 79-94 presents a sober comparison of Egyptian practices with those attested at Phaistos.

⁷² A. Kanta, in *Meletemata* 387-93 provides a convenient summary.

Only one *nodulus* has been reported to date.⁷³ However, the Monastiraki sealings have yet to be fully published and only limited information is available. A few examples, from excavations conducted by Kirsten in the 1940s, have appeared in *CMS V*. Thanks to more recent campaigns (between 1982 and 1998) there are now more than 850 sealings, and an unspecified number of seal-types.⁷⁴ The sealings apparently come from three or four separate areas of the site, all involved in storage. Illustrated examples show imprints of vase rims covered by reed mats and baskets, but peg sealings and impressed ‘loom-weights’ are also reported. The seal-types so far published compare well with the geometric and decorative motifs represented in the Phaistos deposit. Whether any exact matches exist (as claimed) remains to be seen.⁷⁵ The absence of advanced naturalistic designs at Monastiraki fits with the provincial character of the site. Monastiraki was destroyed at the end of MM IIB and, apparently, was not re-occupied.

Mallia

The small but important collection of sealed material from Quartier Mu at Mallia currently provides our best evidence for practices in northern Crete during the proto-palatial period. This large complex situated some 300 metres west of the palace was excavated by the French between 1966 and 1991 (FIGURES 5.3–5.4). The site and finds are exceptionally well published.⁷⁶ Two sizeable buildings (A and B) display a range of functions comparable to those found in palaces. Adjacent were various specialist workshops, including the *Atelier des sceaux* (pp. 93–95). The entire complex was built in MM II and destroyed at the end of that period. Many items were found *in situ* – preserved intact or complete – while others fell from the upper storey. The last seems to be true for the 28 sealings and ten impressed objects (pp. 99–100), as well as the clay documents inscribed in Cretan Hieroglyphic, namely tablets, medallions and cones.⁷⁷ Several direct object sealings were found, including two pegs and parts of a sealed pithos rim (166–167), types familiar from Phaistos and Monastiraki. Also recovered were sixteen *noduli* (e.g. 170–171) and six crescent-shaped nodules (e.g. 168). These crescents do not bear Hieroglyphic inscriptions, as is usually the case at Knossos, but five were impressed with Hieroglyphic prisms. In fact Hieroglyphic seals were used on about half of the sealed and stamped material in Quartier Mu. But no pattern emerges which might help us better understand the nature or role of Hieroglyphic seals (pp. 95–98). On the contrary, decorative and pictorial seal-types occur on exactly the same range of items in roughly the same numbers (see 189–194 for a selection). Nor, sadly, does there appear to be any significant pattern in the distribution of sealings throughout the buildings.⁷⁸ Strangely, none was associated with the row of ground-floor storerooms I 5–8 in *Bâtiment A*, which contained much material *in situ*. Sometimes sealings do occur in distinct clusters, e.g. the *noduli*, direct object sealings and four crescents found in III 16–17. But since these may have

⁷³ Mentioned in *Roundel I* 35, 122; Kanta (n. 72) 391 refers to a sealing inscribed with the Linear A ideogram for wine.

⁷⁴ The figure of 850 does not include ‘many more’ sealings, discovered since 1992, ‘which have not been fully processed yet’: A. Kanta & A. Tzigounaki, in *Administrative Documents* 193–205; also L. Godart et al., in *CMS Beiheft 6* (2000) 95–96.

⁷⁵ The examples given by L. Godart, in *Polemos* 39–46, pl. 2 are not persuasive.

⁷⁶ See above n. 39.

⁷⁷ For the inscriptions: *Mu I* 29ff, 67–79 (now re-published in *CHIC*). For the sealings: *Mu II* 192–229 (*CMS II.6* now provides more accurate drawings and identifications of materials used for the original seals).

⁷⁸ *Mu I*, plan 2; *Mu II*, plan 7; J.-C. Poursat, in *ASSA* 25–29; *Roundel I* 61–62; *CMS II.6* p. 193.

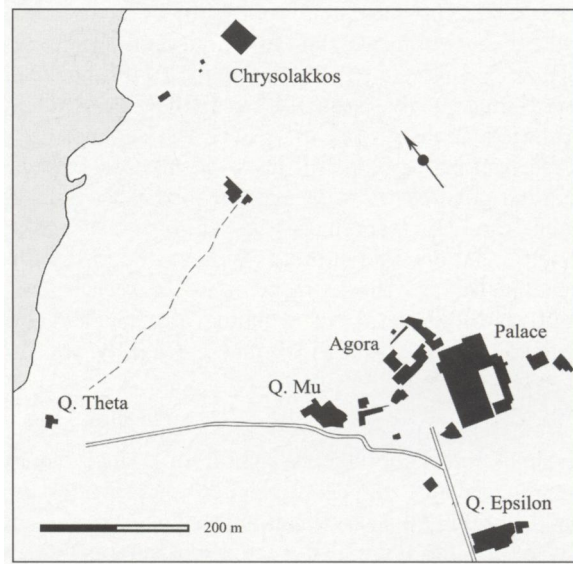


FIGURE 5.3 The Mallia area

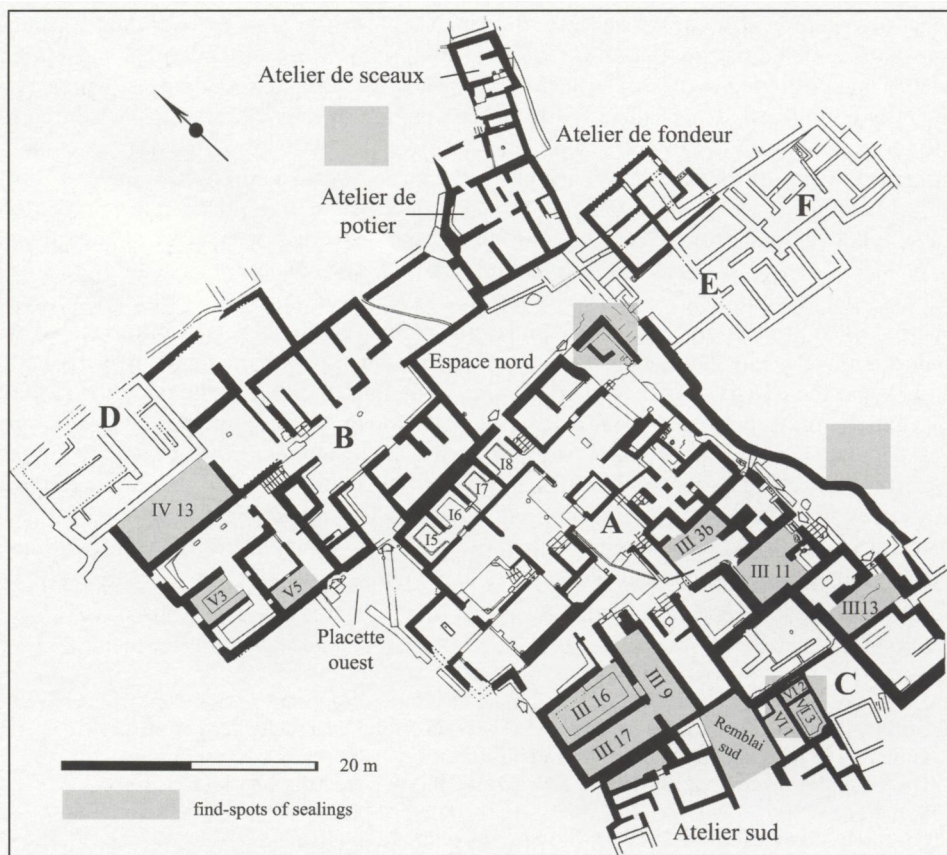
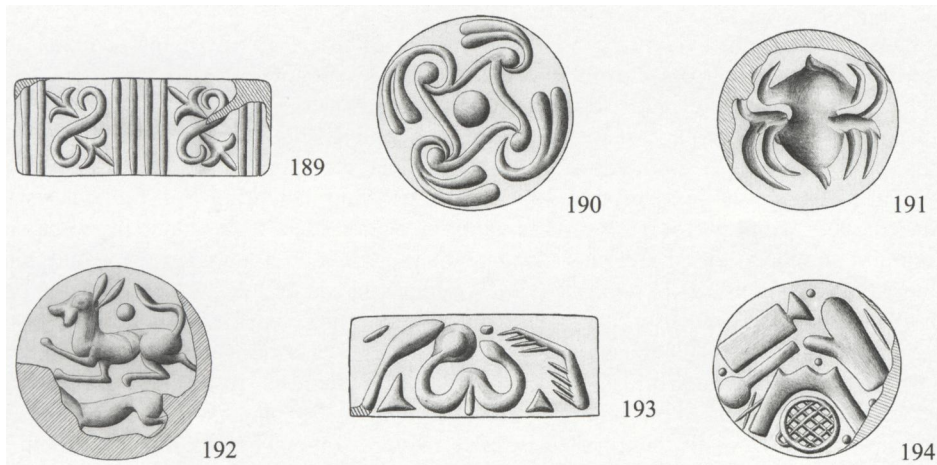


FIGURE 5.4. Mallia Quartier Mu, showing find-spots of sealings.



189-194 Drawings of selected seal-types from Mallia Quartier Mu. Scale ca 2:1.

fallen from above, we cannot be certain of their function at the time of destruction. In other words, had this material been collected for archival purposes, or were the crescents still attached to perishable items in store? Unfortunately, no crescents were found with the 12 inscribed medallions, tablet, and *noduli* and which had fallen into III 3b.⁷⁹ This does have the hallmarks of an archive in the making.

Whether the so-called *Dépôt hiéroglyphique* from the palace at Mallia also belonged to an archive is far from clear. Found under a neo-palatial floor in Room III 8, it comprises a curious mixture of Hieroglyphic tablets, bars and medallions, Linear A tablets, and a few sealings.⁸⁰ These include two inscribed crescents with illegible seal impressions, two or three roundels, a flat-based nodule and a clay 'matrix'. While the Hieroglyphic material would be at home in MM II, the Linear A tablets and certain sealings raise suspicions that this is not a true closed deposit. On one of the roundels is the impression of an oval signet ring engraved with a naturalistic bird, which must be of LM I date. The same may be true of a second roundel, which is inscribed with a Linear A sign. Finally, the 'matrix' bears a fine animal attack, which on stylistic grounds cannot be earlier than LM I.⁸¹ Since these items appear to compromise the unity of the 'deposit', we cannot safely use it as evidence for archival practices. Sadly, the same is also true of the Hieroglyphic 'Deposit' at Knossos (see below). However, there is no compelling reason why the MM IIB destructions should have brought about an immediate change in script and administrative practices. In other words, it is entirely possible that the use of crescent-shaped nodules and the Hieroglyphic script persisted well into the neo-palatial period.⁸²

⁷⁹ The tablet fragment (I/5) was uninscribed. In *ASSA* 26, Poursat (the excavator) assigns it to room III 3b, although *Mu I* and *CHIC* place it in III 13. The final report should clarify the matter.

⁸⁰ *Roundel I* 58-60; *CMS* II.6 pp. 189-90, nos. 168-72. See below n. 81 for the 'matrix'.

⁸¹ *CMS* II.1 no. 419 (wrongly attributed to Chrysolakkos). For dating and purpose see: I. Pini, in *Aux origines de l'hellénisme* 77-78, pl. 14; also now W. Müller, in *CMS* II.8 pp. 81-83. For the famous clay 'matrix' from Knossos, see below pp. 189 and 222.

⁸² Indeed Hieroglyphic and Linear A may have been used contemporaneously: see p. 103 for the new Linear A tablet from Knossos, dated to MM IIA. One of the Knossian *crescents* provides a further twist, as its inscription may be Linear A: HMs 189 (*CMS* II.8 nos. 124 + 702; *CHIC* #019).

Petras

Immensely important evidence for Hieroglyphic administration, involving sealings and inscribed documents, comes from the small palatial site of Petras, near Siteia. The material, preserved by an intense fire destruction datable to MM IIB, was found sealed beneath neo-palatial levels.⁸³ It seems that we are dealing with the remains of an archive housed in a small upper room above the north entrance to the proto-palatial complex. The archival material was discovered in 1996 and at the time of writing is still under study. None the less, from preliminary reports we gain a good idea of the types involved and minimum numbers. Inscribed clay documents include two four-sided bars and nine medallions, but no tablets or cones. Several crescent-shaped nodules were recovered; one complete example was inscribed. Also found were other types of nodules, two peg sealings and a roundel.⁸⁴ The last was somewhat surprising, since roundels were thought to be closely associated with Linear A administrative practices. Instead we must accept that roundels – rather like *noduli* – were used across the island in the proto-palatial period, irrespective of the script used in tablet administration. No *noduli* were found at Petras, although several lumps of clay might have been prepared for that purpose. The lack of *noduli* is a great shame, for we need more from unambiguous contexts to help elucidate their function(s).

Preliminary reports indicate that some of the seals used apparently bore Hieroglyphic signs, while others bore geometric, floral and spiraliform designs. Pictorial motifs, especially animals, are said to be in the majority. Several impressions may have been made by metal signet rings.⁸⁵

When the material from Petras is finally mended, documented and analysed we will have a much better idea of administrative practices at the end of the proto-palatial period. But we must guard against the assumption that practices changed in line with major events in Minoan cultural history. On the contrary some sealing types which become commonplace in the neo-palatial period were already developing by the end of MM IIB. Two-hole hanging nodules, once thought to be a later variety, exist at Petras. Likewise present are nodules which were pressed against items bound with cord, a type generally associated with the late deposits at Knossos and on Mycenaean sites (Chapters 8, 10). Although Petras does offer an exceptionally wide range of archival material, found in a secure context and carefully excavated, we must also recall the hazards of archaeological chance. The absence of certain document or sealing types (tablets, *noduli*, single-hole and flat-based nodules) is not necessarily significant. We have barely begun to understand the various stages of the archival process and current hypotheses need to be tested against new data, should we be lucky enough to find further deposits.

Knossos

It was Sir Arthur Evans who first uncovered clay administrative documents and sealings inscribed in Cretan Hieroglyphic, a particularly satisfying discovery in view of his early interest in seals bearing ‘pictographic’ signs (pp. 95-96 and Chapter 11). Unfortunately, the nature of the so-called Hieroglyphic ‘Deposit’ at Knossos remains problematic in the extreme. According to Evans, most of the material was found beneath a staircase at the

⁸³ Not on a neo-palatial floor as indicated in some early reports. See M. Tsipopoulou & E. Hallager, *Kadmos* 35 (1996) 164-67; E. Hallager, in *CMS Beiheft* 6 (2000) 99-105.

⁸⁴ PE Hc 2: Hallager (n. 83) 101-05, fig. 2.

⁸⁵ Hallager (n. 83) 100-01. The total number of seal-types is not yet known.

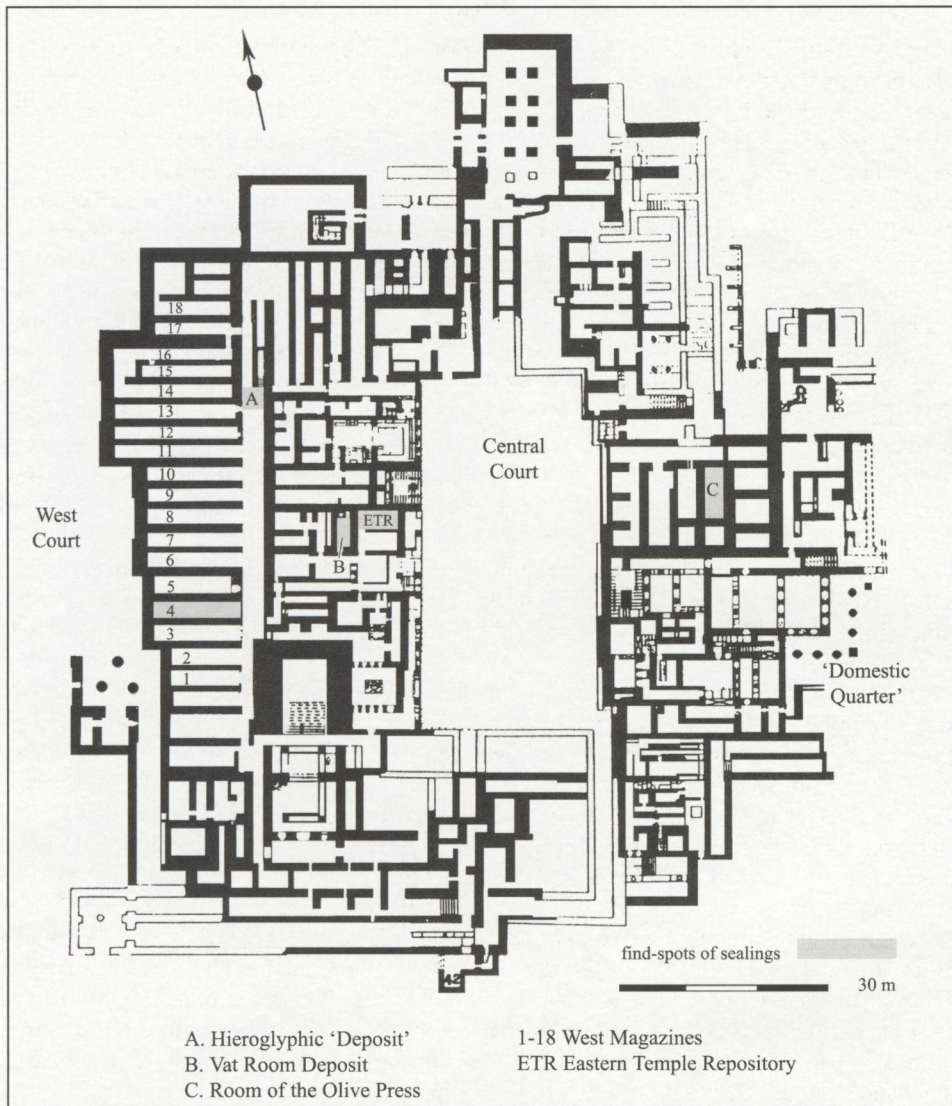


FIGURE 5.5 The palace of Knossos, showing MM-LM I find-spots of sealings. For the Eastern Temple Repository (ETR) see Chapters 6-7.

end of the Long Corridor in the West Wing of the palace (FIGURE 5.5). However, he was not present throughout the excavation and only four sealings appear in his notebook.⁸⁶ It is quite possible that some material, which he later attributed to the 'Deposit', came from elsewhere. Certainly in adjacent storerooms sealings did come to light, but which ones?

⁸⁶ The 'Deposit' was uncovered during the closing days of the 1900 season. Evans published material from it (or attributed it) in *BSA* 6 (1899-1900) 59-63, *SM* I 19-22, 144-79 and *PM* I 271-285. For references to the excavation notebooks and list of attributions, see: M. A. V. Gill, in *CMS* II.8 pp. 101-28, esp. 103, 109-11 (which supersedes her earlier account, *KSPI*). For the inscribed material see *CHIC*.

One (identified) *nodulus*, impressed with Hieroglyphic seals, was found in Magazine 4 – a considerable distance away.⁸⁷ Obviously the ‘Deposit’ is anything but a closed deposit and just to make matters worse, no pottery was found beneath the staircase. This makes it exceedingly difficult to date the material or to interpret its character. It may be that the bulk of the tablets and sealings had indeed been collected for archival purposes, only to be discarded following a destruction in the West Wing. Exactly when that destruction took place is hard to say. Evans himself changed his mind several times, eventually settling on MM IIB.⁸⁸ On balance a date within MM III seems more likely (see below).

The Hieroglyphic ‘Deposit’ (as defined by Evans) comprises numerous inscribed documents – tablets, bars and medallions – as well as about 40 sealings, now fully published in *CMS* II.8. Most of the sealings are crescent-shaped nodules, already familiar to us from Mallia and Petras (see above). The Knossian examples generally bear one or more seal impressions and most carry Hieroglyphic inscriptions (e.g. 169). These must have been added after the crescents were stamped, otherwise the signs would have been deformed or defaced in handling.⁸⁹ Impressions of Hieroglyphic seals occur on about 20 crescents: most frequently represented are three or four-sided prisms of hard stone (e.g. 198-199). The prevalence of hard stone does not necessarily make these prisms later than those used in Quartier Mu. Rather, we may be seeing a distinction between seals produced in a major metropolitan centre and a smaller regional one. As at Mallia, decorative seal-types are also represented on the Knossos crescents (e.g. 196-197), but pictorial motifs are not common. One notable exception is the well-known head of a man, seen by Evans as the portrait of a Knossian ‘Priest-King’ (195; cf. Chapter 6). This uninscribed crescent also illustrates the practice of dual-stamping, which occurs on about a dozen examples at Knossos. Unfortunately, no clear pattern emerges which might help us understand its purpose or indeed the role of Hieroglyphic seals (cf. Mallia above). Sometimes a crescent was impressed with a pair of non-Hieroglyphic seals, sometimes with two Hieroglyphic seals, sometimes with one of each. In a few cases, it seems that two separate faces of the same prism were employed.⁹⁰ In a few others the same seal face is stamped twice. The outsized crescent HMs 172 (169) bears four impressions in all: two from a non-Hieroglyphic seal (197) and two more (partly preserved) from a Hieroglyphic seal. In short the situation is extremely complicated. But our prospects for understanding it are poor, since we are not dealing with a closed deposit and the surviving ‘sample’ (about 29 crescents) is far too small for any statistical analysis.⁹¹ We certainly cannot determine whether the crescents accompanied shipments from outside the confines of the palace or were used for internal control. None the less, it may be worth noting that dual-stamping does persist at Knossos into the neo-palatial period (Chapter 7).

⁸⁷ Attributed to the ‘Deposit’: *SM* I 159: P51a-b. In addition to this disc-shaped *nodulus* (HMs 107: *CMS* II.8 nos. 74 + 80), two hanging nodules were found in Magazine 4, both impressed with LM II-III seals (HMs 240 and 241: *CMS* II.8 nos. 528, 229 respectively) as well as a small deposit of Linear B tablets. The date of the *nodulus* is thus debatable.

⁸⁸ *SM* I 19-22, 143 (MM III); *PM* I 272 (MM IIB).

⁸⁹ J.-P. Olivier pers. comm. (cf. Linear B inscribed nodules: Chapters 8, 10). The inscriptions occur on one, two or occasionally three faces and the crescents vary somewhat in size: HMs 172 (here 169) is the largest example known. *CHIC* 68-85 (Ha #001-029) conveniently illustrates the nodules at 1:1. Ha #001-003 are inscribed but lack impressions.

⁹⁰ E.g. perhaps *CMS* II.8 nos. 62-63 (on crescent AM 1910.207) and nos. 69-70 (on object sealing AM 1938.1153b).

⁹¹ As seemingly attempted by J. Weingarten, thereby identifying a ‘flat’ or non-intensive pattern of seal use: *Knossos Labyrinth* 179-81; *CMS Beiheft* 5 (1995) 285-311, esp. 308.



195-201 Drawings of selected seal-types from the 'Hieroglyphic Deposit', Knossos. Scale ca 2:1.

If we turn to the other sealings thought to be associated with the Hieroglyphic 'Deposit', the picture becomes even more confused.⁹² There are nine or ten flat-based nodules, which sealed pieces of folded parchment or leather, and a pendant nodule – varieties closely associated with neo-palatial administration (see Chapter 7). Several bear impressions of naturalistic motifs (200-201), which should be dated to MM III-LM I on stylistic grounds, in other words later than the seal-types found on the crescents. These advanced nodule types and motifs reinforce our unease regarding the integrity of the 'Deposit' and the simplest solution would be to dissociate them altogether from the crescents and inscribed documents. Certainly this part of the palace sustained later fire destructions, which could have preserved these sealings (Chapter 7). Unfortunately, there are two obstacles to this tidy solution. One of the *crescents* was stamped with a seal depicting a double-axe combined with a sacral knot, a motif not attested before MM III-LM I.⁹³ More troublesome still is the fact that one of the Hieroglyphic prisms was used to impress both a crescent and a flat-based nodule (10). Of course we know that sometimes seals remained in use for considerable periods (above and Chapters 7-8). But to argue

⁹² For complete list of nodules now attributed to the 'Deposit', see: *CMS* II.8, table 2. One (HMs 140: *CMS* II.8 no. 286) is a *Schnurplombe mit offener Rückseite*, i.e. an irregular hanging nodule with open reverse, a variety ordinarily associated with the 'late sealings' (Chapter 8). Petras now seems to provide MM II examples (see above).

⁹³ The inscription may be Linear A: see above n. 82.

that two sealings (using the same seal) were made a generation or two apart *and* were preserved (by chance) in separate fire destructions would stretch our credulity to the limit. In other words, it seems that the crescent and the flat-based nodule must have been impressed at *more or less* the same time.

So where does all of this leave us? Since absolute certainty is impossible, the date and character of the 'Deposit' are largely matters of faith. However, recent work by the *CMS* team points to a late date for the material, though pushing it as late as the Great Destruction of MM IIIB / LM IA Transitional is bound to cause consternation.⁹⁴ Then again, perhaps we should not be unduly troubled by the untidy nature of the material – with its old and new seals and sealing types side-by-side – for most *genuine* deposits of sealings in Minoan Crete present similar anomalies. But the moral of the tale is surely this: if we are to realize the full potential of sealings as evidence for glyptic development and administrative practices, an unambiguous context is essential. Sadly, the history of archaeology is full of missed opportunities; in the case of Knossos we are unlikely to get a second chance (cf. Chapter 8).

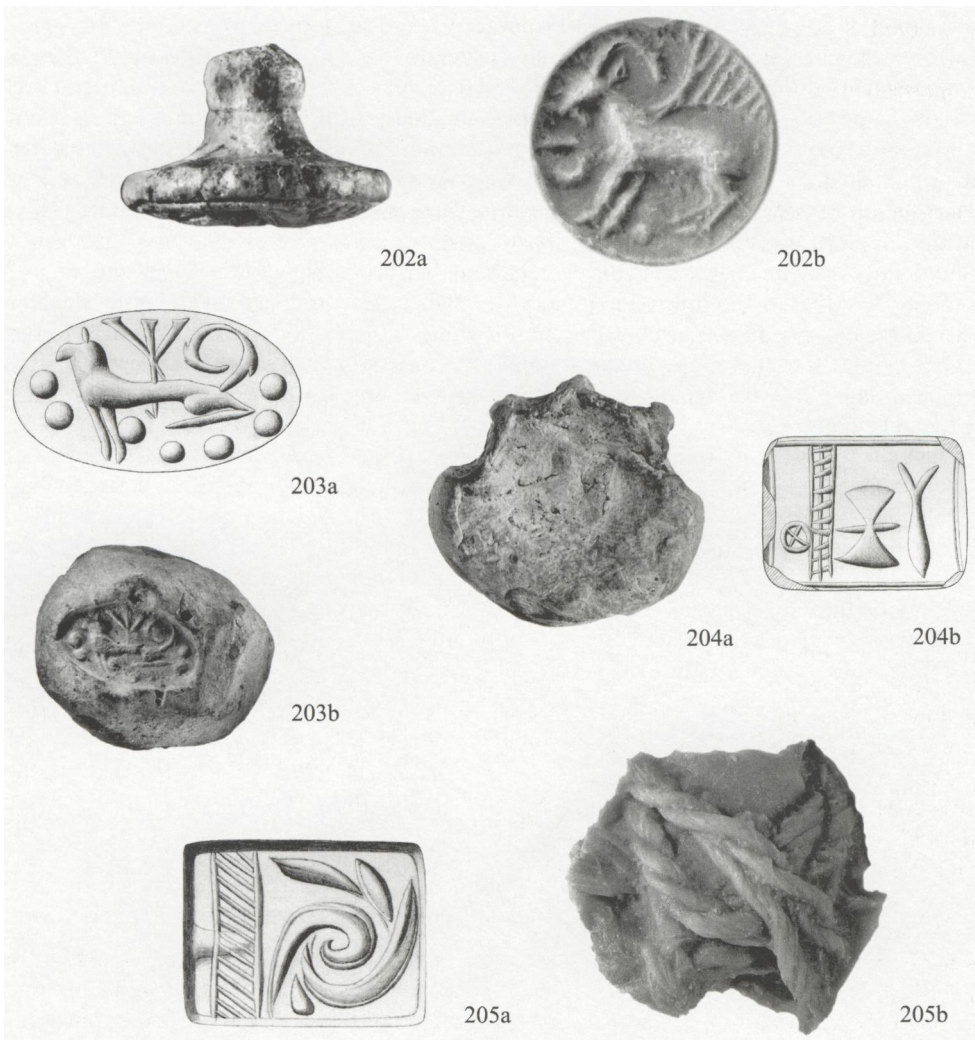
Other Cretan sites and islands of the Aegean

Excavations outside the main palatial centres on Crete do offer scope for increasing our knowledge of proto-palatial seals and sealing practices. As we have already noted, the site of Monastiraki promises to shed light on methods of storeroom control at a local 'second-order' centre. What we so far lack is evidence for comparable practices – either at local or palatial level – in the north and east of the island. And although our non-palatial settlements in these areas have yielded some impressed pottery and 'weights', sealings proper are yet to be found.⁹⁵ One suspects that the blame must (again) be laid on archaeological chance, in view of the large number of seals known from the north and east of the island. Even less material has come to light at Khania in the west – only one or two MM II-III seals and no sealings of any kind. Since LM IB Khania was a major administrative centre, the foundations must have been laid in the proto-palatial period. But much of the Minoan settlement underlies the historic Venetian town, and excavations are usually limited to small plots, investigated on a rescue basis (Chapter 7).

Extraordinary evidence for the spread of Minoan seals and sealing practices to the islands of the Aegean has emerged in recent years. Seals, of course, are small and easily portable – perhaps indicating no more than contact of an indirect kind, passed from one hand to the next and brought home as a curio or souvenir (Chapter 10). Sealing practices are quite another matter, for they indicate Minoan influence or even Minoan presence beyond the shores of Crete. The adoption of Minoan seals and sealing practices in the islands is all the more striking, since during EB II glyptic connexions pointed toward the Greek mainland (Chapter 3).

⁹⁴ Evans's MM IIIB Great Destruction is now often called MM IIIB / LM IA Transitional or LM IA Early (see Chapter 7). The *CMS* team does not assign the 'Deposit' to a specific destruction horizon, but dates the material to MM III-LM I. There may have been an earlier destruction within MM III: *PM* I 405-19, II 287; cf. *ABAC* 54-60, table 2.5; and most recently Macdonald (n. 5) 36-37. If so, this might provide a suitable compromise date for the Hieroglyphic 'Deposit'.

⁹⁵ An object sealing found in LM IB destruction debris at Palaikastro is dated, somewhat improbably, to MM II-III by J. Weingarten, in J. A. MacGillivray et al., *BSA* 84 (1989) 442-44, fig. 20. Her identification of the sealing imprint (as a wooden peg wound with leather thongs) is far from certain (compare her fig. 20 with 167 here). The seal impression is not illustrated, but is said to be from a MM discoid. This cannot date the sealing, since the seal might have been an heirloom. A few object sealings securely dated to LM I (by context and seal-type) do exist: see Chapter 7.



Selected seals and sealings found outside Crete in the MBA. **202a-b** MM I bone button from Miletus; profile and impression. Scale ca 2:1. *Nodulus* (**203a-b**) and roundel (**204a-b**) from Mikro Vouni, Samothrace. Objects shown at ca 1:1; drawings of seal-types at ca 2:1. **205a-b** Direct object sealing, Ayia Irini, Kea; drawing of seal-type (ca 2:1) and silicone of reverse (ca 1:1).

Minoan seals start to travel at the beginning of the proto-palatial period, if not earlier, a fact which chimes with the appearance of MM I-II pottery across the Aegean from Aigina to Samos.⁹⁶ Not all of the seals come from closed contexts and conceivably some could have travelled at a later date. Nevertheless, proto-palatial seals are now known from the islands of Aigina, Kea, Kythera (?), Melos, Rhodes (?) and Thera, and also from Miletus

⁹⁶ *ABAC* 21, 65-67; J. L. Davis, in *Review* 25-26; L. V. Watrous, in *Review* 209-10.

on the coast of Anatolia.⁹⁷ One of the seals from Miletus is a bone stamp, bearing a fine depiction of a wild goat and hatched filling ornament (202). It fits in well with our group of late pre-palatial bone seals (Chapter 4) and so seems to be a trifle older than its context. This can be dated securely to MM IB-II thanks to the presence of imported Early Kamares pottery. A two-hole hanging nodule made of local clay may be of similar date, though it came from a disturbed deposit. A second sealing, tentatively identified as a flat-based nodule, is likely to be of early neo-palatial date. These finds, though few in number, are especially striking, since the excavated area at Miletus is small and subject to water-logging. Recent excavations have, however, made clear that the site has a thoroughly Minoan character until LM IB, thereafter becoming a Mycenaean settlement.

The island of Samothrace in the north Aegean has produced even more startling evidence. Stratigraphical tests at the site of Mikro Vouni have yielded several Minoan-type sealings – roundels and *noduli* – impressed with Minoan seals.⁹⁸ But the clay seems to be local, so the sealings themselves did not travel. One *nodulus* carries the impression of a signet ring with oval bezel depicting a standing lion with large curling tail (203). Its style calls to mind ring impressions from Phaistos. Another *nodulus* has an impression of a cushion bearing two signs of the ‘Archanes Formula’, a similar (but not identical) cushion was used to stamp one of the roundels (204). The second roundel was impressed with four separate seals. Finally, there is at least one direct object sealing, bearing the impression of a fine circular signet ring.⁹⁹ Curiously, there is next to no imported Minoan pottery on the site, so the use of high quality Minoan seals and sealing practices of a kind closely associated with palatial administration on Crete is all the more puzzling. Carbon 14 tests suggest a date within 1873–1684 BC (2σ calibrated).

At least one other Aegean site, namely Aya Irini on Kea, also adopted Minoan sealing practices in the MBA. A small roundel comes from Kea Period V, roughly contemporary with MM IIIA on Crete.¹⁰⁰ Since there is no evidence that roundels ever travelled, even within Crete, this example was surely made on Kea. A direct object sealing from Kea IV is, perhaps, a trifle less diagnostic.¹⁰¹ The silicone impression of the reverse shows the imprints of a wooden peg, smooth leather and cord-binding, perhaps indicating a sack closure (205b). Although precise parallels are hard to muster, in general terms it fits well enough with contemporary practices on Crete, and the sealing was clearly impressed with a Minoan seal (205a).

⁹⁷ Examples from the islands appear in *CMS* V, V Suppl. 1A–B, V Suppl. 3; also VII nos. 22 (‘Rhodes’) and 36 (‘Kythira’). For Miletus: B & W.-D. Niemeier, in *Meletemata* 543–54; W.-D. Niemeier, *BICS* 46 (2002–03) 225–27; *CMS* V Suppl. 3 nos. 476–483 (including some of LBA date). See also Chapter 10.

⁹⁸ *CMS* V Suppl. 1B nos. 321–28 (no. 320 is probably EBA in date); also now V Suppl. 3 nos. 341–343. For the site, see: D. Matsas, in *Politeia* 235–47.

⁹⁹ *CMS* V Suppl. 1B no. 328. A newly published object sealing (*CMS* V Suppl. no. 341) apparently accompanied an imported product, since the clay is not local to Samothrace. It was impressed with a Minoan bone / ivory seal. See W. Müller, in *Emporia* (forthcoming).

¹⁰⁰ *Roundel* II 37: KE Wc 2 (not in the *CMS*).

¹⁰¹ It comes from Kea IVb-c deposit under House EJ: J. C. Overbeck, *Keos* VII (Mainz 1989) 143 BM-11, pl. 72 (presumably the clay is local); see also *CMS* II.6 p. 376, fig. 24 (erroneously dated EH II).

CHAPTER 6 NEO-PALATIAL CRETE

Toward the end of the MM IIB period major destructions occurred at key palatial centres and also at smaller provincial sites. Earthquakes may have been responsible in some cases; interstate warfare has also been blamed, though direct proof is lacking. Nor is it entirely certain that the destructions were truly contemporary in absolute, as opposed to ceramic terms. In any case, following the disasters, major re-building programmes were initiated and in time the palaces gained a more monumental appearance. With energies largely directed toward reconstruction, MM III seems a shadowy phase in Minoan culture and glyptic alike.¹ Knossos suffered earthquake damage some time during MM III and again in the so-called Great Destruction of MM IIIB (or MM IIIB / LM IA Transitional). But craft output swiftly revived and in LM I increasingly sophisticated products flowed from palatial workshops. The objects of ivory, faience and bronze, the stone vases and fine pottery, the seals and signet rings all attest to a prosperous and dynamic period in Minoan culture.²

Beyond the palaces we also find significant developments during MM III-LM I. In towns and regional centres across the island, large mansions and 'villas' were constructed.³ Their architecture often emulates that of the palaces, with provision of special ceremonial or residential suites and storage facilities; refinements such as dressed masonry, gypsum or frescoes are sometimes found. Many of these 'second-order' centres also provide crucial evidence for administrative practices in the form of sealings, and sometimes Linear A tablets, preserved in LM IB destruction deposits (Chapter 7). Certainly by the end of the neo-palatial period, sealing practices had become increasingly complex, presumably in response to growing socio-economic demands. Some features of Minoan administration were also adopted in the islands of the Aegean, where Minoan influence had grown apace from the beginning of the MBA onwards.⁴ But in LM I sealings also travelled, and this is true of the nodules recently discovered at Akrotiri on Thera (Chapter 7). Such graphic evidence for communication between Thera and Crete is very welcome indeed, though is not wholly surprising given the exceptionally close cultural ties between these islands in LM IA. The Greek mainland tells a very different tale: until well into the Shaft Grave era (mid-16th century) Minoan influence was limited. Thereafter we see an influx of high-status products from Crete, followed swiftly by the establishment of local Mycenaean workshops. These drew so heavily on Minoan style and iconography that we often find it difficult to distinguish mainland products from Cretan imports. Glyptic is no exception. Consequently, in this chapter we will sometimes

¹ See Chapter 5, esp. n. 5; also W.-D. Niemeier, in *Knossos Labyrinth* 71-74. Recent surveys of the neo-palatial period include: *Troubled Island*; P. Rehak & J. G. Younger, in *Review* 383-441, 466-470; also papers in *Monuments*. The absolute dating for the neo-palatial period and the Thera eruption in LM IA remains controversial. Here I follow the traditional 'low' chronology, placing MM III-LM IB at ca 1700/1650-1450 BC: see *ABAC* 135-44, 169, table 3.1.

² For a useful summary with references, see: Rehak & Younger (n. 1) 403-420.

³ *Troubled Island* 25-33, 119-247; Rehak & Younger (n.1) 392-402, 467-68; R. Hägg (ed.), *The Function of the "Minoan Villa"* (Stockholm 1997).

⁴ See Chapter 5. MM III-LM I seals are known from many Aegean islands, though some may have travelled at a later date (Chapter 10). For 'minoanization' generally: J. L. Davis, in *Review* 25-27, 29-31, 52-59, 68-71; J. L. Davis et al., in *Review* 77-94; Rehak & Younger (n. 1) 426-33.

refer to examples from the mainland. But since we are concerned as much with the cultural milieu in which seals were used as with stylistic developments, Mycenaean Greece will merit separate chapters (Chapters 9-10).

SOURCES OF EVIDENCE AND DATING

It is well nigh impossible to estimate the number of surviving neo-palatial seals, though a very rough guess would be around 1800.⁵ Very few come from closely dated contexts; many have no provenance at all. Minoan burial customs are largely to blame for this sorry state of affairs. The practice of communal burial persisted into the neo-palatial period, with some tombs being used from MM II / III-LM I. This applies to the tholos of Kamilari near Phaistos, the important new chamber tombs at Poros-Herakleion and several more in the Knossos area.⁶ But there is a worrisome lack of neo-palatial graves across the island and rich interments are very rare indeed. Are they still awaiting discovery or are they long since destroyed? An extensive cemetery of 150 pithos burials dating to MM III-LM I was discovered at Sphoungaras near Gournia. But grave goods were not common and only about ten seals were found; most are in the so-called 'talismatic' style. Similar seals accompanied burials at nearby Mochlos where some of the earlier house tombs were re-used. This general scarcity of undisturbed graves greatly hampers our ability to understand the extent of seal ownership in neo-palatial Crete and related social issues (Chapter 7). However, a number of neo-palatial seals and gold signet rings survived into LM II-III. Some were used to impress the late sealings at Knossos, others were deposited in the rich LM II-III graves of Isopata and Sellopoulo near Knossos, Kalyvia near Phaistos, and Archanes-*Phourni* (Chapter 8). One imagines that most of the high quality neo-palatial seals acquired by Evans and earlier travellers came from tombs disturbed or deliberately looted in the late 19th century AD (Chapter 11).

For securely dated material we rely heavily on the seal impressions preserved in neo-palatial destruction deposits, augmented by comparanda from Early Mycenaean graves. These sources allow us to chart the major stylistic trends of neo-palatial glyptic. Evidence is undeniably poor for MM III, owing to the practice of communal burial noted above

⁵ Problems of dating, definition and lack of systematic studies conspire against us. A. Onassoglou catalogued ca 900 'talismatic' seals: *DtS* (1985). But she included soft stone seals better seen as ornamental (e.g. 224) and certain motifs now attributed to the Cut Style (produced in LM IB-II: below and Chapter 8). About 50 more 'talismatic' seals have come to light since, many from the mainland: we cannot be certain that all are genuinely Cretan products (Chapter 9). Naturalistic seals of hard stone present even greater problems, unless known to have been found on Crete (preferably in secure neo-palatial contexts). In any case, no accurate figures exist. The same applies to soft stone seals: I. Pini, in *CMS Beiheft 5* (1995) 190, estimates 1000 LM soft stone seals are known as originals or impressions, but this figure includes LM II-III pieces. Seal-types attested on sealings are easier to count (see below and n. 9). Neo-palatial seals are widely dispersed and appear in virtually all volumes of the *CMS* (except II.5); also *CM* (Giamalakis Collection) and *CS* (Ashmolean Museum). Note that *CMS* II.3, ostensibly devoted to the neo-palatial period, includes numerous pieces of LM II-III date; *CMS* II.4 contains mostly soft stone seals of LM date, not 'post-palatial' or 'undatable' as the title indicates: see below and Appendix 1. These volumes only include seals that entered the Herakleion Museum before ca 1960. *CMS* II.4 pp. xxvii-xxxv provides valuable lists of seals from dated contexts.

⁶ Rehak & Younger (n. 1) 402-03. For Poros add: N. Dimopoulou, in *Eliten in der Bronzezeit. JRGZM Monograph 43* (Mainz 1999) 27-36; N. Dimopoulou & G. Rethemiotakis, in *CMS Beiheft 6* (2000) 39-56. For Kamilari: E. Fiandra, in *CMS Beiheft 5* (1995) 77-85. For the principal sites mentioned in the present chapter see MAP 4; also MAP 5 for the Knossos area.

and the uncertainties attached to the Hieroglyphic ‘Deposit’ at Knossos (Chapter 5). Our first closed deposit for the neo-palatial period is provided by the Temple Repositories at Knossos, which contained numerous sealings, in addition to the famous snake handlers and other objects of faience. Unfortunately, the date of this crucial deposit is also problematic: either MM IIIB / LM IA Transitional (ca 1600–1575 BC) or LM IA Mature (ca 1525 BC).⁷ However, the most advanced seal-types now find good parallels among the new sealings from Akrotiri on Thera. Certainly these exciting discoveries will lead to a better understanding of stylistic developments in the neo-palatial period. At least 15 seal-types are represented, for which the volcanic destruction in LM IA Mature (ca 1525 BC) provides a secure *terminus post quem non*.⁸ As we shall see, the Thera sealings also offer important insights into seal use and administrative practices in the neo-palatial period (Chapter 7).

Our best information regarding sealing practices undoubtedly comes from the very end of the neo-palatial period. From Khania in the west to Zakros in the east, most towns, villas and palaces suffered violent destruction by fire at the end of LM IB (ca 1450 BC). More than 1800 sealings, with about 500 different seal-types, have survived thanks to these destructions. The largest assemblages are those from Ayia Triada, Zakros (House A) and Khania; small numbers also occur at Gournia, Palaikastro, Pyrgos, Sklavokambos and Tylissos.⁹ Yet in the main palaces – and above all at Knossos – sealings are conspicuous by their absence. As we shall see, this has a bearing on our ability to interpret neo-palatial administrative mechanisms and inter-site relationships in LM IB. Even so, it is apparent that sealing practices had become much more sophisticated and specialized than in the proto-palatial era. We shall consider these new sealing types and survey the principal deposits and groups in the next chapter.

For stylistic developments the neo-palatial sealing deposits also offer important insights. Sometimes the impressions provide examples of motifs or compositions that are not otherwise attested on surviving seals. Metal signet rings, which were often engraved with complex multi-figured scenes, have an exceptionally poor survival rate. Without the seal impressions, the iconographic repertoire would be greatly diminished. More striking still are the hybrid creatures known solely from the Zakros sealings: for these no parallels at all occur on surviving seals. In other cases, seal-types can be compared to extant seals which lack a secure date or provenance. Still others find parallels among the seals from the Shaft Graves at Mycenae and other LH I-II burials (Chapter 9). Grave Circle B at Mycenae yielded three seals: all are likely to be Cretan imports, including an amethyst discoid bearing the well-known ‘portrait’ head (236). The famous gold seals and signet rings from Graves III and IV in Circle A (458-461, 464, 478) must be more or less contemporary with the new sealings from Thera (LM IA Mature in Minoan terms) and perhaps those from the Temple Repositories. The Vapheio tholos tomb near Sparta in Lakonia also provides an immensely valuable collection of closely dated material. The sealed floor cist contained 29 seals, two magnificent gold cups and pottery datable to LH IIA (contemporary with LM IB). Other Mycenaean graves also contain seals of LB I-II date, though closed deposits are sadly all too rare (Chapter 9).

⁷ *ABAC* 61-65, 72-74; *CPSK* 146-48. *Troubled Island* 16-17, 22-23; C. F. Macdonald, in *Monuments* 39-41; idem, *JHS* 123 (2003) 244-45. For the sealings see *CMS* II.8 and Chapter 7.

⁸ Found in Room Delta 18a-b: C. Dumas, *Ergon* (1995) 52-54, figs. 37-38; idem, *PAE* (1995) 127-30, pl. 63; idem, in *CMS Beiheft* 6 (2000) 57-65; also now *CMS V Suppl.* 3 nos. 391-405.

⁹ See *CMS* II.6, II.7, V, V Suppl. 1A–B, V Suppl. 3. The LM III Knossos sealings provide further MM III-LM I and LM I-II seal-types: *CMS* II.8 and Chapter 8.

SEALS AND SEAL-TYPES

In Chapter 5 we focused on seals and seal-types that were attested at the end of MM IIB in the Phaistos sealing deposit, although similar seals were probably made and used well into MM III, namely the early neo-palatial period. After all, glyptic development respects neither ceramic typologies nor architectural modifications to the palaces. In the present chapter we need to carry the story forward from MM III to the end of LM IB, a period of some 200-250 years. The beginning of the period is undeniably hazy; the end is fairly well defined, thanks to our LM IB sealing deposits. For seals which do not come from datable contexts, we must (as usual) content ourselves with stylistic dates: MM III-LM I and LM I-II. These overlapping periods may seem deeply unsatisfactory, but for our purposes it is safer to err on the side of caution. Over-precise dating invariably creates more problems than it solves.¹⁰

MATERIALS, SHAPES, TECHNIQUES

Hard semi-precious stones, first attested in MM II, were increasingly used during the neo-palatial period. Most supplies were probably imported as unworked crystals and nodules. A particularly impressive lump of red jasper has been found in the neo-palatial centre at Archanes-*Tourkogeitonia*.¹¹ The size and quality of this piece probably indicate a foreign source – perhaps Egypt – although jaspers do occur on Crete. Still more exciting are the lumps of red jasper, banded agate, rock crystal and amethyst found in an LM IA workshop at Poros, now an eastern suburb of Herakleion, once the harbour-town for Knossos. Also recovered were rough-outs and blanks, damaged items and workers' waste (flakes and chips). The workshop produced beads as well as seals and made use of local chlorite and serpentine alongside the semi-precious stones. When this material is fully published our knowledge of Minoan seal manufacture will be greatly enhanced.¹²

Sometimes hard stones may have reached the Aegean as half-worked blanks or finished beads, which were re-cut on arrival.¹³ These can be hard to spot, but cylinders – always rare in the Aegean – are obvious candidates and could have been made from cylindrical or barrel-shaped beads trimmed as necessary (208; cf. 450). Some amygdaloids – especially those of carnelian – might also be re-worked beads in disguise; these often have a tell-tale groove on the reverse. A large and exceptionally fine example from Knossos is shown in the FRONTISPIECE and C30.

¹⁰ There is no specialist overview of neo-palatial glyptic: *GGFR*² 36-46, 408-10 and *APG* 218-24 provide short summaries. *ECS* ends with the 'MM IIIB' Temple Repositories; *Middle Phase* deals with glyptic from 'ca. 1700–1550 B.C.' and so includes some seals generally seen as MM III-LM I (and even later). Younger's *Kadmos* articles on 'Masters and Workshops' and 'Stylistic Groups' deal with LBA glyptic as a whole (excluding 'talismanic' seals and the Cut Style). His attributions and use of absolute dates are sometimes problematic: see Chapter 11. *Iconography* provides a useful catalogue of LBA motifs (again not limited to Minoan Crete). Valuable remarks on style, iconography and dating are provided by I. Pini, *CMS* II.4 pp. xix-lxii. See also above n. 5.

¹¹ Measuring 0.15 x 0.18 x 0.14 m: *Archanes* II 614, fig. 649; also P. Warren, *Αρχαιολογία* 53 (1994) 61. For possible sources of jasper and other semi-precious stones see Chapter 5. The Glossary (Appendix 2) summarizes terminology and properties.

¹² Meanwhile see: N. Dimopoulou, in *TEXNH* 433-38, pls. 171-72. Pieces of agate, red jasper, rock crystal and amethyst are displayed in the Herakleion Museum (see also *Crete – Egypt Catalogue* no. 84). For the unfinished seals: N. Dimopoulou, in *CMS* Beiheft 6 (2000) 35-36 nos. 25-30, figs. 3-4. See also Chapter 11.

¹³ H. Hughes-Brock, in *CMS* Beiheft 5 (1995) 112-16; *Middle Phase* 183.

Carnelian became extremely popular in LBA Crete, with stones ranging from yellowish-orange to blood red, dull and cloudy to translucent (FRONTISPIECE; C30-C31; cf. C13). When exposed to heat, carnelian and agate can take on exotic hues and mottled effects (C18). This may have been practised deliberately, although with unprovenanced seals we cannot be sure.¹⁴ Most agates used in MM III-LM I have rather delicate veining, whereas showy banded agates *seem* more common in LM II-III.¹⁵ In fact, the trend was probably underway in LM I, as suggested by C24 (cf. 206), a well-known cushion in Oxford. Perennial favourites, especially for ‘talismanic’ seals, are the jaspers – red, green and occasionally black (C27-C28).¹⁶ Amethyst is used sparingly throughout the neo-palatial period (e.g. C20) and becomes a rarity after LB I, echoing the pattern of exploitation in Egypt (Chapters 5, 9). The source of blue chalcedony, used for a small number of neo-palatial seals, is a mystery (C21, C26). Seals of lapis lazuli remain very rare. The finest example from this period is a lentoid lavishly encased in gold, which came to light in the back yard of the South House at Knossos (207).¹⁷

Several new materials became available to seal engravers in the neo-palatial period, though were apparently more common during LM II-III. One is haematite, a blackish stone with a metallic sheen (cf. C38). Its appearance in the Aegean seems rather belated, as it had been widely used for cylinder seals in Mesopotamia since the Old Babylonian period (ca 1800 BC).¹⁸ Another Eastern material which arrives in LB I is blue glass. Initially Aegean craftsmen treated this like a semi-precious stone; only in LB III did they invent methods of mass-producing glass seals and jewellery in moulds (Chapters 8-9). In the Aegean glass does not survive especially well and is liable to discolour to a greyish-white. Luckily, several seals in Oxford give us an idea of how attractive glass can be, the blues still deep and vibrant (C32). Two are executed in the Cut Style, current during LM IB-II, another bears a simple geometric design.¹⁹ In addition to these exotic materials from the eastern Mediterranean, another new stone reaches Minoan Crete in the neo-palatial period. This is lapis lacedaimonius, or Spartan basalt, found only in the quarries at Krokeai in Lakonia (cf. C37).²⁰ Is it coincidence that it first reaches Crete in LM I, when the Vapheio prince was forming his collection of seals and *objets d’art* in the Minoan style? This material also comes into its own during LM II-III and we will consider it again in Chapter 8.

¹⁴ See also here C11, C16, C41, C46. The matter merits further investigation, coupled with experimental work; meanwhile, see: P. Yule, in *CMS Beiheft 1* (1981) 278-82.

¹⁵ See Chapter 8. Because so much evidence for neo-palatial glyptic comes from seal impressions, observations on the popularity of stones are necessarily tentative. Nor is there an easy way to check their validity, since no data-base exists as yet (Chapter 11).

¹⁶ Black jasper needs more investigation: some seals so described (e.g. by V. E. G. Kenna) are not necessarily jasper (e.g. *CMS VII* no. 88, here 210, which is haematite). The same *caveat* applies to some seals said to be green ‘jasper’. Yellow jasper, sometimes used in MM II-III (e.g. C10), seems unknown in this period.

¹⁷ O. H. Krzyszkowska, in P. A. Mountjoy, *Knossos: The South House*. *BSA Suppl.* 34 (London 2003) 199-206. For sources: *AMMI* 84-92.

¹⁸ *AMMI* 84-85; for Egypt: *AEMT* 38. See also Chapter 2.

¹⁹ *CS* nos. 359 and 364 (381, 385) from the Dictaeon Cave; *CS* no. 362 (‘Ayia Pelagia’). These engraved glass seals have gently rounded backs and narrow string-holes (385a); cf. the profile of a pressed glass seal 540a. For the Cut Style see below and Chapters 8-9.

²⁰ P. Warren, in J. M. Sanders (ed.), *ΦΙΛΟΛΑΚΩΝ* (London 1992) 285-96. *CMS V Suppl.* 1A no. 333 and VII no. 46, both ‘talismanics’, prove the material was already used for seals in this period.

The many fine semi-precious stones should not blind us to the fact that soft local stones were used throughout the neo-palatial period, in marked contrast to Early Mycenaean Greece. At a rough estimate about 25% of the total output during LM I was in soft materials – usually chlorite and serpentine (**C29**) – often erroneously called steatite in older literature (see Chapter 1 and Appendix 2). In fact, steatite, so popular for making prisms in MM II, is now encountered less frequently. Other misconceptions are more serious, namely the equation of soft stones with ‘degenerate’ workmanship and late dating.²¹ Happily, the LM I sealings from Ayia Triada and Zakros, coupled with a growing number of stratified seals from LM I contexts, provide us with ample evidence for neo-palatial seals made of soft stone. Although relying largely on hand tools, soft stone engravers often imitated stylistic features of hard stone seals and metal signet rings; they also drew on much the same iconographic repertoire. And, if desired, one could readily create the illusion of golden seals by applying gold foil over stone, as shown by the famous steatite cushion in the Ashmolean Museum (**C23**; cf. **257**).²² That links existed at workshop level had long been suspected; the discoveries at Poros now confirm that this was sometimes the case (see above)

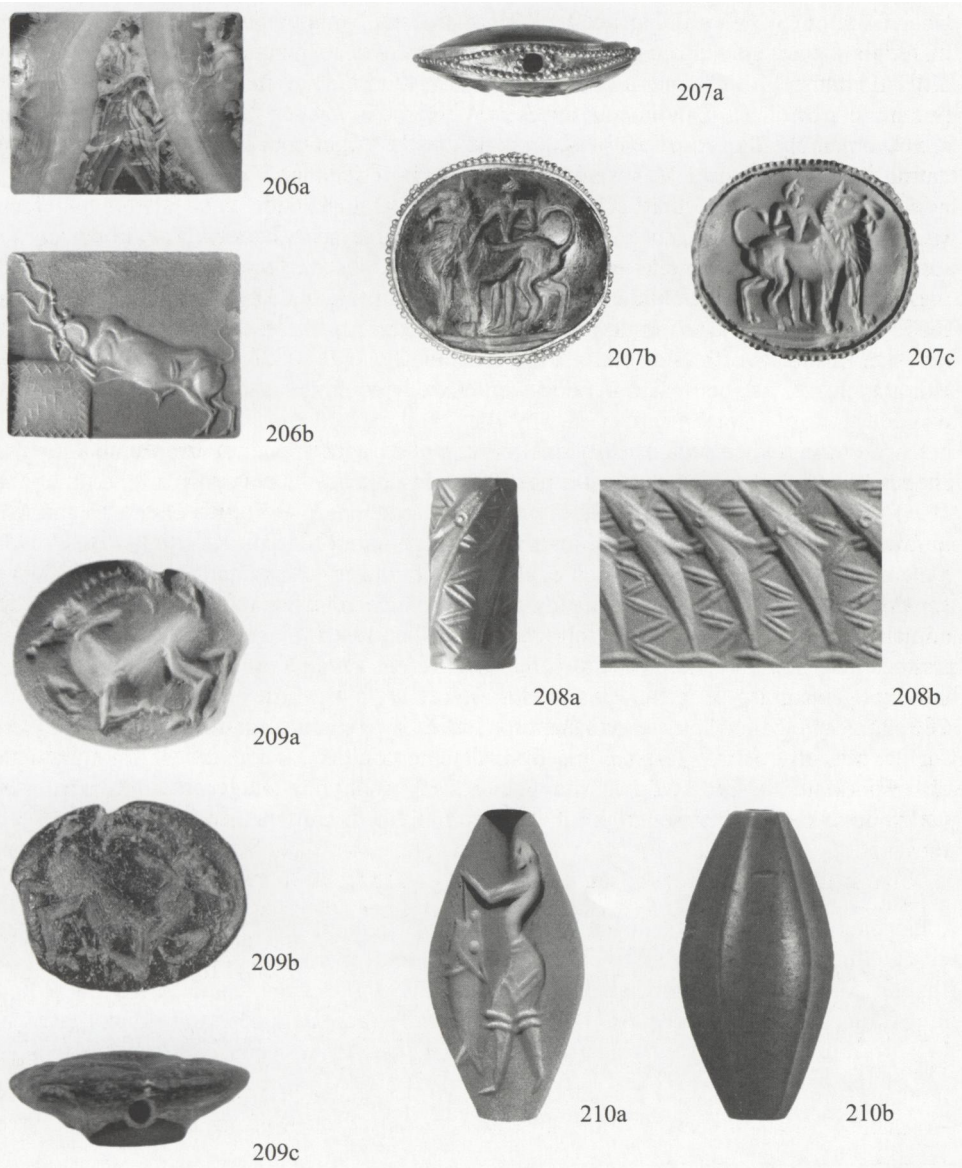
During the neo-palatial period there is a marked reduction in the number of seal shapes.²³ *Petschafte*, buttons and four-sided prisms are abandoned, probably early in MM III. Three-sided prisms no longer occur in soft stones and are much less common than before; their convex faces are round or almond-shaped (**229**). Bi-facial discoids give way to lentoids, usually engraved on a single face. Amygdaloids are also popular, especially for the ‘talismanic’ style. Some are elongated and have elegantly faceted backs; they are sometimes used for vertical compositions (**210**, **238-239**). Cushions, once known as flattened cylinders, are less common than lentoids or amygdaloids, yet some of the finest surviving examples of neo-palatial engraving are found on their rectangular faces (e.g. **206**, **251**, **255**, **257**). These three shapes – lentoids, amygdaloids and cushions – account for the majority of neo-palatial seals in hard and soft stones alike. A few cylinder seals also exist (e.g. **208**). In addition there were signet rings, occasionally made in stone, more often in gold and other metals and having round or oval bezels. First attested in MM II, they occupy a prominent place in the neo-palatial repertoire. Since metal signets rings involve special techniques of manufacture, we will consider them separately below.

Changes to seal shapes extend to seal faces, which are now invariably convex. This was obviously a *desideratum* for hard stone seals, enabling engravers to exploit the lapidary lathe to its full potential, a trend already underway in MM II-III (Chapter 5). But now soft stone seals (and metal signets) also have convex faces. While fashion may have played a part, engravers would also be attuned to practical needs. Once stamp seals with large bodies or integral grips were abandoned, seals had to be controlled by the string alone, pulled taut to form a ‘handle’. The hoop of a signet ring serves the same purpose. To make a good impression – and to remove the seal cleanly from the clay – a convex face offered a clear advantage.

²¹ The myth goes back to Evans (*PM* IV 534-35, 594-95) but was widely disseminated by Kenna: *CS* 64-67, *BICS* 13 (1966) 68-75, and his arrangement of *CMS* IV, VII-VIII, XII-XIII). The definition of the ‘Cretan Popular Group’ by J. G. Younger (*Kadmos* 22 [1983] 117-19, 123-27) and J. H. Betts (in *MUM* 187-88) was a major step forward, since refined in studies by the *CMS* team, e.g. *CMS* II.4 pp. xxvii-lxii; W. Müller, in *CMS* Beiheft 5 (1995) 151-67; I. Pini, *ibid.*, 189-91, 193-207. See also below pp. 147-48 and Chapter 11.

²² The Peak Sanctuary rhyton from Zakros was also gold-covered: *APG* 146-47, fig. 140.

²³ *ECS* Shape Class nos. 1, 8, 9, 11, 19, 28d; cf. Chapter 5 n. 18. The Glossary (Appendix 2) summarizes current definitions of seal shapes.



LM I-II seals. **206a-b** Agate cushion from 'Priene'; face and impression. **207a-c** Lentoid of lapis lazuli, encased in gold, from Knossos; profile, face and impression. **208a-b** Carnelian cylinder from 'eastern Crete'; profile and impression. **209a-c** Steatite ring bezel, broken and provided with string-hole, unknown provenance; impression, face and profile. **210a-b** Haematite amygdaloid with faceted back, unknown provenance; impression and reverse. Scale ca 3:2.

Seal faces remain small during MM III-LM I.²⁴ Lentoids usually measure 1.0–2.0 cm in diameter; most cluster in the middle of the range. Amygdaloids and cushions rarely exceed 2.0 cm in length. The oval bezels of metal signet rings are sometimes larger: 2.0–3.0 cm is not unusual. As we shall see, the size of seals increases significantly during LB II-III, although this cannot be used as a firm criterion for dating individual pieces.²⁵ The small size of neo-palatial seal faces may, in some way, be bound up with function. Direct object sealings are now a thing of the past, so too large crescents bearing Hieroglyphic inscriptions. The new range of hanging nodules and flat-based sealings involve small lumps of clay (Chapter 7). To make impressions on these, small seals would be an advantage. Yet there are still many instances where we have only partial impressions, because the size (or shape) of the seal was too large for the lump of clay (e.g. **284-285**). Other incomplete impressions result from seals being applied carelessly. These observations raise important questions concerning the recognition of motifs and their link to special offices or individuals (Chapter 7).

Engravers of the neo-palatial period employed much the same range of tools and techniques as their predecessors in MM II.²⁶ For hard stones, the lapidary lathe with attached cutting wheels and drills came to be applied with greater assurance and control. The practical and, for that matter, the aesthetic consequences were considerable. In effect, style – or choice of style – increasingly rested with the engraver (or his clientele) and was not dictated by his equipment. For instance, the hallmark of the popular ‘*talismanic*’ style is the rapid, but wholly undisguised application of cutting wheels and drills (pp. 133-37). But the same tools in different hands could produce fine naturalistic studies of birds, animals or human figures. Meanwhile the slower hand tools employed on soft stones, the punches and gravers used on metals offered different advantages and constraints. But to be honest, our grasp of technique – and therefore style – is still imperfect. Broad trends are relatively clear, thanks to painstaking studies by experts. But all too often progress founders because so few seals come from datable contexts. In other cases, comparanda are impossible to find and we may be dealing with rare survivors of a particular workshop or even experimental products of an individual craftsman.

Metal signet rings

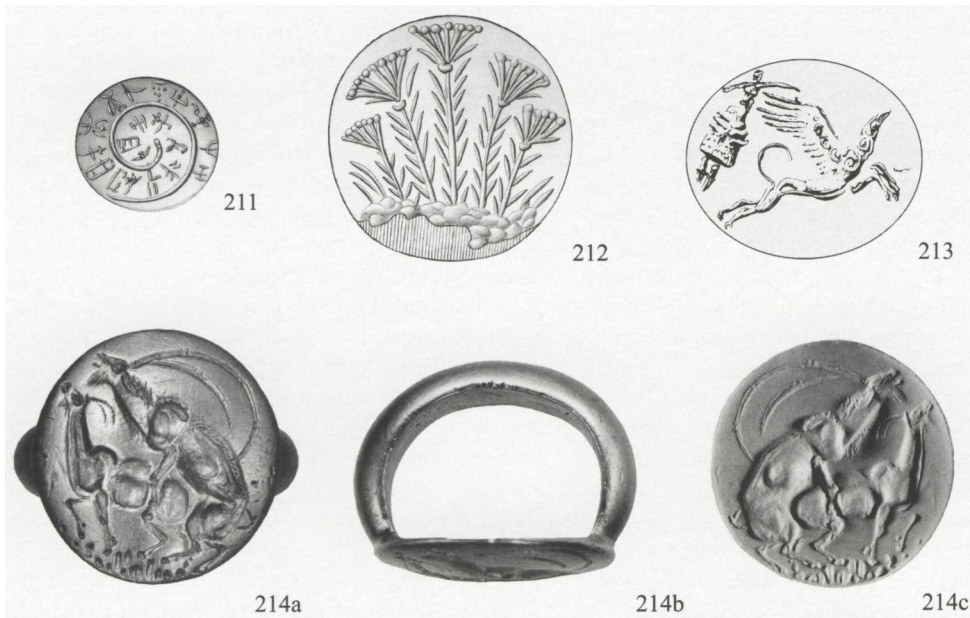
A few impressions made with metal signet rings occur in the Phaistos sealing deposit, thus helping to pinpoint the invention of a new and distinctive kind of seal (**181-183**; Chapter 5). From the neo-palatial period onwards, signet rings came to occupy a prominent place in Aegean glyptic, though numerically the extant repertoire is not large. If we add impressions to surviving rings, the total scarcely exceeds 200 examples; about half can be dated to MM III-LM I. The survival rate for Minoan signet rings is especially poor and few of the 25-30 examples were actually recovered from neo-palatial contexts.²⁷

²⁴ In this chapter most examples are shown at 2:1; for **206-210**, **243-249** the scale is 3:2.

²⁵ See Chapter 8, esp. n. 16, and Chapter 9.

²⁶ See Chapter 5; also *Minoan Crafts I* 160-62.

²⁷ They include: *CMS* II.3 nos. 15 (here **218**), 38 (here **211**), 239, 252 (Mochlos: lost); V Suppl. 1A no. 58 (here **220**). The Gerondouri Cave in Lasithi yielded two rings: *CMS* V Suppl. 1A no. 45 (bronze, tectonic design: MM II-III) and no. 46 (silver: here **212**). The cave was used for burials until MM IIB (not MM III-LM I as originally believed). Thus the MM III-LM I stylistic dating proposed in *CMS* V Suppl. 1A p. xxxvi for both rings (and followed here for the silver ring) should be revised to MM II-III. This merely highlights the importance of well-dated contexts for establishing glyptic chronology. Finally, there is a new gold signet from Poros T. 7, found in a clear LM IB context: Dimopoulou & Rethemiotakis (n. 6). A second ring from Poros is unpublished.



MM III-LM I signet rings. **211-213** Rings from Knossos, Ayios Charalambos and Archanes-Phourni; drawings of impressions. **214a-c** The Burgon Ring, from 'Candia', now in London; face, profile and impression. All are massive (solid) gold, except **212**, which is silver. Scale ca 2:1.

Some LM I signets were preserved in later burials on Crete or the mainland; this applies to the famous rings from Isopata and Vapheio (**215**, **221**). Others have no meaningful provenance at all (e.g. **214**, **216**, **621-623**). Not surprising, then, that controversies should arise over the origin, date and authenticity of these displaced and homeless pieces. We will need to tackle these issues in later chapters;²⁸ here suffice to say that nowadays we are better placed to assess rings on both technical and stylistic grounds.

Most surviving neo-palatial rings are gold, but examples in silver, bronze and lead are also known. Signet rings of stone are attested too.²⁹ On sealings, impressions that are very sharp and detailed usually point to gold rings, while imprints from rivets suggest rings made of bronze (see below). The bezels of neo-palatial rings were usually oval and set at right angles to the hoop, a shape otherwise unparalleled in the ancient world. In the eastern Mediterranean oval bezels were ordinarily aligned with their hoops. Some Minoan signet rings had round bezels, though the fashion seems to have been on the wane by MM III-LM IA. Extant examples include the curious gold ring from the Mavrospelio Cemetery at Knossos, bearing a spiral inscription in Linear A, and the silver bezel (the hoop is lost) from the Gerondomouri Cave at Ayios Charalambos in Lasithi, with an exquisite engraving of papyrus blossoms in a rocky landscape (**211-212**). An unusual ovoid ring made of gold depicts a female figure hovering behind a winged griffin (**213**). Here the engraving is rather worn – a testimony to its age when finally deposited

²⁸ Chapters 9-10 (Minoan signets found on the mainland) and 11 (authenticity).

²⁹ See here **209** (hoop broken and re-worked): H. Hughes-Brock, in *CMS Beiheft 6* (2000) 118-19, figs. 10-11. One wonders if soft stone rings (also known from impressions, e.g. here **22c**) were ever covered in gold, as was CS no. 203 (**C23**).

in Tholos B at Archanes-*Phourni*.³⁰ The Burgon Ring in London has an unusual pedigree and was one of the first Minoan artefacts to reach the West.³¹ Moreover, it is arguably the finest round signet to survive, an outstanding example of Minoan naturalism (214; C22). Its excellent condition also allows us to appreciate the kind of detail that could be achieved on gold, e.g. the bristly coat, beard and delicately ribbed horns of the male goat. Mating scenes are virtually unheard of in Aegean iconography,³² yet this pair of *agrimia* makes a striking composition, the long curving horns admirably suited to the circular field. The bezel of this ring is massive, i.e. made of solid gold, soldered to a solid hoop. The same is also true of the rings from Mavrospelio and Archanes.

Myths and misconceptions, some deeply entrenched and damaging, abound in the literature on gold signets.³³ For instance, claims that rings are massive should be treated with deep suspicion: solid rings are exceptionally rare. Most are hollow, constructed of separate elements made of sheet gold, which were soldered together. The Isopata ring provides a classic example (215). Here the two-part bezel consists of a convex oval face with a deep wedge-shaped section joined to a concave finger-bed plate. A minute hole in the engraved face indicates that this bezel is hollow, a fact now confirmed by X-ray photography and ultra-sound tests. In this case the sheet gold measures about 0.65 mm thick, which is reckoned to be fairly sturdy.³⁴ A ring in Oxford also has a hole in its bezel and is hollow within (622). Once regarded as a forgery, the piece was rehabilitated on stylistic grounds some years ago;³⁵ now technical observations support its authenticity. The suggestion that some bezels were filled with sand or fashioned around a perishable core is often mooted, but remains wholly speculative.³⁶ Although powdery deposits have sometimes been noted, none has been analysed and the normal effects of deposition might well account for traces of sand or earth. None the less, it is fair to say that some hollow signet rings do seem rather flimsy. This is true of a small ring from Kalyvia, near Phaistos (217).³⁷ The ring was found in a LM IIIA1/2 grave, which accounts for the very worn engraving on the bezel.

The hoops of Minoan gold signets are usually narrow and decorated with simple transverse ribbing (215-217; also 221, 593, 621-623; C25). They are also notoriously small; an inner diameter of 1.3 cm is not unusual. This would seem far too small for wearing and has led to the notion that hoops merely served for suspension or as grips when making impressions (i.e. as 'fixed strings'). In fact, we need to make allowances for

³⁰ *Archanes* I 169-79, esp. 177 (context); II 651-53, figs. 718-19 (ring).

³¹ O. Krzyszkowska, in *CMS Beiheft* 6 (2000) 154-55; also Chapter 11

³² Other examples are *CMS* II.1 no. 369 (ivory conoid: Siva) and II.2 no. 306a (steatite prism: unknown provenance).

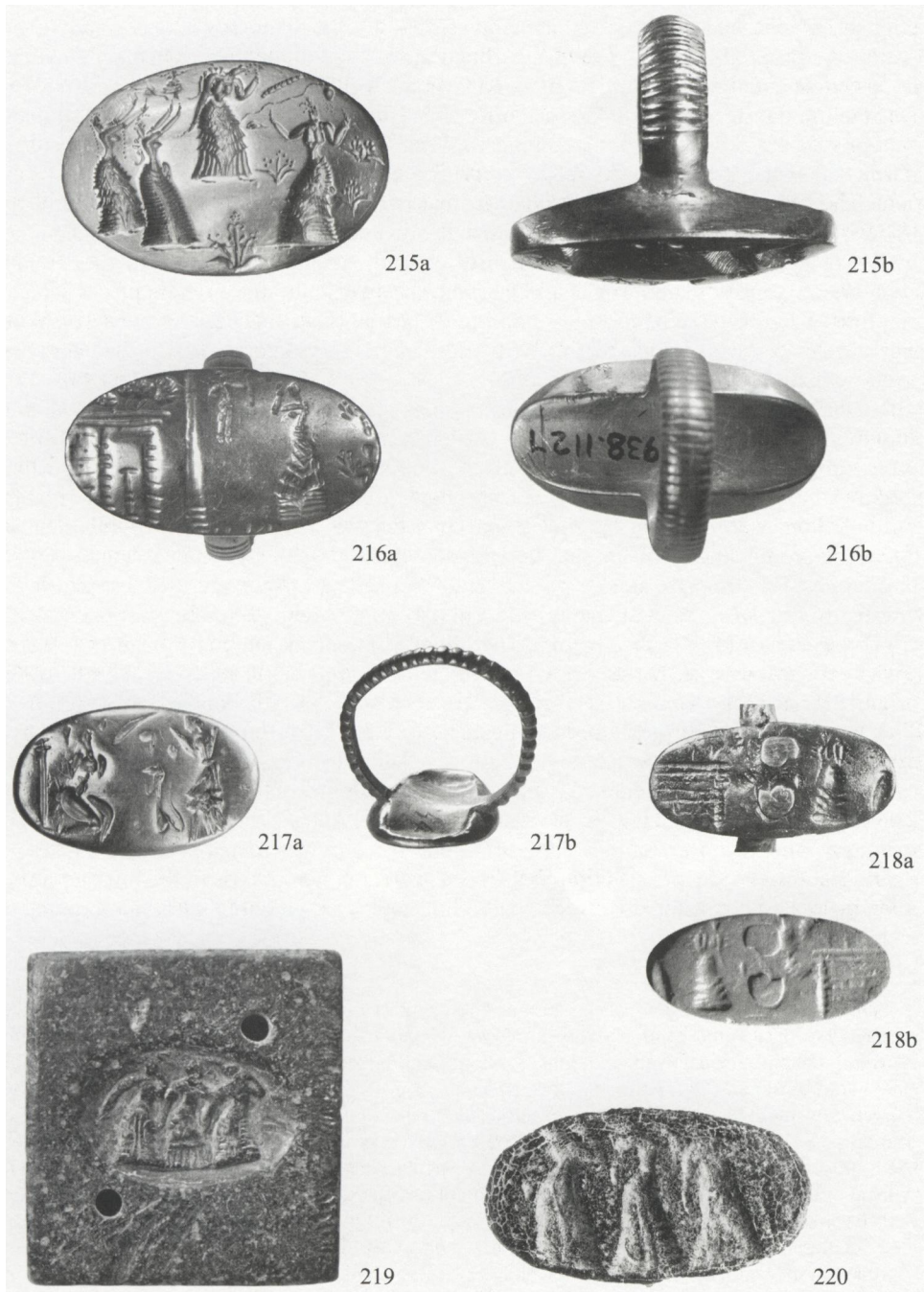
³³ Even certain *CMS* volumes (esp. I, II.3) are unreliable and have helped to perpetuate errors in both specialist and general literature. See now the definitive studies by W. Müller, in *Metron* 147-154 (x-ray analysis) and *ibid.* 475-81 (ultra-sound measurements and ring typology). A further study detailing hoop construction and measurements is in preparation.

³⁴ Müller (n. 33) 476-77, table 2, pls. 101c, 104f (hollow ring with finger-bed plate).

³⁵ C. Sourvinou-Inwood, *Kadmos* 10 (1971) 60-69. See also Chapter 11.

³⁶ Thus J. G. Younger, in *Aux origines de l'hellénisme* 85-86. Note generally that Younger's typology and observations are now superseded by those of Müller (n. 33).

³⁷ Müller (n. 33) 149, pl. 32a; also pls. 100 (table 2) and 104g; The ring weighs only 2.9 gr. (cf. Isopata 9.6 gr.). Another variety attested in LB I-II is the hollow ring with tub-like lower part: *ibid.* 477, pls. 101d, 104k (= HM 1034 from Sellopoulo T.4, weight 2.6 gr.). Though found in a LM IIIA tomb, the ring is certainly LM I in date: I. Pini, *TUAS* 8 (1983) 39-49 (*contra* M. R. Popham et al., *BSA* 69 [1974] 217-19, 223 J8, fig. 14D, pl. 37a-c).



LM I signet rings. **215-217** Gold rings with hollow bezels from Knossos (Isopata), 'Knossos', and Kalyvia. Faces and profiles (**215, 217**); face and reverse (**216**). **218a-b** Bronze ring with silver rivets from Knossos (Gypsades). Face and impression. **219** Steatite mould from 'Kourion', Cyprus. **220** Lead ring bezel from Mallia. Scale 2:1 except **219** (ca 1:1).

small stature and slim build, for which skeletal evidence offers some support.³⁸ By contrast, Mycenaean rings have much larger hoops – inner diameters often exceed 1.6 cm – and fit comfortably on modern hands. In addition, they often have extremely elaborate hoops, decorated with granulation and cloisonné (457, 464, 467-469; cf. also 379). Despite these differences in hoop size and embellishment, the basic construction of many Mycenaean rings is similar to neo-palatial examples. New ring varieties, developed during LB II-III, will be considered in Chapters 8 and 9.

To assemble a ring like that from Isopata and to provide a strong join, each end of the hollow hoop would be splayed so as to insert one tongue between the bezel and finger-bed, while the other would be flattened over the finger-bed. Finally, the various components were soldered in place. Sometimes it is difficult to see where pieces join, so carefully were they assembled and smoothed. It is almost superfluous to state that making signet rings demanded considerable skill and labour. The same applies to the engraving itself, which we will consider below.

Bronze signet rings involved fewer components and simpler methods.³⁹ The example shown in 218 consists of an oval face – which bears the engraving – and an oval back-plate, forming a finger-bed. But the hoop is simply attached by two silver rivets, which might suggest that bronze rings were sheathed in silver or gold foil. This particular example comes from a LM IB context on the Gypsades Hill at Knossos, while another dozen or so are known from sealings (e.g. 244, 326, 437). The motifs employed on bronze signets compare closely to the gold examples: mostly cult scenes as on the Gypsades ring, also several naturalistic animal studies (e.g. 326). In some cases, the engraving is extraordinarily fine and if sheathed in precious metal a bronze ring would have been hard to spot. On sealings, only the tell-tale imprints from rivets alert us to the original material. By contrast, lead rings were very crude affairs. A bezel recovered from a secure LM I context at Mallia supplies useful technical information (220). Here it is apparent that the motif was not engraved – as on gold or bronze rings – but instead was cast in a mould.⁴⁰ This accounts for the lack of detail. A steatite mould, now in the British Museum, helps confirm these observations (219).⁴¹ At first glance the motif is also strikingly similar to that on the Mallia ring, but in reality the image is reversed. That is, on a bezel produced from this mould the female figures would face to the left and not to the right as on the example from Mallia. Lead rings were probably sheathed in precious metals (see also Chapter 9).

³⁸ I. Pini, *BICS* 42 (1997–98) 211 notes that the smallest rings sold by European jewellers today measure 1.3 cm and these can be worn by young women of slender build. Based on measurements of over 1000 limb bones, average heights for males and females respectively are calculated as 5'6" (167.6 cm) and 5'1" (154.6 cm): P. G. P. McGeorge, in R. E. Jones & H. W. Catling (eds.), *New Aspects of Archaeological Science in Greece* (Athens 1988) 48. But skeletal material from the neo-palatial period is very rare and whether these data are relevant to elite members of LM I society needs further investigation: see Dimopoulou & Rethemiotakis (n. 6) 42 n. 5. For the LM II-III Armeni cemetery see: Y. Tzedakis & H. Martlew, *Minoans and Mycenaeans: Flavours of their Time* (Athens 1999) 232-37, 242-43, 246-47.

³⁹ See A. Xenaki-Sakellariou, in *CMS Beiheft* 5 (1995) 316-17, figs. 2-3 (type II).

⁴⁰ Although the motif on 220 appears to be in relief, this is purely an optical illusion created by the lighting used in photography (cf. Chapter 1). For technical details (e.g. traces of casting spurs) see *CMS V Suppl.* 1A no. 58. See also Xenaki-Sakellariou (n. 39) 314-15, fig. 1, but note that she erroneously believed that gold, silver and bronze rings were also cast in moulds (cf. below n. 41).

⁴¹ BM G&R 1924.11-13.1 from Kourion, not Enkomi as stated by J. A. Sakellarakis, in *CMS Beiheft* 1 (1981) 168-70, fig. 4. Note that he too erroneously believed that matrices of this type were used for rings of precious metals (cf. above n. 40 and below).



221a-b LM I gold signet ring with hollow bezel from the Vapheio tholos, near Sparta. Face and impression. The hoop has simple transverse ribbing. Scale ca 2:1.

These observations about lead rings have important implications for gold signet rings. It was once thought that gold bezels were also cast in moulds, with minor details added afterwards by hand engraving – a misconception that remains deeply entrenched.⁴² But intensive study by the *CMS* team has established that the oval bezel plates were first hammered to shape and then motifs were executed *entirely by hand*, before assembly, with punches and gravers.⁴³ The exceptional detail on our surviving rings and ancient impressions makes this plain. There is no question of motifs being cast in moulds, as for lead rings, which might allow for the production of numerous replicas. Nor were motifs produced by hammering the gold over matrices. This crucial fact – that the motif on each gold signet ring is unique – has important consequences for neo-palatial sealings. The myth of the so-called ‘Knossian “replica” rings’ must be laid to rest. We will return to this issue again in Chapter 7 (see also p. 141).

During the neo-palatial period, as at MM II Phaistos, signet rings stood at the very forefront of glyptic development. Clearly the use of gravers and punches directly onto gold permitted remarkably fine detail; perhaps they also encouraged the naturalistic poses and ambitious compositions that are further hallmarks of Minoan signet rings. Even highly artificial conventions, firmly rooted in technique – such as aniconic (featureless) heads and minute dots (resembling strings of pearls) for long flowing tresses – seem to add to the sense of naturalism rather than detract from it (221).⁴⁴ Last, but not least, the elongated oval bezels encouraged engravers to produce complex scenes with two, three or even four figures, engaged in enigmatic cult activities and elite pursuits. Without these, our picture of neo-palatial Crete would certainly be the poorer.

⁴² Thus: J. H. Betts, *Kadmos* 6 (1967) 21-22; Younger (n. 36) 85; idem, in *Meletemata* 953-57; *Middle Phase* 182; *Minoan Crafts II* 426-30; also above nn. 39, 41 for Xenaki-Sakellariou and Sakellarakis, to name just a few commonly cited specialist sources. But the *CMS* team also once believed that bezels were cast, with the motifs (in part or entirely) engraved by hand, e.g. *CMS* II.3 pp. xxxiii-v, li. See now Müller (n. 33) 148-50, 475-81. In fact the use of hammered sheet (not cast) gold is also normal in Egypt and Mesopotamia: *AEMT* 165-66; *AMMI* 225-28.

⁴³ Punching involves the displacement of the metal, while engraving involves its removal: *AMMI* 216. See also J. Ogden, in D. Williams (ed.) *The Art of the Greek Goldsmith* (London 1998) 18; A. Xenaki-Sakellariou, in *CMS* Beiheft 3 (1989) 329-33; Müller (n. 33) 149, pl. 32a (x-ray).

⁴⁴ For stylistic features see Pini (n. 37); idem, in *CMS* Beiheft 1 (1981) 145-49.

MOTIF, COMPOSITION, STYLE

Until MM II the glyptic repertoire was largely dominated by ornamental motifs. Some consisted of simple linear or geometric patterns, others had a vaguely floral character, though were based on abstract elements such as spirals. Alongside these was a pictorial tradition, drawing its inspiration from the natural world – humans and animals of the land, sea and sky. Exotic and imaginary creatures arrived from overseas to enrich the visual landscape. Further variety could be achieved through pose, gesture, attributes or filling ornaments. Faced with this world of almost infinite promise, it is scant wonder that engravers and their clientele increasingly abandoned ornamental motifs during MM III. Growing mastery of rotary tools brought a further boost to glyptic art during this pivotal phase.⁴⁵ Some engravers used their new versatility to create exuberant pieces in the so-called ‘talismatic’ style; others treated their subjects in an increasingly naturalistic manner. But we are dealing here with trends and tendencies, not absolutes. Some depictions are a good deal more life-like than others: individual features rendered more accurately, bodily forms modelled more fluently, poses creating a more convincing illusion of movement. Sometimes we sense that direct observation from nature underlies a representation. But motifs might be imitated and adapted by craftsmen with less skill or inclination to refer to living models. It is worth recalling that our surviving examples – known from seals and impressions – span more than 200 years and represent the output of an unknown number of workshops and individual craftsmen (cf. Chapter 11).

For all the losses, the surviving repertoire is immensely rich, more so than at any other time in the Aegean Bronze Age and links with other arts and crafts abound. Any attempt to present a systematic overview entails a series of compromises, some less happy than others. While pictorial or naturalistic types (as they are often called) understandably merit special attention, we begin our survey with ornamental motifs and the ‘talismatic’ style. The chapter concludes with the strange hybrid creations of the Zakros workshop.

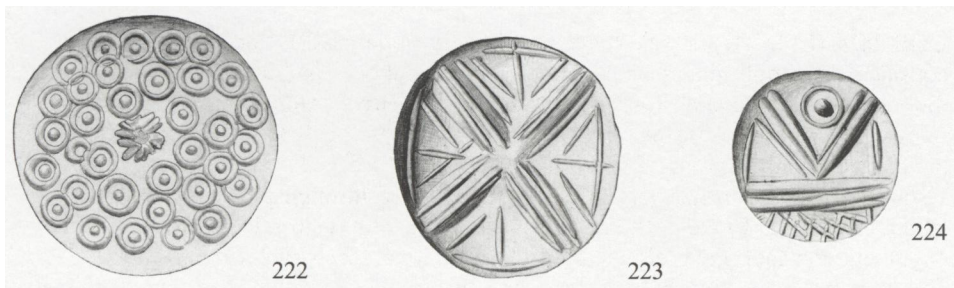
Ornamental motifs

The sheer potential of the pictorial tradition probably made the decline in ornamental motifs inevitable. In any case, the trend can be seen in other crafts too, especially vase-painting, where floral motifs now owe more to nature than to the underlying abstract patterns employed in Classical Kamares.⁴⁶ In glyptic the pictorializing motifs of MM II all but vanish and geometric designs also begin to wane. As far as we can tell the virtuoso tectonic motifs and centred circles belong firmly in MM II-III (Chapter 5). Nevertheless, geometric designs or variations thereon also occur on amygdaloids, cushions and lentoids, in other words, the new seal shapes produced during MM III-LM I. Examples from stratified neo-palatial contexts are slowly helping to confirm this observation. Most, but not all, are made of soft stone. Large multiple centred circles now give way to small simple circles, sometimes covering the entire seal face (222) or sometimes combined with linear designs as seen in 224.⁴⁷ Motifs based on crosses or stars were also produced (223) and provide an intriguing link to the geometric designs that occur much later on fluorite seals (Chapters 8-9). Ornamental motifs of MM III-LM I date rarely crop up in our neo-palatial sealing deposits. While this may be sheer chance, it is likely that some people who owned seals were never involved in administrative tasks (see Chapter 7).

⁴⁵ J. H. Betts, in *CMS Beiheft 3* (1989) 1-17; *Middle Phase* xxi-iv.

⁴⁶ G. Walberg, *Tradition and Innovation: Essays in Minoan Art* (Mainz 1986) 34-38.

⁴⁷ Classed by Onassoglou as a ‘talismatic’ motif: *DtS* 222-23, SP-6, pl. 14 (cf. above n. 5). For the dating of ornamental motifs: I. Pini, in *CMS II.4* pp. xxxvi-viii.



MM III-LM I seals of soft stone with ornamental motifs from Knossos. Drawings of impressions. Scale ca 2:1.

The ‘talismanic’ style

For graphic proof that Aegean glyptic did not develop in a linear fashion, we need look no further than seals engraved in the so-called ‘talismanic’ style. Created during MM III-LM I, and thus contemporary with our naturalistic motifs, the ‘talismanic’ style relies chiefly on the rapid and undisguised use of rotary tools. There is no attempt to smooth away tool marks, to model forms or to make life-like images. That said, almost all the motifs used in the ‘talismanic’ style are ultimately drawn from the natural world or can be related to it in some way.

It was Sir Arthur Evans who first drew attention to the style and invented the term ‘talismanic’.⁴⁸ Though the name has given rise to misconceptions, there is little point in changing it now. Evans correctly dated ‘talismanic’ seals to MM III-LM I, based on examples found by Richard Seager in the cemetery at Sphoungaras. Since motifs included jugs and amphorae, double-axes and horns of consecration, accompanied by stylized vegetation, Evans thought that the seals served as amulets or talismans. Although ‘talismanic’ seals occur throughout the island, they are especially common in eastern Crete, as were the earlier steatite prisms and Hieroglyphic seals. This appeared to strengthen the case for ‘talismanic’ seals being non-sphragistic, since steatite prisms were also regarded as amulets and Hieroglyphic seals were thought to have a religious or symbolic meaning. Moreover, it seemed that ‘talismanic’ seals were rarely used for sealing purposes. Many of these ideas were expressed by Evans or are implicit in his work, though they were greatly embroidered by Victor Kenna. More damaging still was Kenna’s belief that he could identify and date precise stages in the development of ‘talismanic’ motifs.⁴⁹ He also wrongly thought that these seals were made, in increasingly debased form, down to LM III.

A dispassionate appraisal of the ‘talismanic’ style by Artemis Onassoglou, published as a *CMS* monograph in 1985, coupled with new discoveries, has led to a much better understanding of this large and distinctive group of seals.⁵⁰ The style occurs chiefly on seals of hard stone worked with rotary tools, but imitations were also made in soft stone. In all more than 900 examples are documented, but even today barely two dozen impressions are known. Thus there is a strange disparity between the survival rate for ‘talismanic’ seals – which seems remarkably high – and their occurrence in sealing

⁴⁸ *PM* I 672-75; *PM* IV 445ff, 541-42.

⁴⁹ V. E. G. Kenna, *The Cretan Talismanic Stone in the Late Minoan Age*. *SIMA* 24 (Lund 1969). For his over-precise dating: *ibid.* 21-25, also *CMS* IV, VII-VIII, XII.

⁵⁰ *DtS*. See also above n. 5 and Chapter 9 for further examples from the mainland.

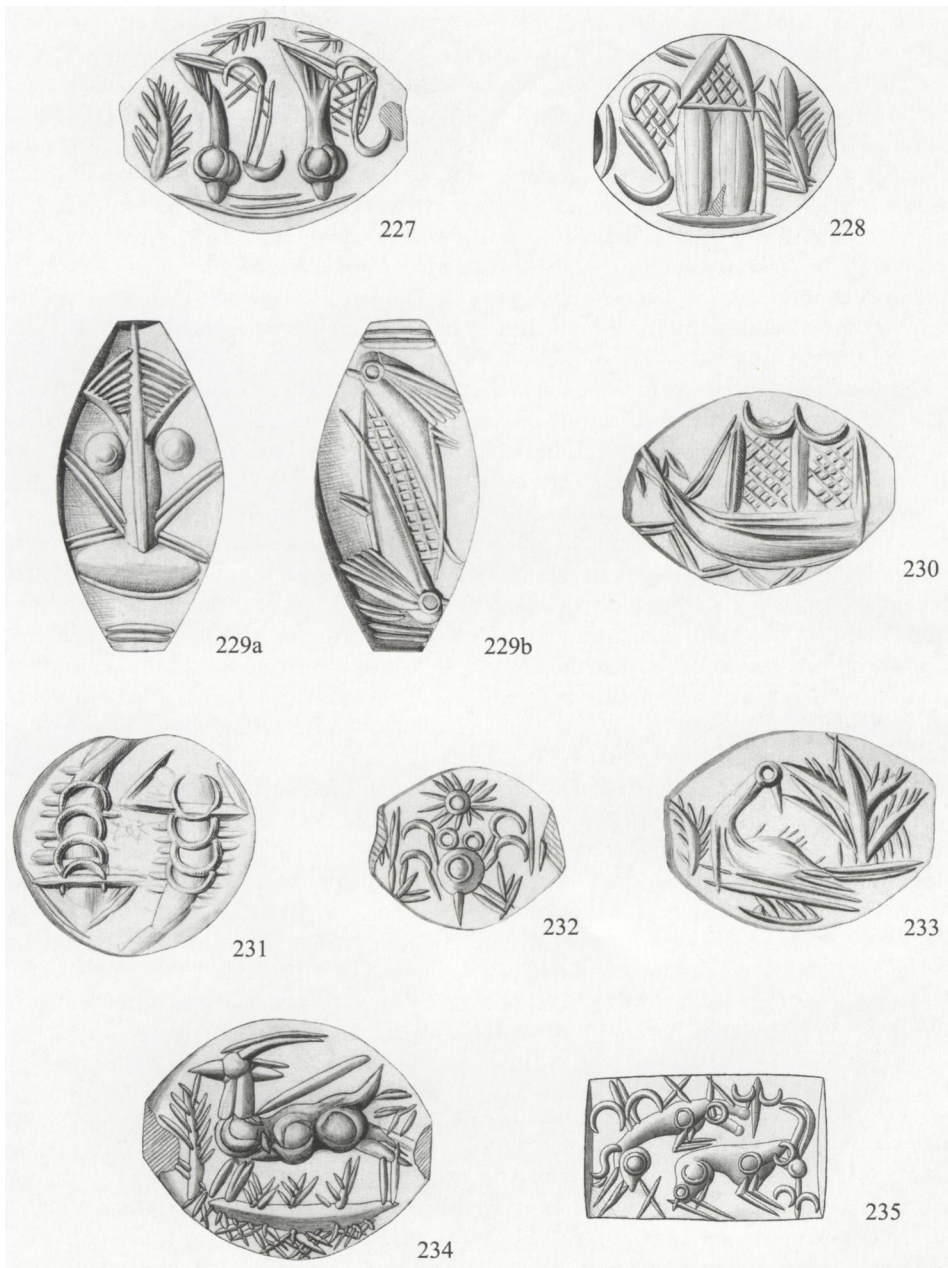


MM III-LM I amygdaloids of hard stone with ‘talismanic’ motifs from ‘Crete’ (225) and unknown provenance (226). Impressions. Scale ca 2:1.

deposits, which is undeniably low. Also curious is the popularity of amygdaloids, which account for more than half the total repertoire. The motifs used on ‘talismanic’ seals are often drawn from the living world. Especially common are marine motifs, such as fish and fish heads, cuttlefish, octopods and crabs (225-226, 229b, 232, 328). There are spiders and scorpions, birds and wild goats (231, 233-234). Stylized plant motifs include papyrus (229a), once seen as lion masks, and sprays, which are often used as fillers (e.g. 226-228, 233-234). Inanimate objects are also depicted, notably double-axes, horns of consecration, amphorae, jugs and tankards (not rustic shrines), as well as sailing ships (227-228, 230). Finally there are a few geometric designs, such as ‘panels’. Most, if not all, of the motifs found in the ‘talismanic’ style can be documented in the proto-palatial period – either among the Phaistos sealings and related types, or on steatite prisms. For example, we can relate the papyrus motif (229a) to a geometric design at Phaistos involving centred circles (173). Many ‘talismanic’ motifs also find parallels in the contemporary naturalistic repertoire. However, inanimate objects (e.g. double-axes and vases) ordinarily serve as principal motifs in the ‘talismanic’ style, whereas on naturalistic types they generally occur as part of larger scenes, often depicting rituals. But before we jump to hasty conclusions regarding the magical significance of these seals, some observations regarding technique and the formation of the repertoire are necessary.

With rotary tools engravers were well equipped to create the ‘talismanic’ style. Cutting wheels produce straight linear cuts that taper on convex surfaces, while solid and tubular drills yield dots and circles, respectively. If the engraver held the seal at an oblique angle to the wheel or drill, he could achieve different effects, e.g. elongated ovals with a solid bit, arcs with a tubular drill. With these basic elements – straight lines, dots and ovals, circles and arcs – any chosen motif can be rendered in the ‘talismanic’ style. For instance, the cuttlefish in 225 consists of an elongated oval for the body, a circle for the eye, and a pair of arcs joined by a straight line on each side for the tentacles – just eight elements in all. To complete the motif required only a few more short strokes: for the feelers above the head and for the sprays, which serve as filling ornaments on either side. That execution was rapid is obvious from the ‘mistake’ on the lower right-hand tentacle where we see a circle in place of the expected arc.⁵¹ No laborious smoothing or modelling was needed: the seals were swift to produce and striking in appearance. And if the surviving repertoire is any indication, they were also very popular.

⁵¹ See also M. A. V. Gill, in *CMS Beiheft* 1 (1981) 87-88.



MM III-LM I 'talismatic' seals of hard stone from 'Aphrati' (227), Knossos (229a-b), 'Crete' (230-231), 'Siteia' (233), Mochlos (234) and unknown provenance (228, 232). Drawings of impressions. 235 Drawing of seal-type from Zakros. Scale ca 2:1.

Once we realize that the ‘talismanic’ style is really a technique, much of the mystery fades away. Motifs that could be conveyed by a few well-chosen elements would be favoured; jugs and amphorae fit these criteria, as do many marine motifs. There is no need to read into the style any special amuletic quality; no need to see a ‘talismanic’ goat conferring special prowess on a hunter by virtue of sympathetic magic. Nor is there any discernible development in the style, certainly no progressive stages of ‘abstraction’, ‘combination’, ‘metamorphosis’, ‘fragmentation’ and ‘degeneration’ as propounded by Kenna.⁵² It is indeed true that not all octopods are as exuberant as that shown in **232** and not all compositions as well conceived as the fish heads in **226**. Among engravers who worked in the ‘talismanic’ style, some were careless and some highly skilled. As for the notion that there was deliberate ambiguity in ‘talismanic’ motifs, this is completely unfounded.⁵³ If ambiguity there be, it lies in our own inability to read the motifs, not in the eyes of the Minoans.

The boundaries between the ‘talismanic’ style and naturalistic motifs were not hard or fast. The lovely water-bird shown in **233** is classed with the ‘talismanic’ style,⁵⁴ though its pose and the lush sprays certainly convey both movement and life – accepted hallmarks of Minoan naturalism. Very different is the effect created by a seal-type from Zakros, where undisguised marks of wheel and drill seem to be added almost gratuitously to an otherwise conventional animal attack (**235**). The desire to classify seals is entirely understandable, for in systematic study lies our best hope of understanding stylistic developments. Yet the engravers themselves were bound by no such constraints: what really counted was individual aptitude and prevailing fashion. And so a skilled engraver might well produce a seal in the ‘talismanic’ style one week and a naturalistic study the next. One cannot help wondering if this is exactly what happened on a lentoid now in London, which displays a ‘talismanic’ jug and horns of consecration on one face, and fine naturalistic bull on the other (**264; C19**).

Popular though the technique was with engravers and their clientele, ultimately its potential was exhausted. While new motifs may have been added as the neo-palatial period wore on, the paucity of datable pieces makes this impossible to prove. There remain other unresolved questions too. Should ‘talismanic’ seals found on the mainland be seen as exports or was the style ever copied in Early Mycenaean workshops?⁵⁵ When should we date the demise of the style? There is no sign that production continued after the end of LM IB: was it already *passé* before the end of that period? This might help to account for its scarcity in LM IB sealing assemblages. At best we can observe that the Cut Style, seen by some as the logical successor to the ‘talismanic’ style, was already being produced before the end of LM IB, as demonstrated by sealings at Ayia Triada and Khania.⁵⁶ Or, is it possible that we do have a group of seals made chiefly for show and not for sealing? Many ‘talismanics’ are made from red or green stones, which might have found special favour among the Minoans. From the Near East we have textual evidence to suggest that stones of various colours were believed to have different magical

⁵² Kenna (n. 49) 26-33.

⁵³ See A. Onassoglou, in *CMS Beiheft* 5 (1995) 183-87 refuting the interpretation of L. Morgan, in *CMS Beiheft* 3 (1989) 152-59.

⁵⁴ *DrS* 275, KO-19, pl. 54.

⁵⁵ See Chapter 9; also Chapter 10 for the circulation of seals in the LBA.

⁵⁶ E.g. **341**. See below p. 147 and Chapters 7, 8, 9. Note also that certain birds with outstretched wings, originally classed by Onassoglou as ‘talismanic’, are better seen as Cut Style, e.g. *CMS* II.6 no. 115 (Ayia Triada). Cf. **381-382; C32**.

properties.⁵⁷ But once we approach the realm of personal choice, we are on the brink of speculation. And as for the relative value of seals – a hard stone ‘talismanic’ *versus* a naturalistic type in soft stone – this is even more obscure (Chapter 7).

Naturalistic motifs

The pictorial tradition in Minoan glyptic found its fullest and arguably its finest expression in the naturalistic motifs of the neo-palatial period. Anatomical forms and poses were now handled with greater assurance, compositions became more complex, while mastery of materials and techniques meant that style could be subtly altered to suit the representation in hand. That said, there is tremendous variation in technical and aesthetic quality, ranging from veritable masterpieces to the undeniably crude. Yet regardless of material and ability, engravers drew on a common iconographic repertoire, dominated by animals and increasingly enlivened by human figures. At no other time in the Aegean Bronze Age is glyptic iconography so rich and varied or echoed so frequently in other media. To offer a balanced introduction – encompassing both the typical and the unique – is no easy matter.⁵⁸

Human figures

The human figure, largely confined to steatite prisms in MM II, assumes a much more prominent role in neo-palatial glyptic, occurring on about 5-10% of seal-types.⁵⁹ Pose, gesture and attributes introduce much variety, as do multi-figured compositions, which are most commonly found on signet rings (see below). Deities in human guise probably lurk amid the male and female protagonists in cult scenes, though identifying them is a major challenge. The so-called ‘portrait’ heads are also open to misunderstanding.⁶⁰ Several examples are datable to MM III-LM I, including three clean-shaven males from the Hieroglyphic ‘Deposit’⁶¹ and the bearded head from Grave Circle B at Mycenae (236). This exquisite engraving occurs on a tiny amethyst discoid, a Cretan shape that was already on the wane by MM III-LM I and was not adopted by mainland workshops. The notion that we are seeing the portrait of a Mycenaean prince is completely fanciful (cf. Chapter 9). Another bearded head appears on a serpentine lentoid from the Little Palace at Knossos (237). Allowing for differences in size and material the two bearded heads are remarkably similar, since stylistic (or technical) conventions are used to render individual features, such as open mouths indicated by short strokes meeting at an angle. Comparable features can be found on the head of an MM II-III sphinx (146). So there is really no question of portraits in the true sense, that is, life-like portrayals of individuals. None the less, the subject is so rare in Aegean glyptic that these seals could have been special commissions, though the status and rank that their owners enjoyed in Minoan society are matters for speculation.

Another interesting series, usually found on amygdaloids, depicts standing male figures wearing long robes and carrying axes, birds or other attributes. On most the male figures appear in profile and have imposing, not to say bulky, bodies. But the fine haematite

⁵⁷ H. Hughes-Brock, in *CMS Beiheft* 5 (1995) 115-16; *AMMI* 78.

⁵⁸ For general accounts and other relevant literature see above n. 10.

⁵⁹ See *ECS Motif* nos. 1A: 2-5, 1B: 47-54; *Middle Phase* 17-24; *Iconography* 119-86 (each subject to provisos: n. 10 above). Younger estimates that humans occur on 15% of seal-types (*ibid.* x) but his catalogue excludes ‘talismanic’ seals and ornamental motifs.

⁶⁰ See now full discussion by I. Pini, in *Meletemata* 661-70, with earlier references.

⁶¹ *CMS* II.8 nos. 40 (here 195), 41 (Evans’s ‘Young Prince’) and 42 (partial impression only).



MM III-LM I and LM I seals and seal-types depicting male figures. Impressions of seals from Mycenae Grave Circle B (236 amethyst discoid); Knossos, Little Palace (237 soft stone lentoid); 'Knossos' and 'Vathia' (238-239 hard stone amygdaloids). Drawings of seal-types from Ayia Triada (240, 242) and Khania (241). Scale ca 2:1.

amygdaloid shown in 239 bears a slender frontal figure,⁶² carrying an axe over his shoulder and turning his head in the opposite direction to present a profile view. Given the size of the head (ca 2 mm) the detail is astonishing and helps to dispel a lingering misconception that the Minoans preferred to depict human figures with aniconic or featureless heads.⁶³ These robed figures are often regarded as priests and perhaps some were. This is certainly plausible in the case of the rotund figure, accompanied by a tethered griffin, on a red jasper lentoid from Vapheio (482). But other representations are less explicit and may simply depict males of high rank, bearing the insignia of office or carrying birds or fish as offerings (238).

⁶² The torso is rendered frontally, but the lower body and feet are in left profile. Described as a *priesterin* (priestess) by Platon at *CMS* II.3 p. 232, corrected by Pini, *ibid.* p. lviii (no. 198).

⁶³ *GGFR*² 47-48. The prevalence of aniconic heads on LM I rings can be explained by technique (punching and engraving), though exceptions do occur, e.g. here 593.

It is impossible to say whether the Vapheio seal was engraved on Crete or the mainland, but the composition and theme have good Minoan credentials, as shown by the impressions of a signet ring from the Temple Repositories (319). There a diminutive lion seems to be restrained by a male figure – not a goddess as Evans thought – who wears a peaked cap and holds an outstretched staff, in a so-called gesture of command. The composition recurs on a lentoid of lapis lazuli, embellished with a gold circlet and lavish granulation, found behind the South House at Knossos (207). Hard to place on stylistic grounds, recent re-evaluation of its context suggests a date within LM IB.⁶⁴ Similar compositions, usually involving a male figure + lion, persist into LB II-III (e.g. 387) and presumably should be seen as symbolizing mastery of the animal world.

The creation of new types from standard compositions by altering attributes or filling ornaments is a common phenomenon in glyptic. An elongated amygdaloid in London replaces the usual robed figure + attribute with a male clad in shorts, holding a fish (210), an image vividly echoed in contemporary frescoes.⁶⁵ But a few fisherman and milking scenes aside (e.g. 249), it must be said that scenes of ‘daily life’ did not seem to capture the imagination of Minoan engravers. Worth mentioning, though, are hunting scenes, for these are often regarded as archetypal Mycenaean pastimes (Chapter 9). In fact, on Minoan Crete the theme can be traced back to the pre-palatial period, specifically to an ivory cylinder which apparently depicts a huntsman and an animal attack (112c). Given the constraints of seal size and shape, hunting is usually indicated in an abbreviated way. For instance, it is implied when animals have spears in their backs, a point borne out by an impression from Ayia Triada where the hunter is actually shown (240; cf. 264). A seal-type from Khania depicts a single-handed attack on a lion, reminiscent of the scene on a gold cushion from Grave Circle A at Mycenae, though obviously style and composition are completely different (compare 241 and 460). Seal impressions from the Temple Repositories at Knossos also represent a hunter, equipped with spear and shield, accompanied by a collared dog (23). From Ayia Triada comes a superb archer clad in shorts (242), while at Zakros huntsmen are shown binding the legs of their prey (350).

Combat scenes also appear in LM I-II glyptic and belie the modern myth of the Minoans as the innocent ‘flower-children’ of the second millennium BC.⁶⁶ While few examples can be dated before LM IB on grounds of context or style, there is certainly no need to regard the iconography as intrusive or the seals themselves as Mycenaean products. In fact, we have more combat scenes from Crete than from the mainland, and there is growing evidence from other quarters that military prowess gained in importance as the neo-palatial period wore on.⁶⁷ So it is all the more frustrating that we have no idea who owned pieces like the armed duel or chariot scene, both now in London (601, 604).⁶⁸ That they were high-ranking individuals seems likely enough, and indeed many scenes involving male protagonists occur on seals of hard stone or signet rings of metal.⁶⁹

⁶⁴ Krzyszkowska (n. 17) 199-206, esp. 203-204.

⁶⁵ C. Dumas, *The Wall-Paintings of Thera* (Athens 1992) 46-47, pls. 18-23; *Aegean Painting* 18, 51, pl. 2 (fisherman vase: Phylakopi).

⁶⁶ D. Evely, in *Minotaur – Centaur* 59-69; I. Pini, in *CMS Beiheft* 3 (1989) 201-17 (combat and hunt scenes, with remarks on dating); also Chapters 9 and 11 (e.g. 614-615).

⁶⁷ E.g. the appearance of so-called ‘warrior burials’ in LM IB: Dimopoulou (n. 6) 27-36; *Poros* 169-75, 196-97. For weaponry see: C. R. Floyd, in *Polemos* 433-42.

⁶⁸ Human figures are harder to date than animals, but Pini (n. 66) 206-07 assigns *CMS* VII no. 129 (601) and XII no. 292 (a similar combat in New York) to LM I-II; the same is probably true of *CMS* VII no. 87 (604; cf. *FRONTISPIECE* and *C30*).

⁶⁹ Crested helmets, by contrast, occur on LM I soft stone seals, e.g. *CMS* VII no. 195 (cf. *CMS* II.6 no. 136: Ayia Triada). Also found on soft stone seals are male processions, e.g. here 349 (Zakros).



LM I signet rings with multi-figured scenes from Ayia Triada (**243**, **245**, **248**), Zakros (**244**), Knossos (**246**) and Khania (**247**, **249**). Drawings of seal-types. Scale ca 3:2.

Scenes of hunting, fighting, chariot-driving and bull-leaping afforded considerable scope for dynamic poses, and these led to some notable departures from strictly profile or frontal aspects, especially on signet rings. The boxer from the Temple Repositories has become justly famous for his three-quarter back view, although the actual impression is somewhat less realistic than the familiar drawing published by Evans.⁷⁰ Here we may be dealing with a scene of ritual combat to judge from the pillar or flag-staff at the right of the fragment and the same might be true of an impression from Ayia Triada (**248**). But another seal-type from the same site (**371**) appears to represent combat of a more deadly variety, a vignette of warfare perhaps. Equally dramatic poses occur on the well-known 'Battle of the Glen' signet ring from Grave Circle A at Mycenae (**478**). Here the engraver adheres to the typical Minoan conventions of impossibly narrow wasp-waists, elongated limbs and muscular torsos. But for reasons that are still obscure, combats are largely confined to seals and signet rings made during LB I-II and this also applies to chariot scenes. Best known are the impressions of a gold ring, attested at LM IB Ayia Triada and

⁷⁰ Compare *CMS* II. 8 no. 280 (here **321**) with *PM* I 689, fig. 509; see also Chapter 1.

Sklavokambos (370). Recently sealings impressed by the same ring came to light in the LM IA volcanic destruction layer at Akrotiri on Thera (322; Chapter 7). A similar chariot scene also occurs on one of the gold rings repatriated to Greece in 1996.⁷¹ While most creatures (real or imaginary) have earlier antecedents in glyptic the horse does not, making these proud horses of LB I-II all the more remarkable. Curiously, they have no descendants either: once engravers abandon chariot scenes, they ignore horses too. It was left to fresco and vase painters to perpetuate their image in LB II-III.⁷²

Of all the activities associated with Minoan Crete bull-leaping is surely the most familiar. But the famous Knossian fresco panels date to LM II-III A1, and so glyptic provides our main evidence for LM I.⁷³ Most examples occur on gold signet rings, or more precisely on sealings impressed by them. Certainly for rendering bulls in flying gallop the elongated oval bezels proved ideal, while the combination of punching and engraving created dramatic contrasts between the bulls' powerful anatomy and the slender grace of the diminutive leapers (e.g. 368-369). It is a very great pity indeed that no LM I originals survive – the well-known Ashmolean ring is probably a trifle later in date.⁷⁴ The new sealings from Akrotiri on Thera show that fine gold rings with bull-leaping scenes already existed in LM IA and, to judge from style, rings of this date were responsible for impressing some of our LM IB sealings (compare 323 and 368-369). More intriguing still is the fact that sometimes sealings impressed by the very same ring have turned up in different parts of the island. These matching impressions have attracted considerable scholarly attention and, it must be said, have created a great deal of confusion. The issues are undeniably complex and have a direct bearing on neo-palatial administration. For this reason, we will tackle them in our next chapter. Here suffice to say that there is no question of 'replicas', reproduced with moulds or matrices – the motifs on each ring were executed by hand and are unique (p. 131). Bound up with the tortuous debate over 'replicas' is an assumption that bull-leaping served as the emblem of Knossian authority throughout the island.⁷⁵ For this there is no hard proof. That the Zakros leaping scenes – dubbed 'local replicas' – differ from other examples in style and quality cannot be denied (356-357).⁷⁶ But where the originals were made, why, and for whom are matters for speculation (Chapter 7). It is also worth observing that some impressions said to be from 'local replica' rings actually come from seals made of stone! An example from the Temple Repositories at Knossos was impressed by a hard (?) stone cushion, another from Zakros by a lentoid.⁷⁷ A famous agate cushion now in Oxford,

⁷¹ K. Demakopoulou, *The Aidonia Treasure* (Athens 1996) 17-20, 70 no. 1. Although attributed to the Aidonia cemetery, its provenance remains uncertain: J. F. Cherry, in *Meletemata* 103-10; also I. Pini, in *CMS V Suppl.* 3 pp. 31-32 and no. 244.

⁷² *Aegean Painting* 92-95, fig. 27; 129-30, pl. 69; *MPVP passim*.

⁷³ The minoanizing fresco fragments from Tell el-Dab'a are probably contemporary, as they are now dated by the excavator to the early 18th Dynasty (ca 1525-1500): M. Bietak, *BSA* 95 (2000) 185-205 with earlier literature. Also fragmentary is a possible leaper from Thera: C. A. Televantou, in S. Sherratt (ed.), *The Wall Paintings of Thera* (Athens 2000) 831-43, figs. 1-2. J. G. Younger, in *Politeia* 507-45 provides a full catalogue of leaping scenes and bull sports generally.

⁷⁴ Usually accepted uncritically as LM I, e.g. *Archanes* II 653-54, fig. 720: see Chapter 8 and 379. For authenticity see Chapter 11.

⁷⁵ As argued by B. P. & E. Hallager, *Politeia* 547-56; *Roundel* I 207-13.

⁷⁶ For 'local replicas' see *Roundel* I 209-13, rejected by I. Pini, in *CMS* II.6 pp. xxv-vii (see also *AJA* 105 [2001] 119). Further discussion by I. Pini, in *Pepragmena* 9 (forthcoming).

⁷⁷ *CMS* II.7 no. 34 (Zakros), II.8 no. 221 (Knossos: here 318). Although Hallager recognized that the latter was impressed by a cushion, he nevertheless classed it as a 'replica ring': *Roundel* I 210-211, fig. 78.

nicknamed the 'bull at the trough', gives a variation on the theme, with a leaper apparently vaulting from a mounting block (206). Clearly, then, LM I leaping scenes were not confined to gold rings, but are found on other shapes and materials too. In this respect the motif is no different from others.

Certainly cult scenes can be found on seals and rings made of almost every imaginable material. There are (or were) rings of gold, bronze, lead and stone, the elongated oval bezels again exploited to good effect. They were ideal for processions (22, 220, 243, 324, 354-355), offering scenes (244, 335, 437) and epiphanies (215-217, 221, 245, 593, 621-623), where as many as four participants are depicted. Male and female figures sometimes mingle in these scenes (221, 354-355, 593, 621-623) and, on occasion, deities in human guise may also be present.⁷⁸ But identifying them puts us into the realm of interpretation or even speculation. And so to begin with it is far safer to describe all figures neutrally, as male or female, without designating role or rank. Pose, gesture, facial features (or lack thereof) and dress need to be documented with care. The same holds good for the paraphernalia of cult, such as horns of consecration, altars and double-axes. With varying degrees of conviction we can also identify sacred stones, known as baetyls, 'sacral knots' and flounced skirts. More puzzling are elements (symbols?) that appear to float in the field – eyes, insects and perhaps shooting stars (215, 217, 221, 245, 622-623). Sometimes we are hard pressed to put a name to them, much less guess at their significance. Obviously, as evidence for Minoan cult practice and religious belief the glyptic repertoire is immensely important. But to use it demands a systematic approach, which is both rigorous and dispassionate, coupled with a thorough knowledge of the entire repertoire.

We will return to this issue in a later chapter, but there is more to be said here regarding motif, composition and style. Female figures occupy a prominent role in cult scenes and also appear individually on seals. In some cases, one suspects these are excerpts from or allusions to the larger and more explicit scenes on signet rings. A good example, found by Evans at Knossos, depicts a female carrying a double-axe over one shoulder and holding what seems to be a flounced skirt in her other hand (253). The impression of a soft stone ring from Zakros gives a variation on the same theme: a double-axe and skirt carried in procession by males wearing hide garments (22). Abbreviated processions, involving male or female figures, also sometimes occur on soft stone lentoids (e.g. 349, 611). Other females are involved in more enigmatic activities. A notable series, which occurs in both soft and hard stone, depicts a female figure carrying a sheep or goat over her shoulder (252; cf. 488).⁷⁹ It is hard to establish whether she is a worshipper or priestess bringing an animal to sacrifice, or a goddess in the guise of the Mistress of Animals. At best we can say that the iconography apparently echoes ring impressions from Ayia Triada and Khania showing a seated female approached by a goat (334).

⁷⁸ W.-D. Niemeier, in *CMS Beiheft* 3 (1989) 163-86 provides a well-illustrated introduction, but his criteria for identifying deities sometimes lack rigour; he also fails to account for likely differences between Minoan and Mycenaean representations, in part remedied by his article in R. Hägg & G. C. Nordquist, (eds.), *Celebrations of Death and Divinity in the Bronze Age Argolid* (Stockholm 1990) 165-70. Epiphanies are defined as ecstatic (a divine presence seen or felt by worshippers) and enacted (in which the deity is played by a human): see R. Hägg, *BICS* 30 (1983) 184-85; *AM* 101 (1986) 41-62. See also P. Warren, *Minoan Religion as Ritual Action* (Göteborg 1988); M. Wedde, in *EIKΩN* 185-93

⁷⁹ I. A. Sakellarakis, *AE* (1972) 245-58; see also *CMS* II.4 p. xli and II.7 no. 23; also now *CMS* V Suppl. 3 no. 38 (an unusually fine example from Mallia). For a later version of the motif see here 422 and Chapter 8.



LM I seals depicting female figures from ‘Crete’ (250) and Knossos (251-254). 250-251 are made of carnelian; the remainder of soft stone. Impressions. Scale ca 2:1.

Similarly we may compare the ‘priestly’ figure on 238 to the female figure carrying a bird on a soft stone lentoid from Knossos (254), but we gain no firm clues as to her status. In other cases, we need to cast our net wider for suitable comparanda and try to make inferences from representations that are later in date or that occur in other media. On this basis, the sword-wielding female on a carnelian cushion from Knossos has been interpreted as a ‘warrior goddess’ (251). But still unexplained are the object(s) behind her back and her curious see-through cloak (?).⁸⁰ Even stranger is the carnelian lentoid in Berlin, where a decidedly buxom female, wearing a broad cap, kneels to take aim with her bow (250). Sadly, her nature – human or divine – remains an open question. The same is obviously true when female figures lack distinguishing attributes of any kind. Worth stressing, however, is that these are sometimes very crudely executed on seals of soft stone (325).⁸¹

Antithetical and symmetrical compositions become common in LB II-III A glyptic and sometimes depict a male or female figure flanked by animals (Chapters 8-9). It seems likely that the composition was already known in LM I-II, though we have no examples from securely dated neo-palatial contexts.⁸² A possible candidate is a green jasper lentoid, now in London, which depicts a female figure standing above waves, holding a long-

⁸⁰ Frescoes from Thera offer plausible parallels: P. Rehak, in *Polemos* 230-31.

⁸¹ Unless from a secure context (as is *CMS* II.6 no. 28, here 325), they can be difficult to date: Pini provides useful criteria in *CMS* II.4 pp. xli-ii. See also Younger (n. 21) 117-18, 123. The cursory treatment impedes interpretation of pose and gesture: Niemeier’s view that they are goddesses is by no means secure: (n. 78) 182-83, fig. 6.12-18.

⁸² Symmetrical compositions involving animals or hybrids are attested in LM I, e.g. 275-276, 330. See also Krzyszkowska (n. 17) 202, 204-05, cat. no. 5.

necked bird in either hand (3). Mastery of the animal world is also implicit in the famous 'Mother of the Mountain' sealings from Knossos (for context see p. 223). Here the central female holds a staff in her outstretched arm and hovers above (or stands atop) a rocky peak flanked by lions (5). She is saluted by a male figure and to the left is a shrine topped with horns of consecration. The image calls to mind the ring impressions from the Temple Repositories, showing a standing male figure, with outstretched staff, restraining a small lion (319; see p. 139). This offers a rare example of a vertical composition on a ring bezel. Another is the justly famous Master Impression from Khania, where a large building complex bedecked with horns of consecration is surmounted by a male figure, displaying a similar 'gesture of command' (247).⁸³

The size of individual figures, their poses, and the amount of free space in a composition all have a direct bearing on style. But these factors are impossible to assess objectively and fluctuations cannot be dated with precision. However, it does seem fair to say that there was a trend away from small lithe figures toward larger, more monumental ones, with a corresponding decline in free space. We can observe that the figures on the Vapheio ring are diminutive in height, occupying barely two-thirds of the available field; despite the many other elements in this scene, the composition is far from crowded (221). Likewise a considerable amount of free space surrounds the small LM I bull-leapers and helps to create the illusion that they are floating effortlessly through space (368-369). But on the Ashmolean ring (379) and other examples of LB II-III date, the leapers crowd what little space is not occupied by the bulls. The same also applies to some figural representations dated by context to LM IB. As we shall see, a similar trend can be observed in animal studies too.

Animals and hybrids

It is only natural that figural representations should capture our attention, since they offer intriguing, if partial, glimpses of Minoan society in the neo-palatial period. But in the glyptic repertoire as a whole, the human figure played a limited role. Instead it was the natural world, especially the animal kingdom, which inspired Minoan engravers. Firm favourites were goats and cattle, but sheep, boar, deer and lions also occur, as well as dogs and a few cats.⁸⁴ All are inherited from MM II-III glyptic: only the horse, always with chariot, is a newcomer in LM I (see p. 141). Creatures of the sea and sky are also depicted. For the most part fish are rendered in the 'talismanic' style or are influenced by it.⁸⁵ The same is often true of birds (233), though some veer toward the Cut Style.⁸⁶ Nevertheless, birds are also rendered in a naturalistic fashion, and delightful they are too (258-259, 316). We also find butterflies and dragonflies (260, 342) and occasional sea creatures – dolphins, nautili and crabs (257, 261, 311-312). Exotic hybrids, such as the griffin, sphinx and Minoan genius, which had first appeared during MM II, now assume a more prominent role (see pp. 148-50). Indeed at no other time in the Aegean Bronze Age

⁸³ For thorough discussion with comparanda: E. Hallager, *The Master Impression*. SIMA 69 (Göteborg 1985).

⁸⁴ For animals and birds in Aegean art during LB I: L. Morgan, *The Miniature Wall Paintings of Thera* (Cambridge 1988) 41-49, 54-67. See also Chapter 5 n. 30.

⁸⁵ See above pp. 133-37 and 208, 226, 229b, 328. For fish and marine creatures see: M. A. V. Gill, in *L'iconographie minoenne* 63-81.

⁸⁶ For 'talismanic' birds see above p. 136; for Cut Style below p. 147 and Chapters 8-9. See also: J.-P. Ruuskanen, *Birds on Aegean Bronze Age Seals* (Rovaniemi 1992).



MM III-LM I and LM I seals depicting the natural world from 'Archanes' (255), 'Mallia' (256), 'Palaikastro' (257), 'Mirabello' (258), 'Knossos' (259, 261), 'Gournia' (260), and Akrotiri, Thera (262). All examples are made of hard stone except 257 and 261, which are soft stone (257 covered in gold). Impressions. Scale ca 2:1.

do so many different creatures – real or imaginary – adorn seals and signet rings. This makes the virtual absence of flowers and plants all the more surprising. Only occasionally are they used as principal motifs. A fine example occurs on the silver ring from Ayios Charalambos, showing papyrus in a rocky landscape (212).

Sometimes plants and rocks are used to create the impression of landscape in scenes occupied by animals or marine creatures. Though few in number, they are among the loveliest images in Aegean glyptic. An oval ring-stone of blue chalcedony in the Giamalakis Collection (256) shows a kid goat, head *regardant*, calmly perching atop a

rocky outcrop.⁸⁷ More enchanting still is the well-known 'hart by a water brook', attributed to the Hieroglyphic 'Deposit'. Here the landscape elements assume pride of place and the couchant animal (probably a kid goat) is tucked away in the lower part of the field (200). On another sealing attributed to the 'Deposit' (201) we find a unique marine attack – involving a fish and a squid, framed by hanging coral, a convention found in other media during the neo-palatial period. Another seascape is the gold-covered cushion depicting dolphins, now in the Ashmolean Museum (257; C23). Finally, 'the wild goat at bay' has an almost narrative character,⁸⁸ anticipating an attack rather than depicting one, as is ordinarily the case (255; C21). This famous cushion, also in the Ashmolean, was acquired by Evans at Archanes. All these examples can be dated to MM III-LM I on stylistic grounds, though landscape elements were already found in the Phaistos sealing deposit, especially on ring bezels (e.g. 182-183). The fashion seems to have been short-lived and does not persist beyond LM IA.

Basic animal poses – standing, sitting, running with legs bent or outstretched – also go back to MM II or earlier, but during the neo-palatial period greater variety and vitality are introduced.⁸⁹ Even static poses could convey movement, through the twist of a head or the arching of a back (263-264). Some animals seem unperturbed by the spears in their backs or darts in their side (264), others twist round to remove the offending weapon (266, 271, 338-339). Dogs and bitches vigorously scratch their heads, perhaps irritated by unseen fleas (265; C28). Movement could also be explored in compositions involving two or more animals, such as suckling scenes or attacks (272-273, 317, 367). For the most part, pose and composition are inspired by nature, though artificial arrangements can also be found (see below). These become more prominent in LB II-III (Chapter 8). Closely bound up with pose and composition is use of space. During MM III-LM I engravers often achieved a remarkable balance between space occupied by the motif and that which was left free (263-264). By LM IB animals not only became bulkier (see below), but also tended to fill much of the available field (e.g. 271-272).

As we have often noted, technique plays a major role in defining glyptic style and this remains true in the neo-palatial period. On the slender animals created during MM III-LM I we find lozenge-shaped heads and stick-like legs, produced by cutting wheels, and simple dotted eyes and joints (2, 38, 256, 263). Modelling is somewhat tentative and still betrays the underlying work of the snub-nosed drill in shaping the rump, belly, shoulder and neck. Especially characteristic is a pronounced shoulder line (e.g. 38, 313-314, 609). Similar effects, created by punches and gravers, can also be seen on the Burgon Ring (214; C22). Yet for all these artificial conventions, the animals were endowed with a sense of movement and life, hallmarks of Minoan naturalism. As we move into LM I-II, engravers achieve even more convincing representations of their subjects. Individual anatomical features are depicted with greater accuracy, bodily forms are better integrated, modelling becomes more powerful. These features are best exemplified by the superb bulls that adorned signet rings in LM I (323, 336, 338, 356-357, 368-369). Equally impressive animals appear on hard stone seals or their impressions (e.g. 206, 266, 339).

⁸⁷ Only a few ring-stones are known; they are oval or round with flat undersides for setting in metal mounts, see: I. Pini, in *CMS* II.3 p. xxxi; J. A. Sakellarakis, in O. Palagia (ed.), *Greek Offerings: Essays on Greek Art in honour of John Boardman* (Oxford 1997) 23-29; add *CMS* V Suppl. 3 no. 331 and J. N. Coldstream & H. W. Catling (eds.), *Knossos North Cemetery: Early Greek Tombs*. *BSA* Suppl. 28 (London 1996) 68-69, 540, fig. 154, pl. 264 (18.f3).

⁸⁸ *PM* IV 508-09.

⁸⁹ For poses: *Middle Phase* 1-3; *Iconography* 1-3. For motifs: *ECS* Motif nos. 2-4, 6-7, 11, 13-17; *Middle Phase* 5-16, 25-37 and *Iconography* 4-118, 187-219 with provisos indicated in n. 10.



MM III-LM I and LM I-II hard stone seals depicting animals from ‘Crete’ (264), ‘Central Crete’ (265), ‘Knossos’ (266) and unknown provenance (263, 267). Impressions. Scale ca 2:1.

But glyptic style did not progress in a linear fashion and even within the hard stone repertoire other trends can be discerned during the neo-palatial period. We have already seen how the ‘talismanic’ style flourished during MM III-LM I, the very same era that produced the exquisite landscapes and animal scenes just described. Similarly, the so-called Cut Style, with its smooth-bodied animals and exuberant use of cutting wheels, had already been created by the end of LM IB, thus overlapping with the richly modelled creatures of the mature neo-palatial period. Good examples can be found on sealings at Ayia Triada and Khania (e.g. 341). But the *floruit* of the Cut Style apparently belongs in LM II and the repertoire of motifs – running goats, couchant lions, birds and griffins – seems scarcely to alter.⁹⁰

Soft local stones, such as chlorite, steatite and serpentine, played an important role in glyptic throughout the neo-palatial period.⁹¹ While some seals produced during MM III-LM I bore ornamental motifs, legacies of the MM II decorative tradition (see p. 132), as the neo-palatial period wore on pictorial motifs came to predominate. For the most part their iconography reflects current trends in hard stone and metal, encompassing both the human and animal kingdoms.⁹² The similarities extend to pose and composition, though

⁹⁰ Chapters 8-9. The discovery of further Cut Style seals in LM IB contexts forces me to wonder whether production did indeed persist into LM II-III A, as previously thought. In other words, the examples from LM II-III A contexts at Knossos (i.e. graves and the Unexplored Mansion) could be heirlooms. See now *CMS V Suppl.* 3 nos. 346-347, 349(?), 350 for Cut Style seals from stratified LM IB deposits at Mochlos; also apparently an unpublished cylinder of lapis lazuli (HM 1966) from the Royal Road, Knossos.

⁹¹ See above, p. 125 and n. 21.

⁹² See Younger (n. 21) 117-19, 123-27 and I. Pini, in *CMS II.4* pp. xxxvii-lxii. For human figures see above.



LM I-II soft stone seals depicting animals from Knossos (266), 'Crete' (270), and unknown provenance (269). Impressions. Scale ca 2:1.

the use of hand tools created significant differences in style. Single animals, either reclining or running with legs bent, form the mainstay of the repertoire (209, 268). Eyes and heads are often rendered as dots within circles (268, 270, 351, 594) or sometimes more schematically still as simple dots (e.g. 327). To delineate the shape of the body and anatomical features such as ribs, contour lines are often used and indeed constitute a hallmark of LM I output in soft stone (268).⁹³ However, this defining feature is not always apparent today, since soft stone will abrade easily. Conventional attack scenes are not common, but instead we find various artificial compositions involving pairs of animals. One is the popular motif of running lions arranged back-to-back and head-to-tail (269, 594). This so-called *tête-bêche* scheme is also found on several seals made of red jasper (267).⁹⁴ Another artificial composition, popular in soft stone, but not well represented in other materials, is the 'chimera' scheme, so-named after the hybrid monsters of Classical mythology. In fact 'chimera' is a misnomer, for these seals do not depict hybrid creatures at all. Instead we seem to be dealing with a kind of attack scene, with a lion turning its head toward a goat, bull or deer, which springs away from its back; only the upper part of the prey is shown (e.g. 270; C29).⁹⁵

Hybrids of various kinds do play an important role in Aegean iconography and are well represented in the glyptic repertoire. All had arrived in Crete during the proto-palatial era and are first attested in the Phaistos sealing deposit or on contemporary seals (Chapter 5). Most common are the griffin – with the head and wings of an eagle and body of a lion – and the Minoan genius, adapted from the Egyptian hippopotamus goddess, Taweret.⁹⁶ Its typical attributes are libation jugs and stylized vegetation, sometimes accompanied by other symbols of cult, such as horns of consecration (e.g. 610; cf. 528). By the neo-palatial period, the genius has lost its earlier corpulence and, together with human figures,

⁹³ And thus provides a useful criterion for dating the many soft stone seals which do not come from secure neo-palatial contexts. For this *Leistenstil* see: Müller (n. 21) 152-54, 163, figs. 1, 11 (bulls, goats); Pini (n. 21) 193-207 (lions); Krzyszkowska (n. 17) 202-03.

⁹⁴ J. H. Betts, in *CMS Beiheft 1* (1981) 5-7, figs. 3-10, where attributed to the 'Jasper Lion Master': cf. remarks by Pini (n. 21) 193-96, who also presents examples in soft stone. *Tête-bêche* compositions also occur in pre-palatial and proto-palatial glyptic.

⁹⁵ The group was identified by I. Pini, in *L'iconographie minoenne* 164, fig. 21 and dated LM I-II in Pini (n. 21) 198-99, fig. 5. So far none comes from a stratified neo-palatial context, but the lions have good LM I parallels.

⁹⁶ See Chapter 5 n. 32 and 181. For the Minoan genius in the LBA: P. Rehak, in *CMS Beiheft 5* (1995) 215-31.



Drawings of selected LM I seal-types depicting animals and hybrids from Ayia Triada (271, 275-276), Khania (272) and Zakros (273-274). Scale ca 2:1.

shares the convention of the impossibly narrow wasp-waist. Sometimes it engages in human activities too. For instance, a fragmentary seal-type from Zakros depicts a genius attacking a bull with a spear (274). On a cylinder found at Kakovatos in the western Peloponnese, the genius stands behind a human hunter, apparently offering support or protection (450). During LB II-III the genius remains active in glyptic and other media, often standing in for human figures in scenes alluding to sacrifice (Chapters 8-9).

The griffin is a very popular subject indeed in LBA glyptic.⁹⁷ Sometimes the creatures appear singly or in pairs, though they also take part in more complex scenes involving animals or human figures. Solo griffins are especially popular in the Cut Style (e.g. 476; see Chapters 8-9). In pairs they are sometimes arranged in balanced compositions, placed antithetically or back-to-back. On a seal-type from Ayia Triada (275) rampant griffins are shown either side of a stylized papyrus, while *tête-bêche* griffins (and tiny offspring) appear on another seal-type from the same site (330). These motifs are especially important, since they help to dispel the notion that antithetical compositions and mirror-images are a Mycenaean trait. That said, balanced compositions do become prevalent during LB II-III (Chapters 8-9). From LB I onwards griffins also interact with animals and humans, in much the same way as do lions. In attack scenes, for instance, their prey is usually a bull or goat, as is true of conventional lion attacks (cf. 273). And sometimes, as we have seen, tethered lions, which apparently symbolize mastery of the natural world, are replaced by tethered griffins (above; 482). On a gold ring from Archanes-Phourni, a female figure floats enigmatically behind a tethered griffin (213). More intriguing still is a newly published ring impression from Knossos, which depicts a chariot drawn by a pair

⁹⁷ Morgan (n. 84) 49-54; *Aegean – East* 46-53; *Middle Phase* 37; *Iconography* 217-18.

of griffins in flying gallop (246). The control of these hybrid creatures strongly suggests that the figures in question are divine, or at any rate, operate under divine protection.⁹⁸

Other hybrids include the sphinx and the Minoan 'dragon'. The latter is a curious creature, with long scaly body and tail and short stubby legs (366). Its origins are obscure and in the Aegean it appears chiefly on seals and signet rings, sometimes bearing a female figure on its back (cf. 489).⁹⁹ Sphinxes ordinarily have the head of human and the body of a lion, but several variations exist, which suggests repeated borrowings from more than one source (compare 146 and 180). Some MM II-III examples are wingless and resemble contemporary Anatolian sphinxes.¹⁰⁰ But the curious winged sphinx on a seal found in the LM IA destruction layer of Akrotiri on Thera has no close parallels and the significance of the dolphin beneath its belly is obscure (262). For the most part, sphinxes in LBA glyptic are shown singly or in pairs and do not engage in the range of activities played by griffins (see Chapter 9).

Finally, we come to the monkey – a creature that is real enough, though its role as intermediary between the natural and supernatural worlds sets it apart from conventional animals. No hint of this special role can be discerned in our early representations (e.g. 4c) and, in common with the hybrids, the monkey only comes into its own in the neo-palatial period.¹⁰¹ A gold ring from the Kalyvia cemetery shows a monkey as one of the adorants in an epiphany scene (217a). Monkeys also make offerings to goddesses or goddess-impersonators, as on a steatite lentoid in the Giamalakis Collection or, more explicitly, on the Xeste 3 frescoes on Thera.¹⁰² In addition they appear antithetically either side of a Minoan altar on a seal-type from Ayia Triada (276). While all our other pan-Aegean hybrids transfer to the mainland and persist in LB II-III glyptic, the monkey does not. The use of heirloom seals and signet rings accounts for its appearance on late sealings at Knossos (24) and Pylos.

The Zakros workshop

A particularly striking group of imaginary creatures, quite unrelated to our familiar pan-Aegean sphinxes, griffins and genii, occurs at Zakros. Roughly half of the 560 sealings found by Hogarth in House A were impressed with seals bearing these strange local 'monsters' (277-282; 358-364).¹⁰³ Since their discovery a century ago, they have been

⁹⁸ Compare also the iconography in Xeste 3 at Akrotiri, where the presence of a rampant griffin probably indicates that the large seated female is a goddess: Dumas (n. 65) 130-31, pl. 122. Griffin-drawn chariots recur on a LB II-III gold ring from Anthia (*CMS V Suppl.* 1B no. 137, here 486), the LM II-III Ayia Triada sarcophagus (*Aegean Painting* 180-81, pl. 53) and a LH III B crater from Enkomi (*MPVP* 43, 202 V.27) For many insights into the harnessing of griffins I am indebted to an unpublished paper by Jennifer Ribeiro.

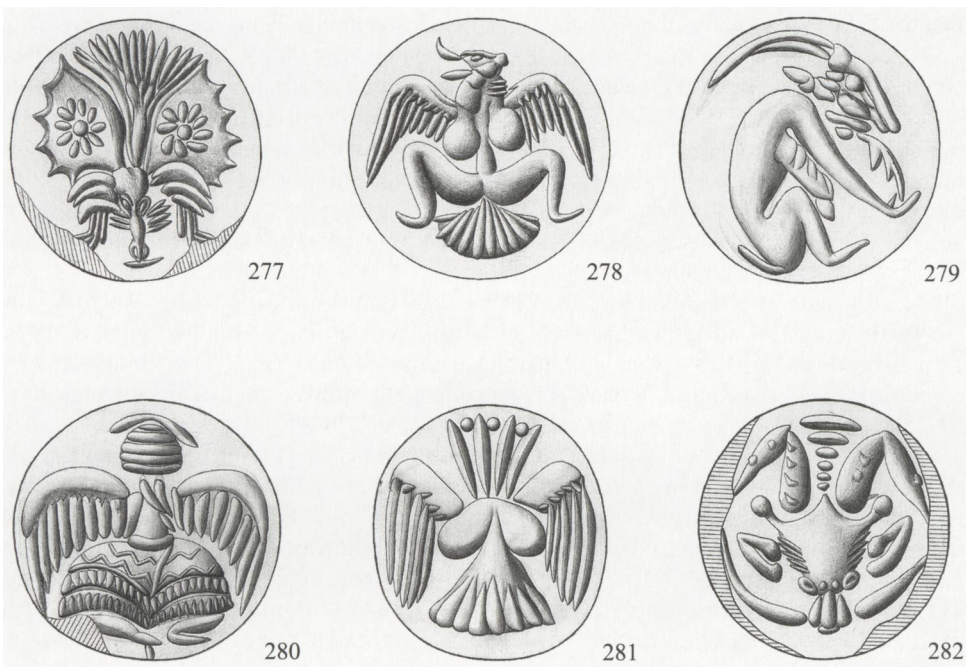
⁹⁹ J.-C. Poursat, *BCH* 100 (1976) 461-68. The earliest Aegean representation appears on a MM II-III discoid, *CMS XI* no. 291. See also Chapter 9.

¹⁰⁰ E.g. *CS* no. 122 (here 146); cf. the Mallia terracotta sphinx (*Mu II* 116-18, figs. 164-65), usually dubbed 'egyptianizing'. These Minoan examples find good parallels in ivory at Acemhöyük: R. D. Barnett, *Ancient Ivories in the Middle East*. Qedem 14 (Jerusalem 1982) pl. 26a, d-e. See also *Aegean – East* 40-45.

¹⁰¹ For apes and monkeys see: J. Phillips, *Aegyptiaca* (forthcoming); N. Marinatos, in T. Linders & G. Nordquist (eds.), *Gifts to the Gods* (Uppsala 1987) 123-32.

¹⁰² Compare *CM* no. 359 and Dumas (n. 65) pl. 122; see also Marinatos (n. 101).

¹⁰³ For the context and sealing practices see Chapter 7. The 262 seal-types are now fully covered in *CMS II.7* (1998), which supersedes previous publications, e.g. D. G. Hogarth, *JHS* 22 (1902) 76-93, pls. 6-10; D. Levi, *ASAtene* 8-9 (1925-26) 157-201; *Zakro Master*.



277-282 Drawings of selected seal-types from Zakros depicting the hybrid fantasy creatures of the 'Zakros workshop'. Scale ca 2:1.

regarded with admiration, bewilderment and dismay. Condemned by some as crude and degenerate, they have been praised by others as inventive, if eccentric. They have even been ascribed to an artist in the grips of schizophrenia. While the existence of a single 'Zakro Master' – mad or otherwise – must be doubted, we may safely attribute these distinctive products to a local workshop.¹⁰⁴ Unfortunately, even at Zakros itself no actual seals of this type survive. Further afield, the record is equally bare: the distinctive hybrids do appear on a few sealings at Ayia Triada and Sklavokambos, but these were probably impressed at Zakros and sent on to the other sites (see Chapter 7).

The lack of actual seals produced in the Zakros workshop underscores the extremely patchy nature of the glyptic record, yet the surviving impressions do enable us to make certain informed comments about the missing originals. The seals were invariably lentoids,¹⁰⁵ often with markedly convex faces, made of a soft material. Suggestions have

¹⁰⁴ The term 'Zakro Master' was coined by Boardman: *GGFR*² 42. M. A. V. Gill diagnosed schizophrenia in *CMS Beiheft* 1 (1981) 85-86. *Zakro Master* 49-57 summarizes earlier comments; see also J. Weingarten, in *L'Iconographie minoenne* 169-80. In *Zakro Master* 58-81, some 84 seal-types are ascribed to his hand, of which 50 were seen as definite, 18 probable and 16 possible. Weingarten's attributions should now be re-evaluated in light of the superb illustrations in *CMS* II.7. See also Chapter 11.

¹⁰⁵ Weingarten (*Zakro Master* 9-10) considers whether lentoids engraved on two faces or three-sided prisms were responsible for the 'invariable combinations' on the Zakros sealings (cf. Chapter 7). Practical experiments demonstrate that this is impossible: *Roundel* I 205, 245-46.

included wood, glass or clay (all unconvincing on technical grounds) and soft stone.¹⁰⁶ But we have numerous soft stone seals and impressions made from them: none seems to show the characteristics that we associate with the Zakros workshop. For instance, the engraving is usually very deep and well rounded, creating rather high relief in impressions. This can be seen in the many creatures with full breasts or fat bottoms. At the same time (often on the very same seal) wings, bristles and dress-patterns show remarkably fine detail, a feature that we would not ordinarily associate with soft stone seals. Perhaps we are dealing with a stone local to the Zakros region. Or might we be dealing with an artificial substance? The extremely fine detail on the MM I 'white pieces' springs to mind (cf. Chapter 4).

Material aside, it is the motifs of the Zakros seals that continue to baffle. We may note the predilection for wings and fantails, generous and often pendulous female breasts, strange heads and bodies – usually animal, sometimes human. They are combined and re-combined in bizarre ways, sometimes creating delightfully whimsical creatures (e.g. 277), sometimes producing monstrous grotesques (e.g. 278-279). Faced with motifs such as these, our descriptive powers are stretched to the limit.¹⁰⁷ There are other oddities too about the Zakros seals: a marked fondness for frontal face animal heads (or masks?) and *en face* compositions in general. These features are relatively uncommon in contemporary neo-palatial glyptic, where profile views predominate. Yet the Minoan penchant for movement is apparent in the Zakros repertoire, albeit expressed in an unusual way. The flying gallop is completely absent; instead arms and legs are splayed, bent knees make some creatures seem ready to leap out at the viewer, wings and fantails serve to heighten the effect.

While some constituent elements – animal heads, for instance – do have a long history in Minoan art, many more lack convincing parallels of any date. Some kind of distant link to the MM II steatite prisms is an attractive suggestion, but impossible to prove. The best parallel lies in a bird (or bird-lady?) from Mallia; another occurs on a prism found in a mixed context at Zakros itself.¹⁰⁸ But it seems scarcely credible that the Zakros engravers took their inspiration from the use of heirloom seals or their chance re-discovery. There is surely more to the Zakros workshop than a simple misunderstanding of earlier stylistic traits. Commentators have generally dismissed any particular religious significance for the Zakros hybrids. But one cannot help wondering whether behind these creatures of fantasy there lay some primitive shamanistic rites, involving animal capes and masks. If the Zakros engravers were inspired by local customs, rooted in the wild country east of Dikte, this might help explain why the imagery does not spread, why the Zakros types make no impact at all on neo-palatial glyptic. Moreover, following their brief and tantalizing appearance in House A, the fantasy creatures vanish with scarcely a trace. Only the bird-ladies may have descendants in the later repertoire, but these could well be derived from collateral types.¹⁰⁹

¹⁰⁶ CMS II.7 suggests soft stone. For glass see J. G. Younger, in *Meletemata* 953-57. However, there is no evidence whatsoever for mould-made glass seals or jewellery before LB II-III (Chapter 9). Moreover, mould-made seals do not display the fine detail (in original or modern impression) that is so typical of the Zakros sealings. See also I. Pini, in *Pepragmena* 9 (forthcoming).

¹⁰⁷ In the past motifs were sometimes given nicknames, which were undoubtedly memorable, but often misleading (e.g. 'butterfly sphinx' for CMS II.7 no. 157). In CMS II.7 the constituent elements of each design are described neutrally as possible: compare the new description of CMS II.7 no. 157 with *Zakro Master* 71-72.

¹⁰⁸ CMS II.2 nos. 243a and 264a; Weingarten (n. 104) 178-79, figs. 35-36.

¹⁰⁹ Examples include CMS II.3 no. 4, IV no. 290, VII no. 143. For remarks on dating, see: CMS II.4 pp. xlii-iv.

There is one further feature of the Zakros seal-types that we must note, namely the existence of related motifs, sometimes known as 'look-alikes'. In some cases the differences are very slight indeed (358-364; Chapter 7). Careful measurement may reveal minor deviations in the size of seal faces or minute differences in the treatment of details, which can only be detected under a microscope. In other cases we find a reversal of the original motif, or more significant changes to particular elements. In fact, related motifs have a long and respectable history in Aegean glyptic and are to be found in most sealing deposits. It is true that Zakros *seems* to have more than its fair share, though this might be an accident of preservation. We will take up this issue again in the next chapter when we consider sealing practices at Zakros.

CHAPTER 7 SEAL USE IN NEO-PALATIAL CRETE

By far the most explicit representation of seal wearing occurs on a LM II-III fresco from Knossos: on the Cupbearer's wrist is a lentoid of banded agate with granulation at the string-holes (FIGURE 1.1; Chapter 8). New discoveries now reveal that the practice goes back to the neo-palatial period, if not earlier. One of the minoanizing frescoes from Tell el-Dab'a in the Nile Delta shows a bull-leaper wearing what seems to be a cushion of blue chalcedony.¹ And the priestly figure on a lentoid from Vapheio also appears to wear a seal on his wrist, indicated by a minute dot.² Other depictions are far less explicit, though sometimes show male figures wearing bracelets or necklaces from which seals might have been suspended. Welcome archaeological evidence comes from the shrine at Anemospilia near Archanes, which was apparently destroyed in MM IIIA by an earthquake.³ Here the so-called priest had a fine agate cushion near his left wrist and an unusual ring of iron and silver on his left hand. Now badly corroded, no trace of a motif survives, but in shape it resembles signet rings with oval bezels. However, most neo-palatial signets have hoops that are too small for modern hands; conceivably they belonged to individuals of slim build. Obvious candidates would be women, though maddeningly there is neither pictorial nor archaeological evidence from this period to support the suggestion.⁴

Trying to gauge the extent of seal ownership and use in neo-palatial Crete is no easy matter. With so few burials to work with – and even fewer with seals *in situ* – we are forced to make inferences from the quantity and quality of surviving seals and impressions. It seems likely enough that the fine signet rings of gold and seals of semi-precious stones, often bearing unique motifs, belonged to high-ranking members of Minoan society. But to suppose we can identify precise ranks or offices through iconography is a delusion. Equally problematic are the numerous seals engraved in the 'talismanic' style (Chapter 6). We cannot begin to guess whether they were confined to a particular social group or class. Nor do we really know how far down the social spectrum seal ownership extended. We can, however, observe that at least 25% of neo-palatial seals were made of soft local stones (Chapter 6). Many are carefully worked and some bear unusual or innovative motifs. But we also have numerous poor quality seals, with simple ornamental designs or crudely executed pictorial motifs. Perhaps these belonged to individuals of limited means. The Greek mainland presents a very different picture: during the Early Mycenaean period seals were made almost exclusively in precious metals or hard stones and were confined to rich burials (Chapter 9).

¹ Fragment F4: widely illustrated, e.g. M. Bietak, *Avaris: The Capital of the Hyksos* (London 1996) colour pls. 3A, 4-5. For date: idem, *BSA* 95 (2000) 185-205. By curious coincidence a cushion of blue chalcedony acquired by Evans in the Knossos area depicts acrobats performing handstands in a field of lilies: *CS* no. 204 (here **C26**).

² P. Rehak, *Kadmos* 33 (1994) 76-84 (cf. here **482**); also J. G. Younger, *Kadmos* 16 (1977) 147-49.

³ *Archanes* I 269-311 (context); II 415-27 (dating); 650-51, fig. 717 (ring: inner diameter not stated); 692-94, figs. 793-95 (seal).

⁴ The new rings from Poros may be a welcome exception, as they were apparently associated with young or female individuals, see: N. Dimopoulou & G. Rethemiotakis, in *CMS* Beiheft 6 (2000) 42 n. 5. See also Chapter 6 and n. 38 for hoop size and Chapters 8-9 for LM II-III Crete and the Greek mainland. A study detailing hoop construction and size is in preparation by W. Müller.

The groups and deposits of sealings found on neo-palatial sites also provide intriguing insights, though sadly they cannot offer direct corroboration for our assumptions regarding social status based on seal quality. It is, however, interesting to note that alongside the impressions of fine seals and signet rings, we also find types of decidedly inferior quality (325, 327). In a few cases the motifs were so poorly executed that they are completely illegible, even though the impressions are clear enough. In other cases impressions were so carelessly made that the motifs are preserved only in part or are sometimes too blurred to read at all.⁵ If recognition proved difficult how on earth did the system work? This small point merely serves to highlight the difficulties we face when studying neo-palatial sealing practices and when attempting to interpret the role they played in administration. We must also grapple with a bewildering variety of sealing types, some found across the island, others that seem to be site or context-specific. To make matters worse, there is no universally accepted terminology or typology. Here I have attempted to combine the new and authoritative findings of the *CMS* team with terms currently used in English-language literature.⁶ The notes below and Glossary (Appendix 2) provide details. In the second part of this chapter we will survey the evidence from individual sites and consider the vexed question of inter-site relationships.

SEALING TYPES

Direct object sealings

Object sealings all but vanish in the neo-palatial period. One or two are reported from MM III-LM I Phaistos and there is a possible vessel sealing in the Temple Repositories at Knossos; singletons also occur at LM IB Ayia Triada and Khania.⁷ The virtual absence of peg sealings from doors or chests, so prevalent at MM II Phaistos, is especially striking and indicates a radical change in the way goods and commodities were controlled.

Flat-based nodules ('packets')

The basic principle of direct object sealing – albeit greatly transformed – takes on a new lease of life in the flat-based nodules. These small lumps of clay also preserve distinctive imprints on their undersides, best studied with modern silicone or plasticine impressions (10-14, 284b, 285b, 288d, 289d). Thus we are able to retrieve the shapes and features of the originals and understand how the nodules were made.⁸ In shape the sealed items

⁵ See I. Pini, *CMS* II.6 pp. xxiv-v.

⁶ Note that I discuss and illustrate only the main types and sub-types; for the full range of variants the relevant *CMS* volumes must be consulted. The new *CMS* typologies devised by W. Müller appear in *CMS* II.6 pp. 339-99, II.7 pp. 271-77 and II.8 pp. 24-93. His descriptions are supported by superb photographs and clear diagrams, but the German terms are difficult to render neatly in English (see *AJA* 105 [2001] 118-20). In this chapter I adopt E. Hallager's English terms (*Roundel* I 21-24, 34-37) and insofar as possible relate them to Müller's more precisely defined types. Weingarten's typology (e.g. *Knossos Labyrinth* 171-72, fig. 1) should no longer be used.

⁷ HMs 680, 674 (*CMS* II.5 nos. 241, 304: Phaistos); HMs 1186 (*CMS* II.8 no. 615: Knossos); *CMS* II.6 p. 360, figs. 5-6 (Ayia Triada); also *Roundel* I 201. Also noteworthy is the stopper with seal impression (*CMS* V Suppl. 1A no. 138) and seven unimpressed stoppers from Khania: E. Hallager, *Arbejdsrapporter / Work in Progress* 99-01 (Århus 2001) 6-16; add now *CMS* V Suppl. 3 no. 107. See Chapter 5 n. 95 for a direct object sealing, perhaps of LM I date, from Palaikastro; for an example from Akrotiri see below pp. 167-68.

⁸ For exhaustive accounts and numerous photographs of silicone impressions, see: *CMS* II.6 pp. 349-60, 367-68, figs. 7-16; II.8 pp. 38-44, figs. 8-10. For the use of silicone see Chapter 1.

resembled *tiny* ‘packets’ made of perishable material, folded several times and wound with fine thread. The soft folds and smooth surfaces point to a pliable material such as parchment or fine leather, not papyrus.⁹ The small pieces of parchment were ordinarily folded sideways two or three times and then once or twice from top to bottom. Next, the fine thread was wound several times around the ‘packet’ and held in place with a tiny piece of clay. Then the clay lump itself was firmly pressed over the ‘packet’. The next step was crucial: the thread was wound into the clay to ensure that the nodule remained firmly attached to the ‘packet’. Tiny thread holes can sometimes be seen on the upper surfaces or edges of the nodules (289b-c). Finally, the nodule was smoothed to take the seal impressions.¹⁰

How are we to interpret the function of these elaborate sealings? First it is important to realize that the term ‘packets’ (German: *Päckchenplomben*) is simply a convenient way of describing the *appearance* of the original objects. The silicone impressions clearly indicate that the ‘packets’ did not *contain* anything. The logical inference is that we are dealing with written messages. Since the silicones indicate that the original pieces of parchment (unfolded) rarely exceeded 6 x 6 cm – and some were smaller – the messages must have been extremely terse. Thus, in length, they might be compared to the inscriptions found on Hieroglyphic crescents and on Mycenaean gable-shaped nodules (cf. Chapters 5, 8 and 10). Certainly, there is no support for the notion that neo-palatial flat-based nodules sealed diplomatic correspondence or other lengthy documents.¹¹

Flat-based nodules can be classified according to the position and number of seal impressions which they carry. The simplest type bears one seal impression on the upper surface. These *single-seal recumbent nodules* (283-285) are found in almost every neo-palatial sealing deposit: altogether more than 300 survive.¹² They are the largest of the flat-based nodules, sometimes reaching 3 cm in length. But the operative factor was evidently the size of the folded parchment, not the size of the seal(s), a point illustrated by the two ‘packets’ sealed by the same ring shown in 284-285. Incomplete impressions are fairly common, especially when large metal signet rings were used, raising important questions regarding the recognition of seal devices (see above). *Two-seal recumbent nodules* bear a second impression, applied at a slight angle to the first (or main) impression (286). These too are found across the island, though in fewer deposits and in smaller numbers than the single-seal variety.¹³ *Standing nodules* are largely confined to Zakros and come in two versions, impressed with either two seals or three (287-290).¹⁴

⁹ Established in tests by the CMS team (CMS II.6 p. 352) and at the Deutsches Ledermuseum, Offenbach: I. Pini, *AA* (1983) 560-62. Strictly speaking, the term ‘parchment’ applies to skins so treated as to take writing on both sides. Obviously, we cannot know if this was true for Minoan ‘parchment’; for Egypt see *AMMI* 303.

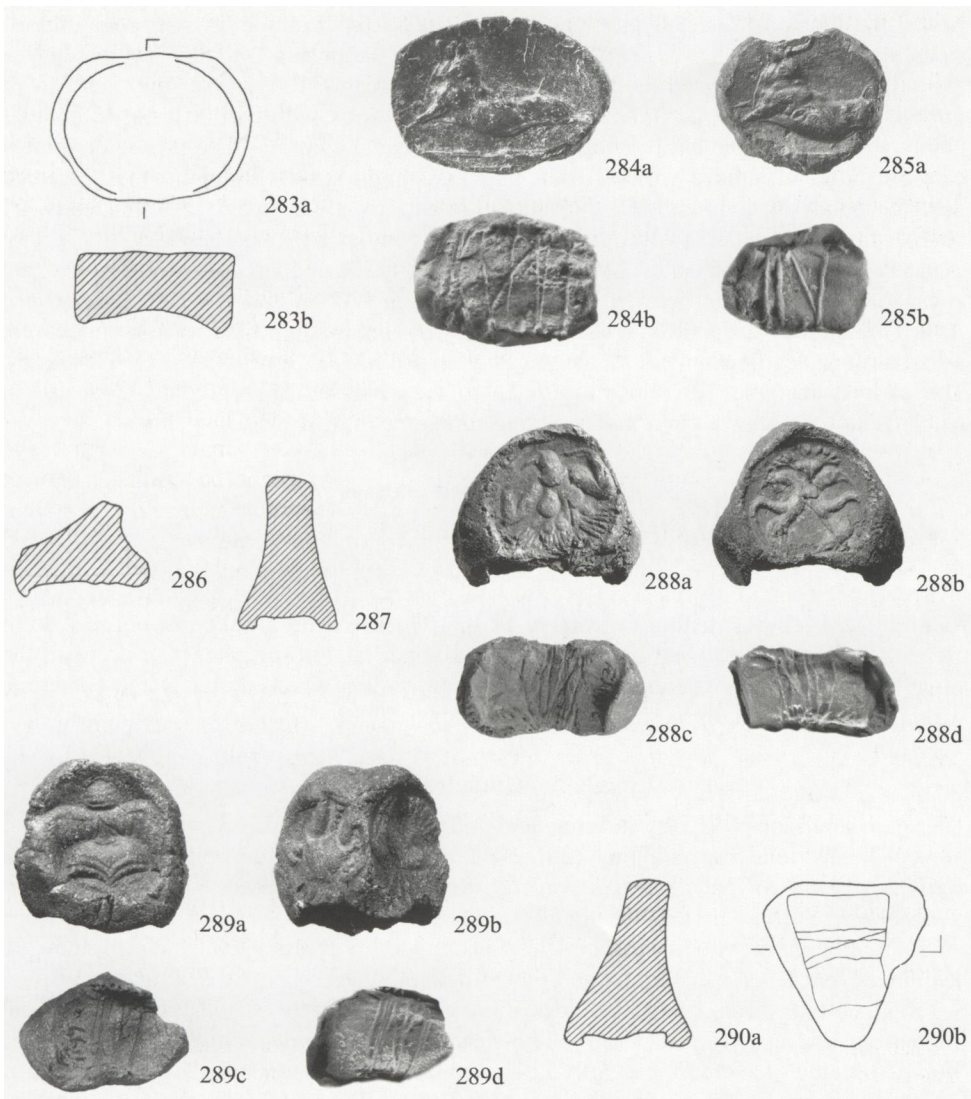
¹⁰ *Roundel* I 27-28 refers to ‘polish’, a feature not observed by the CMS team (pers. comm.).

¹¹ As proposed by J. Weingarten (e.g. *Kadmos* 22 [1983] 8-13) and E. Hallager, *Roundel* I 137-45, fig. 51c. Practical experiments by the CMS team demonstrate that Hallager’s hypothetical reconstruction using an A-4 sheet of *paper* cannot be replicated in parchment or leather: CMS II.6 pp. 355-56 n. 28. See also pp. 160, 192.

¹² *Roundel* I 135-37, table 26. Termed *Päckchenplomben*, *Horizontalscheibe* in CMS II.6 pp. 356-358, II.8 pp. 40-43.

¹³ *Roundel* I 135-37, table 26. Cf. *Päckchenplomben*, *Horizontalscheibe mit zweitem Abdruck* (CMS II.6 p. 358).

¹⁴ A few two-seal standing nodules occur at Ayia Triada and Knossos: *Roundel* I 135-37, table 26; CMS II.6 p. 359; II.8 pp. 43-44 (*Päckchenplomben*, *Vertikalscheibe*). For new examples from Akrotiri, see W. Müller, in CMS V Suppl. 3 pp. 50-57, figs. 8-11. For three-seal standing nodules (*Päckchenplomben*, *Pyramide*): CMS II.7 pp. 271-74; II.8 p. 44. See also below p. 184.



LM I flat-based nodules / 'packets'. **283-285** Single-seal recumbent nodules from Ayia Triada (HMs 498 and 497) and Sklavokambos (HMs 628). Drawings of HMs 498 (for silicone see 14). Upper surfaces and silicones of reverses (HMs 497 and 628). These three nodules bear impressions of the same gold signet ring (see 368). **286** Two-seal recumbent nodule from Ayia Triada; section drawing. **287** Two-seal standing nodule from Zakros; section drawing. **288a-d** Two-seal standing nodule from Zakros; profiles, reverse and impression of reverse. See 358 and 360 for seal-types. **289a-d** Three-seal standing nodule from Zakros; profiles, reverse and impression of reverse. See 289-282 for seal-types and 305 for a two-hole prismatic nodule impressed by the same seals. **290a-b** Three-seal standing nodule from Zakros; drawings of section and underside. Scale ca 1:1.

As we noted in earlier chapters, dual-stamping occurred on a few object sealings at Lerna and Phaistos. Hieroglyphic crescents often bear two, three or even four impressions. But the exact significance of multiple stamping is unclear. And this is certainly true for neo-palatial flat-based nodules. However, it seems likely that the number of impressions relates to the *nature* of the messages. Thus, while all flat-based nodules obviously had the same basic function – to seal parchment notes – the purpose or content of those notes may have varied. Brief messages might serve to identify the bearer, to describe goods or commodities, to record transactions – whether debts or receipts. Of course, these suggestions are purely speculative, and need to be assessed in light of evidence from individual sites. Moreover, some flat-based nodules certainly travelled and attest to communication between Crete and Thera in LM IA and also perhaps between Ayia Triada, Gournia, and Sklavokambos in LM IB (see below). Flat-based nodules were a short-lived phenomenon and all but vanish after the LM IB destructions (cf. Chapter 8). The earliest examples are those attributed to the so-called Hieroglyphic ‘deposits’ at Knossos and Mallia, which probably belong sometime in MM III (Chapter 5).

Crescent-shaped nodules

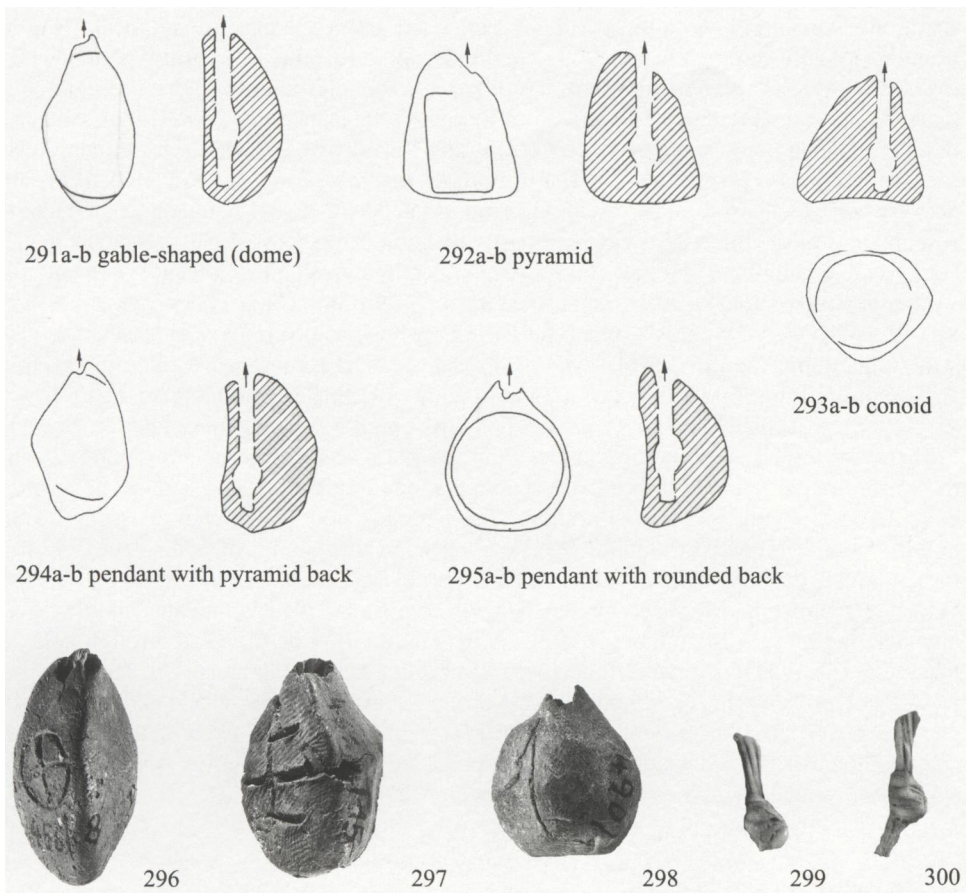
Crescent-shaped nodules are formed around knotted cords and usually bear several seal impressions and brief inscriptions in the Hieroglyphic script. Like the script itself, crescents are found only in north-central and eastern Crete. Good examples have been found in MM IIB destruction deposits at Mallia (Quartier Mu) and Petras, but the use of crescents evidently persisted into the neo-palatial period. At any rate, they occur in the so-called Hieroglyphic ‘deposits’ at Knossos and Mallia, which probably fall sometime within MM III. A full discussion appears in Chapter 5.

Single-hole hanging nodules

These are small lumps of clay fashioned around pieces of thin cord, knotted at one end to prevent the nodule from slipping (291-298). Imprints on broken nodules suggest that cords were made of gut, leather or vegetal fibres (15-16, 299-300).¹⁵ The nodules bear one seal impression only and are often inscribed with a Linear A sign. Our best evidence for single-hole nodules comes from Ayia Triada, with more than 900 examples; they are also attested at Knossos, Khania, and by a singleton at Akrotiri (for Zakros see below). Several sub-types can be readily identified on the basis of shape, position of seal impression and inscription, if any. For instance, *gable-shaped nodules* (also called ‘domes’) seem to have been carefully fashioned on a flat surface, using the forefingers of both hands to produce an elongated gable (291, 296).¹⁶ The nodule was then held with the apex between the index and middle finger; impressing the seal caused the back to become slightly rounded. The *pyramid* was also carefully pre-formed to produce three even triangular faces (292). *Conoids* were invariably impressed on the base: the shape was probably achieved by the act of impressing the seal on the clay, which was held between

¹⁵ CMS II.6 pp. 340-46, fig. 1; II.8 pp. 49-52: *Schnurendplomben*.

¹⁶ *Roundel* I 161-63 gives a good account of how the nodules were formed. Note, however, that Hallager’s sub-types (ibid. and fig. 2) do not correspond exactly to the varieties newly defined by the CMS (n. 15). His ‘domes’ roughly equate to *Schnurendplomben mit giebelförmiger Rückseite*, ‘pyramids’ to *Pyramide* and ‘cones’ to *Konoide*. But ‘pendants’ include both *Schnurendplomben mit pyramidenförmiger Rückseite* and those *mit gewölbter Rückseite*. Here 291-298 reflect the CMS typology.



LM I Single-hole hanging nodules from Ayia Triada. **291-295** Drawings to illustrate principal sub-types. Rear views of gable-shaped / dome (**296**), pendant with pyramid back (**297**) and pendant with rounded back (**298**). **299-300** Silicones of broken nodules showing imprints of knots. Scale ca 1:1.

the tips of the thumb and forefingers (**293**). *Pendants* also seem to take their shape from making the impression. Here a small gable-shaped piece of clay was apparently held between thumb and fingertips. Pressure from the thumb produced a flat surface, while the fingertips created a rather irregular back – pyramidal or slightly rounded (**294-295**, **297-298**). This sub-type shows the greatest variation in appearance, no doubt reflecting the idiosyncrasies of the individuals who made the nodules. Haste, carelessness or even lack of experience might also cause deviations from the norm. For instance, some single-hole nodules actually have a second hole at the lower end, where the knot has protruded (cf. **300**). At first sight they might be mistaken for two-hole nodules.¹⁷

¹⁷ Thus *Roundel* I 161, referring to 11 two-hole nodules from Ayia Triada. Of these, five or six are actually single-hole nodules (*Schnurendplomben*) with a second hole; the remainder belong to the two-hole variety (*Schnurplomben*): *CMS* II.6 pp. 346-48.

But do the different procedures for making nodules reflect significant differences in function? At present we simply cannot say, since the very purpose of these hanging nodules remains enigmatic. We can, however, detect some interesting patterns. For instance, gable-shaped nodules are confined to Ayia Triada and also bear a close resemblance to gable-shaped *noduli* from that site (e.g. 308).¹⁸ Thus we seem to have a distinctive local practice. Conoids too are closely linked with Ayia Triada, although there are sporadic cases elsewhere. The large number of single-hole nodules at Ayia Triada also encourages us to look for possible correlations between seal-type and nodule shape. But analysis of the material is extraordinarily difficult because we must also factor in clay types and inscriptions.¹⁹ About thirteen signs (or ligatures) occur on nodules; but it is well nigh impossible to guess their meaning (cf. 296-297). It is conceivable that they served as arbitrary symbols – much as we might designate groups with the letters ‘A’, ‘B’, ‘C’ – rather than as legible syllables. Scribal hands represent yet another variable. Although we might reasonably question the validity of ascribing nodules on the basis of a single sign, it seems clear that we are dealing with about a dozen different hands.

There are few clues to help us understand the purpose of these hanging nodules. Did the cords actually bind objects? Even so, the nodule itself could not safeguard the contents in any way – it *sealed* nothing. But perhaps security was not at issue and the nodule merely indicated the items had been checked or counted. It is also possible that these nodules occurred in pairs – after all a length of cord has two ends – though concrete evidence is lacking. An attractive but equally conjectural idea is that the nodules were attached to papyrus or parchment scrolls; cords could easily be threaded through holes in the lower edges of documents.²⁰ The nodules would thus authenticate the contents, but would not prevent the document being unrolled and examined. Since parchment and papyrus never survive on Crete, no direct proof can be offered. Nevertheless, size and shape of the nodules are suitable for this purpose; later in this chapter we will see how the suggestion squares with the archaeological evidence.

Two-hole hanging nodules

These nodules are also formed around pieces of cord, but seem very different in concept to the single-hole variety, since the cord runs through the nodule and out each end (301-305). Several broken examples reveal that the cord was apparently knotted or twisted to prevent the clay slipping, in much the same way as on our single-hole nodules (17, 303-304).²¹ If correct, this observation means that two-hole nodules did not secure contents, but again served as tags or labels of some kind, perhaps attached to boxes or sacks. A few nodules of this variety have been identified at MM IIB Petras and at neo-palatial Knossos and Khania.²² At Ayia Triada certain ‘two-hole’ nodules prove to be the single-hole

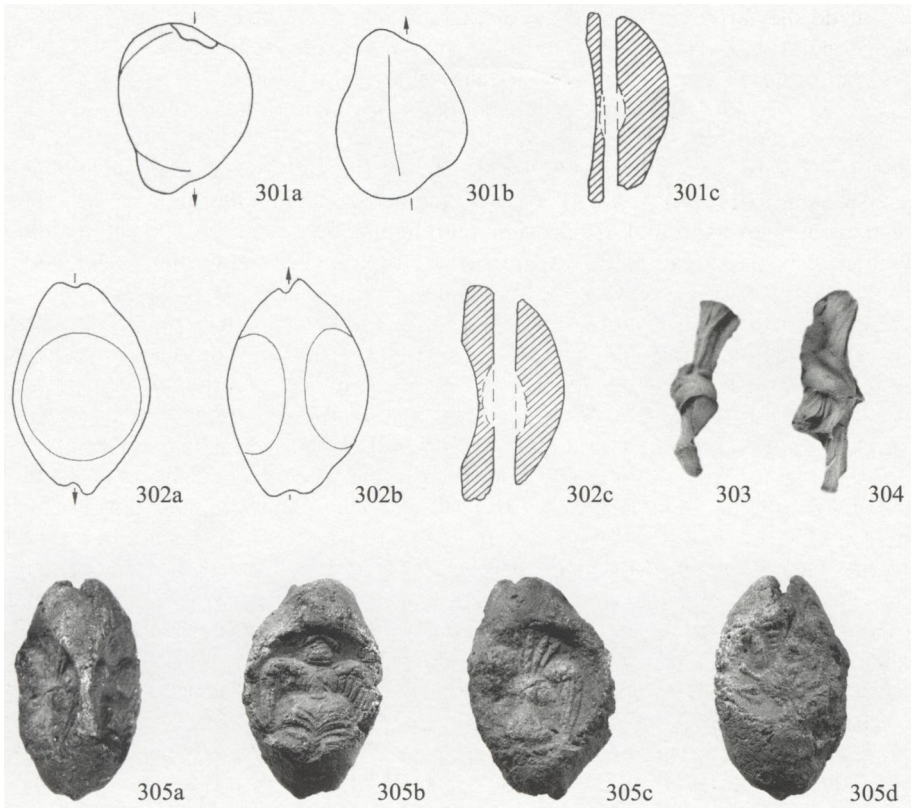
¹⁸ *CMS* II.6 p. 344.

¹⁹ *Roundel* I 171-89; E. Hallager, in *Administrative Documents* 251-60.

²⁰ Suggested by Hallager (*Roundel* I 198); idem, in *Administrative Documents* 259; idem in T. G. Palaima et al. (eds.), *Proceedings of the 11th International Mycenaean Colloquium* (forthcoming). The comparanda he offers are not especially persuasive.

²¹ This seems to be true of two-hole prismatic nodules from Zakros, where most of the examples are intact. By contrast, several two-hole nodules at Ayia Triada seem to involve twisted cords: *CMS* II.6 pp. 347-48, fig. 6. *Roundel* I 161 states that sometimes the knots in two-hole nodules joined two pieces of string, but does not cite specific examples.

²² *Roundel* I 159-61, figs. 59-60. Note, however, that the illustrated examples from Khania look suspiciously like single-hole nodules with a second hole (cf. *CMS* II.6 pp. 346-47, fig. 4 and also above). For Knossos see: *CMS* II.8 nos. 286 (HMs 140) and 191 (HMs 385).



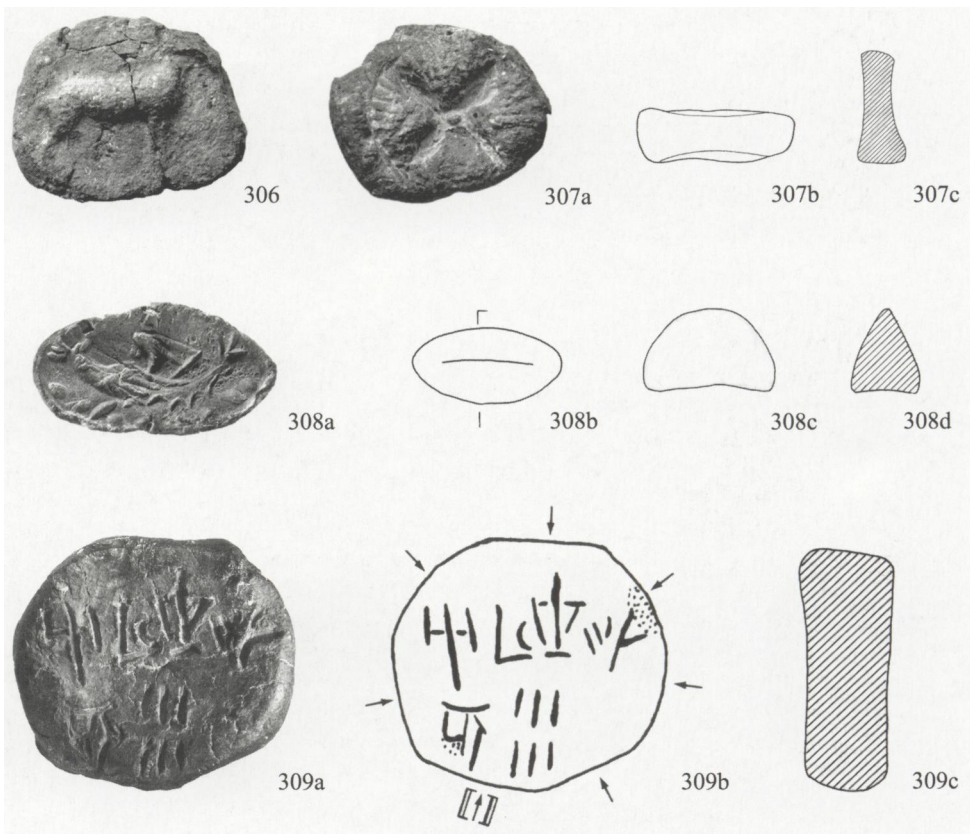
LM I two-hole hanging nodules from Zakros. **301a-c** Drawings of gable-shaped nodule with single seal impression. **302a-c** Drawings of prismatic nodule with three seal impressions. **303-304** Silicones of broken prismatic nodules showing imprints of cords and knots. **305a-d** Profile view and faces of prismatic nodule with three seal impressions (see **280-282** for drawings of seal-types and **289** for a three-seal standing nodule impressed by the same seals). Scale ca 1:1

variety in disguise, with the second hole caused by careless knotting (above; **300**). By far and away the largest group of two-hole nodules occurs at Zakros, with 50-60 examples (see p. 184). These are usually prismatic in shape and normally carry three seal impressions, a common Zakros peculiarity (**302**, **305**). Unlike single-hole nodules, which cease to be found after LM IB, two-hole nodules recur at LM II-III Knossos and in Mycenaean centres on the mainland (Chapters 8, 10).

Noduli

As we have already noted, these are small lumps of clay bearing one or two seal impressions, but without any means of attachment to another item.²³ *Noduli* are first encountered in MM IA (Mallia) and others are known from proto-palatial Knossos, Mallia and Phaistos, as well as MBA Samothrace (Chapter 5). Around 130 have been recovered from neo-palatial sites, including about 45 from the Temple Repositories at

²³ See Chapter 5 for definition and terminology. See also *Roundel* I 121-33; *CMS* II.6 pp. 360-62, 376-79; II.7 p. 273; II.8 pp. 74-80.



LM I *noduli* and roundel. **306-307** Disc-shaped *noduli* from the Eastern Temple Repository at Knossos. Each *nodulus* bears impressions of the same two seals (see **313** and **315** for drawings of seal-types). *Noduli* shown at ca 3:2; drawings at ca 1:1. **308a-d** Gable-shaped (dome) *nodulus* from Ayia Triada. Underside with seal impression shown at ca 3:2; drawings at ca 1:1. **309a-c** Inscribed roundel from Ayia Triada with six impressions of the same seal (see **242** for drawing of seal-type). A seventh impression had been covered with a piece of clay (marked with bracketed arrow). Thus the number of impressions corresponds to the quantity (6) indicated in the inscription. Scale ca 1:1.

Knossos, where the two main varieties of *noduli* – discs and gables – are represented. The disc-shaped variety is a flat and circular piece of clay (D. ca 2 cm), ordinarily bearing a seal impression on each face (**306-307**). In LM IB this type only occurs at Zakros House A, where five examples were found. Most *noduli* from LM IB sites bear a single seal impression on the base, while the upper surface is usually gabled or domed. The shape clearly reflects the way the lump was held when the seal was impressed and so minor deviations are only to be expected. This makes the group of 45 *noduli* found together *in situ* at Ayia Triada especially interesting, since they are nearly identical in appearance and are impressed with the same seal (**308**). Here it seems very likely that a single individual was involved, although perhaps an assistant helped to prepare the clay lumps.²⁴

²⁴ Their uniformity surely indicates they had been prepared on the spot for *distribution*, i.e. not collected for archival purposes (CMS II.6 pp. 361-62 *contra* Roundel I 132).

By and large *noduli* occur in much smaller groups or as singletons, though this may be pure chance. As a result, their precise function is poorly understood. However, the suggestion that they served as ‘tokens’ is reasonable, and is sufficiently flexible to cover various kinds of transactions.²⁵ For instance, they might entitle the bearer to materials, rations or even lodging. By extension they could serve as *laissez-passer* for messengers travelling between sites (cf. p. 185). Brief Linear A inscriptions and counter-marks *supra sigillum* (i.e. over the impression) occur on a few *noduli* from Ayia Triada, suggesting that a commodity or quantity had to be modified.²⁶ One of the *noduli* from Samothrace also bears a Linear A inscription (Chapter 5). *Noduli* are astonishingly long-lived and recur at Knossos and the mainland palaces in LB III.

Roundels

Like *noduli*, these disc-shaped pieces of clay (D. 2–7 cm) were not attached to other objects. The seal impressions are placed on the edge of the disc, while Linear A inscriptions usually occur on the flat face(s). Although roundels have been found at MM IIB Phaistos and Petras (Chapter 5), their *floruit* lies in the neo-palatial period. They were not used during LB III. Our understanding of these objects – though still imperfect – has been greatly augmented by the discovery of 118 roundels at Khania. As a result, the neo-palatial corpus now stands at about 170 examples, drawn from a wide range of sites.²⁷ Outside Crete we have two roundels from Samothrace (MM II-III) and one from a MM III context on Kea (Chapter 5). Most roundels are impressed with a single seal, stamped repeatedly around the edge. The number of impressions is not haphazard; rather they seem to indicate the number of units covered by a transaction.²⁸ For instance, an example from Gournia, inscribed with the ideogram BOS and the numeral five, also bears five seal impressions. Even more telling is a roundel from Ayia Triada, which is inscribed with the numeral six and which has six legible impressions (309; cf. 242). Originally there were seven impressions, but this had been corrected by covering one with a piece of clay. In fact, it is unusual to find numerals on roundels, whereas single ideograms are the norm (e.g. 345-348).²⁹ Many can be matched on Linear A tablets and probably signify commodities. Likely candidates include agricultural produce, livestock, and manufactured goods (e.g. textiles). Longer inscriptions, consisting of several signs, presumably covered items for which no ideogram existed. Since roundels deal with specific quantities (i.e. indicated by seal impressions) of named commodities, it seems reasonable to interpret them as receipts.³⁰ Less clear are the circumstances under which roundels might be issued, since few come from informative contexts. None the less, the concentration at Khania, suggests that they may have been held by the administration rather than by individuals. If so, roundels perhaps documented disbursements, e.g. from storerooms to workshops. In this case, we might envisage roundel receipts involving two parties: the authority responsible for issuing the goods and the agent responsible for accepting or removing them. Presumably the latter made the seal impressions, though it is difficult to be certain (see also p. 177).

²⁵ J. Weingarten initially preferred a narrower interpretation as dockets, i.e. ‘receipts for work done’: *Kadmos* 25 (1986) 17-21; *Kadmos* 26 (1987) 38-43. Later she accepted that some LM IB examples may have functioned as tokens, serving to identify the carrier: *Kadmos* 29 (1990) 16-23.

²⁶ *Roundel* I 125-27, table 23.

²⁷ *Roundel* I 79-120 and II (catalogue) provides an exhaustive account.

²⁸ *Roundel* I 100-01.

²⁹ 139 roundels bear inscriptions: *Roundel* I 108-12, figs. 40-41.

³⁰ *Roundel* I 116-20.

SEALING ‘DEPOSITS’

The diversity of neo-palatial sealing types is matched by the variety of sites which have yielded sealings. For LM IA our principal groups occur at Knossos and at Akrotiri on the island of Thera. To these we may add a single roundel from Gournia and perhaps a few sealings from Phaistos *vani* 10-11.³¹ It may seem rather strange that we do not have more sealings from this major destruction horizon on Crete, associated with the volcanic eruption of Thera, but perhaps reconstruction and reoccupation are to blame (pp. 191-92). In any case, our largest assemblages, namely those at Ayia Triada, Khania and Zakros, belong to the end of LM IB. These destructions also preserved sealings – as singletons or small groups – from Gournia, Palaikastro, Pyrgos, Sklavokambos and Tylissos. Even when sealings are found in some quantity, the term sealing ‘deposit’ is not always accurate. Sometimes the original context and associated material were destroyed in the very fires that preserved the sealings. We can do little or nothing to reconstruct the original circumstances in which they were used or stored – Ayia Triada is a prime example. By contrast, at Khania, we are mostly dealing with material re-deposited as fill for later structures. Only in House A at Zakros do we seem to have a true deposit of sealings *in situ*.³² But this site highlights a further difficulty with our ‘deposits’ – namely the lack of a ‘type site’, with a full array of sealings and administrative documents. Each and every one of our sites differs in character and quality of evidence. House A at Zakros is patently not a palace, and the palace at Zakros has yielded barely a handful of sealings: happenstance has militated against their survival. The implications for understanding inter-site relationships in the neo-palatial period are not encouraging (see pp. 188-92). First we will examine the evidence from the principal assemblages and consider what, if anything, they add to our knowledge of how various kinds of sealings were used.

Knossos

Although the palace at Knossos was apparently unscathed in LM IB, it did suffer several major destructions earlier in the neo-palatial period. One seems to have occurred during MM III, another was Evans’s Great Destruction of MM IIIB – nowadays often termed MM IIIB / LM IA Transitional – and a third was contemporary with the eruption of Thera in LM IA Mature. The material attributed to the Hieroglyphic ‘Deposit’ presumably belongs to one of these horizons, the sealings and damaged cult equipment contained in the Temple Repositories to another (FIGURE 5.5). Unfortunately, no pottery at all was associated with the Hieroglyphic ‘Deposit’ and the date when the Temple Repositories were closed remains debatable.³³ The pottery in these two deep floor cists certainly looks old-fashioned and could well be considered MM IIIB / LM IA Transitional. But all forty vases are large closed shapes; many are made of poor quality clay, carelessly decorated.

³¹ LM IA Gournia: *CMS* II.6 no. 159, *Roundel* II 11 (GO Wc 1). MM III-LM I Phaistos: *CMS* II.5 nos. 241, 304; also HMs 1491, an inscribed hanging nodule with illegible impression: E. Fiandra, in L. Rocchetti (ed.), *Sybrita: La valle di Amare fra Bronzo e Ferro*. *Incunabula Graeca* 96 (Rome 1994) 15-26; P. Militello, *ibid.* 27-30; *Roundel* I 64. For MM IIIB / LM IA Transitional (i.e. contemporary with the seismic destruction on Thera) we might add some (or all?) of the Hieroglyphic ‘deposits’ at Mallia and Knossos (see Chapter 5 and below). For the date of the Temple Repositories, see below.

³² And for LM IA the sealings in Delta 18a-b at Akrotiri on Thera (see below pp. 167-68).

³³ *ABAC* 61-65, 72-74; *CPSK* 146-48; *Troubled Island* 16-17, 22-23; C. F. Macdonald, in *Monuments* 39-41; *idem*, *JHS* 123 (2003) 244-45. See pp. 112-16 for the Hieroglyphic ‘Deposit’.

Unlike small fine wares such as cups, large vessels can remain in use for a considerable period of time; their styles may also be slow to change. In other words, the pottery does not provide a precise date for the destruction which prompted the filling and closure of the Temple Repositories. Unlike the pottery, the famous faience snake handlers and animal plaques have an advanced look about them, and this is also true of certain seal-types (e.g. **23b**, **246**, **317-321**). Good stylistic comparisons are now provided by the Thera sealings, preserved in the volcanic destruction (pp. 167-68). Moreover, *if* the new *CMS* verdict on the Hieroglyphic ‘Deposit’ is correct (Chapter 5) – placing it as late as the Great Destruction – then it would be logical to assign the Temple Repository sealings to LM IA Mature. In any case, with very few exceptions the sealings belong to canonical neo-palatial varieties, well attested at Thera and in our LM IB destruction deposits.

The sealings were all found in the Eastern Temple Repository, but there has been considerable confusion surrounding their precise number. Evans referred to about 150 or 160, but only about 95 sealings can now be located. Thus it was widely assumed that the others had been misplaced in the museum or lost. An altogether less sinister tale emerges from recent studies of Evans’s notebooks.³⁴ These reveal that the figure of 150-160 must relate to the number of impressions and not to the number of sealings. Indeed many of the *noduli* are stamped twice, so too some of the flat-based nodules. The six roundels also bear multiple impressions. So the correct tally seems to be 150-160 impressions made by 50 seals on roughly 95 sealings. *Approximate* figures are 30 flat-based nodules, 45 *noduli*, six roundels, a dozen or so hanging nodules of various kinds, and one or two object sealings. The new *CMS* volume on the Knossos sealings clarifies the picture further, although it will take some time to absorb the wealth of data presented.³⁵ In the meantime, only limited observations are possible.

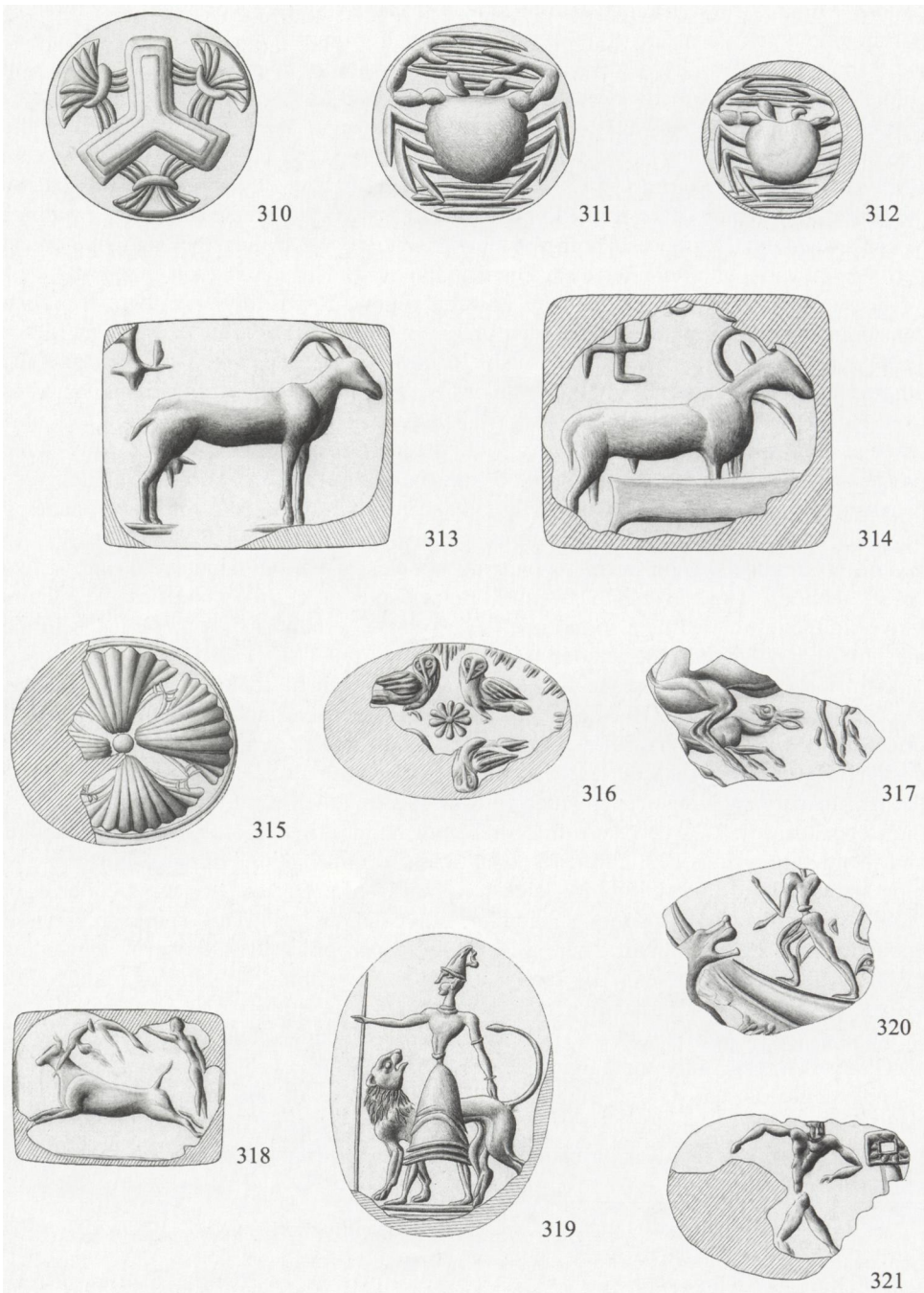
As in the Phaistos deposit, seal-types old and new can be found among the Temple Repository sealings (e.g. **310-321**). Some of the seals were certainly heirlooms – a MM II prism or two, a *Petschaft* with a Hieroglyphic motif, and several discoids with tectonic designs. But others reflect the neo-palatial trend toward naturalistic representations, e.g. the fragmentary suckling scene, which finds a good parallel in the faience plaques from the Repositories (**317**). There are fine studies of human figures on hard stone cushions and metal signet rings (**23**, **246**, **318-321**). While it might be tempting to link these to high status administrators, proof is elusive (pp. 154-55). Nor can we use frequency of seal impressions to reconstruct an administrative hierarchy.³⁶ This approach is risky enough with large assemblages; here it is wholly inappropriate. It is, however, interesting to observe that a given seal-type rarely occurs on more than one kind of sealing. For instance, we have six partial impressions of the ‘Scylla’ motif (**320**) – a male figure standing in the prow of a ship – all occur on flat-based nodules (e.g. **11**). Likewise the 12 surviving examples of the male figure and lion (**319**) occur on gable-shaped *noduli*.

The practice of dual-stamping that we observed in earlier deposits recurs in the Temple Repositories. On an interesting group of flat-based nodules we find an elaborate trefoil pattern (the original seal was probably metal) coupled with impressions of another metal

³⁴ M. Panagiotaki, *BSA* 88 (1993) 49-91, esp. 87-89; eadem, in *Pepragmena* 7 (1995) A2 709-28; *CPSK* 106-118.

³⁵ See *CMS* II.8 (2002) pp. 113-14 and table 1 (pp. 806-10) for a complete list of nodules and seal-types now attributed to the Eastern Temple Repository (superseding *KSPI* and *CPSK* 106-18). I thank the *CMS* team for permission to consult the manuscript prior to publication. See now my review article in *AJA* 108 (2004) 275-79.

³⁶ As attempted by J. Weingarten, in R. Laffineur (ed.), *Transition: Le monde égéen du Bronze moyen au Bronze récent*. *Aegaeum* 3 (Liège 1989) 39-52; eadem, in *Knossos Labyrinth* 181-83.



310-321 Drawings of selected seal-types from the Eastern Temple Repository, Knossos. Scale ca 2:1.

seal or signet ring depicting a crab (310-311). This combination appears on about ten nodules, but on a further example the trefoil is paired with a different seal. This too depicts a crab, but is somewhat smaller than the first (312). Similar motifs like these are sometimes known as ‘look-alikes’, though the term is open to misunderstanding and abuse. More to the point, the significance of this phenomenon – widespread in ancient glyptic – is obscure (see pp. 182-84).

Dual-stamping also occurs on a group of 17 disc-shaped *noduli* (e.g. 306-307). All were impressed with the same seal decorated with four sea-shells (315). On some the second impression shows a short-horned goat (313), while on others we find a long-horned goat behind a trough (?) with a swastika in the field (314). These goats have also been dubbed ‘look-alikes’, but in truth the motifs are not especially close. They do, however, appear to carry the same administrative authority.³⁷ Furthermore, this group of disc-shaped *noduli* is very intriguing. Why is the type so rare? Is it chiefly a Knossian phenomenon? Or is their role more specific and linked to a particular kind of administrative context? The Temple Repositories offer no clues, for we are dealing here with a secondary deposit. We cannot reconstruct the circumstances in which the various sealings were made and retained. It is even difficult to be certain that they were connected to the running of the palace sanctuary.

Thera

The discovery of sealings at Akrotiri on Thera in 1995 offers fascinating new insights into contacts between Crete and this important Cycladic settlement, immediately before the volcanic eruption of LM IA. The nodules came to light in Room Delta 18, which was divided into two narrow compartments (18a and 18b), both apparently serving as storerooms.³⁸ Since the nodules were found near the ceiling in Delta 18b, the excavator, Christos Doumas, suggests that they had been kept in a sack hanging from a beam or in a wooden box which had floated when the room was flooded with mud following the eruption. In the adjacent compartment Delta 18a, a single sealing and fragments of two or three Linear A tablets were discovered.

Happily, information on the Thera sealings now appears in *CMS V Suppl. 3* (2004), accompanied by excellent drawings of the 15 seal-types and important data on the nodules themselves.³⁹ Most of the seal-types are naturalistic in character and comparable in style to seals and seal-types known from LM I Crete. There are impressions of several signet rings, as well as cushions and lentoids. Motifs include a chariot scene, a procession, a hunting scene, bull-leaping and various animal studies, as well as a MM II-III tectonic design. Many of the impressions are fragmentary, though by great good fortune the chariot scene is almost intact (322). Astonishingly, this proves to be from the very same ring as was responsible for impressions at LM IB Ayia Triada and Sklavokambos (370 and below). One of the bull-leaping rings (323) is very similar to types attested in LM IB, but is not an exact match (cf. 368-369).

³⁷ Weingarten 1989 (n. 36) 40; eadem, in *Knossos Labyrinth* 183. W. Müller notes that the two cushions (and the ring with sea-shells) must have been in the possession of the same individual, since disc-shaped *noduli* had to be impressed at the same time, by a single person: *CMS* II.8 p. 78. Conceivably one cushion was inspired by the other.

³⁸ C. Doumas, *Ergon* (1995) 52-54, figs. 37-38; idem, *PAE* (1995) 127-30, pl. 63; idem, in *CMS Beiheft 6* (2000) 57-65. See also now *CMS V Suppl. 3* pp. 567-68.

³⁹ *CMS V Suppl. 3* nos. 391-405; the nodules are discussed by W. Müller (pp. 48-49, 50-58). I thank the *CMS* team for allowing me to consult the manuscript prior to publication.



Flat-based nodules / ‘packets’ found in the LM IA volcanic destruction at Akrotiri on Thera. **322** bears the impression of a gold signet ring depicting a chariot scene known from LM IB sealings at Ayia Triada and Sklavokambos (see **370** for seal-type). **323** was impressed by a ring with bull-leaping scene, similar but not identical to those known from Cretan sites in LM IB. Scale ca 2:1.

With the exception of a peg sealing found in Delta 18a, and a possible single-hole hanging nodule, the assemblage comprises only flat-based nodules. Altogether there are 53 examples. The impressions of the chariot ring are found on single-seal recumbent nodules, which may account for their excellent state of preservation. Standing nodules represent a clear majority; especially significant are ten gable-shaped variants, otherwise only known from the Temple Repositories at Knossos.⁴⁰ According to the excavator, all of the sealings are made of exceptionally pure and fine clay, which is *not* local to the island. In other words, the parchment notes (above pp. 155-58) had been written and sealed somewhere on Crete and were then dispatched to Akrotiri.⁴¹ The fact that so many of the nodules were fragmentary suggests that the notes had been opened and read. Perhaps they had accompanied a shipment of goods to the island and recorded the commodities and quantities involved. As for their origin, without clay analysis this is impossible to say, though Knossos would be a prime candidate. Further insights may come when the new *CMS* data have been fully evaluated.

Ayia Triada

The site of Ayia Triada, comprising a settlement and fine neo-palatial villa complex, lies at the western end of the Mesara plain, about 3 km from the palace at Phaistos. Italian excavations during 1902–03 yielded what remains our largest collection of administrative documents from neo-palatial Crete: 146 Linear A tablets and approximately 1150 sealings.⁴² But sadly, only a few can be linked to precise find-spots, which hampers our ability to interpret this assemblage. Doro Levi’s publication of the sealings in 1926 included brief remarks on nodule types and presented a selection of counter-marks.⁴³ The bulk of his account dealt with the seal-types, accompanied by poor drawings and

⁴⁰ Cf. *CMS* II.8 pp. 43-44, 86 centre (HMs 388/1).

⁴¹ The small peg sealing and possible hanging nodule are not Thera clay either. See W. Müller, in *Emporia* (forthcoming).

⁴² *Roundel* I 41-45 and *Troubled Island* 200-205 provide convenient summaries of the site and finds, with earlier references. See also V. La Rosa, in R. Hägg (ed.), *The Function of the “Minoan Villa”* (Stockholm 1997) 79-89.

⁴³ *ASAtene* 8-9 (1925–26) 71-156.

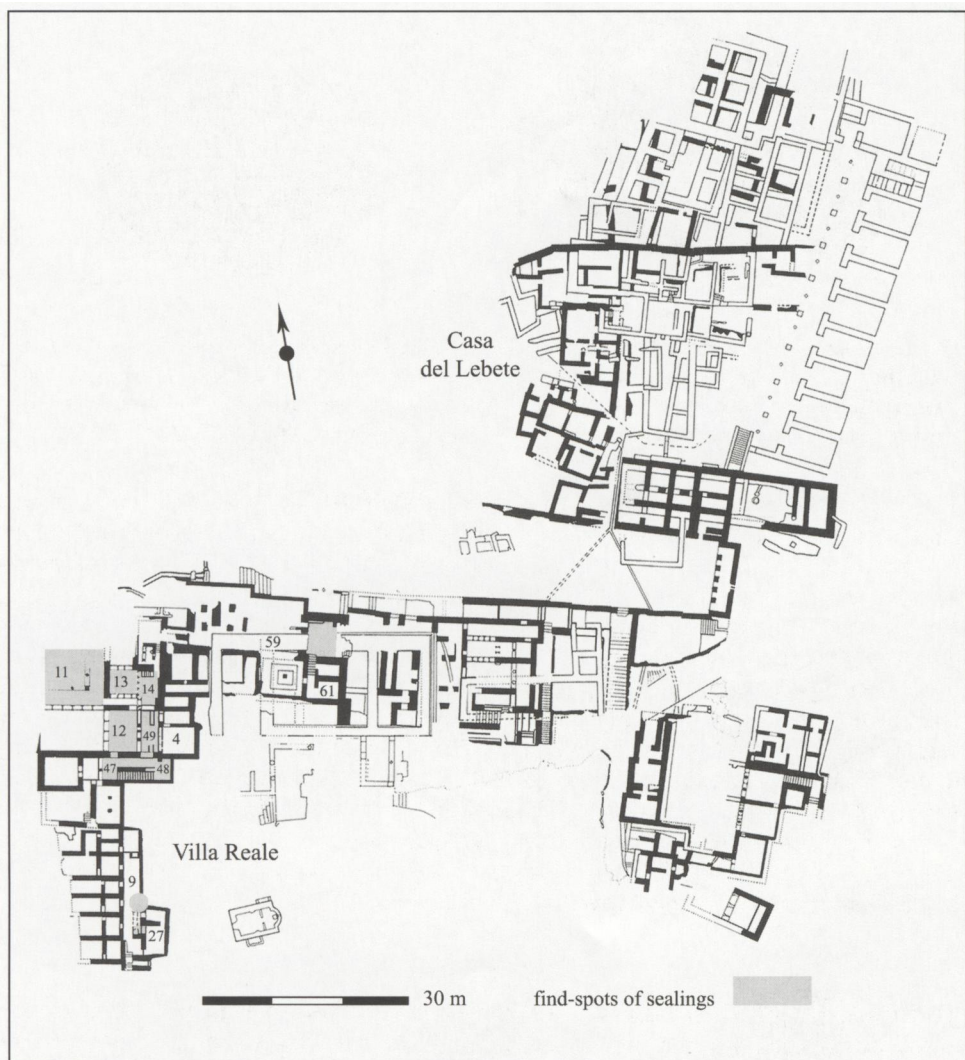
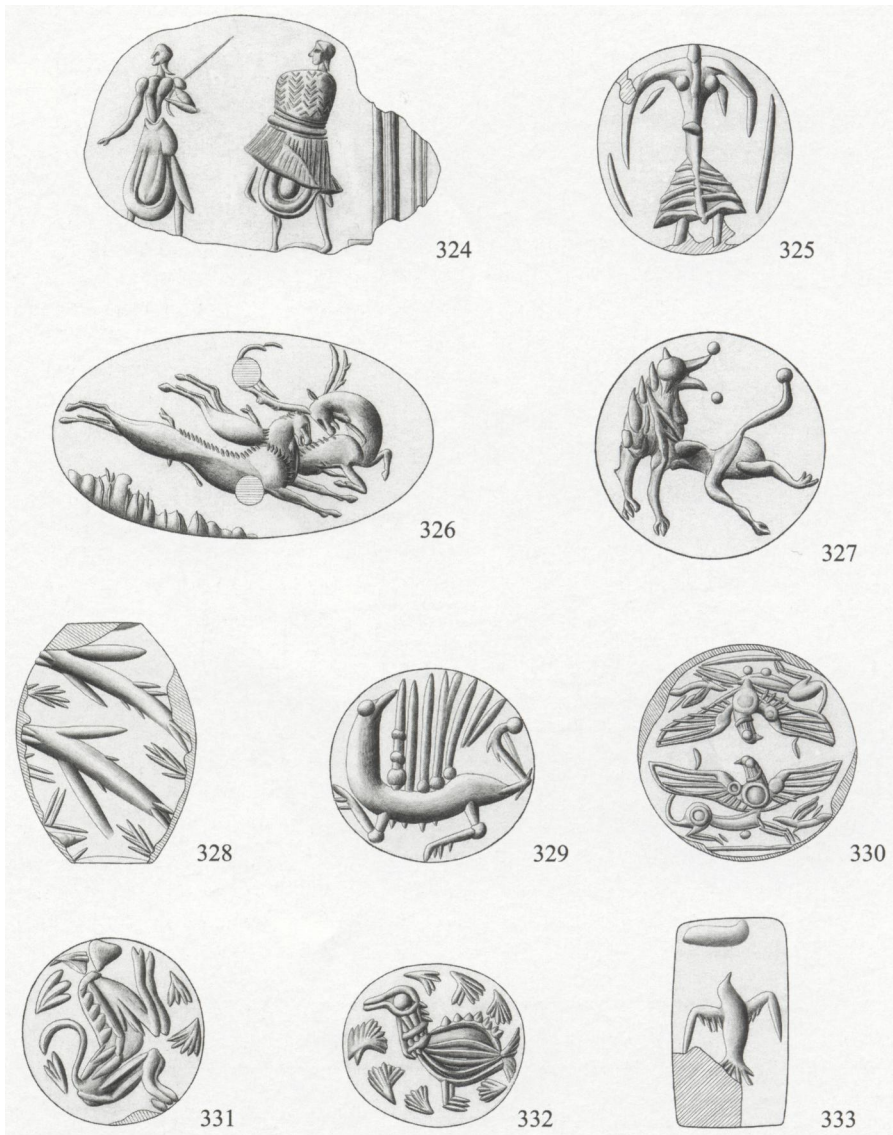


FIGURE 7.1 Ayia Triada, showing principal finds-spots mentioned in the text.

indistinct photographs. Over the years, the shortcomings of the original publication have inevitably led to flawed interpretations of the motifs and the villa's administration.⁴⁴ The superb new drawings published in *CMS II.6* (1999) now enable us to re-assess the style and iconography of the 150 seal-types, while the detailed information about nodule types means that analysis of sealing practices at Ayia Triada can begin in earnest.

⁴⁴ For the unreliability of older drawings see Chapter 1. Earlier accounts of the villa's administration include: M. Pope, *BSA* 55 (1960) 200-10, followed by L. V. Watrous, *AJA* 88 (1984) 128; J. Weingarten, *OJA* 5 (1986) 283-89; eadem, *Kadmos* 26 (1987) 1-38; eadem, *Kadmos* 27 (1988) 89-114; T. G. Palaima, in *Archives* 307-330; also now I. Schoep, in *Monuments* 25-28.



324-333 Drawings of selected seal-types from Ayia Triada. About three-quarters of the numerous single-hole hanging nodules at the villa were impressed by these ten seals. Scale ca 2:1.

Sealings and tablets were found in various parts of the *Villa Reale* (FIGURE 7.1).⁴⁵ One group of 45 *noduli*, all impressed with the same seal (308), was found on the windowledge between corridor 9 and room 27, apparently a storeroom (see p. 162). A single Linear A tablet (HT 24) was found nearby. A few more sealings, of uncertain type and motif, were recovered in the vicinity of storeroom 59. But the great mass of sealings –

⁴⁵ *CMS* II.6 pp. 3-6 provides a useful resumé of find-spots; also *Roundel I* 41-45.

nearly 1100 in all – comes from the north-western part of the villa. Some fell from above into rooms 4-49-12 and 47-48, along with five identifiable roundels and tablets HT 1-5. Other sealings were recovered in room 13, known as the *stanza dei sigilli*; more came from portico 11. From the same general area of the villa also come numerous elite objects, also fallen from above. These include the Boxer Vase and other stone rhyta, Marine Style pottery, and fresco fragments suggesting that a shrine and treasury had existed in the upper rooms. None of the individual sealings or groups of sealings from this area can now be linked to specific find-spots. This is certainly unfortunate. But in any case, the fire destruction which preserved the sealings also deprived us of their *original* context – evidently an upstairs room or series of adjacent rooms (see below). One myth associated with the Ayia Triada sealings must be demolished, namely that some 250-300 examples were found in a ‘gypsum chest’ located between light well 54 and room 55. No such chest exists; the misunderstanding perhaps arose because a roundel (now missing) was found in a built cist or *casella* in the floor of an adjacent corridor.⁴⁶ Tablets, but no sealings, were also discovered in the *Casa del Lebete* in the settlement.

For all the uncertainties over find-spots, the Ayia Triada sealings can be securely dated to the end of LM IB, providing us with a fascinating group of 150 seal-types all in use contemporaneously (e.g. 324-333). There is a superb array of signet rings, made of gold, bronze and stone, depicting cult scenes (e.g. 245), processions (e.g. 243, 324) and combats (e.g. 248, 371). A magnificent pair of wild goats in flying gallop leaps across the bezel of a bronze ring (326). Many other naturalistic depictions of humans and animals appear on lentoids of hard stone (e.g. 240, 271; also perhaps 242). Alongside these we find types of decidedly inferior quality (e.g. 325, 327) suggesting that seal ownership was rather wide (see pp. 154-55). Also interesting is the use of a damaged seal (333 cf. 565a). Every sealing deposit is peppered with some older types, so a few impressions made by Hieroglyphic prisms should cause no surprise. But in iconography and style the vast majority sits happily in LM I, with good parallels among the new Thera sealings and on the Greek mainland in Grave Circle A at Mycenae and the Vapheio floor cist (Chapters 6 and 9). It is, perhaps, a trifle harder to isolate types which herald developments in LB II-III glyptic. There are a few examples of the Cut Style, also attested at LM IB Khania and Mochlos, but which apparently has its *floruit* in LB II (below; also Chapters 6, 8-9). As harbingers of the future we might also point to several antithetical compositions (e.g. 275-276, 330), which become especially popular in LB II-III. Indeed the monkeys – not lions as previously thought – flanking a Minoan altar (276) foreshadow the well-known image of the Lion Gate at Mycenae. Unlike Zakros with its local hybrid creatures, Ayia Triada seems firmly set in the mainstream of neo-palatial glyptic. The only possible hint of a local workshop comes from three seals – all probably by the same hand – for which no stylistic parallels exist elsewhere (331-332).⁴⁷ One last oddity worth mentioning is the impression of a foreign cylinder seal: not rolled, but stamped in true Aegean fashion.⁴⁸

Hanging nodules dominate the assemblage at Ayia Triada: about 975 examples survive. Other sealing types include about 75 flat-based nodules, 53 *noduli*, 21 roundels and one or two direct object sealings. But this simple inventory is deceptive, masking the complexity of sealing practices at this site. Whereas some deposits defy analysis because too few sealings survive, the opposite is true for Ayia Triada. The newly available data in

⁴⁶ *Roundel* I 43 with references.

⁴⁷ The third is *CMS* II.6 no. 132. On the identification of ‘hands’ see comments by Pini (*ibid.* pp. xxx-xxx1); note also his criticism of Weingarten 1988 (n. 44).

⁴⁸ *CMS* II.6 no. 144, impressed with no. 36 on a two-seal recumbent nodule. See also J. Aruz, in *CMS Beiheft* 5 (1995) 11, fig. 8a and Chapters 2, 10.

CMS II.6 should allow us to make progress.⁴⁹ But a systematic framework is essential to deal with the large numbers of nodules and their many varieties, the numerous seal-types and their frequency. For the present the observations we can make are limited and unresolved questions are numerous.

The hanging nodules present a special challenge. These occur in five or six varieties, which certainly represent different procedures for making nodules (see pp. 158-60). Do they also reflect the habits of particular seal-users? What is the significance of the Linear A counter-marks – usually single signs or ligatures – which occur on about 90% of these hanging nodules? At least thirteen ‘hands’ have been identified. But who was responsible for the inscription: the seal user or another individual? The term ‘scribe’ seems too grand for this level of literacy, if literacy it be. How are we to evaluate the frequency of seal impressions? About three-quarters of the hanging nodules were impressed by only ten seals (324-333). For instance, 324 occurs on 255 ‘pendants’ and also on a roundel. Another ‘active’ seal is 330, which appears on about 100 examples. Since these include conoids as well as pendants, perhaps more than one individual had occasion to use this seal. The intensive use of the ten ‘active’ seals contrasts markedly with the great mass of seal-types at Ayia Triada: some are represented by only a few impressions; most occur only once. The differences in frequency are undoubtedly striking, but can we trust them sufficiently to speak of *patterns* of seal use? Are we justified in equating ‘active’ seals with resident administrators? As a working hypothesis this has its attractions.⁵⁰ But we must face a further set of imponderables. The time-span represented by this collection cannot be gauged, the primary context has been lost, and the very purpose of these hanging nodules is obscure.

Single-hole nodules, the most perplexing of all Minoan sealings, were designed to hang freely from cords. They resemble tags or labels – is this how they were used? Were they attached to perishable items stored upstairs in the villa? Or had the ‘tags’ been removed and collected for accounting purposes in an archive? The concentration makes this suggestion more plausible. What of the idea that they were attached (singly or in pairs) to parchment scrolls, serving to authenticate transactions documented thereon? We can easily envisage permanent records of contracts, land tenure agreements and the like, but there is no way to prove that they existed, much less link our enigmatic hanging nodules to them.⁵¹ We can, however, observe that usage of this kind might well produce a highly asymmetrical pattern of seal impressions. But equally, labelled products or commodities – some made within the villa, others received from outlying localities – could yield a similar pattern. In this case shipments in or out might alter the picture dramatically from one day to the next.

Though far fewer in number the flat-based nodules or ‘packets’ also merit attention. As we have seen, these nodules sealed small pieces of folded parchment (see pp. 155-58). At Ayia Triada 58 examples bear a single seal impression, while 18 were stamped twice. It seems likely that the number of impressions was linked to the nature of the messages (see p. 158). So once again interpretations founder on an unknown. We can, however, observe that many examples were impressed by signet rings. Sometimes, a seal-type recurs on several nodules, most are attested only once. In a few cases, a seal-type appears on both a single-seal nodule and on a two-seal nodule. These cases are potentially informative. For instance, a powerful combat scene (371) occurs on five flat-based nodules,

⁴⁹ Especially valuable are the definitive lists of nodules, seal-types and references to *GORILA* (for inscribed examples) provided in *CMS* II.6 pp. 401-518 (tables 1-3).

⁵⁰ Weingarten 1986 (n. 44) 283-89; eadem 1987 (n. 44) 1-38.

⁵¹ See above and n. 20 for references.

twice paired with a cult scene (245), and the famous chariot ring (370) occurs on two examples, once paired with bull-leaping. But the picture becomes even more complex when we note that the same combat (371) also occurs on two pendants at Knossos, and the chariot is found on flat-based nodules at Sklavokambos – and now at LM IA Thera (322, 370). These matches inevitably raise questions of travelling nodules and travelling administrators, to which we will return below. Here it is worth stressing that the condition of the nodule must be taken into account. In other words, we must try to establish whether the messages were still sealed at the time of destruction.⁵²

Finally, it is worth noting that there are very few instances where seals cross from one kind of nodule to another. The seal-types associated with flat-based nodules do not normally appear on other kinds of sealings.⁵³ Only three of the numerous seal-types found on hanging nodules appear on other varieties. In short, the tasks performed by the seal-users – whether villa officials or private individuals – seem to be circumscribed. But as ever the spectre of archaeological chance looms large. At Ayia Triada the assemblage is sufficiently large and varied to encourage cautious observations and inferences. Further study and analysis may provide additional insights.

Khania

Remarkable evidence for Minoan activity in the western part of the island, especially at Khania, has come to light since the mid-1960s. However, in Khania itself neo-palatial remains are located under the old Venetian districts of the town. Archaeological investigations are necessarily limited in scope, frequently confined to isolated plots uncovered in rescue excavations (FIGURE 7.2). Though a monumental building with central court has yet to be located, Khania displays many other hallmarks of a palatial centre.⁵⁴ A fine lustral basin with painted decoration and associated *polythyron* (Minoan hall) was discovered in the Splanzia district. On the Kastelli hill to the west lie other parts of the settlement, including several well-appointed houses. These were exposed during Greek-Swedish excavations in Ayia Aikaterini Square. In House I two *noduli* and an unusual flat-based sealing were recovered, as well as two Linear A tablets. These are dated by context to LM IB. But other tablets, roundels and sealings – including the famous Master Impression – come from mixed deposits, disturbed by later building activity. The largest concentration of sealings and tablets came to light in 1973-74 during excavations at Katré Street 10. Here the finds included 82 tablets, 112 roundels, 57 flat-based nodules, 26 hanging nodules, and one *nodulus*. The numerous tablets – only Ayia Triada has more – and the range of sealing types suggest we may be dealing with the remains of an archive. But none of the material is in a primary context. Rather, it is LM IB destruction debris, which was apparently shifted and levelled prior to LM II-III A building activity. Moreover, some of the Katré Street roundels provide close matches, through seal-type

⁵² The issue has not been adequately addressed so far, but might shed further light on internal control *versus* external connexions. Some nodules appear to be intact, some are certainly damaged, others are hard to judge. To open a message without damaging the sealing would involve cutting carefully through the thread (with a risk of damaging the note). On the face of it, unopened messages would make little sense, unless they had just arrived or were awaiting despatch immediately prior to the destruction. Or were the notes ever sealed and retained on-site, i.e. for archival purposes? See also below pp. 176, 184-85.

⁵³ CMS II.6 nos. 11, 21, 70 also occur on roundels.

⁵⁴ *Roundel* I 47-53 and *Troubled Island* 121-24 provide good summaries of site and finds; also now M. Andreadaki-Vlasaki, in *Monuments* 157-66.

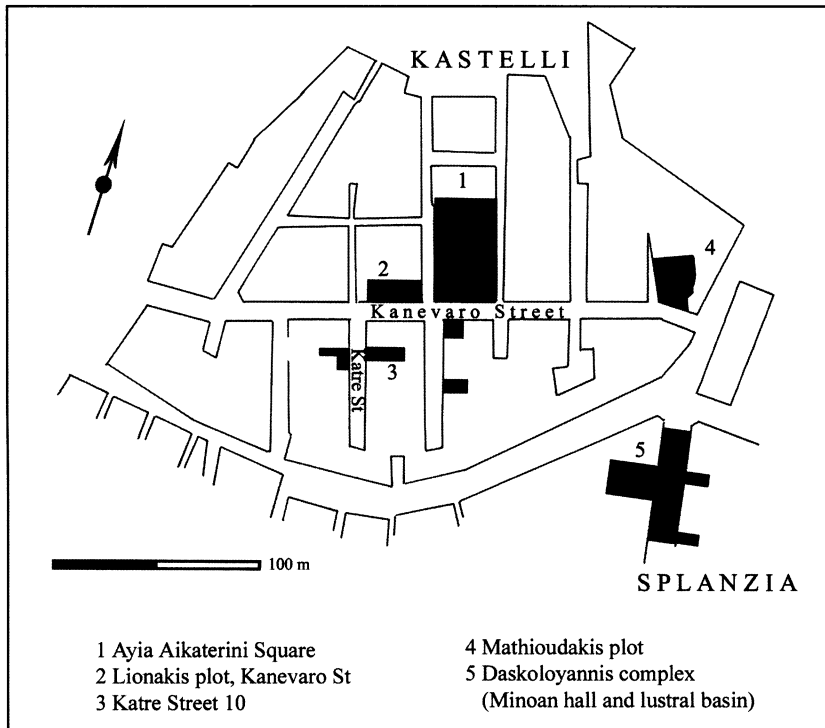


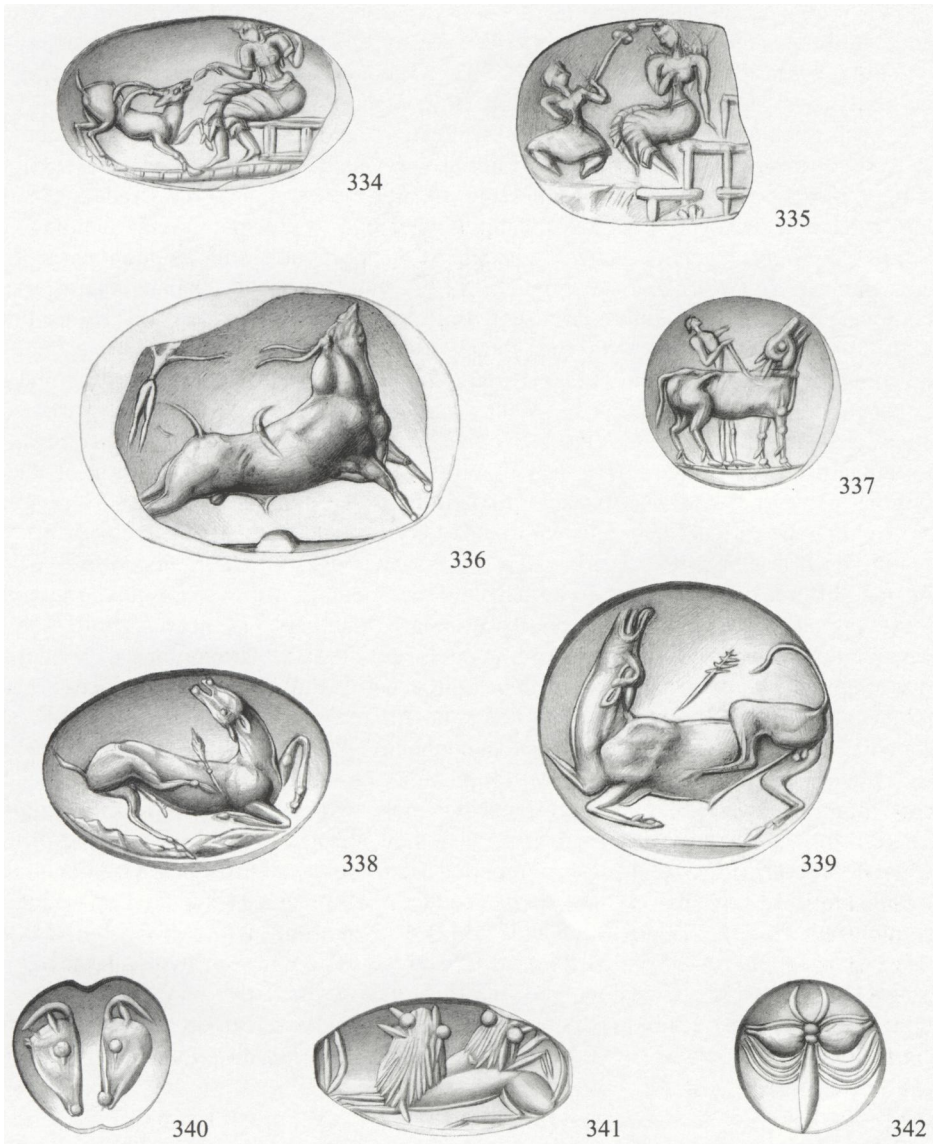
FIGURE 7.2 Map of Khania, showing principal Minoan excavations.

and inscription, for examples found some 25–30 m away in a LM IIIA pit on Kanevaro Street. We cannot, of course, be certain they were originally kept together. But the extent of disturbance throughout this area is so great that we can say little about the nature of administration in Minoan Khania. It is, however, worth remarking that at Zakros our *extant* sealing deposit comes from House A, not from the palace itself (see pp. 178–80). In other words, we cannot assume that administration was necessarily centralized in a single palatial archive.

The Khania tablets and sealings have fared rather well since excavation. Initial publication followed swiftly and the roundels have been studied exhaustively by Erik Hallager.⁵⁵ A few seal-types appeared in *CMS V* (1975), most are covered in *CMS V Suppl. 1A* (1992): the total stands at about 58. They include a fair share of unique pieces, which have greatly enriched our body of Minoan iconography (e.g. 334–342). Apart from the Master Impression (247) there are several important, if enigmatic, cult scenes (e.g. 334–335). The seated ‘goddess’ and goat (334) offers a useful parallel for the motifs attested on fragmentary sealings at Ayia Triada and Knossos.⁵⁶ The milking scene (249) –

⁵⁵ *Roundel I* 79–120, II 39–156. The final report on the Greek-Swedish excavations is in preparation. The Katre Street tablets appear in I. A. Papapostolou, L. Godart & J.-P. Olivier, *Γραμμική Α στο μινωικό αρχείο των Χανίων*. *Incunabula Graeca* 62 (Rome 1976) and seal impressions in I. A. Papapostolou, *Τα σφραγίσματα των Χανίων* (Athens 1977), the latter now supplemented by the *CMS* coverage and *Roundel II*.

⁵⁶ *CMS* II.6 nos. 30–31 and II.8 no. 261.



334-342 Drawings of selected seal-types from Khania. Scale ca 2:1.

a rare vignette of daily life – is all the more striking for having been engraved on a metal signet ring. The impressions of a hard stone amygdaloid (341) provide further evidence for dating the Cut Style (Chapters 6, 8-9). There are many fine naturalistic studies of animals (e.g. 272). Worth singling out as variations on the same theme of a wounded bull are 338-339. The treatment is so close that we must imagine some kind of link at workshop level, even though one is engraved on a metal signet ring, the other on a lentoid of hard stone. Other motifs include birds, butterflies, hunt scenes and bull-leaping – all

belong firmly in the mainstream neo-palatial repertoire (**241, 336-337, 342**). By contrast, Zakros is replete with its creatures of fantasy, products of a local workshop (Chapter 6 and below). And even at Ayia Triada, a few seal-types hint at a local style – or at any rate one not yet attested elsewhere (e.g. **331-332**). Of course, archaeological chance may still hold surprises: our knowledge of neo-palatial workshops is virtually non-existent.

In sealing practices, too, Khania displays features which we have already encountered at Knossos and Ayia Triada. Most – if not all – of the 26 hanging nodules belong to the single-hole pendant variety, many bearing counter-marks as at Ayia Triada.⁵⁷ There is also a handful of two-hole nodules, sadly not enough to elucidate their function.⁵⁸ The flat-based nodules generally bear a single seal impression and are unremarkable in appearance. However, two examples from Ayia Aikaterini Square merit special comment.⁵⁹ The Master Impression sealed a fairly bulky piece of folded leather bound with sturdy string, rather than fine thread (**344**; cf. **247**). The piece of leather was certainly larger than a normal ‘packet’, though we cannot readily gauge its original size or shape, much less its purpose. While the Master Impression naturally draws our attention to the sealing, it does not prove that the contents were unusual. By contrast, the irregular nodule **343** must have sealed something out of the ordinary. First of all, the original piece of leather was sizeable: *folded*, the packet measured an astonishing 10.8 x ca 2 cm. It was securely bound with sturdy cord, made of twisted fibres (**343b**). The sealing itself is even more remarkable: a gable-shaped piece of clay stamped twelve times by ten different seals (**343a**).⁶⁰ Perhaps we are dealing with a complex transaction, involving numerous parties or necessitating a large number of witnesses. More than that we cannot say. The seal-types offer no insights and the fact that one (and only one) seal was impressed three times is more than a little perplexing. Yet the existence of multi-party transactions (or agreements) in neo-palatial Crete should not surprise us. We shall soon have cause to reconsider this issue in connexion with the Zakros deposit.

Roundels occupy pride of place at Khania. Nowhere else do we find such a concentration; indeed they represent approximately two-thirds of all known examples.⁶¹ Therefore, it is all the more regrettable that they were not found in a closed primary context. We can, however, make a number of useful observations. First, a particular seal-type is not linked exclusively to a single product or commodity (indicated by a Linear A sign or sign-group).⁶² Thus seal KH 13 (**341**) deals not only with AB 61, but also with AB 21 (SHEEP) and A408, A411 (various ‘tripod’ signs). Moreover, the ten roundels with seal KH 13 and sign AB 61 involved four different ‘scribes’, two of whom also worked on tablets (**345-348**). If this were not complicated enough, we can observe that the tripod sign A411 is associated with two more seal-types.⁶³ Further links and cross-links

⁵⁷ *Roundel I* 179-89. Although clear descriptions of the sealings appear in *CMS V* and *V Suppl. 1A*, no typology as such was presented. Thus for the following account I rely on Hallager’s concordances (*Roundel II* 299-336, esp. 315-17) and as far as possible relate them to the new observations and typology of the *CMS* team, published in *CMS II.6*.

⁵⁸ *Roundel I* 159-61, figs. 59-60. But some may be single-hole nodules with accidental second holes (above pp. 159-60 and esp. n. 22).

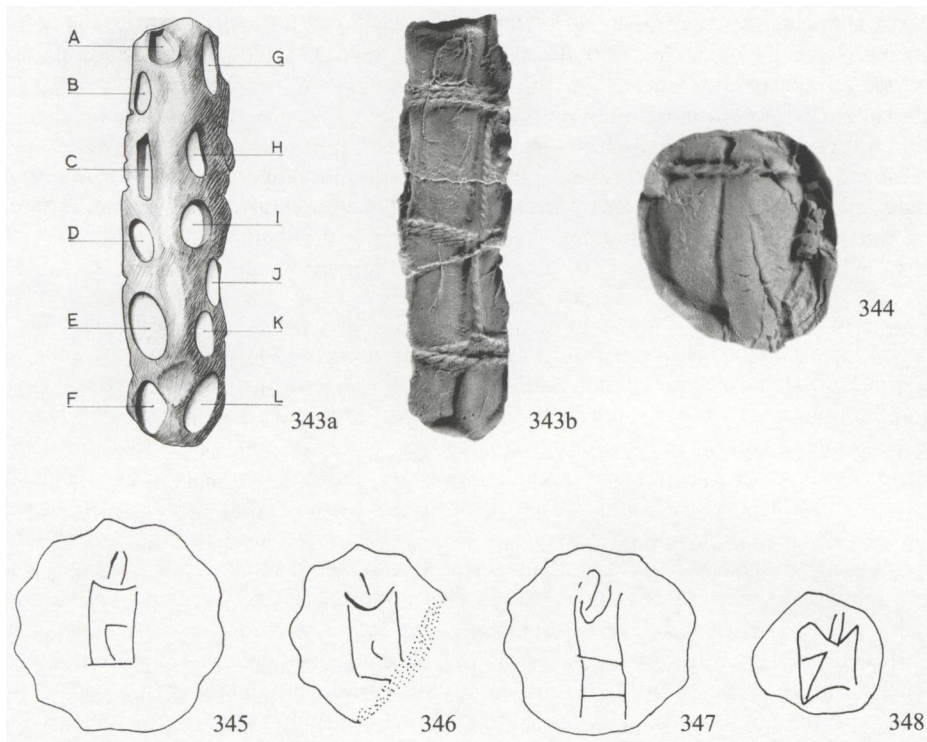
⁵⁹ *Roundel I* 202-03, fig. 75: KH 1559 and 1563 (here **343-344**). A third (*ibid.*: KH 1570) from a mixed level in Kanevaro Street, is impressed with a bull-leaping ring (*CMS V Suppl. 3* no. 103).

⁶⁰ Another irregular flat-based nodule (with six impressions) is HMs 132, attributed to the Hieroglyphic ‘Deposit’: *CMS II.8* p. 44, fig. 8d-f.

⁶¹ *Roundel I* 79-120; II 39-156.

⁶² *Roundel I* 92-98, fig. 36 (here **345-348**), tables 11-12.

⁶³ *CMS V Suppl. 1A* nos. 158 (KH 22: here **340**) and 170 (KH 21).



Selected sealings and roundels from Khania. **343a-b** Irregular flat-based nodule with 12 impressions of ten different seals; diagram to show arrangement of impressions and silicone of reverse. Scale ca 1:2. **344** Irregular flat-based nodule; silicone of reverse (see **247** for seal-type: ‘The Master Impression’). Scale ca 1:1. **345-348** Four inscribed roundels with the sign AB 61 (0), impressed by same seal (see **341** for drawing) but written by four different hands. Scale ca 1:2.

between seal-types, signs and hands leave us reeling. It is difficult to determine the roles played by the different parties or to grasp the circumstances under which roundels might be issued. In short it is hard to make sense of the system.⁶⁴ However, it *is* clear that the number of seal impressions corresponded to quantities of a commodity (**309** and p. 163). This fact means that roundels provided a foolproof guarantee for the parties involved. Goods could be issued or transferred, say, from storeroom to workshop without risk. Loss or damage would be easy to prove; so too false charges of theft or fraud. As for the inscriptions, it is we who find them incomprehensible; no doubt even illiterate Minoans could understand the simpler signs.

We can make only limited observations about seal use at Khania. As at Ayia Triada we occasionally find that a seal-type recurs on different kinds of sealings, e.g. **342** appears on both roundels and pendants. We also find a number of ‘active’ seals, responsible for

⁶⁴ Notwithstanding the exhaustive treatment in *Roundel I* and *II*. Note that Hallager assumes that one seal = one person (with very few exceptions: *ibid.* 99). But, as I argue elsewhere, a given individual may have had use of more than one seal (cf. above n. 37) and, conversely, a single seal could have been wielded by several individuals (cf. Chapter 10 nn. 84-85).

impressing numerous sealings. Among the roundels **340** and **341** stand out, with 30 and 21 examples respectively, and the ‘goddess and goat’ ring (**334**) stamped 26 flat-based nodules. Similarly the metal rings **336** (bull-leaping) and **338** (wounded bull) impressed a further nine or ten examples each, while a fine lentoid (**337**) occurs on seven more flat-based nodules. By contrast, at Ayia Triada, ‘active’ seals are associated with hanging nodules only. Archaeological chance may well account for the difference and underscores the hazards of trying to isolate local variations in administrative practices. However, the frequency of metal signet rings on the Khania flat-based nodules is striking, all the more so since rings probably constituted a small proportion of the seals in circulation.

Zakros

The first neo-palatial sealing deposit to be discovered came to light in the spring of 1901 during D. G. Hogarth’s excavations at Kato Zakros.⁶⁵ About a dozen houses were investigated on the north-east hill, but flash floods in mid-May halted further work. Thus, the palace, which occupies flat marshy ground to the south, lay undetected until the 1960s. House A, where the sealings were found, is a sturdy building constructed of ‘cyclopean’ masonry (FIGURES 7.3 and 7.4). Inside the entrance was a ‘wine press’, while storage pithoi, coarse amphorae and conical cups were found in room VIII. In room VII about 45 cm above the floor and beneath collapsed ‘brick-tiles’ were bronze tools, vases, a stone lamp-stand and ‘nearly 500 well preserved clay nodules’. These were concentrated in a small circular area, about 1 m in diameter. Also found were a Linear A tablet and a roundel. From Hogarth’s plan and admirably clear description, we may infer that the sealings had been stored in the rafters or upstairs, probably contained in a basket. The function of the house itself is harder to determine, but the presence of two Marine Style rhyta dates its destruction to LM IB.⁶⁶

With exemplary speed, Hogarth published an account of the sealings in 1902. He managed to isolate 144 seal-types, while Levi later added a further 56 motifs.⁶⁷ But the descriptions are cursory, the photographs indistinct, and the drawings count as little more than sketches (e.g. **22a**). Nodules were not documented individually, a crucial requirement at Zakros where many sealings are stamped two or three times with different combinations of seals (see below). As a result, subsequent attempts to interpret this, our most complicated sealing deposit have been greatly impaired.⁶⁸ Above all the Zakros sealings demand meticulous attention to detail and illustrations of the highest quality – criteria only now met with the publication of *CMS* II.7 (1998). But this superb volume represents no more than a first step; analysis and interpretation of this extraordinary deposit will require more labour still.

⁶⁵ D. G. Hogarth, *BSA* 7 (1900–01) 129–34; *Roundel* I 73–74.

⁶⁶ D. G. Hogarth, *JHS* 22 (1902) 333–35, pl. 12.1; pieces of a second are in the Ashmolean Museum. Evans dated the deposit to LM IA and regarded many seal-types as contemporary with the Temple Repositories, i.e. MM IIIB (*PM* I 699–701; see also Chapter 11). Further confusion has arisen since most vases are ‘sub-LM IA’ (i.e. pottery of LM IA style produced during LM IB). For the LM IB date: *Zakro Master* 2–6; *Roundel* I 74. *Troubled Island* 240 raises the possibility of an earlier destruction in LM IA. See also below n. 103.

⁶⁷ D. G. Hogarth, *JHS* 22 (1902) 76–93; D. Levi, *ASAtene* 8–9 (1925–26) 157–201.

⁶⁸ E.g. *Zakro Master* and other accounts by Weingarten, ante-dating primary publication in *CMS* II.7. Her claim (*Zakro Master* 20 n. 1) that the number of seal-types and their frequency ‘may be taken as definitive for all practical purposes’ must be discounted.

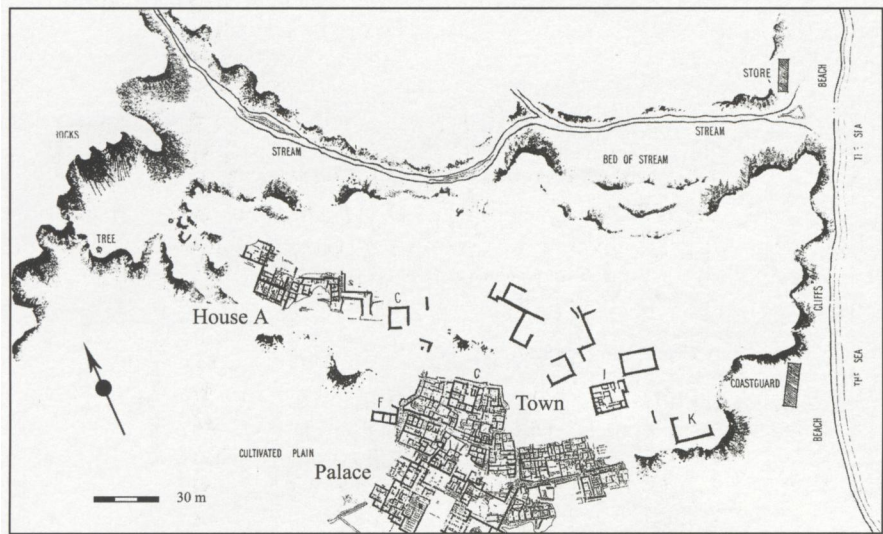


FIGURE 7.3. The Zakros area

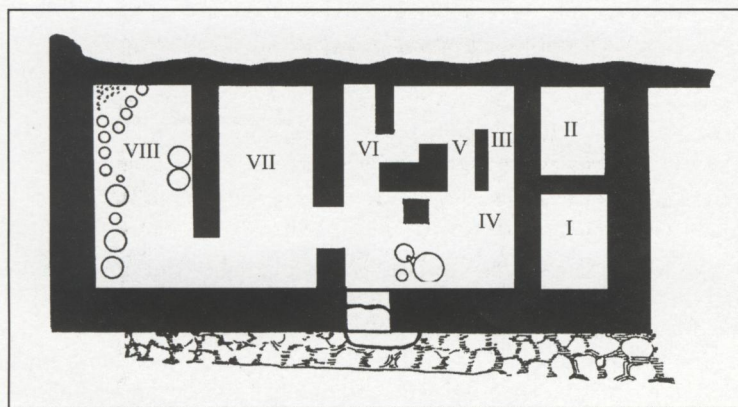


FIGURE 7.4. Zakros, House A.

Aside from the main deposit in House A, some sealings were also found by Nicolas Platon in the palace (FIGURE 7.5). Unfortunately, the precise number is not known, nor are find-spots well documented.⁶⁹ A *nodulus* believed to come from the Archive Room (XVI) is of particular interest, since the bull-leaping scene is an identical match for impressions found at Gournia, Sklavokambos and Ayia Triada (368; see p. 185). In the Archive Room only 13 Linear A tablets survived, others had certainly disintegrated,

⁶⁹ Some sealings mentioned by Platon could not be located in the Herakleion Museum; the current tally stands at only five: *CMS* II.7 xvii-xviii, fig. 3; *Roundel* I 74-77. Note that HMs 1152 / Z231 was apparently found in the Treasury (*ibid.* 76-77, 159, 163) and was not associated with a chest in the Archive Room as claimed by Weingarten (in *BA Trade* 304). *CMS* II.7 no. 250 compounds the confusion by wrongly attributing it to House A.

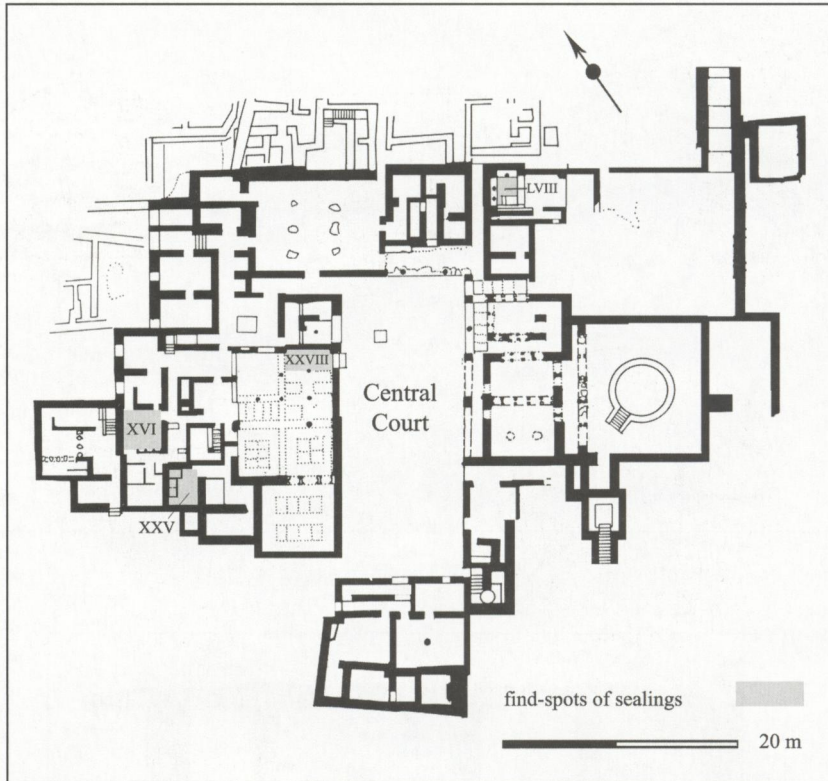
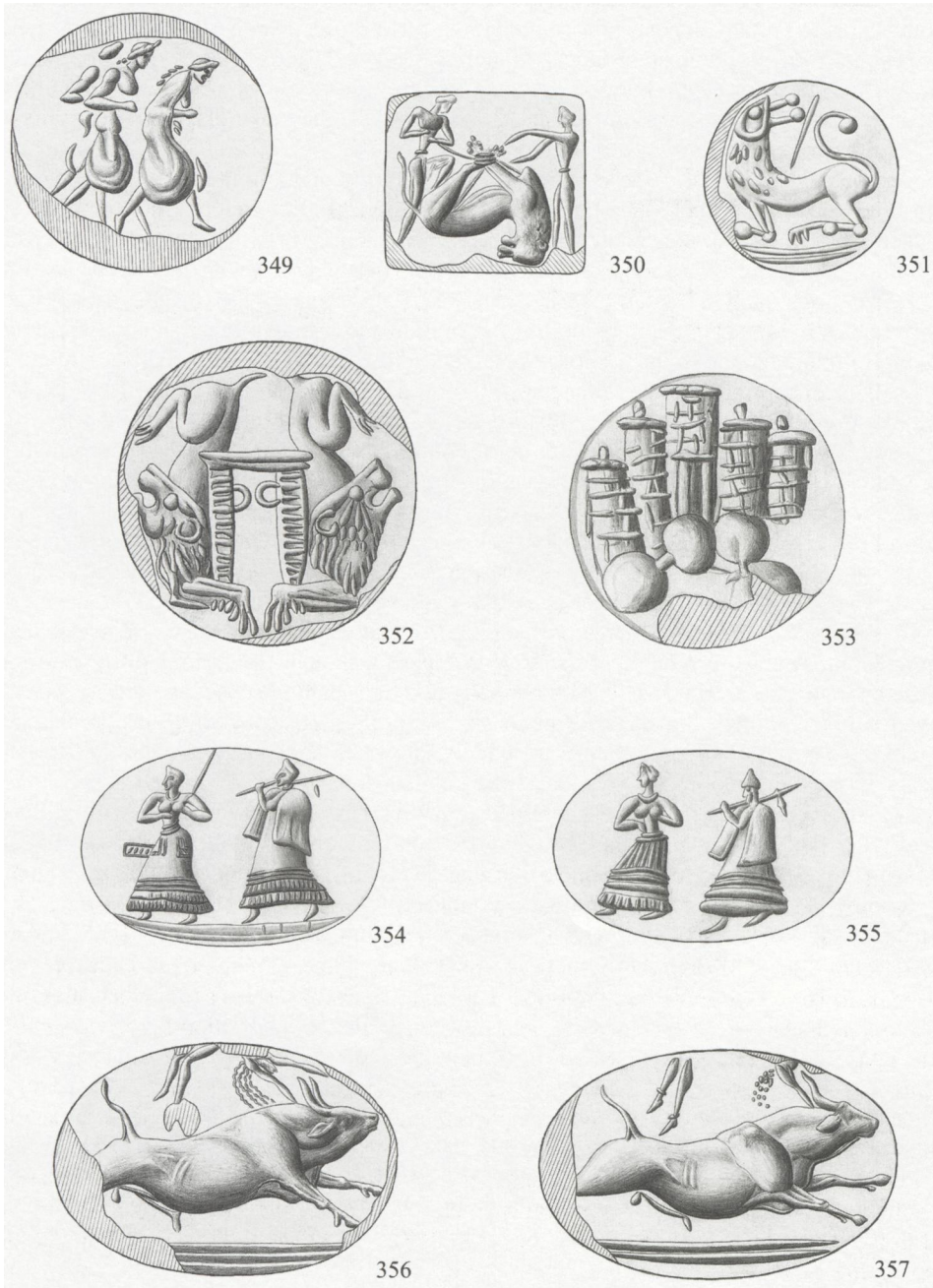


FIGURE 7.5. The palace of Zakros, showing find-spots of sealings.

perhaps through inadequate burning or later water-logging of the site. Sealings too might have suffered this fate. Three more tablets had evidently fallen from above into the Hall of the Ceremonies (XXVIII), where another *nodulus*, bearing the impression of a cult scene also came to light. The paucity of archival material in the palace underscores the haphazard nature of our evidence for Minoan administration. Here at Zakros – luckily – just enough survives to tell us that palace administration was functioning at the time of the LM IB destruction. Otherwise we might have concluded, quite erroneously, that House A was the principal administrative centre for Zakros. However, we face with a major dilemma in interpreting the role played by House A. Did it complement palatial administration or operate independently?

When we think of the Zakros sealings, it is the hybrid creations which immediately spring to mind (Chapter 6). Yet in reality, more than half of the 234 seal-types would be at home in any neo-palatial context (e.g. 349-357).⁷⁰ There are a few MM II heirlooms and some examples of the ‘talismanic’ style, including an unusual (if not altogether successful) animal attack (235). Other animal studies reflect familiar neo-palatial trends in hard and soft stone alike (273-274, 351) and the same is also true of the multi-figured compositions – often on signet rings – depicting ritual activities and processions, hunt and combat scenes, and bull-leaping (22, 244, 349-350, 354-357). While individual

⁷⁰ 234 refers to legible motifs; CMS II.7 nos. 235-262 are illegible or very fragmentary.



349-357 Drawings of selected seal-types from Zakros, House A. Scale ca 2:1.

pieces sometimes lack precise parallels in terms of style or iconography (352-353), this is to be expected in any deposit or assemblage. In other words, among the naturalistic types we cannot readily spot local products, though it is perfectly possible that some were made at Zakros. As to the local hybrid creatures, these products are in no way inferior to the mainstream types – just very different. As we shall see, they also play a very distinctive role in sealing practices.

One peculiarity at Zakros does demand close scrutiny, namely motifs that exist in two or three versions.⁷¹ Sometimes the differences involve slight variations in size or detail, which can only be spotted with a keen eye. For instance, two seal-types bear a hybrid creature consisting of a bird-like head in profile, frontal torso with pendulous breasts, upraised arms, and a fantail below (358-359). Close inspection of the pair reveals differences in the shape and position of the breasts and arms, in the elements separating torso from fantail, and in the number of feathers. The two seal-types also differ slightly in size. It is important to realize that these minor differences are *not* created by careless impressing or poor preservation.⁷² Instead we are dealing with impressions made by two separate seal faces. The same is also true of 360-361, which depict another pair of hybrid creatures. Here we can readily see variations in shape of the birds' heads, central crests, wings and conjoined bodies (?). Other seal-types are more distantly related and not only reveal minor variations in detail and size, but also add new elements or even reverse the basic motif. A good example is a set of 'triplets', each motif depicting a hybrid creature made up of a stag's head, human arm(s) and several oval elements (362-364).

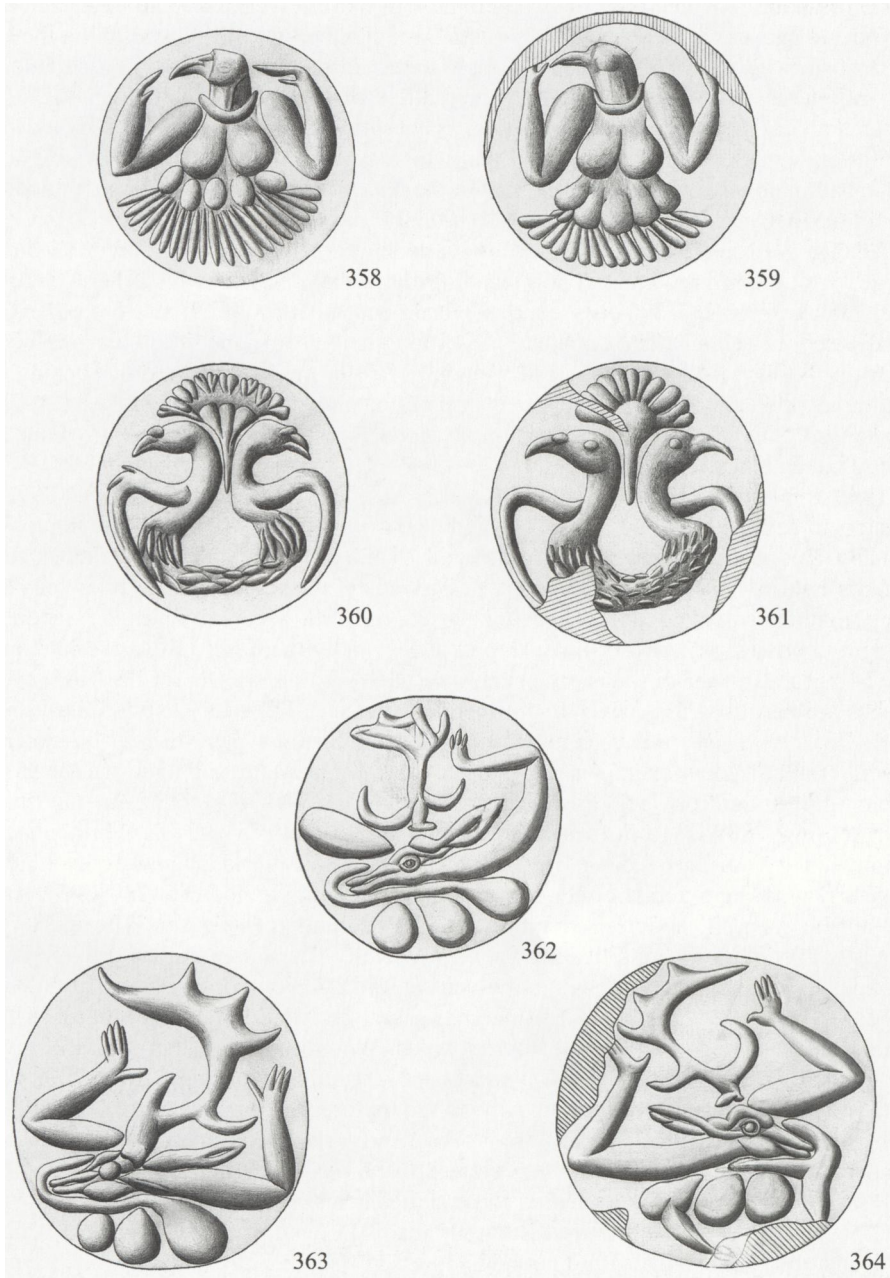
It is not only the hybrid creatures at Zakros that appear in several versions. Two procession scenes are remarkably similar in concept, though the figures differ in dress, pose and attributes (354-355).⁷³ And between two bull-leaping scenes the differences are even slighter, though the rings differ in size (356-357). In fact, duplicates, copies and more distant variations on a theme are widely known in ancient glyptic. In the Aegean, seals with similar motifs are nowadays often called 'look-alikes'.⁷⁴ But the expression is best avoided, for it is both ill defined and imprecise, having been applied willy-nilly to seal-types that are united by no more than a common theme, as well as to those that are near-identical. We can, of course, easily imagine circumstances under which seals might be copied. An official might require a second seal for his deputy, a father for his son, a husband for his wife. An apprentice might perfect his craft by imitating seals already produced in the workshop. Fashion, taste or personal whim – on the part of engravers and their clients – could also prompt the copying of designs, their embellishment and

⁷¹ Already noted by Hogarth (n. 67) 79-86.

⁷² This is apparent from CMS II.7 and the casts held in the CMS Archive. However, in the case of eight seal-types slight differences were noted by the CMS team, perhaps caused by 're-engraving'. Re-touching or simple cleaning of the intaglios between impressions may be nearer the mark. Whatever the correct explanation, we are dealing with repeated impressions of the same seal, not of copies or 'look-alikes'. In CMS II.7 the eight seal-types are designated as nos. 104A/B, 109A/B etc. Unfortunately printing errors add confusion to an already complicated issue, see JHS 120 (2000) 188 for corrections.

⁷³ The differences between CMS II.7 nos. 16-17 were first noted by the CMS team.

⁷⁴ The term was originally coined by Weingarten, e.g. *Zakro Master* 15ff, 61ff; *OJA* 5 (1986) 289-293. But, as Pini stresses, the term has never been adequately defined, nor can it be, since the dictionary definition itself is vague: *Pepragmena* 9 (forthcoming). Moreover, Weingarten and others have applied the term to motifs merely linked by subject or theme, e.g. J. G. Younger, in *Meletemata* 953 n. 4 (referring to the groups of soft stone seals studied by I. Pini, in *CMS Beiheft* 5 [1995] 193-207).



358-364 Drawings of selected seal-types from Zakros, depicting hybrid fantasy creatures of the Zakros workshop. Seals with similar or related motifs are well known in ancient glyptic, but the incidence of 'pairs' and 'triplets' seems especially high at Zakros. Scale ca 2:1.

transformation. All this is clear enough and can be observed time and again in Aegean glyptic. What strikes us about Zakros is the large number of variants attested in the House A deposit, where altogether about 30 motifs exist in multiple versions. These amount to 66 individual seal-types or roughly one-quarter of the total. If anything, the original figures at Zakros may have been higher, because some impressions are now too poorly preserved to assess and other seal-types, which survive only as singletons, might once have had mates that were not preserved in the deposit. There is something decidedly odd about seal use at Zakros and the same is certainly true of sealing practices.

Among the 559 sealings in House A varieties peculiar to Zakros predominate. The largest group consists of about 350 standing flat-based nodules, with either two or three seal impressions (287-290). By contrast, recumbent nodules, familiar from other Cretan sites amount to about 125 examples. In addition, there are around 50-60 hanging nodules, four disc-shaped *noduli* and a single roundel. Most of the hanging nodules belong to the two-hole prismatic variety with three impressions, known only at Zakros (302, 305). Pendants, conoids and other single-hole nodules, so common at Ayia Triada, are conspicuous by their absence.⁷⁵

This simple tally does little to convey the complexity of sealing practices at Zakros. Easiest to deal with are the recumbent nodules: they generally bear a single impression – usually naturalistic, occasionally ‘talismanic’, or a MM II heirloom – almost never a Zakros hybrid.⁷⁶ Curiously, the seal-types found on the recumbent nodules only rarely crop up in the so-called multiple sealing system or MSS, which involves the standing and hanging nodules with two or three impressions.⁷⁷ Why there is so little overlap between the two groups is one of the many puzzles we have yet to solve. As for the MSS, even the basics are hard to grasp, never mind their significance. The many extraordinary hybrids and variants, occasionally combined with naturalistic types, merely heighten our bewilderment. A few examples will help to show what we are up against. The first is a seemingly straightforward case of dual-stamping (358 + 360) found on ten standing nodules (e.g. 288). But a further three standing nodules, plus a disc-shaped *nodulus*, were impressed by variants (359 + 361). Similarly we find a trio of seal-types (280-282) regularly working together on ten standing and four hanging nodules (289, 305). And yet on a fifth hanging nodule, variants of the three seal-types appear. The existence of variants is certainly a complicating factor, especially when impressions are imperfect or nodules damaged. That said, within a given set, the same two or three seals usually work together, as do the variants. But sometimes a seal known from one combination breaks free and associates with entirely different types. When we realize that the MSS involves around 150 seal-types and some 400 nodules, it is enough to make our heads spin.

In truth, we have a very long way to go before we can hope to understand the complicated sealing practices at Zakros. For nearly a century progress was thwarted by inadequate data and hopelessly inaccurate illustrations. Although the publication of the *CMS* volume in 1998 has remedied these deficiencies, analysis will be no easy matter. Our best hope lies in the promised study by the *CMS* team, which will present additional data and observations that could not be included in *CMS* II.7. In the meantime, we are left with a host of questions. Were the recumbent nodules impressed at Zakros or elsewhere? Did they seal delivery notes that accompanied shipments of commodities, as may have been the case with the Akrotiri sealings? Or did they record transactions at Zakros itself?

⁷⁵ For the conoid HMs 94 (*CMS* II.7 no. 45) see below p. 188 and n. 93.

⁷⁶ Possible exceptions are *CMS* II.7 nos. 193, 211.

⁷⁷ For the MSS see *Zakro Master* 7-24; also Weingarten 1986 (n. 74) 289-93; eadem, *OJA* 11 (1992) 25-28 (with the usual *caveats* about studies published prior to *CMS* II.7).

Insights might come from clay type – is it local or foreign – and the state of the nodules. The latter might help us decide if the parchment notes had been opened and read or if they were still sealed at the time of destruction.⁷⁸ This point is even more crucial when it comes to the hundreds of standing nodules with two or three different seal impressions. Why are there so many? Are they an internal means of control, perhaps recording disbursements of raw materials or rations? The pattern of seal use makes this seem a trifle unlikely. Perhaps they accompanied agricultural goods produced in the hinterland of Zakros. Can the hanging nodules, sometimes impressed with the same combination of seals, offer a clue? They certainly resemble labels, perhaps this is how they functioned. And what exactly is the purpose of multiple stamping? Practical experiments in making nodules mean that we have to rule out the use of bi-facial lentoids or three-sided prisms, attractive though the idea might seem.⁷⁹ So two or three separate seals were used on each nodule, though they do not necessarily indicate two or three separate individuals. But if not, we are left with yet another question: why should so many people in the Zakros area possess more than one seal?

Smaller Cretan sites

To complete our picture of seal use in neo-palatial Crete, we must now turn to the small groups of sealings from Gournia, Palaikastro, Pyrgos, Sklavokambos and Tylissos. Although these sites differ in size and character, ranging from urban to rural, they clearly belong to the wide network of villas, towns and second-order centres which spread across the island in MM III-LM I. The sealings were preserved in LM IB destruction deposits, making them more or less contemporary with the large assemblages at Ayia Triada, Khania and Zakros. Intriguing connexions between centres large and small can be traced occasionally through distinctive nodule types and, most famously, through sealings that bear impressions of the very same signet ring.

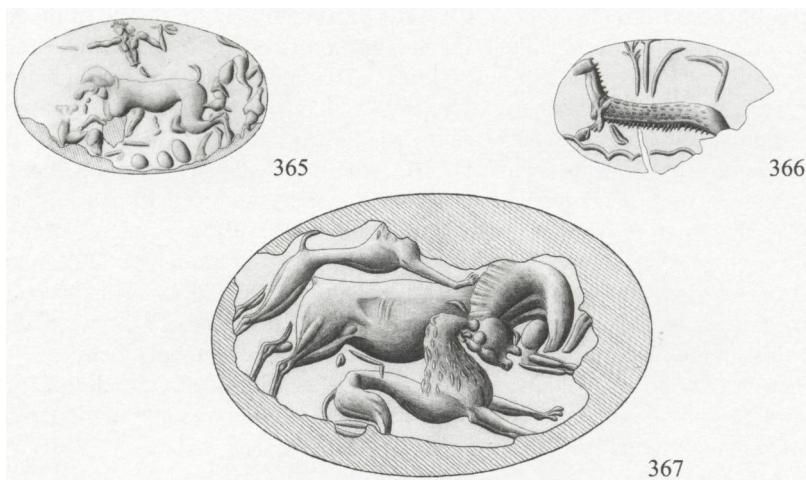
Gournia

Our most complete example of a Minoan town is Gournia on the Bay of Mirabello, excavated in the early years of the 20th century by Harriet Boyd Hawes. A roundel with a Linear A inscription from House Cf 25 probably dates to LM IA, but all the other sealings apparently belong to the LM IB destruction horizon.⁸⁰ An interesting concentration of *noduli* came to light in House Fg 30 in the northern side of the site. All eight examples were impressed with the same seal (a ‘talismanic’ goat) and were found inside the inverted lid of a vase. The principal building at Gournia, sometimes seen as a ‘mini-palace’, yielded half a dozen sealings. Three are small *noduli* with identical impressions of a lentoid. A large gable-shaped *nodulus* was impressed by a famous bull-leaping ring with a distinctive nick or flaw on the baseline (368). Impressions of the very same ring also occur on a *nodulus* from the palace at Zakros and on flat-based nodules (i.e. ‘packets’) from Ayia Triada and Sklavokambos. A different bull-leaping ring (369) impressed one of the flat-based nodules from the Gournia ‘palace’. Impressions of this ring also appear on flat-based nodules at Ayia Triada and Sklavokambos, but not at Zakros. This may not be unduly significant as the palace at Zakros has suffered from water-logging (above pp. 179-80). The matching impressions are considered below.

⁷⁸ Cf. above n. 52.

⁷⁹ For experiments: *Roundel* I 205, 245-46; cf. Hogarth (n. 67) 90; *Zakro Master* 9-10.

⁸⁰ For find-spots see *CMS* II.6 pp. 171-72; also *Roundel* I 39-41. *Troubled Island* 211-15 provides a good summary of site and finds.



Drawings of selected LM I seal-types from Palaikastro (365), Sklavokambos (366) and Tylissos (367). Scale ca 3:2.

Palaikastro

The town of Palaikastro, situated at the eastern end of the island, was first investigated in the early 20th century by the British School at Athens and has been the focus of a new campaign since 1985.⁸¹ A Linear A tablet found in the early excavations apparently pre-dates the main LM IB destruction horizon. So far this has yielded only two or three *noduli*, all found in Building 5. One bears the impression of a large metal ring, depicting a hunting scene (365).⁸² In addition, 17 pyramidal ‘loom-weights’ with seal impressions were recovered in the entrance to Building 4, demonstrating remarkable continuity of an old east Cretan practice.⁸³ Although the absence of roundels and flat-based nodules is disappointing, the search for a palatial building at Palaikastro goes on.

Pyrgos

Two Linear A tablets, two roundels and a gable-shaped *nodulus* were found at Pyrgos on the south coast.⁸⁴ Several were surface finds, though all came from the so-called villa, an elegant neo-palatial building, which dominated the small settlement until the LM IB destruction. While proto-palatial Pyrgos seems to have enjoyed close links with Mallia (Chapter 5), the LM I villa apparently had strong ties with Knossos. Sadly, the sealings and tablets can shed no light on the matter, much less prove that Pyrgos came under Knossian administration.

⁸¹ *Troubled Island* 227-34.

⁸² *CMS V Suppl.* 1B no. 341. To see the figure as Dictaeon Zeus hurling a thunderbolt is fanciful: H. Sackett & S. MacGillivray, *Archaeology* (Sept. / Oct. 1989) 30-31. A second *nodulus* bears the impression of a soft stone lentoid: *CMS V Suppl.* 1B no. 342. J. Weingarten, *BSA* 84 (1989) 442-44 describes another *nodulus* (impression illegible) and a direct object sealing (see Chapter 5 n. 95).

⁸³ See p. 99. The impressions are poorly preserved and only one appears in *CMS V Suppl.* 1B (no. 343); others are also said to depict quadrupeds. For the possible function as sack-closures, see: J. Weingarten, in *Pepragmena* 8 (2000) A3 485-95. Other ‘weights’ from the site are harder to date, but *CMS* II.6 no. 247 is stamped with a LM I-II seal and no. 248 with a LM II-III seal (Chapter 8).

⁸⁴ *CMS* II.6 nos. 232-235. For site and finds: *Roundel* I 68-69; *Troubled Island* 217-18.

Tylissos

Before turning to Sklavokambos, with its important evidence for inter-site connexions, brief mention should be made of Tylissos. This important settlement lies about 13 kms west of Knossos, in the fertile district of Malevisi, long famous for its wine. Much of the Minoan town now underlies the modern village, but three substantial buildings were uncovered here by Joseph Hazzidakis in the early 20th century. The large and well-appointed House A contained storage pithoi, bronze cauldrons, a copper oxhide ingot, two Linear A tablets and a handful of sealings.⁸⁵ These include two small roundels, two *noduli* and a single-hole hanging nodule, comparable to the conoids known from Ayia Triada. Whether the similarity is pure chance or the sealing had travelled is unclear. One of the *noduli* bears the impression of an exceptionally large signet ring, probably made of hard stone, depicting an animal attack (367).

Sklavokambos

About 6 kms beyond Tylissos lies Sklavokambos, situated on an important route between north-central and western Crete. The sturdy building was discovered and indeed partly destroyed when the modern road was constructed in 1930. Once regarded as an isolated 'country house', the building actually belonged to a small settlement and was located conveniently close to the river which ran through the valley.⁸⁶ At the western end of this valley, and on the surrounding hills, lie important outcrops of serpentine, which may well hold the clue to the site's importance. The most significant finds by far were the 38 sealings, many impressed by signet rings, which had apparently fallen from an upper room. Moreover, several impressions apparently had close matches at Ayia Triada, Gournia and Zakros.⁸⁷ At long last, with the publication of *CMS* II.6 (1999), we have been provided with superb photographs, drawings and, most crucially, authoritative data on the types of nodules involved.⁸⁸ However, in the intervening years, a regrettable fog of confusion has engulfed the Sklavokambos sealings and their mates at other sites. The myth of the so-called 'Knossian "replica" rings' may prove hard to dispel (pp. 189-91).

With one exception the 35 flat-based nodules from Sklavokambos all bear a single impression, often made by a signet ring. Four examples famously bear the impressions of a chariot scene (370). Two impressions of the same ring occur at Ayia Triada (once paired with a bull-leaping ring). The same chariot ring also occurs on three flat-based nodules at Akrotiri on Thera in a LM IA context (322). The bull-leaping ring with flawed baseline, which impressed *noduli* found at Gournia and Zakros, is also found on two flat-based nodules at Sklavokambos and a further three at Ayia Triada (368). A second bull-leaping ring appears at Ayia Triada, Gournia and Sklavokambos, each site with one flat-based nodule apiece (369). This exhausts the list of certain matches.⁸⁹ However, three more bull-leaping rings impressed a further 16 flat-based nodules at Sklavokambos.

⁸⁵ *CMS* II.6 nos. 274-278. For site and finds: *Roundel* I 71-72; *Troubled Island* 128-31.

⁸⁶ V. Fotou, in R. Hägg (ed.), *The Function of the "Minoan Villa"* (Stockholm 1997) 44-49, figs. 7-8; also *Roundel* I 70-71; *Troubled Island* 127-28.

⁸⁷ Already recognized by the excavator: S. Marinatos, *AE* (1939-41, pub. 1948) 86-96; also J. H. Betts, *Kadmos* 6 (1967) 15-40, with earlier references. Some matches claimed by Marinatos, Betts and others must be rejected in light of the *CMS* coverage.

⁸⁸ *CMS* II.6 nos. 255-272 (three sealings found by Marinatos were not included).

⁸⁹ A fragmentary bull-leaping impression *CMS* II.6 no. 258 has a *possible* match at Ayia Triada (II.6 no. 41), but not with Zakros II.7 no. 36 as previously thought. Nor does it match the new examples from Akrotiri (as tentatively suggested at II.6 nos. 41, 258).

Another ring impression shows a fine Minoan 'dragon' (366). Other seal-types include a griffin attacking a lion or hound, and a crude depiction of two human figures (on a *nodulus*). Finally, there is a fragmentary flat-based sealing, shaped like a pyramid, which originally bore five seal impressions. Two closely resemble the hybrid creatures of Zakros, which seems the likely origin of this unusual nodule.⁹⁰

Inter-site relations

A few Zakros-type nodules may also have travelled to Ayia Triada, but whether any reached the 'harbour-town of Knossos', as claimed by Evans, is open to doubt.⁹¹ One example, obtained by Richard Seager in 1918, is now in New York. It is a typical Zakros prismatic hanging nodule and has a well known combination of three seal-types, which is attested in House A on both hanging and standing nodules. A similar hanging nodule (305), with the same combination of seal-types, and a standing nodule were acquired by Evans in 1922. These are in the Ashmolean Museum, along with examples presumably donated by D. G. Hogarth, the excavator of House A.⁹² In the early 20th century excavators were permitted legitimately to retain a selection of 'duplicates' and this is a possible explanation for the Zakros strays. Some nodules might also have passed into less honest hands, travelling to the modern harbour town of Herakleion, where avid collectors like Evans and Seager could acquire them (Chapter 11). In any case, these cannot be used to bolster our picture of inter-site connexions in the neo-palatial period.

Several more examples of travelling nodules prove to be equally suspect. Among the Zakros sealings is a conoid with Linear A counter-mark, thought to be an import from Ayia Triada, where single-hole nodules of this variety are common. But doubts are raised by the existence of two more conoids, identical in size and seal-type, at Ayia Triada itself. Any travelling done by the 'Zakros' example almost certainly occurred within the museum storerooms.⁹³ Inadequate publication has also helped to cloud the picture, especially at Knossos. For instance, a seal-type very close in style to the Zakros hybrids appears on one of the Knossos sealings, thus apparently reinforcing links between these two sites in LM IB.⁹⁴ In reality, the nodule was found among the late sealings in the

⁹⁰ HMs 642 with *CMS* II.6 nos. 267-270. Another oddity is HMs 636, a gable-shaped standing nodule with two impressions: one a large ring of bronze, the other illegible (*CMS* II.6 nos. 263-264). The shape resembles nodules from Zakros (and a few from Ayia Triada, which in turn may come from Zakros): *CMS* II.6 p. 368 and below.

⁹¹ For Zakros-type nodules at Ayia Triada: *CMS* II.6 p. 359 (see also above n. 14). For alleged examples from the 'Harbour-Town of Knossos': *PM* II 254-55.

⁹² Evans's nodules are AE 1801-1802 (*CS* nos. 10S-11S = *CMS* II.7 nos. 155 + 226 and nos. 129B + 135B + 194B). The remaining Zakros nodules in the Ashmolean bear the numbers AE 1199a-z and may have been given by Hogarth, though the registers provide no confirmation. Kenna (*CS* 144-46) compounds the confusion by listing all the Zakros nodules under 'Sealings from the Harbour-Town of Knossos'. Seager's nodule is NY MMA 26.31.409 (*CMS* XII no. 174 = *CMS* II.7 nos. 129B + 135B + 194A). For seal-types designated A/B see above n. 72.

⁹³ *CMS* II.7 p. xix n. 27, p. 56: HMs 94 (*CMS* II.7 no. 45) closely matched by HMs 1660 and 1668 (= *CMS* II.6 no. 68). There is also much confusion over the sealings impressed by a ring depicting a pair of magnificent lions in flying gallop. HMs 40/1-2 are prismatic hanging nodules found at Zakros (*CMS* II.7 no. 71). HMs 1339, 1375, 1445 (*CMS* II.8 no. 298) are broken nodules from Knossos, find-spot / date uncertain (but probably LM III). Whether the flat-based nodule in the Pigorini Museum was really found at Ayia Triada is far from certain: see comments by Pini at *CMS* II.8 no. 298 (correcting earlier errors).

⁹⁴ J. Weingarten, in *BA Trade* 307, pl. 7. See now *CMS* II.8 no. 189 (HMs 163). For date and sealing type, *Schnurplombe mit pyramidenförmiger Rückseite*: *ibid.* pp. 68-69.

‘Wooden Staircase & Secretaries’ Bureau’ and, more tellingly, is a variety *not* known in LM I. Further confusion has arisen over a ring impression from Zakros (244) and the so-called clay matrix and associated sealings from LM II-III Knossos (433-435; Chapter 8). New studies show that we are dealing with two separate originals, differing in size and details, though the imprints of rivets reveal that both rings were bronze.⁹⁵ In any case, Evans’s claim that the matrix came from ‘a level not later than LM I’ may be safely discounted.⁹⁶ It belongs with the late sealings and is not contemporary with the LM IB impression at Zakros, though both original rings were indeed LM I in date.

LM IB Knossos is a notorious black hole as far as sealings and tablets go and this severely hampers our attempts to reconstruct the political geography of neo-palatial Crete. Not that absence of evidence has noticeably dampened scholarly enthusiasm for the subject. And, regrettably, what evidence we do have – in the form of matching impressions – has often been misunderstood. As we have already seen, Minoan signet rings of gold and bronze were engraved entirely by hand and could not be replicated in moulds or matrices. There is simply no question of ‘replica’ rings and so the term should be abandoned without delay.⁹⁷ When matching impressions do occur at several sites, the very same ring was responsible. So far we have four confirmed sets of matching impressions, namely two different bull-leaping scenes, the chariot scene, and a combat scene (368-371). The combat appears on five flat-based nodules at Ayia Triada (twice paired with a cult scene, 245) and on two fragmentary hanging nodules at Knossos. As it happens, the latter are very similar in shape *and* clay to single-hole hanging nodules known from Ayia Triada.⁹⁸ Happily, in this case, there is no question of a mix-up in the museum and we can be reasonably confident that the hanging nodules travelled from Ayia Triada to Knossos.

Visual inspection of clay is, however, rarely so unequivocal and much controversy surrounds the matching impressions of the chariot and bull-leaping rings. If clay is local to the site, the sealings were stamped on the spot by travelling administrators. If not, the sealings themselves travelled from another location. Either way – so the argument runs – the trail leads back to Knossos.⁹⁹ But even if most high quality signet rings were produced in a Knossian workshop – and for this there is no proof – it does *not* follow that they were used exclusively by Knossian administrators. Elite products of Knossian origin or style are found the length and breadth of the island – and beyond. Can we seriously believe that each and every one was owned by a representative of Knossos? Why should signet rings or seals be any different?

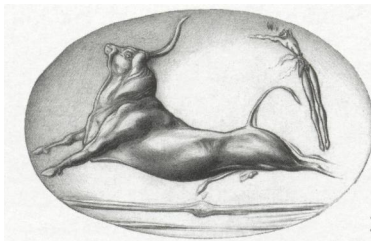
⁹⁵ *CMS* II.7 no. 8 and II.8 no. 268 (with earlier references).

⁹⁶ Evans rightly recognized that the original ring was LM I in date (i.e. contemporary with that used at Zakros), but thought it remained in use for many years, since it also impressed sealings associated with Linear B tablets: *PM* II 768-69. For recent tests in the Room of the Clay Signet, see: N. Momigliano & S. Hood, *BSA* 89 (1994) 130-31; Weingarten’s views on the matrix (ibid. 152-53), i.e. that it was used to produce replica ‘look-alike rings’ and that LM I-style rings may have been fabricated in LM IIIA1/2, are best ignored. See below and Chapter 8.

⁹⁷ See pp. 131, 141. The term ‘look-alike’, applied by Weingarten (in *ASSA* 111; *BA Trade* 308-10) to certain ring impressions, creates further confusion. The impressions shown here in 368-369 depict different stages in bull-leaping and are merely variations on a theme; they certainly do not look alike: see above pp. 182-83 and n. 74.

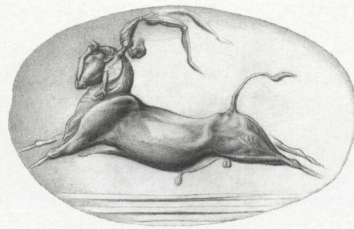
⁹⁸ W. Müller, in *CMS* II.8 p. 50 (HMs 369: II.8 no. 279).

⁹⁹ Thus Betts (n. 87) 25-27; J. Weingarten, in *ASSA* 110-12; eadem, in *BA Trade* 308-10; *Roundel I* 207-13, to name but a few commonly cited specialist sources, which in turn have influenced general literature. I. Schoep, *AJA* 103 (1999) 213-17 questions Knossian control in LM IB, but falls into the usual trap regarding ‘replicas’ and ‘look-alikes’.



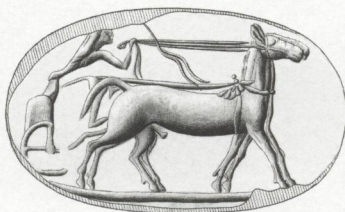
368

Ayia Triada (*CMS* II.6 no. 43)
 3 flat-based: 1 impression (HMs 497-499)
 Gournia (*CMS* II.6 no. 161)
 1 nodulus (HMs 101)
 Sklavokambos (*CMS* II.6 no. 259)
 2 flat-based: 1 impression (HMs 628-629)
 Zakros Palace (*CMS* II.7 no. 39)
 1 nodulus (HMs 1051)



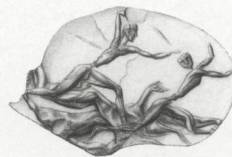
369

Ayia Triada (*CMS* II.6 no. 44)
 1 flat-based: 1 impression (RMP 71974)
 Gournia (*CMS* II.6 no. 162)
 1 flat-based: 1 impression (HMs 102)
 Sklavokambos (*CMS* II.6 no. 255)
 1 flat-based: 1 impression (HMs 612)



370

Akrotiri (*CMS* V Suppl. 3 no. 391)
 3 flat-based: 1 impression
 Ayia Triada (*CMS* II.6 no. 19)
 1 flat-based: 1 impression (HMs 591)
 1 flat-based: 2 impressions (HMs 516)
 (combined with II.6 no. 41)
 Sklavokambos (*CMS* II.6 no. 260)
 4 flat-based: 1 impression (HMs 632-635)



371

Ayia Triada (*CMS* II.6 no. 15)
 3 flat-based: 1 impression (HMs 526/1-3)
 2 flat-based: 2 impressions (HMs 595-596;
 combined with II.6 no. 4, here 245)
 Knossos (*CMS* II.8 no. 279)
 2 single-hole hanging (HMs 369, 1275)

Impressions from the same signet rings are attested at several Cretan sites in LM IB (368-371) and now at Akrotiri on Thera in LM IA (370). The known matches are listed here by site (with *CMS* numbers) and the specific nodules on which they are found. Scale ca 3:2. See also 14, 283-285 for further illustrations of the flat-based nodules / 'packets' from Ayia Triada and Sklavokambos (368) and 322 for one of Akrotiri nodules, impressed with the chariot ring (370).

Iconography, naturally enough, attracts our attention, but offers no certain answers.¹⁰⁰ What is especially Knossian about chariot or combat scenes? Why have cult scenes failed to gain admission to the exclusive circle of ‘Knossian’ rings? Is there any firm proof – as opposed to circular argument – that bull-leaping was a Knossian insignia?¹⁰¹ And now the Thera sealings provide a further twist. Since the excavator has stated that the clay is not local, the sealed notes presumably came from Crete (pp. 167-68). One of the bull-leaping rings is very close in style, but is not identical in detail, to those known from LM IB sites.¹⁰² The famous chariot ring, attested at Thera, certainly remained in circulation until LM IB. In other words, some of the so-called ‘Knossian “replica” rings’ were heirlooms at the time of the LM IB destructions.¹⁰³ This, in turn, may have a bearing on the so-called ‘local “replica” rings’, which are supposedly inferior in quality to the genuine ‘Knossian’ rings. Impressions from these local ‘rings’ (some prove to be seals) occur in the Temple Repositories at Knossos (318), and at Ayia Triada, Khania and Zakros.¹⁰⁴ Stylistic differences can certainly be detected, say, between the ring with flawed baseline (368) and a pair of bull-leaping rings used in House A at Zakros (356-357). But where this pair was made and *when*, we cannot say. It is entirely possible that a motif, which had its home at Knossos in LM IA, spread to other centres in LM IB. But we cannot guess for whom the seals and signet rings were made and, sadly, their impressions tell us nothing about the governance of the island.

As for the matching impressions, at best they attest to communication between Crete and Thera in LM IA and between Cretan centres, large and small, in LM IB. They do not prove that Knossos was the political capital of the island in this period, or indeed the opposite. The recent suggestion that administration in LM IB was less centralized than in LM IA rests almost entirely on negative evidence.¹⁰⁵ We have virtually no sealings and tablets from LM IA contexts – bar those from the Temple Repositories at Knossos and, now, Akrotiri on Thera (see p. 164). While Knossian influence – in architecture and elite

¹⁰⁰ Pace Betts (n. 87) 27 and *Roundel* I 207-09, fig. 77 (‘Knossian “replica” rings’). Hallager’s inclusion of the combat HT 113 (= *CMS* II.6 no. 17, here 248) is based purely on size and iconography, since it is not matched at other sites; the same applies to the bull-leaping scene KH 1 (= *CMS* V Suppl. 1A no. 171, here 336). Other combats and bull-leaping scenes, likewise without matches, are relegated to the status of ‘local “replica” rings’ (*Roundel* I 209-212, fig. 78). For cogent criticisms of this approach see now I. Pini, in *Pepragmena* 9 (forthcoming).

¹⁰¹ See discussion with references in Chapter 6, esp. pp. 141-42.

¹⁰² *CMS* V Suppl. 3 no. 392 (here 323) and *CMS* II.6 nos. 41, 258 (see above n. 89).

¹⁰³ I. Pini, in *CMS* V Suppl. 3 pp. 37-38, now somewhat perversely questions the LM IB dating for the Ayia Triada, Sklavokambos and Zakros sealings, since they were not found in clear LM IB destruction horizons. It is true that the original excavation reports are not always as explicit as we might like regarding a close association of LM IB pottery and sealings; but it is hard to dispute the LM IB destruction dates (especially at Ayia Triada). Pini further argues that the widespread use of heirlooms is a LB II-III phenomenon and is not associated with the ‘flowering’ (*Blütezeit*) of Minoan glyptic. In fact, virtually all our LM I sealing ‘deposits’ – from Akrotiri to Zakros – include a few impressions of heirloom seals dating back to MM II-III (above pp. 165, 167, 171, 180). Thus the use during LM IB of seals or signet rings made in LM IA is hardly surprising.

¹⁰⁴ *Roundel* I 209-212. See above n. 100 and discussion in Chapter 6, pp. 141-42.

¹⁰⁵ *Troubled Island* esp. 77-78; Schoep (n. 99) 220-21; eadem *Aegean Archaeology* 2 (1995) 29-65. Cf. Weingarten’s suggestion (in *ASSA* 110-12) that there were four administrative centres in LM IB: Knossos, Ayia Triada, Zakros and Khania. What is becoming increasingly apparent is that the fortunes of individual centres (whether canonical court-centred ‘palaces’ or sites exhibiting ‘palatial functions’, e.g. Ayia Triada) waxed and waned throughout the 200+ years of the neo-palatial era; papers in *Monuments* now provide valuable insights.

products – was clearly very strong during LM IA, this does not automatically translate into political domination. As for LM IB, we can certainly say that distinctive local sealing practices were employed at Zakros, apparently in tandem with more conventional methods (see pp. 184-85). At Ayia Triada, the preponderance of single-hole hanging nodules is less suspicious, since similar sealings are found elsewhere on the island. The same applies to the large number of roundels at Khania. In other words, the character of these assemblages is context-specific – linked to particular administrative functions in one area of the site. There is no single site to serve as a ‘type-site’, nor a palatial archive to provide a yardstick.¹⁰⁶ And, in consequence, we cannot claim that administration in LM IB was less centralized – or more – than it had been in LM IA. As ever, the status of Knossos continues to elude us.¹⁰⁷

How then should we proceed? First and foremost by relying on the newly published *CMS* volumes, with their high quality drawings and photographs, accurate data on nodule types and experienced observations of the editors. We also must learn to distinguish fact from fiction in earlier accounts and to subject every hypothesis to rigorous testing. Clay analysis would certainly provide objective insights into which nodules travelled and which did not. But a non-destructive method has yet to be devised and prospects are not encouraging. Finally, we must rid ourselves of any lingering suspicions that the flat-based nodules sealed lengthy documents or diplomatic correspondence. The numerous silicones published by the *CMS* team make plain that the pieces of parchment were very small, sometimes tiny, capable of bearing no more than a few sign-groups or ideograms (see p. 156; 10-14, 283-285, 288-290). The messages were certainly no longer than those on Hieroglyphic crescents and Linear B gable-shaped nodules. Were they similar in content? If so, perhaps the level of literacy in neo-palatial Crete meant that records of transactions had to be concealed. Regrettably, this is no more than idle speculation, for unlike the inscribed Mycenaean nodules, we will never be able to retrieve the contents of our neo-palatial ‘packets’. But with further scrutiny of the nodules, we ought to be able to decide if the messages had been opened at the time of the destruction.¹⁰⁸ This, in turn, might help us answer a range of questions. Did they document the receipt of goods or their dispatch? Did they accompany shipments as delivery notes, to guarantee that quantities sent matched those received? Were they used solely in the official sphere or did private individuals record transactions in this way also? It is unlikely that we will ever succeed in answering all of these questions and, if we keep an open mind, new ones will surely present themselves. Above all, we should learn to recognize the natural limitations of evidence that has been preserved for us by sheer chance.

¹⁰⁶ And without such an archive it is equally difficult to ascertain the true relationship between sealings and tablet administration. Cf. I. Schoep, *The Administration of Neopalatial Crete. Minoan Suppl.* 17 (Salamanca 2002) 193-97. More fundamental still is the extent to which ‘palaces’ (i.e. court-centred buildings) were involved in administration during the neo-palatial period: see J. Driessen, in *Monuments* 1-14 (arguing for a largely ceremonial role).

¹⁰⁷ It is, of course, notoriously difficult to reconstruct political systems from the archaeological record alone; could we really retrieve the character of 5th century BC Athenian democracy solely on the basis of surviving monuments and iconography?

¹⁰⁸ See above pp. 168 (Thera), 173 (Ayia Triada) and 184-85 (Zakros).

CHAPTER 8 LM II-III CRETE

The LM IB destructions marked a major turning point in Minoan cultural development and had repercussions beyond the island itself – this much one can say with certainty. But the causes and consequences are among the most hotly debated issues in Aegean archaeology. Natural disaster, civil disturbance, a Knossian power bid, or a Mycenaean military take-over have been blamed.¹ Each theory has its drawbacks and merits, but proof is beyond our grasp. We can say that during LM/LH II-III A ties between mainland Greece and Crete are very close indeed, especially between the Argolid and Knossos. On Crete we now find a new emphasis on individual or family tombs in well-defined plots or cemeteries, a custom well attested on the mainland and quite unlike the older Minoan practice of communal burial.² Parallels extend to a range of elite products: bronzes and weaponry, ivories, jewellery and seals. Indeed to distinguish mainland from Cretan products in this era often proves impossible.

In administration there is a marked break with the Minoan past, and the sole functioning palace – Knossos – is evidently in Mycenaean hands. Tablet administration is conducted in Mycenaean Greek, expressed in the Linear B script, while complicated neo-palatial sealing practices give way to simpler methods. Unfortunately, controversy still surrounds the date of the tablets, sealings and final destruction of the palace (below and FIGURE 8.3). If one takes a pan-Aegean view, then the conventional date – initially proposed by Evans and modified by Popham, namely LM IIIA1/2 (ca 1375/1350) – still seems plausible. However, it must be stressed that there is no close stratigraphical association between tablets and pottery. Thus, we cannot exclude the possibility that occupation on the site after the LM IIIA1/2 destruction was neither so miserable nor so illiterate as Evans envisaged for his ‘squatters’. What is clear is that administration in the late palace at Knossos finds close parallels in the mainland centres, which were destroyed in LH IIIB (below and Chapter 9). Moreover, on Crete itself administrative functions are maintained during LM IIIB at Khania.

SOURCES OF EVIDENCE AND DATING

As we have seen in earlier chapters, sealing deposits provide one of the most important tools in establishing glyptic chronology. Unfortunately, during LM / LH III their value diminishes. One factor is the uncertainty surrounding the date of the latest sealings at Knossos; another is the increasing use of heirloom seals in palatial administration. Although the latter is most striking in the LH IIIB sealing deposits on the Greek mainland, the trend can already be discerned among the late Knossos sealings. We will examine the implications of this phenomenon in more detail below. Here we may simply note that the latest seals used for sealing at Knossos can be dated on stylistic grounds to LM IIIA. Seals of the same date were also used to impress sealings at Khania and Mallia during LM IIIB.

¹ P. Rehak & J. G. Younger, in *Review* 440-41; *Troubled Island* 105-15.

² For burials: Rehak & Younger (n. 1) 444-45 with references; *ibid.* 441-58, 471-72 provide a good summary of the period; also M. R. Popham, in *Knossos Labyrinth* 89-102; *EDK* 117-132. See MAP 4 for the principal sites mentioned in this chapter, and MAP 5 for the Knossos area.

As evidence for style and iconography the late Knossos sealings are altogether less satisfactory than our neo-palatial impressions, since most of the nodules were deliberately broken. Where several impressions exist, original motifs can be reconstructed wholly or in part (5). But all too often we have only a single broken impression to work with. Moreover, for the past century we have been forced to rely on drawings published by Evans.³ For studying style these are often deeply misleading (e.g. 24; Chapter 1). Furthermore, Evans selected only about 70 motifs for drawing; in reality several hundred seal-types are attested on the late sealings, although some represent LM I heirlooms. This lamentable situation has finally been remedied with the publication of the Knossos sealings in *CMS* II.8 (2002). The wholesale re-appraisal of this material – including the new data on sealing practices – will occupy many years to come (see pp. 216-30).

For seals from datable contexts we rely heavily on the new family chamber tombs and small tholoi, which appear on Crete from LM II onwards. But very few can be dated to a single ceramic period and evidence for LM II is especially thin.⁴ While some seals and signets like the Isopata Ring (215) are obvious LM I heirlooms, others are much harder to pin down. The so-called Cut Style provides a good example; already attested in LM IB, this style apparently continued in vogue during LM / LH II (see pp. 201-03). Dating an individual piece is well nigh impossible.⁵ The common practice of assigning broad dates to glyptic developments – namely LB I-II and LB II-III – though commendable for its caution, has one obvious but unfortunate consequence: LB II seems ill-defined. And yet many seals (and seal-types) belong in this phase, roughly a century in duration. Ceramic chronology adds to the confusion; LM IB on Crete is contemporary with LH IIA on the Greek mainland, while LM II corresponds to LH IIB. Furthermore, in many cases LM II pottery cannot be distinguished from LM IIIA1.⁶

Glyptic development aside, the LM II-III tombs in central Crete also offer intriguing insights into changing patterns of seal ownership. Even in the Knossos area, seals are generally confined to rich graves.⁷ The large Zapher Papoura cemetery – with 100 tombs spanning LM II / IIIA-III B – has yielded only eleven seals. Only two of the eighteen LM III graves in the Gypsades cemetery contained seals and all were LM I heirlooms. By contrast four seals came to light in Tomb III (LM II?) in the small burial ground near the New Hospital. Three more seals and two signet rings were found in Sellopoulo Tomb 4, which is dated to LM IIIA1.⁸ The burials in the Phourni cemetery at Archanes and in the

³ Usefully collected in *Latest Sealings* pls. 27-31.

⁴ For seals from datable contexts, see: I. Pini, in *CMS* II.4 pp. xxxi-xxxiii. Note that many LM II-III seals appear in *CMS* II.3, ostensibly devoted to the neo-palatial period; *CMS* II.4 contains mostly soft stone seals of LM date (not 'post-palatial' or 'undatable' as the title indicates: see Appendix 1). These volumes contain seals that entered the Herakleion Museum prior to 1960. Other LM II-III seals appear in *CMS* IV, V, V Suppl. 1A-B, V Suppl. 3; *CM* (Giamalakis Collection). The dispersal of seals in the LBA means that some found on the mainland or islands could be Cretan products, though identifying them is not easy (see Chapters 9, 10). The same applies to seals acquired in the 19th and 20th centuries AD, published in *CMS* I, I Suppl., VII-XIII; *CS* (Ashmolean Museum).

⁵ Several good examples of the Cut Style were found in the Unexplored Mansion at Knossos, see: J. H. Betts, in *MUM* 187-96. This site, published in exemplary fashion, offers our best non-funerary context for the period. See here 40 (HM 2507) and below.

⁶ *Minoan Pottery* 149-58, 163-71; *ABAC* 81-84; 97-98 (for LM / LH correlations).

⁷ See also below pp. 214-16. Seals from the Knossian graves appear in *CMS* II.3 and II.4 (with useful information on contexts and earlier references). For Sellopoulo T. 4 see n. 8.

⁸ M. R. Popham et al., *BSA* 69 (1974) 210-25 (seals); 254-57 (dating of tomb). The seals and a ring bezel are LM II-III in date (below and n. 29), but the ring with cult scene (HM 1034) is a LM I heirloom: see Chapter 6 n. 37.

Tombe dei Nobili at Kalyvia near Phaistos are a trifle later, dating to LM IIIA1-2. These too contain a number of seals; most seem contemporary with the burials, though some gold signet rings are certainly LM I heirlooms.⁹ For the following period, LM IIIA2-B, in central Crete the evidence is patchy: few intact burials contained seals and, on stylistic grounds, these are certainly earlier than their context. While tomb robbing, ancient and modern, has undoubtedly taken its toll, a change in seal ownership and use can be discerned. One wonders whether this is linked to the fall of Knossos (see below).

For LM IIIA2-B we turn to the burials of western Crete.¹⁰ Rescue excavations in Khania have brought to light a few burials containing seals, while the plundered tholos tomb at Phylaki Apokoronou also adds to the repertoire. Here and in the large cemetery at Armeni near Rethymnon there is the same mixture of LM I heirlooms and seals of more recent (LM IIIA) date observed in central Cretan burials. Certainly there is no sign that any hard stone seals were produced in LM IIIB. The Armeni graves are especially important, since many were unlooted and are datable to LM IIIA-B or LM IIIB. Aside from a sprinkling of earlier hard stone seals there is a striking number of seals made of soft local stone, usually described as serpentine or schist, which are rarely found in the rich graves of central Crete or the Khania region. The Armeni cemetery also contains a number of seals made of fluorite, bone, steatite and glass, similar to examples produced on the Greek mainland in LH IIIA-B (pp. 212-14 and Chapter 9).

SEALS AND SEAL-TYPES

In attempting to assess glyptic developments during LM II-III we are undoubtedly hampered by having so few seals which can be firmly attributed to the earlier part of this period. Irritating though this may be, the situation does have parallels in the proto-palatial and neo-palatial periods, where the bulk of our evidence dates to the destruction horizons at the end of MM IIB and LM IB, respectively. Now the stakes seem higher in view of the controversies regarding the character of Knossian and Cretan society in the wake of the LM IB destructions. Sadly, the glyptic record alone cannot resolve the debate, though it offers important clues.¹¹ We can observe that in material, shape, technique and iconography close parallels exist among contemporary seals found on the Greek mainland. And, since seals and other elite products could travel, we cannot be sure that

⁹ For Kalyvia, see: *CMS* II.3 nos. 99-115; rings 103 (here 217) and 114 are LM I. For the Phourni Cemetery, see *Archanes* I 158-80 (Tholoi A-B), 189-93 (Grave Enclosure); II 450-63 (dating), 651-662 (rings), 698-701 (seals). Of LM I date are HM 1017 (here 213) and HM 989 (ring with cult scene). The latter is not 'solid, cast' as claimed by the excavator (*ibid.* 654) but has a hollow bezel, see: W. Müller, in *Metron* 476-77, table 2, pl. 104j.

¹⁰ Seals from western Crete appear in *CMS* V, V Suppl. 1A-B, V Suppl. 3. The Armeni seals originally kept in Khania have now joined more recent finds in Rethymnon. Few of the west Cretan graves are adequately published, but useful information appears in the *CMS* volumes.

¹¹ W.-D. Niemeier, in *Crète mycénienne* 297-311 (stressing elements of continuity, with earlier literature). J. G. Younger, in *CMS* Beiheft 6 (2000) 347-60, believes that innovations in style are linked to the new administration. There is no specialist overview of LM II-III glyptic *per se*, though aspects are covered by Younger's *Kadmos* articles on 'Masters and Workshops' and 'Stylistic Groups' (to which references are given below as appropriate). His attributions and use of absolute dates are sometimes problematic: see Chapter 11. *Iconography* provides a useful catalogue of LBA motifs (not limited to Crete). Remarks by I. Pini on style, iconography and dating are found in the introductions to *CMS* II.3, II.4, II.8, V, V Suppl. 1A-B and V Suppl. 3. The general accounts in *APG* 228-31 and *GGFR*² 46-54, 410-12 are less than satisfactory and Boardman's 'palatial styles' (*ibid.*) have not met with acceptance (Chapter 11).

every piece found on Crete was actually made on the island (see also Chapter 9). Unprovenanced seals of hard stone, especially the lost souls in collections outside Greece, are notoriously hard to date closely and to attribute to Cretan or mainland workshops. They are best described neutrally as LB I-II and LB II-III. However, some conventions that appear on hard stone seals in LM IIIA – notably eyes rendered with tubular and solid drills – do seem more prevalent on Crete and may well have developed there. With soft stone seals we are on safer ground: Cretan products can usually be distinguished from those made on the Greek mainland (see below and Chapters 9-10).

MATERIALS, SHAPES, TECHNIQUES

Alongside a few gains in materials, shapes and techniques during LM II-III, there are also notable losses. Among hard stones, the popular jaspers of the neo-palatial period decline sharply, with green jasper being especially rare. Rock crystal is no longer common, amethyst virtually non-existent. Carnelian remains popular, but much is dark reddish-brown, usually termed ‘sard’ in older publications.¹² Agates display considerable variety: some translucent with fine veining, others with showy opaque banding (**378b**; **C33-C34**, **C36**). Haematite, first attested in LM I, now seems more frequent than before (**C38**). Whether these changes can all be laid at the door of Mycenaean influence is difficult to say. Much of our glyptic evidence for the late neo-palatial period comes from LM IB sealing deposits. While great strides have been made in determining whether impressions were made by seals of hard or soft stone, the appearance of those stones naturally cannot be retrieved. In other words, some stones ordinarily associated with LB II-III glyptic may have their origins in the preceding period.¹³ For instance, we know that lapis lacedaimonius – the attractive flecked green stone quarried at Krokeai near Sparta – was already used in LM I, although its popularity *seems* to increase in LM II-III (**C37**). A large store of unworked blocks found in the East Wing at Knossos apparently belongs to the LM II-III occupation.¹⁴

A change sometimes attributed to mainland influence is an increase in seal size.¹⁵ Lentoids now often have a diameter of more than 2.0 cms, a few even exceed 2.5 cm. Many have strongly biconvex faces, with very precise edges. Particularly striking is a seal from New Hospital Tomb III, depicting the Mistress of Animals, which measures 3.1–3.5 cm in diameter (**373**). Other outsized seals occur among the late sealings at Knossos (e.g. **440**). While large seals certainly figure in Early Mycenaean tombs – Dendra has some truly enormous pieces – size is not an infallible indicator of date, much less origin (Chapter 9). Exceptions do occur, as shown by a large lentoid of serpentine (D. 2.9 cm) from the MM III-LM IA villa at Nerokourou near Khandia.¹⁶ Although lentoids were very common throughout the neo-palatial period, now they dominate the

¹² Including certain *CMS* volumes. Cf. ‘sardonyx’ for what is now usually called banded agate. It is also important to remember that published identifications are sometimes unreliable, e.g. haematite being erroneously described as ‘meteorite’ by Platon in *CMS* II.3. Even hard and soft stones are sometimes confused. Corrections by Pini appear in *CMS* II.3 pp. xxii-xxvi, xlix-lxv; II.4 pp. lix, lxiii-lxxi. See also Appendix 1. For possible sources of stones see Chapters 5 and 6.

¹³ See Chapter 6, pp. 122-23, esp. n. 15; also Niemeier (n. 11) 297-300.

¹⁴ P. Warren, in J. M. Saunders (ed.), *ΦΙΛΟΛΑΚΩΝ* (London 1992) 285-96. Chapter 6 n. 20 for ‘talismanic’ seals made of lapis lacedaimonius.

¹⁵ E.g. I. Pini, in *CMS* II.3 p. xxix; cf. Niemeier (n. 11) 300-01.

¹⁶ *CMS* V Suppl. 1A no. 186; also N. Dimopoulou, in *CMS* Beiheft 6 (2000) 35 no. 35, fig. 3 (Poros). Note also the very large ring impression from Tylissos (here **367**). See also O. H. Krzyszkowska, in P. A. Mountjoy, *Knossos: The South House*. *BSA* Suppl. 34 (London 2003) 202-03.



Selected seals from LM II-III Knossian graves: New Hospital T. III (372-374), Isopata T. 1 (375), Sellopoulo T. 2 (376), Ayios Ioannis 'Gold Cup Tomb' (377), and Zapher Papoura T. 36 (378a-b). All are made of hard stone. Faces (372a, 375a), back (378b) and impressions. Scale ca 3:2.

repertoire in hard and soft stone alike. Cushions and amygdaloids are still found, but are almost exclusively produced in hard stone (e.g. **375-376, 408**). Three-sided prisms, cylinders and stone signet rings are rare (e.g. **372, 384, 405, 407**). The Greek mainland presents a similar picture (Chapter 9).

The embellishing of seals with gold caps is sometimes seen as a mainland fashion.¹⁷ The practice is certainly well known in the Early Mycenaean period (Chapter 9) and a few examples occur at LM II-III A Knossos (**372a, 375a**). Indeed the seal worn by the Cupbearer in the Procession Fresco, dated to LM IIIA1, has granulation at the ends of the string-hole and the stone appears to be banded agate (FIGURE 1.1). But similar granulation occurs on a three-sided prism associated with an LM IB burial at Poros. The motifs – an amphora and a double-axe with sacral knot – point to a Minoan origin for the seal. Likewise a hanging nodule from LM IB Khania preserves the imprint of granulation at the string-hole. A lentoid of lapis lazuli with exceptionally lavish decoration, found behind the South House at Knossos, probably dates to LM IB (**207**). Thus it is better to see the embellishment of seals as a short-lived phenomenon, which occurred on Crete and the mainland alike.

Seals of soft local stone had played an important role in the neo-palatial repertoire and impressions from them were frequent in our LM IB sealing deposits.¹⁸ As we shall see, tracing later developments in soft stone engraving is rather difficult (see pp. 212-14). However, serpentine and schist were certainly used during LM II-III and are especially common in the Armeni cemetery near Rethymnon (**417-420, 422-423**). This cemetery has also yielded numerous seals made of fluorite, decorated with geometric patterns, reminiscent of earlier double-axe motifs and tectonic designs (**425**). In addition, from western Crete we have a few seals of steatite, so close to examples produced on the mainland in LH IIIA-B that they might well be imports (p. 214 and Chapters 9-10).

Whether the few pressed glass or mould-made seals found on Crete are also imports is impossible to say.¹⁹ The technique of making seals and jewellery in steatite moulds was apparently developed during LM / LH IIIA1, replacing the earlier practice of engraving glass like stone. Two seals now in Oxford illustrate this point exceptionally well, for both bear motifs engraved in the Cut Style, datable on stylistic grounds to LB I-II (**381, 385; C32**).²⁰ Lentoids aside, amygdaloids and cushions were also produced. All have gently rounded backs and string-holes measuring ca 1–2 mm (**385a**). These LB I-II engraved glass seals have a wide distribution on Crete and in Early Mycenaean graves on the mainland, whereas most of our pressed glass seals are concentrated in the late cemeteries (LH IIIA2-C1) of central Greece.²¹ A possible mould for making glass seals, dated stylistically to LM IIIA1, was acquired in the ‘harbour-town of Knossos’ by Richard Seager.²² The distinctive features of mould-made seals are described in Chapter 9.

¹⁷ For full discussion with references to examples mentioned in this paragraph, see Krzyszkowska (n. 16) 200-01.

¹⁸ See Chapter 6 (esp. pp. 124, 147-48) and Chapter 7 (esp. pp. 154-55).

¹⁹ *CMS V Suppl.1B* nos. 239, 288 (both from Armeni); *V Suppl. 3* no. 155 (Mitsotakis Collection, Khania). For glass seals generally: I. Pini, *JRGZM* 28 (1981) 48-81; idem in *Peripheria* 331-38. Pini, in *Pepragmena* 9 (forthcoming), dismisses J. G. Younger’s idea that mould-made glass seals were used to impress the Zakros sealings (*Meletemata* 953-57).

²⁰ Both from the Dictaeon Cave: J. Boardman, *The Cretan Collection in Oxford* (Oxford 1961) 70, nos. 309-310, pl. 24; *CS* nos. 359, 364.

²¹ Compare Pini’s figs. 2-3: *Peripheria* 332. See also Chapter 9.

²² Allegedly from the so-called ‘Lapidaries Quarter’ in what is now Poros-Katsambas, the eastern suburbs of Herakleion: *PM II* 237-38, fig. 134 = *CMS XII* no. 262 (here **541**).

The basic tools and techniques employed for seal engraving were much the same as before.²³ For hard stones the lapidary lathe remained essential. But new stylistic effects are achieved in LM II-III by the undisguised use of cutting wheels and drills, creating smoother bodies, stick-like limbs and prominent eyes. For the most part, powerful modelling and the rendering of minute anatomical details are abandoned. As we would expect, soft stones were ordinarily engraved with knives, burins and slow hand-turned drills. Metal rings are discussed below. Unfortunately, we have next to no workshop evidence for this period. Although a few unfinished seals in steatite were found by Evans at Knossos, like so much in the late palace, their date and find-spot are problematic. Certainly there is no evidence in the contemporary notebooks to support Evans's later attribution of these pieces to the so-called 'Lapidary's Workshop' on the South Front.²⁴

Evans assigned these unfinished seals to his 'Re-occupation Period' (i.e. LM IIIB), but the extent to which the engraving of soft stone seals persisted on Crete in the 13th century BC is far from clear. And, as already noted, hard stone engraving seems to have ended by LM / LH IIIA2. Production of metal signets may have ceased somewhat earlier. This sorry end to Cretan glyptic after more than 1000 years of continuous development must surely reflect profound social changes, perhaps linked to the fall of Knossos.

Metal signet rings

Neo-palatial signet rings and their contemporaries from the Shaft Graves at Mycenae had displayed some of the most complex scenes attested in Aegean glyptic (Chapters 6, 9). The technique of direct punching and engraving lent itself to Minoan naturalism and indeed may have contributed to this trend. Certainly one senses that the gold rings and to a lesser extent their counterparts in bronze were in the very forefront of glyptic development. Reconstructing the later history of signet rings during LM II-III is no easy matter, since the extant repertoire is not large. Several kinds of construction are attested. The Ashmolean bull-leaping ring has a classic hollow bezel made of sheet gold (379). Here the motif is punched and engraved, as on neo-palatial signets.²⁵ But unlike our LM I examples, the hoop of the Ashmolean ring easily fits on a modern finger (inner D. 1.5–1.7 cm) and is embellished with rows of granulation, somewhat carelessly executed (379b). On many Early Mycenaean signets the hoops range from 1.5–2.0 cm in diameter and decoration is very common indeed (Chapter 9). Some hoops have elaborate granulation, others are adorned with cloisons filled with coloured glass (457, 467, 469). Although the latter does not occur on any LM II-III signet rings, cloisonné is found on decorative finger-rings at Sellopoulo and Kalyvia.²⁶

Kalyvia also provides an important example of a 'bi-metallic' ring (380). This term is something of a misnomer, since recent analyses reveal that three metals were involved, namely thin sheets of gold and iron pinned onto a core which was made of bronze.²⁷

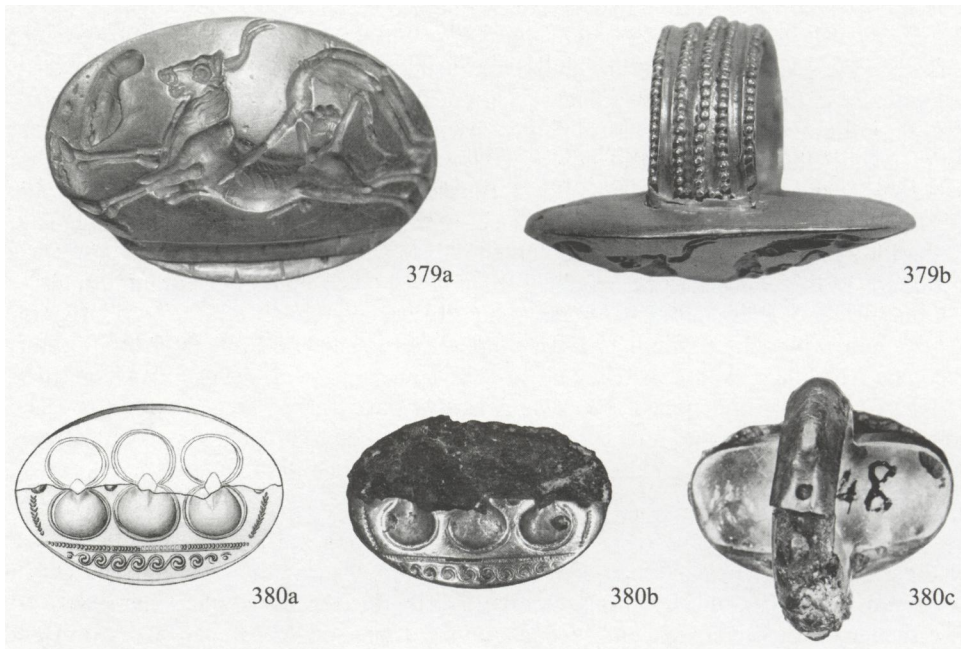
²³ *Minoan Crafts I* 162-67 provides useful comments on tools and techniques, but follows *GGFR*² in matters of dating and style (not generally accepted: see above n. 11).

²⁴ *PM IV* 594-95, figs. 589-90. The evidence is thoroughly discussed by J. G. Younger, *BSA* 74 (1979) 258-68; see also N. Momigliano & S. Hood, *BSA* 89 (1994) 134-37.

²⁵ See Chapter 6. For date and authenticity of the Ashmolean ring (379) see Chapter 11.

²⁶ I. Pini, *BICS* 42 (1997-98) 210. Sellopoulo: Popham et al. (n. 8) 219, 222, fig. 14H, pl. 37g (J6). Kalyvia: L. Savignoni, *Monumenti Antichi* 14 (1904) 592, fig. 53.

²⁷ W. Müller, in *Metron* 150, pl. 32g-j (x-rays); 477-78, table 2, pls. 101f, 104h (gold-iron ring). This supersedes earlier accounts, e.g. *CMS* II.3 p. 131 (bezel thought to be coated half in silver, half in gold); A. Xenaki-Sakellariou, in *CMS Beiheft* 3 (1989) 327-28 (Type VI); J. G. Younger, in *Aux origines de l'hellénisme* 87-89 (Type VII).



Selected LM II-III signet rings. **379a-b** Gold ring with hollow bezel from 'Archanes', now in Oxford; face and profile. **380a-b** 'Bimetallic' ring from Kalyvia T. 10; restored drawing of motif, face and reverse. The term 'bimetallic' is a misnomer, since the ring consists of a bronze core covered with gold and iron (now badly corroded). Scale 3:2.

Iron was an extremely rare material in the Bronze Age and, although now disfigured by heavy corrosion, the contrasting metals must once have made a fine show. Another ring variety consists of a flat bronze core set into a cup of gold foil or sheet and covered with an equally thin gold bezel.²⁸ Rings of this kind differ markedly from LM I bronze signet rings, where the motif was engraved and punched directly onto the bezel. Now, the decoration was applied to the flimsy gold sheet, with the core merely serving as a support. Whether the decorated bezels were sufficiently robust for sealing purposes is another matter. Several complete examples were found at Archanes Tholos A, while bezels alone survive from Knossos Sellopoulo Tomb 4 and Kalyvia.²⁹ A complete ring of this variety, now in the Benaki Museum, apparently comes from Thebes (470) and 'bi-metallic' rings have been found in the Argolid (see Chapter 9). Although one suspects these two varieties are later than the classic hollow signet rings, it is impossible to date any examples more precisely than LB II-III.

²⁸ Müller (n. 27) 477, pl. 101e (hollow ring with gold-plated bezel) superseding earlier accounts, e.g. Xenaki-Sakellariou (n. 27) 327 (Type V); Younger (n. 27) 87 (Type VI)

²⁹ *Archanes* II 660-61, figs. 726-28: three examples each decorated with figure-of-eight shields. Sellopoulo: Popham et al. (n. 8) 219, 223, fig. 14E, pl. 37f (J7: couchant griffin). Kalyvia T. 9: Savignoni (n. 26) 520-22, figs. 11-12 (two examples: running bull, couchant griffin).

By and large the motifs on our LM II-III rings and ring impressions are unexciting, far removed from the ambitious compositions of the neo-palatial period. There is a complete absence of cult scenes and combats; indeed aside from bull-leapers, human figures are all but non-existent. Processions of male figures carrying figure-of-eight shields prove to be LM I heirlooms and not late motifs indicative of a Mycenaean presence at Knossos.³⁰ The late sealings also include several types depicting figure-of-eight shields and ‘sacral knots’. These offer little scope for stylistic dating, but similar motifs occur on surviving LM II-III rings, including the gold-iron ring from Kalyvia (380), a classic hollow signet ring from Archanes Tholos A, and three flimsy rings from the same tomb.³¹ Among the late sealings we also find a few unadventurous animal scenes (443-444). A spectacular griffin attack (416) provides the sole exception to an otherwise humdrum series. Although the repertoire of motifs used on hard and soft stone seals also contracts in LM II-III, in the case of metal signet rings the decline seems swift and dramatic.

MOTIF, COMPOSITION, STYLE

During the neo-palatial period Aegean glyptic had reached its acme. The repertoire of motifs was rich and vibrant, inspired by the human and natural world. Variety was added through pose and composition; mastery of tools and techniques further contributed to stylistic diversity. On almost every count, LM II-III witnesses a decline. There is a marked contraction in glyptic iconography and human figures become noticeably infrequent. In animal studies pose and composition become increasingly divorced from nature, as do the conventions for rendering anatomical features – now often produced by undisguised cutting wheels and drills. But there are gains as well as losses. New hybrid creatures called ‘minotaurs’ enrich the repertoire and many LM II-III seals are both technically excellent and striking in appearance. In the following sections we will focus on trends in the hard stone; seals of soft stone are treated separately below.

The Cut Style

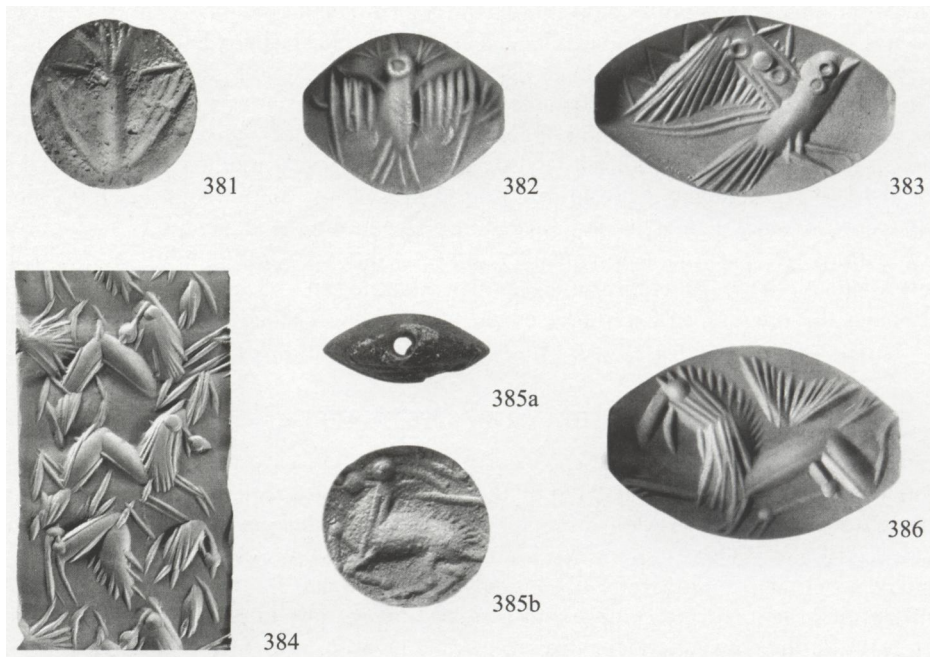
In terms of technique the Cut Style is often seen as the natural successor to the ‘talismanic’ style, for both rely heavily on the undisguised use of rotary tools.³² But thereafter similarities abruptly end. The inanimate objects, marine creatures and weed-like fillers so popular in the ‘talismanic’ style are abandoned. Although birds and goats are retained and new motifs – lions and griffins – added, the repertoire is very limited indeed.³³ Poses are likewise few in number. Running goats with bristly backs are usually speared and are found on lentoids (40, 385b). Lions are usually recumbent, sometimes occurring in pairs, back-to-back; these regularly appear on amygdaloids (341, 386, 477).

³⁰ *CMS* II.8 nos. 276-278; for dating see I. Pini, *ibid.* p. 145.

³¹ For the flimsy rings from Archanes see n. 29. For the ring with hollow bezel: *Archanes* II 660, fig. 725. The hoop of this ring has longitudinal ribbing, a feature also found on LB II-III rings from the mainland (e.g. 466). Seal-types from Knossos include: *CMS* II.8 no. 126 (‘sacral knots’: lentoid) and no. 127 (‘sacral knots’ and shields: ring). Although Pini regards these as LM I, there is no evidence for figure-of-eight shields or ‘sacral knots’ serving as *principal* motifs (as opposed to elements within combat and cult scenes) in that period. The conventional name ‘sacral knot’ is probably a misnomer; the items often resemble flounced skirts (cf. *CMS* II.7 no. 7, here 22).

³² The Cut Style was first identified by Boardman, *GGFR*² 47-48, 412. For a thorough appraisal and earlier references, see now: I. Pini, in T. Mattern & D. Korol (eds.), *Munus: Festschrift für Hans Wiegartz (Scriptorium 2000)* 209-20, pls. 54-55.

³³ See lists in Pini (n. 32) 219-20.



Selected Cut Style seals from the Dictaeon Cave (**381**, **385**), Knossos Isopata T. 1a (**382**), 'Kritsa' (**383**), Knossos New Hospital T. III (**384**), and 'Tzermiadon' (**386**). **381** and **385** are made of glass; the remainder are hard stone. Impressions and profile (**385a**). Scale 3:2. Although Cut Style seals are well represented at LM II-III Knossos, increasing numbers are now attested in secure LM IB contexts. Whether production actually continued into LM II-III, as previously thought, is not certain.

Griffins are shown in profile with wings displayed behind (**476**). Birds show the most variety – sometimes depicted frontally, wings outstretched, sometimes in profile – and are hardest to distinguish from their 'talismanic' cousins (**381-383**, **475**; **C32-C33**).³⁴ With its limited repertoire and distinctive technique the Cut Style is easy enough to recognize. The smooth bodies have little modelling; the underbelly, back and neck are sometimes marked with a contour line. The cutting wheel was also responsible for spindly legs, bristly hairs on the backs of goats, shaggy manes on lions, and spiky plumage on birds and griffins. Sometimes wheel-cut fillers are found: bushy plants behind lions or zigzags above griffins. But unlike the earlier 'talismanic' style, drills are used sparingly – for eyes and sometimes for joints and wing-markings (e.g. **383**, **476**).

As we have already seen, this style had certainly developed before the end of LM IB (Chapter 6). Indeed one of the most 'active' seals at Khania (**341**) depicts Cut Style lions back-to-back, while several birds at Ayia Triada hover somewhere between the new style and the older 'talismanic' tradition. The style seemingly persisted into LM II and is also attested on the mainland and the islands of the Aegean (see Chapter 9). Good examples occur in LM II-III contexts at Knossos, including three from the Unexplored Mansion

³⁴ Frontal birds with displayed wings were classed as 'talismanics' by Onassoglou (*DtS* 138-52), but are better regarded as Cut Style, since drill-work is negligible and typical 'talismanic' fillers are also absent (cf. **233**). See also Pini (n. 32) 210-13.

and one from Isopata Tomb 1A (40, 382).³⁵ A carnelian cylinder from New Hospital Tomb III depicts a complex motif with lions, a wild goat, and a water-bird (384). Sometimes motifs outside the normal repertoire display affinities with the Cut Style. This applies to the complicated scene on another carnelian cylinder from Knossos, where a lion chases a wild goat, a griffin chases another quadruped (perhaps a calf?) and a dolphin fills the centre of the field.³⁶ Such multi-figured compositions are not especially successful and the Cut Style is at its best in single figure studies. However, no style exists in a vacuum and this is certainly true for the Cut Style, which in reality is a technique associated with a limited range of motifs. Just as the boundaries between the ‘talismanic’ style and naturalistic renderings were sometimes blurred (Chapter 6), the same holds good for the Cut Style and its contemporaries.

‘Naturalistic’ motifs

The reliance on undisguised marks from rotary tools to create stylistic effects is not confined to the Cut Style; indeed it is merely part of a wider trend in Aegean glyptic at this time.³⁷ The powerful animals of LB I-II with richly modelled musculature and detailed renderings of veins and joints eventually disappear. Instead we increasingly find bodies rendered as a series of smooth planes or facets, legs as stick-like appendages with dotted joints, prominent eyes and bulbous muzzles created by solid and tubular drills.³⁸ But these new conventions do not replace the older naturalistic approach all at once and conflicting tendencies can sometimes be discerned on the same seal. A three-sided prism from New Hospital Tomb III provides an interesting example (372; see also pp. 325).

While drills were used only sparingly in the Cut Style, they seem to become *de rigueur* in the animal studies of LM II-III. For instance, the frontal head of a lion at Zapher Papoura (377) is created by four solid dots – a large pair for the eyes, a smaller one for the nose and a fourth to mark the back of the head or occiput. Sometimes animals have unduly swollen cheeks, as if suffering from mumps: the solid drill is again responsible (402). Animals frequently have dotted joints and feet; even human figures are not immune, as illustrated by the bull-leaper on a lentoid of lapis lacedaimonius in the

³⁵ *MUM* 188-89, pls. 184c-d, 185a (LM II context). Isopata T. 1A was plundered, but contained LM IIIA1 sherds. Another example (*CMS* II.3 no. 61) comes from the Gold Cup tomb, usually dated LM IB-II, though no painted pottery was found. It is generally supposed that production of the Cut Style continued through LM / LH II-III A1. But the surviving repertoire, though widely dispersed, is rather small. And, as additional examples from secure LM IB contexts come to light, one is forced to consider whether those in LM II-III A1 contexts are heirlooms (see Chapters 6, 9).

³⁶ *CMS* VII no. 94 (here 605). Pini (n. 32) 217 places it at the border of the Cut Style (wrongly listed as *CMS* VII no. 45). The cylinder was presented to the British Museum by A. W. Franks in 1880, along with the large amygdaloid *CMS* VII no. 87 (FRONTISPIECE; 604; C30), with the provenance ‘Gnosus’ (Chapter 11). Yet another Cut Style cylinder, of lapis lazuli, was recovered by Sinclair Hood on the Royal Road, apparently from a LM IB context. It depicts a griffin, two lions, a deer and a water-bird (unpublished; mentioned in *MUM* 188 and by Pini [op. cit.] 211).

³⁷ Many LB II-III motifs employ conventions and poses that are highly artificial, yet they are still classed as ‘naturalistic’ (in inverted commas). While the term is not really satisfactory, the more neutral expression ‘pictorial motifs’ is even less suitable, for the Cut Style and, to a lesser extent, the ‘talismanic’ style also employ motifs that are pictorial or representational, albeit rendered in a stylized manner, deploying a narrow range of technical conventions. See also Chapter 9.

³⁸ See J. G. Younger, *Kadmos* 24 (1985) 50-52; idem, *Kadmos* 25 (1986) 121-38. His concordance (*Kadmos* 28 [1989] 101-36) will allow readers to pursue specific seals that I discuss in the following sections. The usual provisos regarding dating and attributions apply: see also below n. 39 and Chapter 11.

Ashmolean Museum (394). Prominent eyes that appear to wear spectacles or bulge unnaturally are very popular indeed. Some are simply a large solid dot, others a dot-on-dot involving two drills of different sizes, while the spectacles were created by a tubular drill encircling a solid dot.³⁹ Tubular drills also sometimes provide fillers in the field (375, 403). Since these conventions were combined and re-combined on a wide range of types, they do not constitute a single 'style', as is readily apparent from a glance at the impressions shown in 372-378 and 387-408. While some engravers achieved a striking balance between the smooth-bodied animals and their boldly drilled eyes, muzzles and joints, others carried the conventions to excess (405a-b). Although prevalent in LM II-III these conventions can also be found on the mainland. Nevertheless, prominent eyes are extremely popular on Crete and may well have been invented there.⁴⁰

Human figures

Representations of human figures decline sharply during LM II-III. Some losses are hard to comprehend, though the absence of complex cult scenes – processions, offerings and epiphanies – may be attributed to the collapse of neo-palatial society. In their stead depictions of the Mistress or Master of Animals, flanked by various creatures of the land, sea or sky, gain in popularity (cf. 3). On the large lentoid from New Hospital Tomb III (373), the *Potnia* wears an elaborate head-dress or mask – conventionally called a 'snake-frame' but resembling bull's horns – surmounted by a double-axe.⁴¹ A lentoid in the Ashmolean Museum from the Dictaeon Cave and another from Ialysos, with flanking griffins in the Cut Style, offer good parallels. All three seals are exceptionally large, about 3 cm or more in diameter. A pair of carnelian lentoids from CT 515 at Mycenae depicting the *Potnia* surmounted by 'snake-frame' and flanked by lions must be more or less contemporary (33-34; Chapter 9). Lions are by far the most common attendants in LB II-III and usually flank a male figure (without attributes) as seen in a seal-type from Knossos (410).⁴² Mastery of the natural world is also implied by motifs which depict a standing male figure and tethered lion or griffin. This composition has its roots in the neo-palatial period, but continues into LB II-III.⁴³ A carnelian amygdaloid from the Mavrospelio cemetery at Knossos provides a good example (387).

During LB I-II chariot, hunt and combat scenes had formed a small but striking part of the glyptic repertoire. Though sometimes regarded as archetypal Mycenaean themes, good examples occur in the LM IB sealing deposits (Chapter 6). Strangely, chariot scenes and combats all but disappear after LB I-II and hunts are very rare indeed. An agate lentoid, now in Oxford but acquired in the Mirabello region, provides an example (388).

³⁹ W. Müller, in *CMS Beiheft 6* (2000) 186-90, figs. 3-5, provides an instructive series of enlarged photographs illustrating the different drill marks. As Müller observes, many of Younger's 'Speckies' fail to meet his own definition, i.e. a 'spectacle-eye' created by a hollow drill encircling a single dot (Younger 1986 [n. 38] 121). See also Chapter 11.

⁴⁰ This seems a reasonable inference from their concentration on the island and especially at Knossos: Younger 1986 (n. 38) 131. Whether it is appropriate to link these stylistic features to a new administration in LM II-III is quite another matter: Younger (n. 11).

⁴¹ R. Hägg & Y. Lindau, *OpAth 15* (1984) 67-77. Their table 1 and fig. 1 assemble other seals depicting the *Potnia* wearing a 'snake-frame'. None can be dated earlier than LM / LH II on grounds of context or style, but Hägg & Lindau argue that the 'snake-frame' had developed into an emblem of the goddess by LM IB and an oversized stucco version was installed in the East Hall at Knossos (ibid. 75-77).

⁴² Cf. 484. For further examples see Müller (n. 39).

⁴³ See Chapter 6 (e.g. 207); also Krzyszkowska (n. 16) 201 and nn. 21-22.



Selected LM II-III hard stone seals depicting male figures and the Minoan genius from Knossos Mavrospelio T. 3 (387), 'Mirabello' (388) and 'Crete' (389-391). Impressions. Scale ca 3:2.

Here the contorted pose of the wild goat and prominent eye marks it out as a LM IIIA product. In the field between the hunter's legs is a *bucranium*. Equally rare in the surviving LM II-III repertoire are the related themes of the hunter accompanied by dog or carrying his kill. On a blue chalcedony cushion with gold caps from Isopata Tomb 1 (375) we find two male figures dwarfed by a huge collared bulldog. The imagery may seem a trifle confusing, for it apparently echoes motifs where outsized lions are controlled by male figures, thus surely variants on the Master of Animals theme (e.g. 387). Though the males on the cushion hold no weapons, an allusion to the hunt seems probable and overly large hunting dogs re-appear in Mycenaean frescoes.⁴⁴

A further allusion to the hunt may recur on a unique seal-type (409), where a male figure carries a boar and kid suspended on a pole.⁴⁵ Close in composition is an agate lentoid in Berlin, which depicts a Minoan genius carrying a pair of lions on a pole (390). While the involvement of the genius with hunting or sacrifice has its roots in the preceding period (e.g. 274, 450), several new motifs now appear. Sometimes the creature bears an animal across its shoulders (391, 599) – adopting a role previously played by female figures – or stands in for a male figure leading a tethered bull, as if to sacrifice (389, 600).⁴⁶ In an *apparent* departure from neo-palatial imagery, we now occasionally find explicit scenes of animal sacrifice. A seal-type from Mallia (447b) shows a male

⁴⁴ E.g. at Pylos and Tiryns: *Aegean Painting* 197, 202, pls. 68, 74.

⁴⁵ A much earlier version of the subject occurs on a steatite prism CS no. 36a.

⁴⁶ Compare 252, 488 (female figures and goats) and 337 (male leading bull). Cf. also 420 and 603 where the composition is adapted further to depict a lion and goat. A curious lentoid of lapis lacedaimonius found at Patras depicts a Minoan genius carrying a male figure (alive or dead?) over its shoulder (see 531 and Chapter 9).



Selected LM II-III hard stone seals depicting bull-leaping from 'Crete' (392) and unknown provenance (393-394). Impressions. Scale ca 3:2.

figure reaching over the back of a large trussed bull on an offering table. The motif calls to mind the sacrificial scene on the Ayia Triada sarcophagus.⁴⁷ Several fragmentary sealings from Knossos also depict animals on offering tables, but we cannot be sure that humans were shown as well. In all about a dozen sacrificial scenes exist (most with animals alone) and are equally divided between Crete and the mainland, making it hard to establish the origin of the motif or the practice.⁴⁸

Whatever doubts we may harbour about the practicalities of bull-leaping, the scenes on our LM I signet rings are among the finest examples of Minoan naturalism. The leapers are shown in two main poses: vaulting over the bull's head or soaring gracefully over its back (368-369). Two seal-types from Knossos, the Ashmolean ring described above and several rings from the Greek mainland show that these poses persist into LB II-III.⁴⁹ But small agile leapers with flowing locks and athletic postures are a thing of the past: the Ashmolean leaper is an altogether larger figure, with short curly hair and heavy lifeless limbs, which echo the curving edge of the bezel (379a). An unidentified object (perhaps a 'sacral knot') in front of the bull looks suspiciously like a filler, intended to balance the composition. With its overlarge eye and elongated muzzle the bull seems a good deal tamer and more artificial than his magnificent LM I predecessors. The striated neck is a convention found on other bulls in LB II.

On seals a new pose – known as the 'floating leaper' – gains popularity during LB III. The most distinctive examples – lentoids made of lapis lacedaimonius or haematite – come from Crete (392-394; C38).⁵⁰ Unlike the earlier 'naturalistic' poses, the floating leaper is unashamedly artificial, his limbs arranged to fit the field. The bulls no longer charge, but prance with their triangular heads shown frontally. In common with other LB III animals, their bodies are lean, their joints and eyes dotted (see below). The artificial

⁴⁷ *Aegean Painting* 100-02, pl. 51. The tomb is now dated to the beginning of LM IIIA2, see: V. La Rosa, in V. La Rosa et al. (eds.), *Επί πόντον πλαζόμενοι* (Rome 1999) 177-88.

⁴⁸ See also Chapter 9 (e.g. 504). For comparanda and bibliography see *CMS* II.6 no. 173. Add *CMS* II.8 nos. 480-482. None of the seals can be dated more closely than LB II-III. In *CMS* II.6 p. xlviii Pini dates no. 173 to LM II-III(?). But one cannot exclude the possibility that it is earlier (i.e. LM I-II). The impressions on the Mallia stopper are not as clear as the drawing implies (here 447b).

⁴⁹ *CMS* II.8 nos. 222-223 (the latter wrongly assigned to a MM IIIB deposit in *PM* I 686, fig. 504d). For the mainland, see Chapter 9 (495). For the authenticity of the Ashmolean ring, see Chapter 11.

⁵⁰ A. Tamvaki, *AAA* 6 (1973) 308-15; also Younger 1986 (n. 38) 136-37. Cf. an amygdaloid made of haematite, now in London, depicting two male figures and a bull (602). For representations of bull-leaping and bull games generally, see: J. G. Younger, in *Politeia* 507-45.



Selected LM II-III hard stone seals depicting 'minotaurs' from the Dictaeon Cave (395), Knossos Sellopoulo T. 1 (396), 'Phaistos' (397), 'Crete' (398) and 'Cyprus' (400). Impressions. Drawing of seal-type from the Queen's Megaron, Knossos (399). Scale ca 3:2.

pose inevitably raises the question as to whether bull-leaping was still practised in the Aegean during this era. But neither the seals nor the late frescoes at Knossos or the mainland palaces can offer conclusive proof.⁵¹

'Minotaurs'

Among the most striking images in Aegean glyptic are the 'minotaurs', strange creatures combining human and animal parts, which appear during LM II-III.⁵² Ordinarily they have the lower limbs and waist of a man, joined to forequarters and head of an animal. This is frequently a bull – hence the conventional term 'minotaur' – but sometimes the forequarters of a wild goat, stag or lion are found. They usually appear in contorted poses, in common with contemporary animals and perhaps also reminiscent of bull-leaping (see above). Thus on a seal from the Dictaeon Cave, now in Oxford, the legs, body and head of the minotaur arc round the seal face in a circular composition (395). A seal in London (398; C37) shows a curious variant: the forequarters of a wild goat and a bull conjoined to a single pair of human legs walking in profile. The composition is reminiscent of types involving a central figure, usually a Minoan genius, which carries a pair of animals on poles or a single beast slung over its shoulder (e.g. 390-391). Here the goat's head (shown in profile with prominent spectacle eye) and the frontal bull's head

⁵¹ While the artificial poses on the seals suggest that an image from the past is being repeated without first-hand knowledge of the game, many LB II-III animal studies are equally artificial (see below). Stylization is a widespread phenomenon in this period, not confined to glyptic. For bull-leaping on LB III frescoes: *Aegean Painting* 175, 190, 196, 202, pls. 41, XVI-XVII.

⁵² N. Schlager, in *CMS Beiheft* 3 (1989) 225-39; Younger (n. 11) 350.

with dotted eyes hang down either side of the human legs. On a sealing from Knossos, the forequarters of two goats are joined to the running legs of a male (399). Then, in a further iconographic twist, 400 shows the torso and head of a Minoan genius, human legs wearing a kilt and running in profile, joined at the waist to the forequarters of dogs, arranged antithetically! Although acquired on Cyprus, the seal is certainly an Aegean product.⁵³ Like several seals in this group, it is made of haematite, as is 397; others occur in lapis lacedaimonius (395, 398) and agate (396). Sometimes the 'minotaur' seals include fillers such as twigs, stars, figure-of-eight shields, or 'impaled triangles'. Since they occur on other LM II-III seals, it is difficult to know whether they have any special significance. The 'impaled triangle' is especially intriguing; although it resembles the Linear B ideogram for wheat, GRANUM, its occurrence on seals of this period defies explanation (cf. 412, 414, 441, 602).⁵⁴ For that matter the 'minotaurs' are equally hard to comprehend. They have no clear antecedents in neo-palatial glyptic, even among the Zakros fantasy creatures, and their production during LM II-III was probably short-lived. Only five seals from this group were found on the mainland and, as noted, one reached Cyprus.⁵⁵ Most examples were acquired on Crete by early collectors; several come from Knossos itself. This certainly seems the most likely home for the motif, but why it was created remains a matter for speculation. Equally enigmatic is the later history of the minotaur. It is the only purely Aegean hybrid creature to survive into the Early Iron Age.⁵⁶ But is survival the correct term? Or was it the re-discovery of old Cretan seals which prompted the revival of the imagery and the creation of the minotaur legends?

Animals and hybrids

Animals dominate the iconographic repertoire during LB II-III. Most frequently represented are cattle, goats and lions, along with a few deer, dogs and boar. Gone are marine creatures, such as fish, octopods and nautili. Monkeys, which had played a special role in neo-palatial religious iconography, and cats (which did not) likewise disappear. Birds persist into LM II, chiefly in the Cut Style, but thereafter vanish, as do butterflies and dragonflies. The natural world of Minoan Crete is a thing of the past. We see similar losses in fresco with the abandonment of nature scenes, but marine creatures and birds see a revival on LM III pottery and larnakes,⁵⁷ which makes their absence in the glyptic repertoire all the more striking. Among the hybrids, the griffin remains a firm favourite (e.g. 415-416) and the Minoan genius is still active (see above; 389-391, 405b, 446, 599-600). The absence of sphinxes and the Minoan 'dragon' may be mere chance, since they are found on the mainland and decorate LM II-III ivories.⁵⁸

Animals continue to stand, walk, run and recline during LM II-III but rarely do engravers manage to capture that indefinable sense of movement and life which had

⁵³ CMS VII no. 126. I. Pini, in G. C. Ioannides (ed.), *Studies in Honour of Vassos Karageorghis. Kypriakai Spoudai* 1990-91 (Leukosia 1992) 207-210 no. 4. See also Chapter 10.

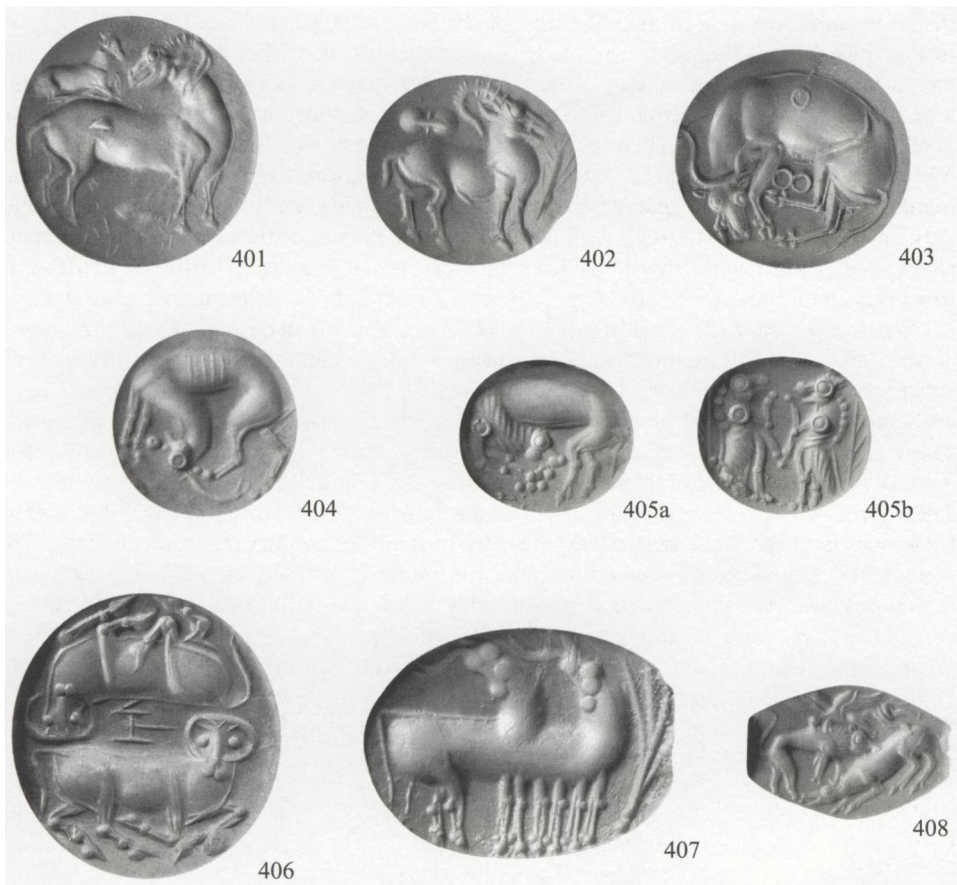
⁵⁴ M. A. V. Gill, *Kadmos* 5 (1966) 11-15; Younger (n. 11) 350.

⁵⁵ CMS I nos. 77 (Mycenae), 216 (Prosymna); V Suppl. 1B no. 159 (Patras); V Suppl. 2 no. 112 (Elateia); V Suppl. 3 no. 223 (Midea: agate cushion). For CMS VII no. 126 from Cyprus see n. 53.

⁵⁶ Schlager (n. 52) 225-26 provides references to Archaic and Classical representations.

⁵⁷ *Minoan Pottery* 161-62, 167-68.

⁵⁸ See Chapter 9 (e.g. 489, 530). J.-C. Poursat, *Les ivoires mycéniens* (Paris 1977) 59, 64, pls. 8.7, 10.5-6 (sphinxes); idem, in *BCH* 100 (1976) 468-74 (for crocodiles rather than 'dragons' on LBA ivories); also J. Phillips, in C. J. Eyre (ed.), *Proceedings of the Seventh International Congress of Egyptologists*. *Orientalia Lovaniensia Analecta* 82 (Leuven 1998) 849-62.



Selected LM II-III hard stone seals depicting animals from Knossos Isopata T. 3 (401), Kalyvia (402-403, 405a-b), 'Siteia' (406), Phylaki Apokoronou (407-408) and unknown provenance (404). Impressions. Scale ca 3:2.

characterized LM I naturalism.⁵⁹ Then animals often stood legs outstretched, as if about to spring into action (263-264). Now they usually stand stiff and straight-legged, movement constrained by fillers, such as figure-of-eight shields, 'impaled triangles' or plant-like motifs (e.g. 402, 442). The flying gallop all but vanishes, not least because it better suits elongated fields. Since amygdaloids, cushions and oval rings are now rare and the lentoid reigns supreme, there is a concomitant impact on pose and composition. Nevertheless, many favourite poses of the past continue to be deployed by LM II-III engravers. Goats still occasionally run with their forelegs bent as they had done since the proto-palatial period (35-42). But if we look more closely at the seal from Sellopoulo (41; cf. 441) we see important changes: the head is turned back, the spear has become a plant-like filler, and even the species has undergone a transformation. Perhaps the short beaded

⁵⁹ *Iconography* 1-3, though the schematic pose-types relate to LBA glyptic generally.

horns are meant to indicate a domesticated animal; certainly the gracefully arched horns of the *agrimia* are now less commonly found. Bulls sometimes adopt the same pose. In bull-leaping scenes there is no doubt as to their identity, but some of our LB II-III cattle are so long-horned and lean that distinguishing them from goats can be tricky, especially when shown in profile. Tails offer the best clues: long for cattle (407, 442), short for goats (41, 401-402, 441). Nevertheless, some LM II-III bulls are undeniably beefy (372c, 374, 376; cf. also 445), which simply underscores the danger of making sweeping generalizations in the face of such glyptic diversity. And, as already stressed, we cannot be certain that all seals found or used on Crete during this period were actually made there. The seal depicting couchant bulls back-to-back from Knossos (374) helps to illustrate this point. While the motif itself can be traced back to LM I, it gains popularity during LB II-III (e.g. 511-512; Chapters 9, 11). Most examples that have a known provenance come from the Greek mainland and we cannot entirely rule out the possibility that 374 was engraved there too.⁶⁰

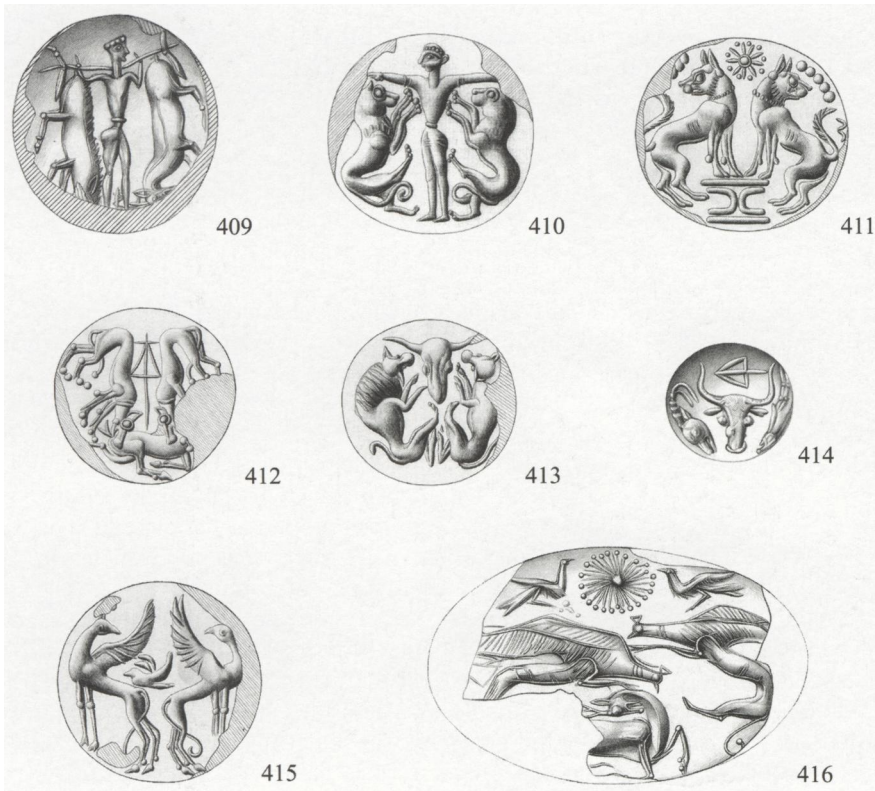
Contorted and artificial poses become increasingly common in LB II-III animal studies. These have their origins in the preceding period, when animals twisted and turned to remove painful darts from their sides, to scratch fleas, lick hind-legs, or nurture young.⁶¹ Then there was a clear reason for their contortions, now the prime concern seems to be filling the circular field (e.g. 404). Perhaps most effective are the contorted poses of 'minotaurs' (e.g. 395-397), which conjure up memories of bull-leaping. But the results are not always so happy. Heads turned sharply below the belly, behind the back or even across the flank can lead to awkward transitions or misjudged proportions. Yet artificial compositions can be striking as the attack scene on 377 from the Gold Cup tomb shows. Here the animals are arranged in a so-called chiasmic scheme, which is popular during LB II (cf. 32). Indeed animal attacks – like human combat scenes – flourish chiefly in LB I-II glyptic. Though later examples do occur, they are no longer directly inspired from nature. A small amygdaloid from Phylaki Apokoronou (408) reveals a dog-like lion attacking the back of a stag, while above a griffin springs from the hindquarters of the stag to attack the back of the lion. There is virtually no free space in the field – indeed the same *horror vacui* can be found in much LB II-III glyptic. A seal-type from Knossos depicts another artificial attack scene (412). Here a pair of outsized dogs, arranged back-to-back either side of an 'impaled triangle', bite into the hindquarters and neck of a running quadruped.

By far the most complex animal attack from LM II-III Crete occurs on two fragmentary sealings from Knossos (416). Happily, most of the scene can be reconstructed to show a running deer with its head turned sharply back, set upon by a pair of winged griffins. These are surmounted by a central 'sun' motif, flanked by a pair of water-birds.⁶² This is generally regarded as the latest ring impression known from Crete, datable on stylistic grounds to LM IIIA1 or IIIA2. Noteworthy are the antithetical arrangement of the birds, the lean bodies of the animals, and the strongly upturned hind-legs of the right-hand griffin (cf. 410, 413). Another impressive griffin attack, of similar date, appears on a ring used at Pylos in LH IIIB2 (573; see Chapters 9-10).

⁶⁰ I. Pini, in *CMS Beiheft* 6 (2000) 245-55, esp. 253-54, n. 57, fig. 8. See also Chapter 11.

⁶¹ See Chapter 6 and 265-266, 271-272; 338-339.

⁶² The 'sun' motif, flanked by water-birds, may represent Eastern influence: see I. Pini, *Pepragmena* 3 (1973) A' 221-30; idem, *Φίλια Έπη εις Γεώργιον Ε. Μυλωνάν* (Athens 1986) A' 300-03, esp. 301-02. For further bibliography and comparanda see now *CMS* II.8 no. 192; a similar 'sun' motif occurs on *CMS* II.8 no. 326 (here 411).



409-416 Drawings of selected LM II-III seal-types from Knossos displaying symmetrical or balanced compositions. Scale ca 3:2.

Various kinds of symmetrical compositions are popular in LB II-III. Sometimes animals are arranged *tête-bêche*, that is, back-to-back and head-to-tail, as on a lentoid of lapis lacedaimonius from Siteia, which depicts frontal-faced running bulls separated by an 'impaled triangle' (406). Sometimes they occur in mirror image, as on a sealing from Knossos, with a pair of svelte griffins and small bird flying centre field (415). Other kinds of antithetical compositions have a prominent central motif flanked by balanced (if not identical) elements. Several good examples occur among the late sealings at Knossos. On 414 we find a frontal bull's head or *bucranium*, surmounted by an 'impaled triangle' and flanked by the heads (skulls?) of a goat and a deer, while on 413 a bull's head is flanked by a pair of lions, seemingly suspended in mid-air. The pose of these lions, with their wasp-waists and hind-legs turned up toward their bellies, occurs on other LB II-III representations. At Knossos a good parallel is afforded by the lions on 410, where they are grasped by a central Master of Animals. Last, but not least, among the antithetical compositions at Knossos is 411. Here we see a pair of collared dogs with heads turned back and front paws on a Minoan altar with incurved sides. A well-known parallel from Mycenae, near contemporary in date, shows a pair of lions sharing a single frontal head (505). But before we rush to ascribe the Knossian seal-type to mainland influence, we would do well to recall that good neo-palatial antecedents exist (e.g. 276).

Soft stone seals

Tracing the development of soft stone seals in LM II-III is no easy matter, for we have to contend with scholarly prejudice on top of unsatisfactory archaeological evidence. The prejudice goes back to Evans and was perpetuated by later scholars, who equated the use of soft stone with 'decadence' and a late or post-palatial date (i.e. LM IIIB-C).⁶³ However, more recent studies have rightly stressed the importance of soft stones in neo-palatial glyptic and publication of the LM IB sealing deposits in the *CMS* has refined our knowledge further. Indeed about 20% of our LM IB sealings were impressed by soft stone seals and, if anything, the figure in circulation may have been somewhat higher.⁶⁴ Alongside naturalistic studies, we also find a fair share of poorly executed pieces, which effectively counters earlier claims equating crude workmanship and late date.

The iconography of neo-palatial soft stone seals was astonishingly varied, covering the human world with its processions and cult scenes and the natural world with its birds, animals, and marine creatures. Also depicted were hybrids like griffins and the Minoan genius, not to mention the fantastic creations of the Zakros workshop (Chapter 6). The LM IB destructions dealt a fatal blow to this imagery – so much is clear. But what happens to soft stone workshops in the immediate aftermath of the destructions is uncertain. Very few soft stone seals occur in central Cretan burials dating to LM II-III A1/2. While this absence of evidence has interesting social implications (p. 215), it denies us a basic framework for assessing questions of continuity and change in soft stone output. And although some of the late sealings at Knossos were impressed by soft stone seals, they do little to elucidate developments during LM II and early LM IIIA. The same applies to the Armeni cemetery, just outside modern Rethymnon, which provides our best evidence for LM III soft stone seals. Here the earliest burials may go back to LM II-III A1, but the main use of this cemetery was somewhat later, i.e. LM IIIA2-B.⁶⁵

It is possible, but by no means provable, that there was some disruption in the engraving of soft stones in the wake of the LM IB destructions. In any case, during LM II-III, the iconographic repertoire contracts sharply; humans are rare, quadrupeds – mostly cattle and goats – the mainstay. Thus the losses are even greater than among hard stone seals, where possible influence from the mainland and local innovations (e.g. 'minotaurs') helped reinvigorate the repertoire. Nevertheless, in pose and composition, our late soft stone seals betray influences from contemporary products in hard stone. As already noted, running goats are transformed in LM III, having short beaded horns and back-turned heads (cf. 41). Standing goats are far more common and good examples occur at Armeni (e.g. 43, 419; cf. also 595).⁶⁶ They usually have elongated noses, large open jaws, swollen chests and high rounded rumps. And although the animal itself seems too large for the field, subsidiary fillers – usually plant motifs – cram the remaining space. A carnelian lentoid from Kalyvia (402) displays similar features. Other elements borrowed from hard stone seals include prominent eyes, dotted joints, and figure-of-eight fillers (418-419, 423, 595). But it is worth stressing that even among the Armeni seals

⁶³ See Chapter 6, esp. n. 21; also Chapter 11 (pp. 319, 321).

⁶⁴ I. Pini, in *CMS* II.6 p. xxiv (for LM I sealings impressed by soft stone seals). Since a data-base for Aegean glyptic does not yet exist, estimating overall frequency is difficult. See also Chapter 6 (esp. pp. 124, 147-48) and Chapter 7 (esp. pp. 154-55).

⁶⁵ The Armeni Cemetery remains unpublished, but useful information on finds and dating appears in *CMS* V pp. 185-88; V Suppl. 1B pp. 205-14; V Suppl. 3 p. 475.

⁶⁶ For LM III goats and bulls, including further examples from Armeni, see: W. Müller, in *CMS* Beiheft 5 (1995) 158-62, 163-67, figs. 5, 7-10, 12-14.



Selected LM II-III seals made of soft stone (417-423), bone (424) and fluorite (425). All come from the Armeni Cemetery except 421 (unknown provenance). Impressions. Scale ca 3:2.

there is no uniformity in style:⁶⁷ compare the standing bull on 418 and the lean running animal on 417. Yet another kind of bull – ponderous and fleshy – appears on several seal-types at Knossos (445). Occasionally we find more ambitious compositions, such as animal attacks. As in the hard stone repertoire, these are increasingly divorced from nature (421). An attack (or its aftermath?) is also implied on 420, where a standing lion seemingly holds a goat in his outsized muzzle.⁶⁸ Hybrid creatures are very rare indeed and their characteristics seem at best half-remembered. The goat-like griffin (?) on 423 provides a good example: only the beaky head and wing mark it out as a hybrid. Of exceptional interest is 422, which depicts a female figure with raised arm facing a standing goat. Here we seem to have a distant echo of the neo-palatial theme of female figure and goat (252, 334; Chapter 6). This seal was found in a LM IIIA2-B burial at

⁶⁷ For stylistic diversity among the Armeni seals, see: I. Pini, *CMS Beiheft 5* (1995) 201-07. This, in turn, suggests we are not dealing with the products of a single (local) workshop, as sometimes supposed: *ibid.* 201-02; *CMS V Suppl. 1B* p. xxxi.

⁶⁸ *CMS V Suppl. 1B* no. 285, found in a LM IIIA1-B1 grave (T. 177), is described as 'workshop fresh' and dated by Pini to LM IIIA: *ibid.* pp. xlvii, 212, 276. For further examples of this motif, see Pini (n. 67) 203-05, figs. 9-10. Compare the composition to 391.

Armeni and the style of the goat fits with a LM IIIA date. Had the female figure appeared alone, we could well be at a loss. Needless to say, seals that lack good parallels may prove hard to date. Ordinarily, soft stone seals in good condition are more or less contemporary with their context.

As in the neo-palatial period most LM III soft stone seals are made from local chlorite and serpentine.⁶⁹ In addition, we sometimes encounter steatite, fluorite and even bone, materials previously attested for Cretan seals in the proto-palatial period. These materials are also used on the Greek mainland in LH III and raise the question of imports and influences. Motif and style sometimes provide helpful clues. For instance, the standing deer on a bone seal from Armeni (424) can be related to other Armeni animals, so we are probably dealing with a local product. More than 30 seals at Armeni are made from fluorite, a milky-white medium hard stone (Mohs 4), which is often confused with hard translucent rock crystal. Almost all the Armeni examples are decorated with simple geometric motifs, such as filled crosses and similar tectonic designs (425). These too are likely to be local products, since their motifs differ markedly from the mainland fluorite seals, where diamonds and twig-like patterns prevail (Chapter 9). Indeed it seems likely that the inspiration for the fluorite group lies in earlier Cretan seals with ornamental motifs.⁷⁰ If so, this would mean that the fashion for fluorite seals on the mainland represented Cretan influence. By contrast, the few seals made of steatite with geometric motifs and schematic animals may well be imports, for they closely resemble seals of the Mainland Popular Group, which are typically made of shiny black steatite.⁷¹ Other possible imports from the mainland are a few glass seals, produced in moulds.

Although the Armeni cemetery remained in use until the LM IIIB2 period, it provides no definite clues regarding the end of Minoan glyptic. Among the animal studies, there are no clear signs of later (i.e. LM IIIB) developments in style and neither the fluorite seals, nor those of serpentine and chlorite with geometric designs are susceptible to fine dating. Elsewhere on Crete we also draw a blank. When seals occur in LM IIIB-C contexts, they are invariably earlier products.

SEAL USE

From a glyptic perspective, our overriding impression of neo-palatial Crete was one of widespread seal ownership and use. We need think only of the quantity of seals that survive and the numerous seal-types represented in our LM IB sealing deposits. The range and quality strongly reinforces this notion, for alongside the finely worked gold signet rings and seals of semi-precious stones, we find humdrum or even crude products made from local materials (Chapters 6-7). Whether every adult possessed a seal is a matter for speculation, but the possibility exists. Island-wide destructions on the scale of those experienced at the end of LM IB certainly did profound damage to the social fabric of Minoan Crete. This alone might well have had an impact on the ownership and use of seals. If, as seems probable, a Mycenaean presence was established at Knossos in the wake of the destructions, then this too ought to be discernible in the glyptic record.

⁶⁹ As noted elsewhere the terms applied to Cretan soft stones are often inaccurate and there is considerable variation even within volumes of the *CMS*. In *CMS V Suppl.* 1B some of the Armeni seals are described as 'Schiefer' (i.e. schist), which I prefer to call 'chlorite' or 'chlorite schist'. See *MSV* 129-30, 137-41; also here Appendix 2.

⁷⁰ For a thorough account of fluorite seals, the distinctions between Cretan and mainland products, and earlier antecedents, see now: Dickers 87-95.

⁷¹ Dickers 226-27, nos. 382-89. For the Mainland Popular Group: Chapter 9.

What strikes us forcibly about LM II-III A1 Knossos is that ordinarily only rich graves contain seals and signet rings. Usually the seals are contemporary products made of hard stone, but the gold rings are sometimes LM I heirlooms.⁷² The same picture is repeated in other rich central Cretan burials of LM IIIA1/2 date, notably at Archanes and Kalyvia. On the face of it, seal ownership seems to have been limited to the great and the few, as was also the case on the Greek mainland during LH I / II-III A1 (Chapters 9-10). There, rich graves alone contained seals and signet rings, and these were made exclusively of hard stones and precious metals. We must not, however, press the analogy too far. The mortuary record suggests that some segments of the populace are archaeologically invisible during this period in central Crete and conceivably soft stone seals, often recovered as stray finds, belonged to these individuals. By contrast on the Greek mainland no soft stone seals were produced until well into LH IIIA (Chapter 9).

Continuing controversy over the final destruction date of the palace at Knossos undoubtedly impairs our understanding of seal use in LM II-III Crete (see below). However, several hundred seal-types, none matched by extant seals, are attested on the latest sealings and this should make us wary of placing too much faith in the mortuary record alone. As we move into LM IIIA2 / B1 the number of seals recovered from central Cretan burials seems to decline further. By this time, hard stone output had certainly ceased, but heirloom seals were sometimes deposited in graves. The term 'heirloom' is probably a misnomer, for it is most unlikely that the seals in question were passed down from one generation to the next. Rather one senses that 'finders keepers' was the operative principle. This is certainly the impression we gain from the Upper Gypsades cemetery at Knossos. In total four seals were found – two each in Tombs II and VII – and all are MM III-LM I products.⁷³ Remains of LM I habitation came to light in the vicinity and this might be the origin of the seals. Heirloom seals figure prominently in late graves on the Greek mainland too (Chapters 9-10).

At first sight, the large Armeni cemetery near Rethymnon seems to go against trends observed in central Crete. To date about 75 of the 227 graves have yielded a total of 156 seals. Unfortunately, we have only limited information on the contents of the graves, but many features of the cemetery – including tomb type and the iconography of the painted larnakes – suggests that we may be dealing with a mixed population.⁷⁴ Alongside a sprinkling of hard stone seals, many of the Armeni seals are made of soft stone and are likely to be more or less contemporary with the *floruit* of the cemetery (p. 214). But any comparisons with central Crete need to be made with utmost caution. In the Knossos area especially, chance destruction and deliberate plundering of tombs have certainly taken their toll. In the large Zapher Papoura cemetery, used from LM II-III B, roughly 40% of the tombs had been disturbed to a greater or lesser extent prior to excavation in 1904.⁷⁵

⁷² E.g. CMS II.3 no. 51 from Isopata T. 1 (here 215) and HM 1034 from Sellopoulo T. 4 (see n. 8). For LM I rings at Archanes and Kalyvia see above n. 9. For mortuary practices at LM II-III Knossos, see: L. Preston, *BSA* 94 (1999) 131-43; eadem, *BICS* 45 (2001) 178-79. For the location of the Knossian cemeteries see MAP 5.

⁷³ CMS II.3 nos. 46-49. In all 19 tombs were investigated, T. XVIII and perhaps T. VIII were MM; several had been plundered: S. Hood et al., *BSA* 53-54 (1958-59) 194-262.

⁷⁴ The CMS volumes provide the most convenient summaries of the graves and their contents: see above n. 65; also Y. Tzedakis, in *Atti del II° congresso di micenologia* 1121-30. For examples of the painted larnakes: idem, *AAA* 4 (1971) 216-22; see Rehak & Younger (n. 1) 446 for further references. Preston 2001 (n. 72) 179 suggests that by LM IIIA2 tomb types probably no longer carried specifically mainland associations.

⁷⁵ A. J. Evans, *The Prehistoric Tombs of Knossos* (London 1906) 1-3, 103-04. CMS II.3 nos. 39-45; II.4 nos. 3-6; II.8 no. 431 (sealing HMs 416: see below).

By contrast, intact tombs are still coming to light in the Armeni cemetery. But, as already intimated, graves can provide only limited insights into the quantity of seals in circulation at any given time.

Several dozen seals, mostly of LM II-III date, have also come to light in the Dictaeon (or Psychro) Cave, situated above the Lasithi Plateau (e.g. **381, 385, 395**).⁷⁶ Whether the dedication of seals in sanctuaries is a new phenomenon in this period is hard to say. About a dozen pieces from the Dictaeon Cave are MM II-LM I in date, but since there is no stratigraphy to speak of, we cannot say when they were deposited. The same applies to the few seals found in the Idaean Cave and at Mount Juktas, probably the sole peak sanctuary in use during LM II-III.⁷⁷ From the sanctuary of Kato Syme we have a fine lentoid depicting a 'minotaur' and goat, clearly of LM II-III A1 date, which was apparently found in a burnt deposit of the Early Iron Age.⁷⁸ Seals found in sanctuaries and shrines are also discussed in Chapter 10.

The bulk of our evidence for sealing practices and tablet administration in LM III Crete comes from Knossos. In recent years, however, a few sealings and fragmentary Linear B tablets have come to light in Khania, while several more sealings (though no tablets as yet) have been found at Mallia. Sealed jar stoppers are reported from Kommos. And, at Palaikastro, the old east Cretan tradition of stamped 'loom-weights' seems to persist into LM III. Whether the absence of evidence from other key sites of this period, most notably Ayia Triada, holds any significance is a matter for speculation. Much hinges on one's views concerning the fate of Knossos during LM III.

THE LATE SEALINGS AT KNOSSOS

For more than a century the Knossos sealings have been dogged by misfortune, none more so than the 'late' sealings which are associated with the LM III palace. Although difficulties do surround the date and character of both the Hieroglyphic 'Deposit' and Temple Repositories, as groups they are reasonably well defined (Chapters 5, 7). The problems we face with the late sealings are far more intractable and, arguably, are insuperable. Within the first few weeks of excavation at Knossos, sealings and Linear B tablets began to appear – sometimes singly, sometimes by the handful or in more substantial quantities. It is perfectly clear, from the notebooks of Sir Arthur Evans and the daybooks kept by his field director, Duncan Mackenzie, that they were at times overwhelmed by the complexity of the site and the sheer quantity of debris shifted by their large teams of workmen. Their records range in quality from reasonably explicit to extremely terse. While Mackenzie's daybooks sometimes provide precise details of find-spots, descriptions of the sealings themselves leave much to be desired and often prove insufficient for identification. Evans, on the other hand, sometimes sketched sealings and seal-types, noting their frequency and find-spot, but his records are far from complete. His preliminary reports often flesh out the bare bones of his excavation notes, yet even in the short space of time between excavation and publication demonstrable errors crept in. More serious errors still appear in *The Palace of Minos*, especially volume IV, where the

⁷⁶ About 48 seals were found, now divided between Herakleion and Oxford: *CMS* II.2 no. 246; II.3 nos. 224-226, 289; II.4 nos. 59, 66, 202-203; Boardman (n. 20) 68-71, pl. 24.

⁷⁷ Idaean Cave: *CMS* II.2 no. 4; II.3 no. 7; Y. Sakellarakis, in O. Palagia (ed.), *Greek Offerings: Essays on Greek Art in Honour of John Boardman* (Oxford 1997) 23-29, figs. 1-4. Juktas: A. Karetsou, *PAE* (1974) 237, pl. 178a; eadem, *PAE* (1978) 255-56, pl. 169a-δ; A. Ioannidou-Karetsou, *PAE* (1976) B' 415, pls. 230γ, 231α.

⁷⁸ A. Lembessi, *PAE* (1976) B' 406-07, pl. 226ς'-ζ; *AR* 24 (1977-78) 64, fig. 113 (HM 2624).

late sealings were treated and which was compiled more than 30 years after they had been found. Margaret Gill has made several valiant attempts to untangle the web of confusion left by Evans and Mackenzie, most recently in *CMS II.8* (2002).⁷⁹ But the sad fact remains that only about 400 or so late sealings have been attributed by the *CMS* team to known find-spots, with varying degrees of confidence. In some cases the ‘find-spots’ are little more than general locales within the palace, such as the ‘Domestic Quarter (?)’. At a very rough estimate a further 350 nodules, with no provenance at all, should be considered late sealings – based either on nodule type or seal-type or both. Precise figures should become clearer when we are able fully to absorb and evaluate the new data in *CMS II.8*.⁸⁰ But even the Herculean labours of the *CMS* team have not been able to undo the damage created by incomplete and inconsistent records, much less conjure up the many sealings known from Evans’s records but now missing (see below).

If we turn to seal-types, the deficiencies in our pre-existing information are further highlighted. Evans published drawings of about 70 seal-types; a few more sketches appear in his notebooks and were published by Margaret Gill. Mervyn Popham estimated that about 250 seal-types were represented among the late sealings,⁸¹ but the final total is likely to be double that number. Many are fragmentary in the extreme and have taxed the skill and patience of the *CMS* team to the limit. Equally important is the new *CMS* work on the various sealing types used in the late palace. These prove to be remarkably similar to those employed on the Greek mainland in LH IIIB. In the following section, I present a simplified version of the new *CMS* typology, but make no attempt to present a detailed account.⁸² This is followed by a general appraisal of sealing practices at Knossos and some observations on the character of the late palace. The chapter ends with brief comments on sealings from other LM III sites.

SEALING TYPES

The sealing types used in the late palace at Knossos bear little resemblance to neo-palatial varieties. Single-hole hanging nodules and roundels vanish without a trace and flat-based nodules are greatly transformed. Two-hole nodules of various kinds predominate and are joined by a new range of combination nodules and direct sealings.

Flat-based nodules (‘packets’)

Four sealings found in the Room of the Chariot Tablets (FIGURE 8.1) have been classed as flat-based nodules (e.g. **426-427**).⁸³ Imprints on their undersides reveal that they sealed narrow pieces of leather, folded lengthwise and bound once in the middle with leather or gut about 2–3 mm wide (**426b**, **427b**). They differ significantly from the tiny parchment

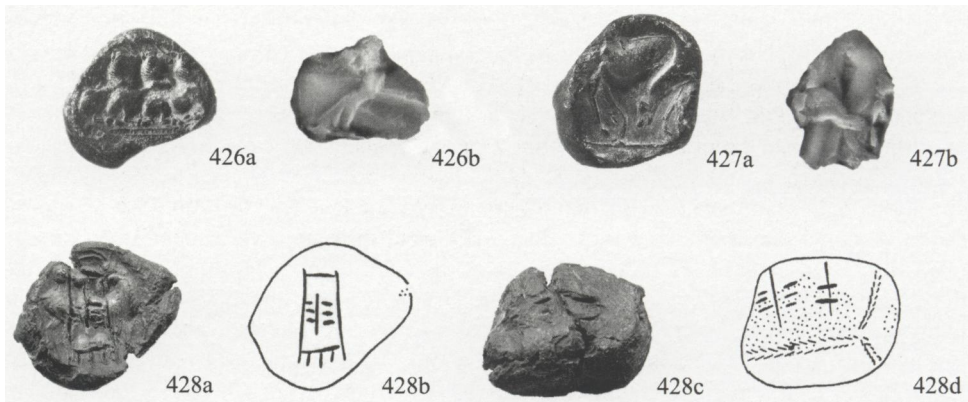
⁷⁹ *CMS II.8* pp. 101-28, superseding *KSPI* and *Latest Sealings* 5-38. However, these earlier accounts are of interest for quotations from daybooks and notebooks.

⁸⁰ The *CMS* team generously allowed me to consult their manuscript prior to publication, but analysis of the data will require many years. See also my review article in *AJA* 108 (2004) 275-79.

⁸¹ *Latest Sealings* 2. For convenient reproductions of Evans’s drawings: *ibid.* pls. 27-31.

⁸² As in previous chapters I have substituted English terms (notably those devised by Erik Hallager) for the difficult German expressions used by the *CMS* team, e.g. W. Müller, *CMS II.8* pp. 24-93; *Tonplomben* 53-66, figs. 1-4. Cf. E. Hallager, in T. G. Palaima et al. (eds.), *Proceedings of the 11th International Mycenaean Colloquium* (forthcoming). Weingarten’s typology is confusing and inaccurate: *OJA* 7 (1988) 5-10; *Knossos Labyrinth* 185-87, fig. 1.

⁸³ HMs 110, 111, 253, 1243 (*CMS II.8* nos. 497, 460, 307, Add. 6) and probably HMs 1650 (without provenance). J. Driessen (*EDK* 64-66) and Weingarten 1988 (n. 82) 10-11 mention two flat-based nodules from this room; Hallager (n. 82) identifies seven.



Selected sealings from LM III Knossos. **426-427** Flat-based nodules from the Room of the Chariot Tablets; faces and silicones of reverses. **428** Inscribed gable-shaped nodule from the Room North of the Room of the Stirrup Jars; face (**a-b**) and reverse (**c-d**). See **442** for seal-type. Scale ca 1:1.

'packets' bound with fine thread found in neo-palatial contexts (e.g. **10-14**) and ought, perhaps, to be called by a different name, though the *CMS* team has decided to stick with '*Päckchenplomben*'.⁸⁴ The precise purpose of these late 'packets' remains obscure. Though we cannot exclude the possibility that they too bore short written messages, we cannot prove it either. Also unclear is whether they should be regarded as true lineal descendants of the neo-palatial variety (see also below p. 228). Late flat-based nodules do not occur elsewhere at Knossos, nor have they been found in Mycenaean sealing deposits on the Greek mainland.

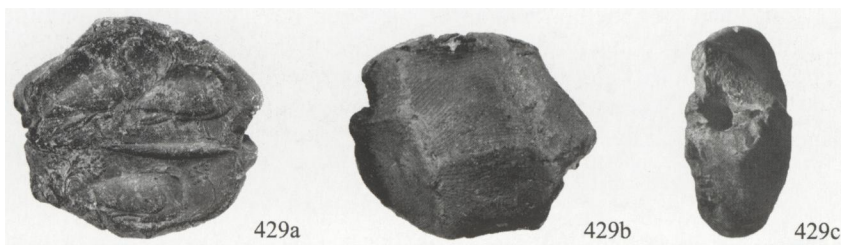
Gable-shaped hanging nodules

These lumps of clay are shaped carefully around a fine knotted cord, which runs through the centre of the nodule.⁸⁵ They usually have a more or less gable-shaped section, created because the lump was held between the thumb and index finger while the seal was impressed. Fifteen examples at Knossos bear short Linear B inscriptions: sometimes no more than an ideogram inscribed *supra sigillum* (i.e. over the impression), sometimes spreading to one or two faces of the nodule. For instance on **428** the ideogram TELA³ + TE covers the seal impression, and *te-pa* is written on face β.⁸⁶ Here, at least, the sense is reasonably clear – the nodule related to a consignment of cloth. Other inscribed nodules are less informative, e.g. bearing undeciphered ideograms, sometimes in conjunction with

⁸⁴ *CMS* II.8 pp. 42-43, fig. 11. The *CMS* silicones make clear that the 'packets' were bound with leather or gut, not linen as claimed by Weingarten 1988 (n. 82) 10.

⁸⁵ *CMS* II.8 pp. 66-67, fig. 25: *Schnurplomben mit giebelförmiger Rückseite*; cf. *Tonplomben* 56-58, fig. 1, pls. 37-38 (x-rays). See also Hallager (n. 82).

⁸⁶ *CoMIK* IV Ws 8153 impressed with *CMS* II.8 no. 419; attributed by the *CMS* team to the Room North of the Room of the Stirrup Jars. For the meaning of the inscription: *Docs*² 584-85 (under TE and *te-pa*). Another inscribed nodule (*CoMIK* IV Ws 8497) comes from the same location, as well as two broken nodules: these too were impressed with *CMS* II.8 no. 419 (here **442**). *CMS* II.8 p. 136 provides a convenient list of all the inscribed nodules with references to *CoMIK*.



429a-c Nodule with ridged back from the Arsenal, Knossos; face, reverse and profile. See **440** for seal-type. Scale ca 1:1.

personal names. Whether inscribed or not, gable-shaped nodules are ordinarily found intact, in marked contrast to the vast majority of two-hole nodules at Knossos, which had been deliberately broken (pp. 225-26). The *CMS* team plausibly suggests that gable-shaped nodules served as labels.⁸⁷ Similar nodules occur on the mainland at Midea, Mycenae, Pylos and Thebes (e.g. **556**, **563**, **582-584**; Chapter 10).

Hangng nodules with ridged backs

These large nodules are rather flat in section and have a distinctive ridged reverse created by the imprints of the index and middle finger.⁸⁸ Only eight or nine examples are known. Four were found in the Arsenal, all impressed with the same outsized lentoid depicting water-birds (**429**; **440**). And indeed other ridged-back nodules also involved sizeable seals, which may well account for their unusual shape. A single example is broken and seems to show traces of a fine knotted cord. Thus it would appear that, like the more common gable-shaped nodules, those with ridged backs were meant to label and not to secure. No examples of this variety have been reported from the mainland.

Irregular hanging nodules

These nodules vary considerably in shape and were rarely formed with the same care as the preceding varieties. Many have a domed back and resemble plums, others are more almond-shaped, a few have flattish backs. Through the centre of these nodules ran thick cords, made of leather, gut or fibre.⁸⁹ Some evidently involved two cords or, sometimes, two lengths of the *same* cord that had been twisted together, by pulling one end taut and winding the other around it (**431b-c**).⁹⁰ Most irregular nodules had been deliberately broken, either along the line of the cord or, in about 100 cases, from front-to-back (**430-432**). All their characteristics suggest that irregular nodules actually secured or sealed

⁸⁷ Supported by the existence of inscribed nodules or 'labels' without impressions: *CMS* II.8 pp. 54-55, fig. 15 (HMs 117, 125, 193). Cf. *Tonplomben* 80-81, pl. 36 and W. Müller, in *Pepragmena* 9 (forthcoming). See also Chapter 10.

⁸⁸ *CMS* II.8 p. 67, fig. 26: *Schnurplomben mit dreigratiger Rückseite*.

⁸⁹ *CMS* II.8 pp. 52-66, 67-69, figs. 16-18, 20-23 (silicones); *Tonplomben* 56, 58, 67-69, figs. 1, 4, pls. 40-45. Müller sub-divides his *Schnurplomben* into various categories according to profile and condition (i.e. broken on the string-hole or having an open reverse). Here I group them all together as irregular two-hole nodules; cf. Hallager (n. 82).

⁹⁰ Termed *Wickelband* by Müller: *CMS* II.8 pp. 63-64, fig. 22; cf. *Tonplomben* 68-69; pls. 41-43.

objects of various kinds.⁹¹ More than that we cannot say, since the nodules were designed to hang freely and only the imprints of the cords survive. The concentration of irregular nodules in the East Wing of the palace is especially striking and may indicate that incoming commodities were dealt with here (see below). Irregular nodules, formed and broken in much the same way as the Knossian examples, also occur on the Greek mainland, especially at Pylos (see also below and Chapter 10; 557-560).

Combination sealings

These are rather rough-and-ready affairs, which combine features of hanging nodules and direct object sealings. That is, the lumps of clay show imprints of objects on their undersides as well as the cords that bound them (433-434). Generally the imprints indicate basketry (433b-c) or matting (18), though in some cases the objects had a flat surface.⁹² One combination sealing was found in the Room of the Chariot Tablets (RCT), two more came to light in the Arsenal (MAP 5). Since tablets were also recovered in these areas, it has been supposed that the sealings belonged to chests or baskets containing tablets.⁹³ For this there is no concrete proof. In all there are nearly 50 examples of combination sealings at Knossos; a few examples have also been found at Mycenae and Pylos (561; Chapter 10).

Direct object sealings

In some cases lumps of clay were placed directly onto the containers which they sealed. Imprints indicate various kinds of wickerwork as well as leather or hide.⁹⁴ A number of enigmatic examples show irregular tongue-shaped protrusions on their undersides, as if the clay had been forced into an opening. Six sealings of this type – all differing slightly in shape – were discovered in the Royal Tomb at Isopata (436).⁹⁵ Sadly it is not possible to determine what kind of object they sealed, much less to decide how sealings came to be in the tomb. Equally mysterious is how, when and where the sealings were baked or rather burnt to a reddish brown, since no traces of fire were found in the tomb.

Stoppers

Only one possible example of a clay stopper with seal impressions could belong to the late sealings.⁹⁶ Unfortunately the piece has no provenance and the impressions are illegible. On Crete stoppers have been found at LM III Khania, Kommos and Mallia, though the most informative group came to light in the House of the Oil Merchant at Mycenae (see below pp. 230-31 and Chapter 10).

⁹¹ CMS II.8 pp. 55-66; Müller (n. 87).

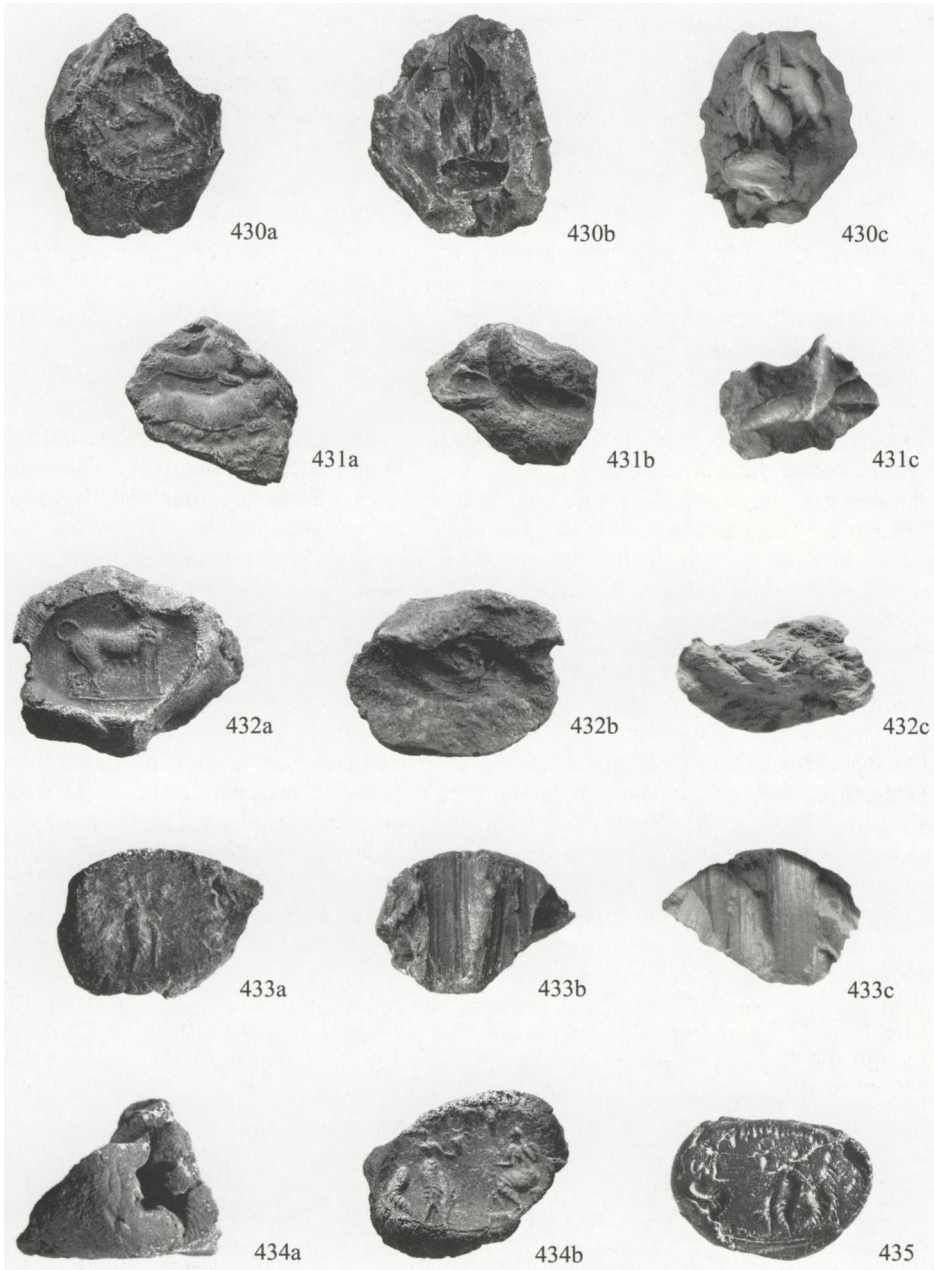
⁹² CMS II.8 pp. 69-74, figs. 28-31: *Objektschnurplomben*; also *Tonplomben* 58, fig. 2. Occasionally those with flat undersides seem to show the grain of wood, others may have been attached to the lids of clay vessels: Müller (n. 87). The term 'combination sealing' is adapted from Hallager and Weingarten.

⁹³ A similar suggestion was made *apropos* a sealing in the Archive Room at Pylos: *PN I* 97-98 (see also Chapter 10). For the RCT: *EDK* 62-63, though Driessen doubts the association between the tablets and the carbonized wood / hinges (*ibid.* 63). See also: J. Weingarten, *BSA* 89 (1994) 154 (Arsenal); eadem, in *Crète mycénienne* 519-23 (Queen's Megaron).

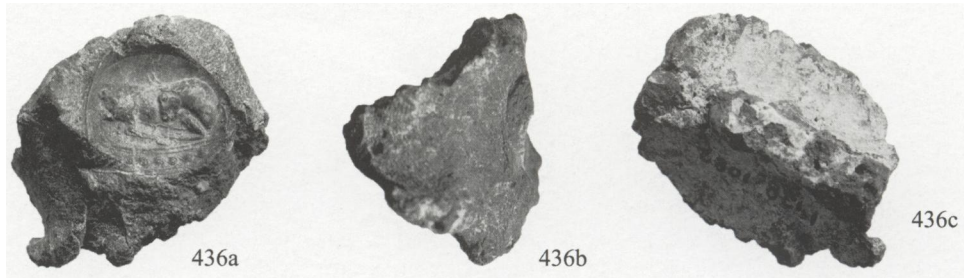
⁹⁴ CMS II.8 pp. 32-36, figs. 5-6: *Objektplomben*; cf. *Tonplomben* 58, fig. 2.

⁹⁵ CMS II.8 pp. 37-38, fig. 7: *Objektplomben: Zapfenform*.

⁹⁶ CMS II.8 pp. 27-29, fig. 3c-d: AM 1938.1153a.



Selected sealings from LM III Knossos. **430-432** Irregular nodules, broken front to back; faces, reverses and impressions of reverses. **433a-c** Combination sealing; face, reverse and impression of reverse. **434a-b** Combination sealing; profile and face. **433-434** were impressed by the same LM I signet ring (here **437**). The clay 'matrix' (**435**) bears the impression of an impression from the same signet ring (**437**). Scale ca 1:1.



436a-c Direct object sealing from the Royal Tomb at Isopata; face, profile and reverse. See **439** for seal-type. Scale ca 1:1.

Noduli

Small lumps of clay with seal impressions, but without any means of attachment, are termed *noduli*. First attested in the late pre-palatial period, *noduli* are well represented on neo-palatial sites and persist with only minor changes in shape until the end of the LH IIIB period on the Greek mainland.⁹⁷ Four examples can plausibly be attributed to the late palace at Knossos, but do little to elucidate their suggested function as ‘tokens’. Two *noduli*, both impressed with the same ring (**444**), bear simple counter-marks in Linear B – the ideograms for man and woman, respectively.⁹⁸ The practice of inscribing *noduli* has antecedents in neo-palatial Ayia Triada where several were counter-marked in Linear A.

Clay ‘matrix’

The famous clay signet or ‘matrix’, found in the southern part of the palace, is similar in shape to *noduli*, but it bears an incomplete impression in intaglio not in relief, as is ordinarily the case on sealings (**435**).⁹⁹ In other words, the impression on the ‘matrix’ has been made from an impression – a decidedly curious state of affairs. As it happens, a few other clay ‘matrices’ are known from Aegean sites, but they too are hard to explain and none comes from an informative context.¹⁰⁰ In a workshop, an impression of an impression might have served as a useful *aide memoire* when it came to reproducing seals with similar motifs. But, as we have seen, metal signet rings could not be replicated from clay ‘matrices’.¹⁰¹ Strangely enough, several irregular nodules and combination sealings bear impressions of the original ring (**433-434**). Perhaps – in the absence of the ring itself – an impression was taken of it from a sealing and the ‘matrix’ in fact served as a *nodulus*. The original ring was bronze and was a LM I heirloom (**437**). A similar ring, differing in size and details, impressed a sealing at LM IB Zakros.¹⁰²

⁹⁷ See Chapters 4, 5, 7, 10; also *CMS* II.8 pp. 74–80.

⁹⁸ *CoMIK* IV Wn 8713 (HMs 156: Room of the Niche) and Wn 8752 (HMs 224: unknown provenance) both impressed with *CMS* II.8 no. 513 (here **444**). The two uninscribed *noduli* are HMs 312 (*CMS* II.8 no. 208: here **414**) and HMs 1293 (*CMS* II.8 no. 241: attributed to the ‘Domestic Quarter (?)’ by the *CMS* team). Hallager (n. 82) mentions seven ‘late’ *noduli* from Knossos, but does not list them by inventory number.

⁹⁹ *CMS* II.8 pp. 77, 81–83, fig. 35 e–f (HMs 283).

¹⁰⁰ E.g. *CMS* II.1 no. 419 from the *Depôt hiéroglyphique* at Mallia (Chapter 5 n. 81). For further examples: I. Pini, *Aux origines de l’hellénisme* 77–80; W. Müller, in *CMS* II.8 pp. 81–83.

¹⁰¹ And especially not from an incomplete one! See Chapters 6–7 for ring manufacture and ‘replicas’.

¹⁰² *CMS* II.7 no. 8 (here **244**). See also Chapter 7 and n. 96.

DISTRIBUTION AND DATING

As Evans himself stressed, the late sealings differed markedly from earlier groups at Knossos, which had been found in reasonably well-defined areas or deposits.¹⁰³ Although some concentrations of late sealings did occur – notably in the East Wing – others were widely scattered throughout the palace, singly or in small numbers. There was no doubt that most if not all had fallen with debris from upper floors. This clearly impedes any attempt to interpret the sealings themselves or their relationship to tablet administration. While Linear B tablets and fragments were sometimes found in the same areas as sealings, the basic stratigraphy is so confused and information on precise find-spots so sketchy that hopes of reconstructing their original patterns of distribution are remote.

This is certainly true of the West Wing. Altogether a dozen sealings were found scattered in several magazines, while small clusters occurred in rooms situated between the Long Corridor and Central Court (FIGURE 8.1). Several nodules with the well-known ‘collared bitch’ motif (438) – a LM I-II hard stone ring – came to light in the Room of the Jewel Fresco.¹⁰⁴ One carried a short inscription and other impressions from this ring were found in the South-West Basements (see below). Four inscribed sealings – three nodules and a *nodulus* – were recovered in the nearby Room with the Niche, but the inscriptions tell us little.¹⁰⁵ Six broken nodules impressed with the Mother of the Mountain ring (5) came to light in the so-called Central Shrine. But the function of this area in LM III is obscure and inferences based on the iconography of the ring (a LM I heirloom) are unjustified.¹⁰⁶ In any case, these sealings like others in the West Wing may have fallen from rooms above and significant find-associations are lacking.

At first sight the Room of the Chariot Tablets (RCT) seems more promising, with its well-defined group of over 600 tablets and about 15 sealings. Of these only ten can now be located; one disintegrated in a sudden rainstorm, the fate of the others is unknown. There are four or five flat-based nodules, otherwise unparalleled in the late palace, and possibly related to the neo-palatial variety (e.g. 426-427; see above). In addition there are a few broken nodules, a combination sealing, and two inscribed gable-shaped nodules.¹⁰⁷ The inscriptions are not informative. While the RCT certainly stands apart from other deposits epigraphically – perhaps reflecting an earlier destruction in the palace – the sealings offer only limited insights.¹⁰⁸

This depressing picture is repeated elsewhere in the palace – notably in the northern sector and the South-West Basements.¹⁰⁹ The East Wing tells a rather different tale, for it

¹⁰³ *PM* IV 592-93.

¹⁰⁴ Information on find-spots is taken from *CMS* II.8, esp. table 2. The find-spot of AM 1938.1014b (here 432) is uncertain (Room of the Egyptian Beans?).

¹⁰⁵ *CoMIK* II Ws 1701: HMs 108; *CoMIK* IV Ws 8753: HMs 225; *ibid.* Ws 8494: HMs 118; *ibid.* Wn 8713: HMs 156 (*CMS* II.8 nos. 222, 308, 510, 513 [here 444], respectively).

¹⁰⁶ E.g. *PM* IV 596; *CPSK* 238-41. Even more fanciful is Weingarten’s linking of *CMS* II.8 no. 161 (the partial impression of a fine LM I ring? with dolphins) found in the vicinity of the Queen’s Megaron and the Dolphin Fresco from the same general area: *Crète mycénienne* 523.

¹⁰⁷ *CoMIK* IV Ws 8500: HMs 122 (*CMS* II.8 no. 507), Ws 8712: HMs 121 (II.8 no. 467).

¹⁰⁸ See below. For the RCT generally see *EDK passim* and J. Driessen, *The Scribes of the Room of the Chariot Tablets at Knossos*. *Minos* Suppl. 15 (Salamanca 2000).

¹⁰⁹ SW Basement Deposit: *PM* IV 593-94; 601-02. For recent stratigraphical tests: N. Momigliano & S. Hood, *BSA* 89 (1994) 103-50. The *CMS* coverage now underscores the deficiencies in Weingarten’s account of the sealings and seal-types: *ibid.* 151-56. For the administrative function of the North Entrance Passage and adjacent rooms, see: J. Driessen, in S. Deger-Jalkotzy et al. (eds.), *Florent Studia Mycenaea* I (Vienna 1999) 205-26. For some sealings from this area see above n. 86.

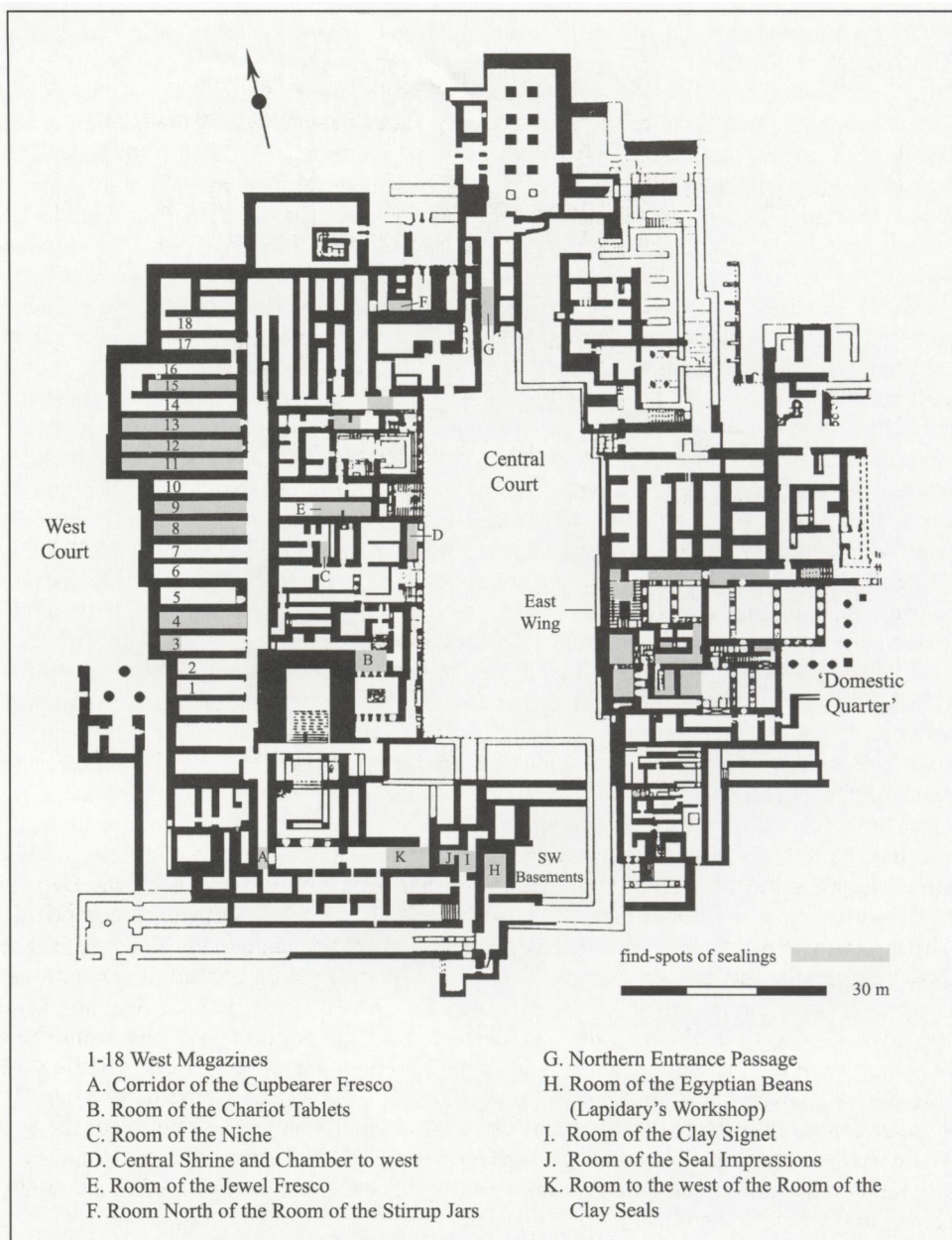


FIGURE 8.1 The palace of Knossos, showing principal LM III find-spots of sealings mentioned in the text. For the East Wing see FIGURE 8.2.

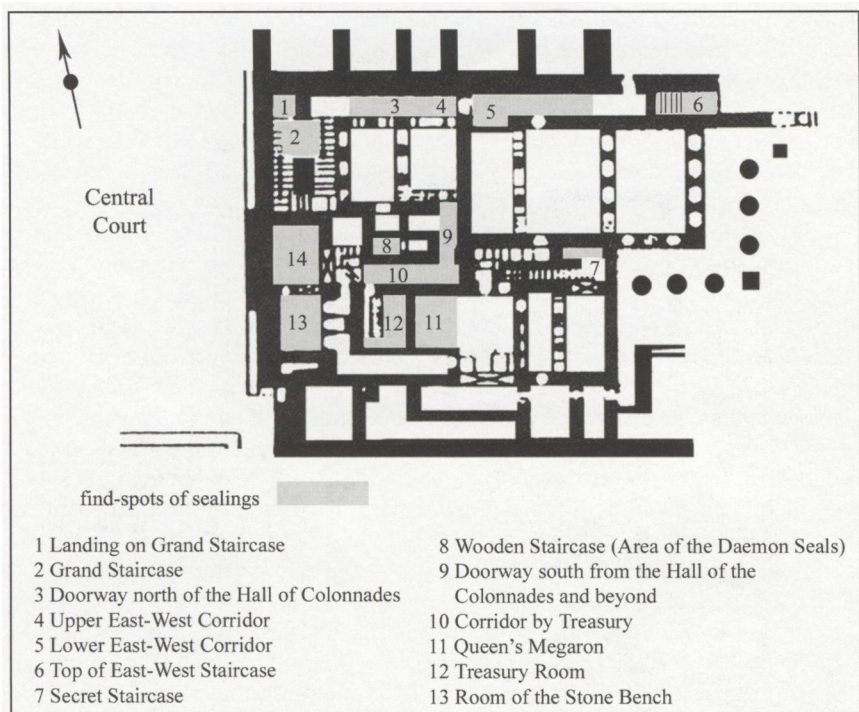


FIGURE 8.2. The East Wing of the palace at Knossos, showing principal LM III find-spots of sealings.

was here that the largest concentrations of sealings came to light (FIGURE 8.2). In *The Palace of Minos IV*, Evans divided them into two main groups: the 'Archives Deposit (C)' and an adjacent 'East Hall Borders Deposit (D)'.¹¹⁰ In reality they comprise a number of locations, some better defined than others. They include the Landing on the Grand Staircase, the Lower East-West Corridor, the Doorway south of the Hall of Colonnades and the so-called Wooden Staircase & Secretaries' Bureau. Sealings were also found in the Queen's Megaron. As Evans himself noted, many nodules from these areas had been deliberately broken, an observation now confirmed and amplified by the new *CMS* data. The same also applies to nodules assigned to the 'Domestic Quarter (?)' without precise provenance. At least 250 sealings come from the East Wing, but the true figure was probably much higher – perhaps even double. As already indicated, there exist several hundred late sealings with no provenance whatsoever; some of these surely belong to the East Wing too.

Outside the palace proper, sealings also came to light in the Arsenal on the Royal Road, so-named after the quantities of arrow-heads and tablets relating to chariotry found there (see MAP 5). Appropriately enough, three nodules are inscribed *o-pa* (an obligation) and *pa-ta-ja* (javelins); two are also counter-marked *supra sigillum* with the javelin ideogram.

¹¹⁰ *PM IV* 596-99; 602-05.

The same lentoid of soft stone seal was used on all three.¹¹¹ In the Little Palace, Evans originally recorded well over 100 sealings, but only about 20 can now be located.¹¹² The varieties are comparable to those found in the main palace itself. Later excavations in the nearby Unexplored Mansion yielded a single gable-shaped nodule, but this was found on the surface.¹¹³ As mentioned above, six direct object sealings were found in the Royal Tomb at Isopata, all impressed with the same LM I-II lentoid (436; 439), while Zapher Papoura Tomb 56 contained an unbroken irregular nodule.¹¹⁴ The purpose of these sealings in graves is obscure.

Given the horribly confused circumstances in which sealings were found, and lack of detailed information on find-spots, one may reasonably wonder if anything at all can be said regarding patterns of seal use in the late palace. Though Evans took great care to recover the smallest of fragments in sieving, the fact that tablets and at least one sealing disintegrated in the rain reminds us that archaeological chance is a constant enemy. That said, many seal-types are attested just once, or at most two or three times. This ‘non-intensive’ pattern suggests that we could well be dealing with incoming shipments from a variety of sources.¹¹⁵ If any tallying did occur – and that is far from certain – it must have been while the sealings were intact and their motifs still legible. In other words, the hundreds of broken nodules in the late palace are discards pure and simple.¹¹⁶ Similar nodules found in good floor deposits at Pylos help to support this view (Chapter 10).

Sometimes a particular seal-type does crop up on a number of sealings. For instance, there exist ten nodules impressed by the collared bitch seal (438): two combination sealings, several irregular nodules (all broken, e.g. 432) and an inscribed nodule, now missing. The goddess and cup ring (437) impressed combination sealings and irregular nodules, not to mention the impression of an impression on the so-called ‘matrix’ (433-435; see above). It is conceivable, but by no means certain, that multiple examples reflect the work of resident officials.¹¹⁷ Possible support comes from the fact that examples are sometimes found in different areas of the palace. But uncertainty over find-spots thwarts further progress. For instance, the most ‘active’ seal-type – with about 55 impressions – was a LM II-III soft stone lentoid depicting a beefy bull walking to the right (445). Not one has a known provenance.¹¹⁸ With the new *CMS* data, our understanding of seal use at Knossos is bound to improve, though the picture will always be hazy.

¹¹¹ *CMS* II.8 no. 305: on *CoMIK* II Ws 1704 (HMs 401) and Ws 1705 (HMs 403); *CoMIK* IV Ws 8495 (HMs 119).

¹¹² *PM* IV 599-600, 605-06; *Latest Sealings* 23-28; *CMS* II.8 pp. 1, 107, 123-27.

¹¹³ *KSM* UM 68 / 114 (*CMS* II.8 no. 425).

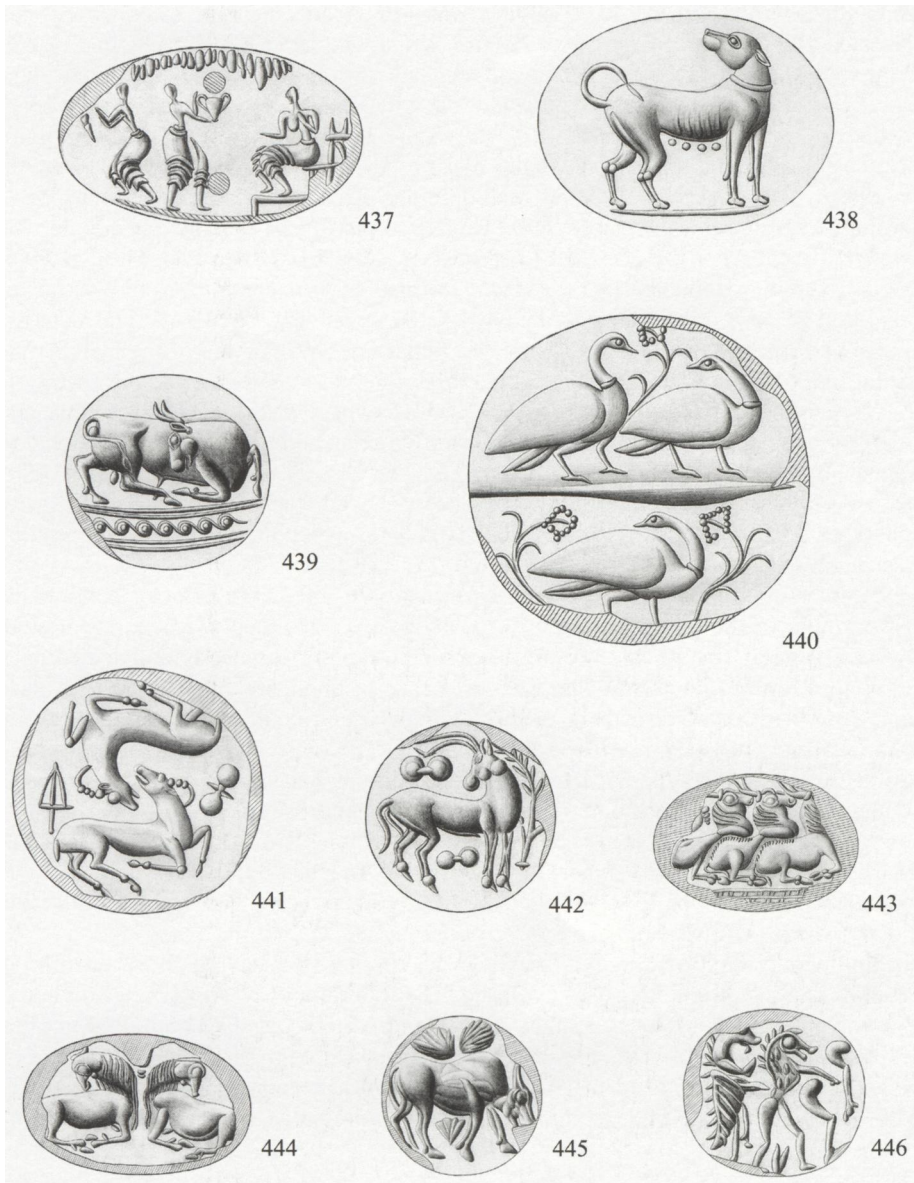
¹¹⁴ HMs 416 (*CMS* II.8 no. 431). Also HMs 1696 (*CMS* II.8 no. 713) from the Gypsades Cemetery and HMs 1058 (*CMS* II.8 no. 26) perhaps from same locale; neither is datable.

¹¹⁵ J. Weingarten, in *Crète mycénienne* 518-19.

¹¹⁶ A point stressed by Müller (n. 87), who found that 94% of two-hole nodules (i.e. *Schnurplomben*) at Knossos are broken.

¹¹⁷ Weingarten identifies resident officials through combination sealings, based on her assumption (probably erroneous) that these nodules were attached to baskets / chests containing tablets: see above and n. 93. Her attempts to link specific seals to named individuals (e.g. *a-nu-wi-ko*) or officials (e.g. the *ra-wa-ke-ta* and *qa-si-re-u*) are, at best, highly speculative: *Crète mycénienne* 522-32; *BSA* 89 (1994) 151-56.

¹¹⁸ This highlights the haphazard nature of Evans’s records. He did, however, sketch a similar motif, which occurs on six sealings thought to come from the Lower East-West Corridor: *Latest Sealings* 20, 45, pl. 43 R 52 (*CMS* II.8 no. 402). Yet another seal-type depicting a bull walking to the right, also sketched by Evans, occurs on a nodule from the Corridor of the Cupbearer Fresco: *ibid.* 8, pl. 33 F1 (*CMS* II.8 no. 404).



437-446 Drawings of selected seal-types from LM III Knossos. Scale ca 3:2. Heirloom seals include **437** (LM I) and **438-440** (LM I-II). Others illustrated here are datable to LM II-III or LM IIIA on stylistic grounds, but add nothing to the debate concerning the final destruction date of the palace.

And a veritable fog of uncertainty continues to surround the date of the sealings and the fall of the palace (FIGURE 8.3).¹¹⁹ Evans was in no doubt that the sealings and tablets were baked in a massive destruction by fire, which had taken place at the end of LM II. Thereafter, the palace proper remained choked with rubble, though limited squatter re-occupation occurred on the fringes. Unease with Evans's reconstruction of events and the date of the final destruction surfaced in the late 1950s, prompted by similarities between the frescoes and tablets found at Knossos and Pylos. During the early 1960s the controversy continued to rage and opinions became increasingly polarized. The philologist Leonard Palmer supported a very late date for the destruction – at the end of LM IIIB or even early IIIC – while studies by John Boardman and Mervyn Popham upheld Evans's reading of the evidence. Refinements in ceramic typology, however, meant that Evans's date was re-defined as LM IIIA1 or early LM IIIA2. This date is still accepted by many, though it must be stressed that only in the Area of the Daemon Seals (within the Wooden Staircase) is there a close association between datable pottery (LM IIIA1/2) and sealings (e.g. 446).¹²⁰ Here, and elsewhere in the palace, virtually all the pottery of this date comes in the form of sherd material, and not whole pots. Popham and those who support the traditional date argue that this is consistent with the kind of massive fire destruction, engulfing upper floors, needed to preserve tablets and sealings, in stark contrast to the whole pots of LM IIIB date, which are seen as belonging to the 're-occupation' period.¹²¹

But can a single deposit truly date the destruction of the entire palace? If one believes unswervingly in the so-called 'Unity of the Archives' it must.¹²² More recent studies, however, suggest that links and cross-links between scribal hands and matching seal impressions are not universal. The RCT is a case in point, for the tablets here have no connexions with those elsewhere in the late palace and could very well stem from an earlier destruction, i.e. in LM II or early IIIA1.¹²³ The existence of four or five 'packet' sealings (e.g. 426-427), perhaps related to the neo-palatial variety, may lend support to this theory. But the precise date remains uncertain, because no pottery whatsoever was found in this room and the seal-types offer no clues either, since they range from LM I to LM II-III A1 (e.g. 443). The discovery of Linear B tablets at Khania in a LM IIIB1 context may dissolve the 'Unity of the Archives' still further, though the identification of Knossian hand 115 at Khania has now been disclaimed.¹²⁴

In the lengthy controversy over the final destruction, the sealings have been brought into play as an additional form of evidence. The traditional LM IIIA1/2 destruction date was apparently upheld by the fact that no seals of LM IIIB date had been used to impress sealings.¹²⁵ On the face of it, this seemed a persuasive enough argument. But we now realize that the production of metal signet rings and hard stone seals had ceased by the end of LM IIIA2 and, on Crete, output in soft stone probably ended about the same time.

¹¹⁹ The literature on the 'final' destruction is vast: useful summaries in E. Hallager, *The Mycenaean Palace at Knossos* (Stockholm 1977) 7-10; W.-D. Niemeier, *Minoan Society* 217-36, esp. fig. 43 (here reproduced as FIGURE 8.3); *EDK* 4-7.

¹²⁰ M. R. Popham, in *Crète mycénienne* 375-85.

¹²¹ But as Hallager (n. 119) 91-93 points out, burnt sherds of LM IIIB date do exist.

¹²² *OKT* i 132, 170-72, 192; cf. *EDK* 7; J.-P. Olivier, in *Knossos Labyrinth* 165-68.

¹²³ Driessen (n. 108) 217-32.

¹²⁴ J.-P. Olivier, *BCH* 117 (1993) 19-33; idem, *BCH* 120 (1996) 823; T. G. Palaima, *Minos* 27-28 (1992-93) 261-81. See also J. Driessen, in *Crète mycénienne* 113-34.

¹²⁵ Thus V. E. G. Kenna, in *OKT* ii 96-100; L. R. Palmer, *The Penultimate Palace of Knossos* (Rome 1969) 131-37; *Latest Sealings* 54-59; Popham (n. 120) 375-85.

B.C.	PERIOD	EVANS	PALMER	RAISON	BOARDMAN	HOOD	POPHAM	SMITH	HALLAGER
1450	LM I	PALACE			PALACE	PALACE	PALACE	PALACE	PALACE
			PALACE	?	MYCENAEANS	MYCENAEANS	MYCENAEANS		
1400	LM II	LINEAR B/PS			LINEAR B/PS		PS	PS	PS
1375	LM IIIA 1						LINEAR B/PS	PS	PS
1350						LINEAR B/PS		MYCENAEANS	MYCENAEANS
1300	LM IIIA 2	RE - OCCUPATION		PALACE LINEAR B	RE - OCCUPATION		RE - OCCUPATION	LINEAR B - SECRETARIAT	
1250	LM IIIB		PS MYCENAEANS PALACE						PALACE
1200									LINEAR B
1150			LINEAR B						

FIGURE 8.3 Chart outlining the main scholarly positions regarding the character of LM II-III Knossos and the destruction date of the palace (after Niemeier 1983). The controversy has yet to be resolved.

Seals deposited in LM IIIB tombs are invariably older than their context, some are veritable antiques of LM I date or earlier (see above p. 215). Thus, conceivably, heirloom seals might also have been used to impress sealings at Knossos during LM IIIB. This is certainly the case at Pylos, destroyed in LH III B2 / C1, where the bulk of the seal-types are dated LB II-III A, though some are LB I-II.¹²⁶

The varieties of sealings found in the late palace also have very close parallels at Pylos and other mainland centres destroyed during LH III B. Indeed individual nodules are sometimes virtually indistinguishable – a remarkable enough state of affairs, given their geographical distribution, never mind any chronological differences.¹²⁷ The similarities extend to tablet administration. On the traditional date for the Knossian destruction we

¹²⁶ See Chapter 10. For Knossos *CMS* II.8 (esp. table 3) now provides additional insights into the style and dates of seal-types used in the late palace. About 425 late sealings have datable motifs; a rough count yields the following figures: pre-LM I ca 2%; LM I ca 25%; LM I-II ca 10%; the remainder are LM II-III A1 or LM III A1. Note that many seal-types are undatable, owing to poor or fragmentary preservation. The proportion of heirloom (i.e. LM I-II or earlier) seals is far higher than at Pylos. Two explanations are possible. First, that output on Crete was probably much greater than on the mainland in LB I-II (hence more heirloom seals were still in circulation during LM IIIB). But this does not chime with the evidence from the Knossian graves (see above). Conversely, the high proportion of LM I-II heirlooms could help to support the traditional LM III A1 / 2 date (or the compromise LM III A 2 / B1 position). Among the LM II-III seal-types are impressions from a few rings, some soft stone lentoids and mostly hard stone seals. See here 5, 24, 437-440 for LM I-II seals and signet rings used on the late sealings.

¹²⁷ Stressed in *Tonplomben* 68-69, esp. pls. 42-46, where mainland and Knossian examples are illustrated side-by-side; cf. *CMS* II.8 pp. 52-74. See also Chapter 10.

are left with a gap of about a century until the earliest sealings and tablets on the mainland.¹²⁸ This is probably within acceptable limits. Significant developments in sealing types will only occur if there are marked changes in administrative requirements. In any case, the Knossos sealings cannot give a firm date for the destruction of the palace.

Since certainty will always elude us, we must fall back on possibilities and probabilities. The case of the RCT shows that ‘Unity of the Archives’ – long enshrined as dogma – is open to challenge. In turn this paves the way for a more mature approach to the final stages of the palace. It is highly unlikely that this huge complex should have remained wholly unscathed for a period of some 150 years – from LM IA Mature until early LM IIIA2.¹²⁹ This would fly in the face of previous periods of Knossian history. Nor, on reflection, does the ‘big bang’ scenario – in which the entire edifice burnt and collapsed in early LM IIIA2, only to be re-occupied later by miserable and illiterate squatters – any longer have the ring of truth. It seems altogether more plausible to envisage a series of destructions throughout LM II-III, some less grave than others, each contributing to an inexorable decline. In time, the fine halls and entrances of the palace and its dependencies were turned over to more mundane purposes: storage, manufacture, and record-keeping. If there ever was such a thing as a ‘final’ destruction, then the end of LM IIIA2 or the transition to LM IIIB1 may prove closer to the mark.¹³⁰

A date of around 1300 BC in absolute terms would have undoubted merits when it comes to the sealings, for it helps narrow the gap between the Knossian examples and those found on the mainland. In any case, the destruction of Knossos – whether early or late in LM IIIA2 – had a profound impact throughout the rest of the island and further afield. One cannot help feeling that the fall of this once-great palace provides the key to the otherwise mysterious demise of Cretan seal engraving after more than 1000 years of continuous development.

SMALLER CRETAN SITES IN LM II-III

Beyond Knossos sporadic discoveries of LM II-III sealings have been made. At Palaikastro a LM II-III hard stone lentoid was used to stamp a discoid loom-weight, demonstrating that this old east Cretan practice was remarkably long-lived.¹³¹ A LM IIIB context in House Epsilon at Mallia has yielded the upper part of a stopper, stamped by a pair of seals – one depicting an animal attack, the other a sacrificial scene (447).¹³² Another stopper, with the impression of a LM II-III soft stone lentoid, was found in the vicinity of Quartier Mu, while a two-hole hanging nodule came to light in Quartier Nu.¹³³ So far no Linear B tablets have been found at Mallia; the few sealings tell us little about the role of this site in LM IIIB. Stopper sealings are also attested at LM IIIB Kommos.¹³⁴

¹²⁸ The earliest securely dated sealings are LH IIIB1; a fragmentary Linear B tablet has now been found in a LH IIIA2 context at Petsas House (see Chapter 10 n. 32).

¹²⁹ For LM IA destructions see *Troubled Island passim*, esp. 35-37, fig. 4. There is, of course, no LM IB destruction in the palace.

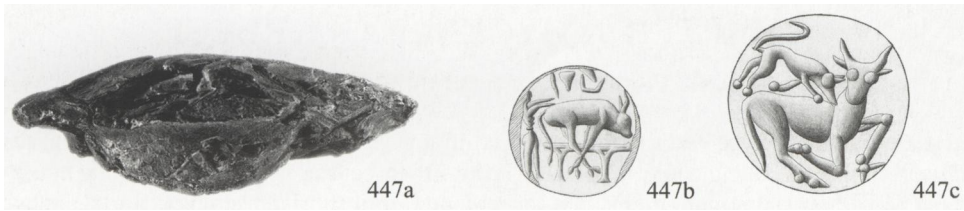
¹³⁰ Recently re-iterated by Momigliano & Hood (n. 109) 148-49.

¹³¹ CMS II.6 no. 248.

¹³² The attack scene is clearly LM IIIA in date; for the sacrificial scene see above pp. 205-06.

¹³³ CMS II.6 nos. 210 (HMs 1085: stopper) and 211 (hanging nodule). See FIGURE 5.2 for location of House Epsilon.

¹³⁴ L. V. Watrous, *Kommos III: The Late Bronze Age Pottery* (Princeton 1992) 83, 87-88, 143-44, pl. 38. No. 1524 is a complete stopper from a stirrup jar, with possible illegible seal impression. No impressions are preserved on the fragmentary stopper no. 1523, nor on nos. 1525-1526, which are described as stoppers (?) for storage vessels, perhaps short-necked amphorae.



447a-c LM III stopper cap (originally belonging to a stirrup jar) with multiple impressions of two hard stone lentoids. Profile shown at ca 1:1; drawings of seal-types at ca 3:2. Mallia House Epsilon.

In Khania, our evidence comes solely from small plots uncovered in rescue excavations (cf. Chapter 6-7). Nevertheless, the discovery of several Linear B fragments and sealings indicates that Khania continued to be an administrative centre during LM III.¹³⁵ Indeed its ancient name Kydonia is recorded on the Knossos tablets. As already noted, the Khania tablets – from a LM IIIB1 context – do not shed direct light on the destruction date of Knossos. Nor do the finds necessarily support the view that Khania became the administrative ‘capital’ of the island after the fall of Knossos.

¹³⁵ Khania tablets see above. The sealings include two stoppers, KH 1566 (with *CMS V Suppl.* 1A nos. 147-148) and KH 1564 (*ibid.* no. 149), as well as an object sealing, KH 1567 (*ibid.* no. 141).

CHAPTER 9 MYCENAEAN GREECE

The destructions at the end of EH II ushered in a period of set back or recession on the Greek mainland lasting many centuries. Proto-urban centres with their corridor houses gave way to simpler communities, not far removed from subsistence level. Burials in cist graves or pithoi were accompanied by few grave goods, if any. Against this backdrop the absence of seals and sealings is hardly surprising.¹ Although contacts with the Aegean were restored by early in the MH period, the impact on mainland society seems minimal, restricted to small amounts of pottery, probably channelled via the prosperous *entrepôt* of Aigina. Of other Minoan products and practices, so prevalent in the islands of the Aegean, there is scarcely a trace (cf. Chapters 5 and 7). None the less, signs of increasing social diversity in the later MH period herald the emergence of powerful elites during LH I (ca 1600–1500 BC).² Mycenae still provides our most striking evidence for this phenomenon, with ever-more elaborate burial practices – notably the construction of two Grave Circles and deeply-cut Shaft Graves – and increasingly lavish grave goods. While the source of this astonishing wealth remains an open question, military prowess may have been a factor, to judge from the amount of weaponry found in the later graves. More striking still are the quantities of prestige goods, some obviously acquired from Minoan Crete, others doubtless made locally in the Minoan style.

Death and burial necessarily dominate our picture of Early Mycenaean Greece (LH I/II-III A1), since continuous occupation and levelling in the later palatial centres has obliterated crucial settlement evidence for this period.³ Family tombs used for several generations become the norm, while the construction of both monumental tholoi and richly endowed chamber tombs attest to the continued spread of local elites, seeking to achieve and consolidate status through funerary display. Contacts with Crete intensify and apparently culminate in a Mycenaean administration at Knossos during LM II-III A1/2 (ca 1450–1375/50 BC; see Chapter 8). Indeed, throughout the central and eastern Aegean, settlements previously within the Minoan cultural orbit, notably Phylakopi on Melos, Ialysos on Rhodes and Miletus on the Anatolian coast, now acquire a Mycenaean character.⁴ At the same time, there is an expansion in long distance trading networks to the central and eastern Mediterranean.

¹ Scarcely more than a handful of seals are known from EH III-MH contexts and some are likely to be out-of-context: see Chapter 3 n. 44 and I. Pini, in *CMS V Suppl.* 3 p. 21. For general background on EH III and MH: J. B. Rutter, in *Review* 113-35; 148-55. For EH II-III: J. Maran, *Kulturwandel auf dem griechischen Festland und den Kykladen im späten 3. Jahrtausend v. Chr.* (Bonn 1998) 27-30, 161-305.

² *ABAC* 96-97, 214 for dating. Rutter (n. 1) 124-47, 151-55 provides a good overview, with recent literature on MH and LH I-IIB.

³ While Rutter (n. 1) and others define the Early Mycenaean Period as LH I-IIB, I prefer to extend this to LH III A1: as Mountjoy observes, the borderline between LH IIB and III A1 is still unclear (*Mycenaean Pottery* 63). For burials see: W. Cavanagh & C. Mee, *A Private Place: Death in Prehistoric Greece*. *SIMA* 125 (Jonsred 1998). For the principal sites mentioned in this chapter see *MAPS* 2-3.

⁴ J. L. Davis, in *Review* 27-28, 49-50, 71-72; J. L. Davis et al., *ibid.* 90-94. For Miletus see: W.-D. Niemeier, *BICS* 46 (2002–03) 225-27. See also Chapter 10.

During LH IIIA2-B (ca 1375/50–1200 BC) there are palpable changes in Mycenaean society.⁵ Fortified citadels and palaces are constructed in the Argolid, Attica, Boeotia and Messenia. These major building programmes are accompanied by a marked shift in the disposition of wealth, which was increasingly absorbed and controlled by the palatial centres. Rich burials are now less frequent and the deployment of imported materials – be they essential supplies of copper and tin or luxuries, such as gold, ivory and semi-precious stones – becomes ever more restricted.⁶ Craft output is largely dominated by serial production; in glyptic gold signet rings and hard stone seals give way to new types made of steatite, fluorite and pressed glass. The extent of palatial control in the LH IIIB period is best seen in the detailed records of disbursements and receipts maintained on clay tablets, written in the Linear B script, coupled with sealing practices akin to those employed in the late palace at Knossos (Chapters 8, 10). These bureaucratic mechanisms vanish with the collapse of the mainland palaces at the end of LH IIIB2 (ca 1200 BC).⁷ Then, as the manufacture of steatite seals dwindles and the last remaining heirlooms in circulation are deposited in graves of the post-palatial era, the long history of Aegean glyptic finally comes to an end (Chapter 10).

SOURCES OF EVIDENCE AND DATING

The first seals attested on the Greek mainland in LH I come from Circle B at Mycenae and were probably imported from Crete.⁸ Two are ‘talismanic’ seals incorporated into necklaces belonging to the female burials in Graves Mu and Omicron. From Grave Gamma we have the fine amethyst discoid bearing a male head in profile, sometimes hailed as the first portrait of a Mycenaean prince (236).⁹ In fact, the representation is generic not individualized, and the discoid is a Cretan shape (current in MM II-III / LM I) which was not adopted by mainland workshops. The wealthy ‘Royal Graves’ in Circle A (perhaps a trifle later) offer a much more heady mix of Minoan and minoanizing material. This certainly applies to the eight seals recovered from Graves III and IV, including three gold cushions and two signet rings (458-461, 464, 478). These burials are broadly

⁵ C. W. Shelmerdine, in *Review* 329-77, 378-81 provides a recent account of LH IIIA-B. As she rightly points out, the earliest megaron complexes go back to LH IIIA1 or earlier, but the inception of palatial authority is harder to date: *ibid.* 350-51.

⁶ On the decline in rich burials see: S. Voutsaki, in *Politeia* 55-63; eadem, in S. Voutsaki & J. Killen (eds.), *Economy and Politics in the Mycenaean Palace States. Cambridge Philological Society Suppl. 27* (Cambridge 2001) 195-213. S. Sherratt provides a stimulating discussion of sub-elite and substitute elite products in J.-P. Crielaard et al. (eds.), *The Complex Past of Pottery* (Amsterdam 1999) 163-211. See also Chapter 10.

⁷ For causes and dates of the destructions: Shelmerdine (n. 5) 372-76, 381.

⁸ *CMS* I nos. 5-7 from Graves Gamma, Mu and Omicron, respectively. These are ‘late’ graves, contemporary with the first burials in Circle A; Gamma and Mu contained LM IA vases: O. T. P. K. Dickinson, *The Origins of Mycenaean Civilisation. SIMA 49* (Göteborg 1977) 44-45, 50-51; *ABAC* 96-97, 214; G. Graziadio, *AJA* 92 (1988) 343-72, esp. 362, table 5; idem, *AJA* 95 (1991) 403-40, esp. 406, table 1. Another ‘talismanic’ seal (*CMS* V no. 421) was found in Grave θπ4 at Eleusis, associated with beads of copper, crystal and glass (?): G. E. Mylonas, *Το δυτικόν νεκροταφείον της Ελεούσινος* (Athens 1975) B 18-19; Γ pl. 102. It apparently came from a ‘pit’ in the SE corner with pottery dated by the excavator to the end of the MH period. However, this cist grave (unlike the Shaft Graves) was re-used in LH III and the ‘pit’ does not seem to have been sealed; thus the association of beads, seal and late MH pottery is not necessarily secure.

⁹ See Chapter 6 for discussion; also J. H. Betts, *TUAS* 6 (1981) 2-8.

contemporary with LM IA Mature and the volcanic destruction of Thera.¹⁰ For a slightly later period, equivalent to LM IB on Crete, the tholos at Vapheio near Sparta provides invaluable evidence. Here, the single burial in the floor cist had an array of rich finds, including the famous pair of gold cups, and a veritable collection of 29 seals. The pottery, which dates to LH IIA, provides a secure *terminus post quem non*.¹¹

Unfortunately, most graves throughout central and southern Greece remained in use for long periods of time (i.e. LH I/II-III) and closed deposits within them are all too rare.¹² With no sealings to guide us – and none survives before LH IIIB1 – dating individual seals can be difficult. For securely dated comparanda, we can sometimes turn to seals and sealing deposits of LM IA and LM IB or well-defined groups of the LM II-III A period (see Chapters 6-8). Even so, for seals of hard stone and precious metal, we must generally content ourselves with broad stylistic dates: LB I-II and LB II-III A. An unavoidable consequence of this approach is that LB II, about a century in duration, often seems ill defined, though in truth it probably represented the heyday of Aegean glyptic (cf. Chapter 8). On the whole it seems wiser to avoid the term Helladic, except when describing pottery or contexts. Cretan-made seals certainly reached the mainland during the LBA, isolating them is another matter (see below and Chapter 10). For seals without any provenance, neutral terms (e.g. LB I-II) are obviously essential.¹³

The re-use of tombs also impairs our ability to address questions of seal ownership in Mycenaean Greece, since rarely is it possible to link grave goods to specific burials. What we can observe is that ordinarily only rich graves contained seals in the Early Mycenaean period. Indeed some cemeteries have yielded only a handful of seals, others none at all. Naturally, we must allow for the disturbance and removal of grave goods in antiquity and looting in modern times, as well as poor standards of retrieval and publication.¹⁴ None the less, it seems fair to say that seal ownership was limited to the elite members of Early Mycenaean society. This goes hand-in-hand with the fact that seals in this period are made exclusively of hard semi-precious stones and precious metals. By contrast, soft local stones had accounted for roughly 20-25% of neo-palatial output; quantities were also considerable during LM II-III A2 / B1 (see Chapters 6, 8). On the mainland, soft stone seals are apparently not produced before LH III A, when the so-called Mainland Popular Group in steatite appears, along with seals made of fluorite and

¹⁰ *ABAC* 96-97 and esp. 214-15. For Circle A: Dickinson (n. 8) 46-51; I. Kilian-Dirlmeier, *JRGZM* 33 (1986) 159-98; Gradziado 1991 (n. 8) 403-40, esp. 430-37.

¹¹ Thus contemporary with LM IB: see Chapter 6. Seals from the cist illustrated here include: 31-32, 39, 480, 482, 488, 502, 528. Unlike the floor cist, the main chamber contained LH III A1 sherds. See here 221, 483. For the Vapheio seals see *CMS* I nos. 219-261; J. G. Younger, *AJA* 77 (1973) 338-40; G. Korres, *AE* (1976) 148-63. For the tomb generally: I. Kilian-Dirlmeier, *JRGZM* 34 (1987) 197-212.

¹² The *CMS* volumes for the Athens National Museum and smaller Greek museums contain valuable accounts of contexts, dating, associated finds and references. In the case of recently excavated sites, these are usually compiled by the excavator(s). See *CMS* I, I Suppl., V, V Suppl. 1A-B, V Suppl. 2, V Suppl. 3. Cavanagh & Mee (n. 3) provide useful lists of datable burials.

¹³ This applies to many seals in English, European and North American collections, covered in *CMS* VII-XIII and *CS* (Ashmolean Museum). Place of acquisition (when known) is not necessarily a reliable guide to origin, e.g. especially for seals purchased in Athens or Salonika in the 19th century: see Chapters 10-11.

¹⁴ Dickers (109 n. 753) observes that 82% of graves containing late seals (Mainland Popular Group, fluorite, pressed glass) are unpublished, i.e. known only through preliminary reports or the short accounts provided by excavators in *CMS* volumes (above n. 12). See also Chapter 10.

pressed glass.¹⁵ At much the same time, the manufacture of hard stone seals and metal signet rings seems to decline and – as far as we can tell – ceases by the end of LB IIIA2.

For the later Mycenaean period (LH IIIA2-C) sources of evidence are more varied, their distribution is much wider, the overall picture complex and puzzling. Graves still provide the bulk of our finds, especially those in Achaia, Elis, Kephallenia, Lokris, Phokis, Phthiotis and Thessaly, some distance from the palatial centres of the Mycenaean ‘heartland’.¹⁶ For instance, more than 120 seals have been published so far from excavations at Elateia in Phthiotis, while the Medeon cemetery in Phokis has yielded over 80 examples. The burials mostly date to LH IIIA-C and contain a fascinating mix of heirlooms and contemporary products in soft stone, fluorite and pressed glass (see also Chapter 10). In some cases the steatite seals are ‘workshop fresh’, as if made explicitly for funerary use. But most Mainland Popular seals are worn from use, and this is especially true in the ‘heartland’ (see pp. 271-73). Seals of soft and hard stone alike are also deposited in sanctuaries, such as the Cult Centre at Mycenae, the Temple at Ayia Irini on Kea, and the shrines at Phylakopi on Melos (Chapter 10). Further examples have come to light on sites that were to become sanctuaries in the Archaic period, such as Delphi (Chapter 10). Settlements and palatial centres have also yielded seals, though all too often they are stray finds, lacking significant associations. By way of compensation, the LH IIIB destructions at Mycenae, Midea, Pylos and Thebes provide evidence – at long last – for Mycenaean sealing practices. With only a few exceptions, the sealings are all impressed with heirlooms made of hard stone or precious metal. While soft stone seals were still made in the LH IIIB period, like other defining characteristics of Mycenaean culture, they too dwindled and production eventually ceased.

SEALS AND SEAL-TYPES

Seals and signet rings constitute our prime source of pictorial evidence from the Early Mycenaean period and as such their importance is clear. Far less clear is how to approach them, for even experts struggle to distinguish Mycenaean pieces from Minoan.¹⁷ Of course, the acquisition of Minoan, or Minoan-style, exotica by emerging Mycenaean elites is a well-known phenomenon.¹⁸ What is a trifle disconcerting is the wholesale transfer of glyptic style from Crete to the mainland in the early LBA *and* its longevity. This is in marked contrast to LH I-II pottery, where we can readily see how selected elements from the Minoan repertoire (e.g. in shape and decoration) were grafted onto local ceramic traditions.¹⁹ But herein lies the rub, for in glyptic there was no indigenous

¹⁵ About two dozen soft stone seals from the mainland cannot be readily assigned to the late Mainland Popular Group. Some are surely Cretan products (e.g. here 594-595); others are harder to place (e.g. here 563, 578-580, seal-types from Mycenae and Pylos). Thus we cannot wholly rule out the possibility that soft stone seals were occasionally produced on the mainland in LB I / II-III A1.

¹⁶ Our understanding of the ‘heartland’ vs ‘periphery’ is hazy at best: see papers in *Peripheria* for a range of views. It is worth stressing that the discovery of new cemeteries in western and central Greece owes much to the pressure of modern development.

¹⁷ See also below and Chapter 11. General accounts of Mycenaean seals (now somewhat dated) include: APG 224-31 and *GGFR*² 54-59, 60-62, 412-15.

¹⁸ Rutter (n. 1) 139-40. For the role of foreign exotica in secondary state formation: J. C. Wright, in P. Rehak (ed.), *The Role of the Ruler in the Prehistoric Aegean*. Aegaeum 11 (Liège & Austin 1995) 63-80. For imported Minoan seals: I. Pini, in R. Hägg & N. Marinatos (eds.), *The Minoan Thalassocracy: Myth and Reality* (Stockholm 1984) 123-31.

¹⁹ *Mycenaean Pottery* 33-52. Still obscure are where the production centre(s) of the earliest Mycenaean pottery was / were located and how the style spread: Rutter (n. 1) 137.

tradition whatsoever. We can only surmise that Cretan craftsmen, equipped with their rotary and engraving tools, were brought to the mainland to ensure a continued supply of Minoan-style seals and signet rings. Logically, the training of Mycenaean apprentices would follow, though we can detect little hesitancy in execution and workshop material is altogether lacking. Instead we have polished craftsmanship and seals that are all but indistinguishable from Cretan pieces. We might, however, expect differences to emerge in time, reflecting changing tastes (or needs) of Mycenaean patrons and their craftsmen. In the realm of iconography, for instance, some elements of the Minoan repertoire might well be misunderstood, transformed or rejected altogether as irrelevant. We might also predict differences in composition and the use of space, not to mention materials and techniques. In short, we might anticipate the emergence of a distinctive Mycenaean style (see below). There is no shortage of clues, but rarely do they add up to incontrovertible proof. Of course, it is worth recalling that there was no such thing as a single 'Minoan style' in neo-palatial glyptic. Rather, there was considerable stylistic diversity, even among seal-types attested on a single site, such as Ayia Triada, presumably reflecting the output of different workshops and craftsmen, the subtle variations in needs and tastes of their clientele. The mainland presents a similar picture. As for any expected divergence from Minoan traditions, this was largely if not wholly countered by intensive contact between mainland Greece and Crete during LB II-III A1 (Chapter 8). As we shall see, it is not until the appearance of the Mainland Popular Group during LH III A that we can truly speak of a Mycenaean style. In the following sections we will concentrate on hard stone seals and metal signet rings made during LB I-III A, though it goes without saying that not every example was necessarily produced on the mainland. Late soft stone seals are treated separately below (see pp. 267-73).

MATERIALS, SHAPES AND TECHNIQUES

The most striking fact about LB I-III A seals on the mainland is that they are almost invariably made from hard semi-precious stones. The exceptions are few and far between, and also employed imported materials such as blue glass or gold. Most signet rings are gold, occasionally combined with other metals and sometimes embellished with cloisonné of coloured glass (see pp. 241-46). Of soft stones there is scarcely a trace until the later Mycenaean period: the few seals made of serpentine or chlorite schist readily betray their Cretan origin (594-595; Chapter 10). The avoidance of soft stones by Mycenaean craftsmen and their patrons represents a radical departure from Minoan practice stretching back to the pre-palatial period and has important social ramifications, which we will consider in due course (see below and Chapter 10).

Among the semi-precious stones employed on the mainland, agate clearly predominates: sometimes translucent and finely veined, often with opaque banding (449, 453-454; C41, C43-47). There is an astonishing variety of colours, from milky-white through pale grey or blue, lightish brown, orange and red, chocolate, charcoal grey and even black. Some are remarkably delicate, others garish. It is possible that agate and other hard stones were sometimes deliberately heated to alter colours or opacity and to enhance banding. A seal in Berlin, opaque and creamy-white with lovely light-grey banding, provides a possible example (C41).²⁰ Agate aside, there is a good deal of carnelian, some amethyst, rock crystal and blue chalcedony, as well as red jasper.

²⁰ CMS XI no. 62; also no. 53. Both bear a faint network of fine cracks (*craquelure*) on parts of their surface. See also P. Yule, in CMS Beiheft 1 (1981) 278-82.

Green jasper is exceptionally rare (see below), but otherwise we find much the same range of stones as in neo-palatial Crete (Chapter 6). That said, comparisons are a tricky business, not least because so much evidence for LM I glyptic comes from sealing deposits. Variations over time are also hard to gauge. After LB I-II there does seem to be a sharp drop in red jasper, rock crystal and chalcedony; amethyst is virtually non-existent. We noted a similar pattern in LM II-III Crete (Chapter 8). Two stones employed on Crete, especially during LM II-III, are haematite and lapis lacedaimonius; neither is common on the mainland. Since lapis lacedaimonius is quarried near Sparta in Lakonia, it seems odd that the stone was not used more extensively. Indeed most if not all of the seals made from this material could be Cretan imports.²¹ About ten seals from the mainland, spanning LB I-III, are identified as lapis lazuli; the stones are often poor quality with calcite inclusions.²² Even so, sometimes they are embellished with gold, emphasizing the preciousness of the material (see p. 241 and C42). Whether blue glass, which first appears in the Aegean in LB I, was invented as a substitute for lapis remains to be established. During LB I-II glass was cut and engraved in much the same way as hard semi-precious stones: only in LB IIIA were new techniques devised which allowed jewellery and seals to be replicated in moulds (pp. 267-70; C48).

The origin of the blue glass used in the Aegean is far from clear and the same, alas, can be said for most semi-precious stones. Much more work is needed on sources and patterns of exploitation in the Aegean, Egypt and the Near East, if we are to move beyond idle speculation. Does the scarcity of green jasper simply reflect Mycenaean taste or a serious decline in supplies and, if so, from what source? Perhaps the few seals made from this material are Cretan imports (e.g. 502).²³ On rare occasions concrete evidence from the East does exist against which to measure Aegean finds. Amethyst is a good example, albeit puzzling. In Egypt this is much favoured during the Middle Kingdom and small amounts do indeed reach Crete in the MBA (Chapters 5-6). But the most striking concentration of amethyst – all of an exceptionally high grade – occurs in the Pylos area, especially Tomb IV at Englianos.²⁴ On stylistic grounds the seals can be dated to LB I-II (e.g. 451) and the necklaces probably also belong to burials of this period. But did any amethyst arrive in Messenia unworked, or are we only dealing with imported jewellery, occasionally re-cut to make seals? The lack of workshop evidence leaves us without positive proof.²⁵

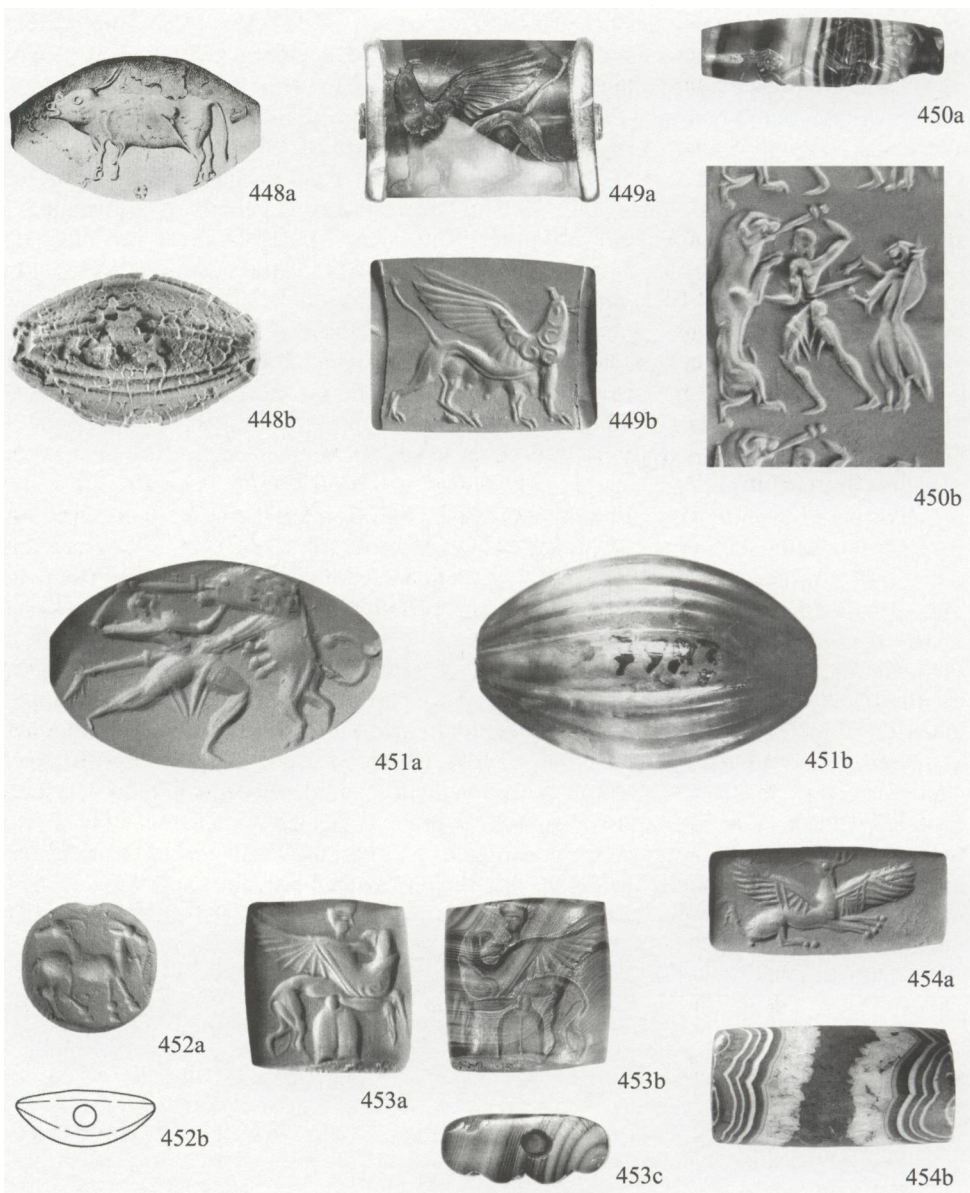
²¹ See Chapter 8 for use in LM II-III glyptic. Seals from the mainland include: *CMS* I nos. 48, 106, 115 (Mycenae); 182, 188 (Midea), erroneously described as conglomerate, jasper, jadeite etc.; V Suppl. 1B nos. 142 (Anthia), 153 (Patras: here 531); V Suppl. 3 no. 384 (Medeon). *CS* no. 209 was acquired by Evans at 'Gythion' (the provenance 'Taygetos' given by Kenna for *CS* no. 307 [here 600] is erroneous, see Chapter 11 n. 6). *CMS* XI nos. 34 and 176 were purchased in Athens; no. 39 said to be from Salonika (cf. n. 13 above). See also: P. Warren, in J. M. Sanders (ed.), *ΦΙΛΟΛΟΓΩΝ* (London 1992) 285-96.

²² From the mainland: *CMS* I nos. 181, 255 (gold caps), 288-289; I Suppl. nos. 5, 34; V nos. 424, 600 (here 452), 639 (gold caps); V Suppl. 1B. no. 101. From Delos: *CMS* V no. 312 (gold caps).

²³ *CMS* I no. 234 (Vapheio; here 502) and V Suppl. 1B no. 76 (Mycenae) represent the sole examples from secure contexts on the mainland.

²⁴ *PN* III 124-26 (246 beads); *CMS* I nos. 290-291. The elaborate grooving on the back of no. 290 (here 451b) is a sure sign that this is a re-worked bead. Other amethyst seals from the Pylos area include: *CMS* I nos. 272-273, 299; V nos. 643, 646. *CMS* I no. 263 from Tragana is not amethyst but blue chalcedony. For sources see Chapter 5. A more detailed account is in preparation.

²⁵ The fragment of a Minoan amethyst rhyton was found with other 'workshop' material inside the West Gate at Midea (context LH IIIB) and may have been intended for re-cycling; a second fragment was found by Tsountas at Mycenae: K. Demakopoulou, in *Aegean – Orient* 222, pl. 21.



Selected LB I-III seals from mainland Greece. **448a-b** Amber amygdaloid with grooved back from Mycenae CT 518; drawing of impression and back. **449a-b** Agate cushion with gold caps from the tholos at Pylos-Routsi; face and impression. **450a-b** Agate cylinder from Kakovatos; profile and impression. **451a-b** Amethyst amygdaloid with grooved back from Pylos-Englianos T. IV; impression and back. **452a-b** Lentoid with flat face of lapis lazuli from the Cult Centre, Mycenae; impression and profile drawing. **453a-c** Agate 'cushion' with flat face and grooved back from Tiryns; impression, face, and profile. **454a-b** Agate three-quarter 'cylinder' from Thebes; impression and back. Scale ca 3:2.

Our best evidence for the working of hard semi-precious stones comes from Thebes, but includes no seal engravers' debris and is difficult to date. A large piece of rock crystal and quantities of agate, including blanks – maybe intended for jewellery and inlays – as well as unfinished pommels came to light in the 'Old Kadmeion'.²⁶ If hard stones were still being used for making jewellery in the later Mycenaean period, then the decline and eventual cessation of hard stone glyptic around the end of LH IIIA2 is all the more perplexing. Elsewhere at Thebes, a veritable hoard of 38 Near Eastern cylinder seals (32 were lapis lazuli), 50 pieces of lapis jewellery and 100 agate beads was found in the so-called Treasure Room, dating to LH IIIB (Chapter 10). While the jewellery was probably imported ready-made, re-cycling was always an option. So it seems that the demise of hard stone glyptic cannot be attributed to a shortage of raw materials.

Re-cycled imports probably account for much of the lapis lazuli in the Aegean.²⁷ Although re-worked pieces are sometimes hard to identify, the very flat seal face on a tiny lapis 'lentoid' from Mycenae looks suspicious (**452b**). As we noted in Chapter 6, amygdaloids – especially of carnelian – are sometimes re-worked beads: usually they have tell-tale grooves on their backs. An unusually elaborate example made of amethyst was found in Tomb IV at Englianos (**451**; see above). More unusual still is an amygdaloid with grooved back from Mycenae CT 518, for it is the only surviving Aegean seal made of amber (**448**).²⁸ A very different kind of bead, made of a translucent agate with attractive veining, was used for a seal found in the Unterburg at Tiryns (**453**). It is roughly square in shape, ribbed on one face, flat on the other, which bears the motif: a curious composition depicting a female figure and griffin. Cylinders and a few oddly shaped half-cylinders may also represent trimmed down beads: most are made of showy banded agate (e.g. **450, 454, 496, 592**).

These few special cases aside, the standard seal shapes on the mainland are lentoids, amygdaloids, occasionally cushions, three-sided prisms, and stone signet rings, in other words, the same as in neo-palatial Crete. But the lentoid, already popular during LB I, comes to dominate the repertoire during LB II-III on the mainland and Crete alike. When it comes to seal size, we observe similar pan-Aegean trends. In neo-palatial Crete, lentoids normally measured 1.0–2.0 cm in diameter, with most clustering in the middle of that range (Chapter 6). Among the lentoids in the Vapheio floor cist (LH IIA) the average diameter is fractionally under 2.0 cm, and a range of 1.5–2.0 cm seems to hold good for other LB I-II seals on the mainland.²⁹ While large lentoids, in excess of 2.0 cm, are sometimes regarded as a mainland fashion, it is worth remembering that several LM I seals also fall into this category.³⁰ Perhaps it is safer to say that large seals are a pan-Aegean fashion, which gathers pace in LB II and leads to some exceptionally large pieces well in excess of 3.0 cm in diameter. The Dendra tholos contained three enormous

²⁶ Rock crystal: K. Demakopoulou (ed.), *The Mycenaean World* (Athens 1988) 217 no. 202 (colour illustration and earlier literature). Unfinished jewellery, inlays, pommels: A. D. Keramopoulos, *AE* (1930) 29-58; cf. K. Demakopoulou & D. Konsola, *Archaeological Museum of Thebes* (Athens 1981) 50. For the 'Old Kadmeion', see now: A. Dakouri-Hild, *BSA* 96 (2001) 81-122, esp. 106 (destruction perhaps in LH IIIB1).

²⁷ A phenomenon also attested in the East during the second millennium BC: *AMMI* 90, 92.

²⁸ H. Hughes-Brock, in *CMS Beiheft* 5 (1995) 113, suggests it could have been cut down from a globular bead.

²⁹ Illustrations in this Chapter are mostly at 3:2, **455-457** and the ring hoops (**464b, 465b, 466-469, 470b**) are shown at 1:1.

³⁰ See Chapter 8, p. 196 and n. 16; also large ring impression from Tylissos, here **367**.



455-456 Outsized lentoids from the tholos tomb at Dendra-Midea; impressions. **457a-b** The great ring from the Tiryns Treasure; face and profile. Scale 1:1.

lentoids, D. 3.7, 3.6–4.0 and 4.0 cm respectively, conspicuous display on a truly grand scale (**455-456**). Seals of comparable size are also found in LM II-III Crete (e.g. **373**, **440**). But outsized seals are not common and, allowing for difficulties in dating, seem confined to LB II. Many LB II-III lentoids, including the extra-large examples, have strongly biconvex faces with sharp profiles.³¹

Another fashion usually attributed to Mycenaean influence is the embellishing of seals with gold, in the form of caps, circlets and decorated string-holes. In fact, a few examples on Crete pre-date the LM IB destructions and are surely Minoan products (**207**); others are known from LM II-III graves in central and western Crete (**372**, **375**; Chapter 8). That said, most examples do indeed come from the mainland, reinforcing the impression of conspicuous display already created by the exclusive use of semi-precious stones. Of course, deliberate deposition in graves favours the preservation of gold – whether in the form of jewellery, signet rings, or capping on seals. Occasionally only a trace of gold tubing survives in the string-hole, suggesting damage during the owner's lifetime or rifling among earlier grave goods in re-opened tombs. The quality of embellishment varies a good deal; sometimes caps are made of flimsy gold sheet, in other cases they are more substantial (**449**; cf. **558a**, **570**). At the string-hole there may be lavish granulation, or no more than a simple bead. By far the greatest concentration of embellished seals

³¹ Cf. Chapter 8. During LB IIIA some hard stone seals are given conical backs, a feature which is widespread among seals of glass, fluorite and steatite produced in LH IIIA-B (see pp. 267-73).

occurs in the Vapheio tholos – an astonishing 17 examples, of which nine were found in the floor cist. Also found was a gold tube, with granulated caps attached, apparently made to adorn a lentoid, but never used.³² Sometimes gold foil was used to sheathe whole seals. Best known is the MM III-LM I steatite cushion in the Ashmolean Museum (C23), but a lentoid belonging to the Mainland Popular Group, now in Paris, shows that Mycenaean seals were sometimes treated in this way.³³ Rather more substantial sheet gold was used to encase a cushion made of lapis lazuli, datable on stylistic grounds to LB I-II, which was found in Enkomi Tomb 93. At some point in the seal's history, the casing was partly cut-away to reveal the face (C42).³⁴

Metal seals and signet rings

Mycenaean seals and signets made of gold and other metals have always attracted a good deal of attention, not least because many bear complex multi-figured scenes, drawn from the realms of combat and cult (see below). But all too often, that thorny issue – what is Minoan and what Mycenaean – has been side-stepped or ignored entirely. On the technical side, there has also been a fair share of misunderstanding and confusion.³⁵ We cannot hope to resolve all the difficulties here: a comprehensive study is long overdue.

As we have already noted, gold foil could be applied to a seal made from stone to create the appearance of a golden seal (see above). But during LB I-II seals made entirely of gold are also attested, although they are not solid (as one might suppose). Instead, their construction resembles that used for 'classic' hollow signet rings (see p. 243). In other words, they consist of several components made from sheet gold, cut to shape, and then engraved and embellished *before* being soldered together.³⁶ The most famous examples are the three matching cushions found in Shaft Grave III at Mycenae (458-461). Another cushion, from Pylos-Englianos Tomb IV, has an exceptionally elaborate net pattern on the reverse (463), and from nearby Pylos-Routsi Tomb 2, we have two gold amygdaloids: one with granulation at the string-holes, the other has cloisonné decoration on the back (462).³⁷ A LB II gold lentoid, used to impress one of the Pylos sealings, also must have been hollow, since the motif had been embossed on the seal face (571).³⁸ While these examples might lead us to suppose that gold seals are a purely Mycenaean fashion, it would be unwise to rule out the possibility of neo-palatial antecedents, given that LM I signet rings are constructed in the same manner (Chapter 6). Hollow construction is also

³² Korres (n. 11) 156, pl. 56a-γ (ANM 1828). Another comes from Menidi in Attica: *ibid.*, 157-58, pl. 56ζ' (ANM 1913).

³³ CMS IX no. 204. Gold casings (now hollow) for lentoids: CMS V no. 200; V Suppl. 1A no. 71.

³⁴ CMS VII no. 168; I. Pini, in G. C. Ioannides (ed.) *Studies in Honour of Vassos Karageorghis. Kypriakai Spoudai* 1990-91 (Leukosia 1992) 207-10 no. 5.

³⁵ Major insights are now provided by the x-ray analyses and ultra-sound tests carried out by W. Müller of the CMS team: see *Metron* 147-54 and esp. 475-81. Here I also draw on unpublished information lodged in the CMS Archive. Note that data and descriptions in CMS I are often unreliable and have helped to perpetuate errors in specialist and general literature (see Appendix 1).

³⁶ I. Pini, 'Metal seals and stamps of the Aegean Bronze Age' (unpublished paper 1996).

³⁷ PN III 114 states that the net pattern on the reverse of CMS I no. 293 (here 463b) was meant to be filled with 'glass paste or some semi-precious stone' and notes that 'one inlay of black-blue paste survives'. But I. Pini observes that the embossed network is unsuitable for inlay (pers. comm.); perhaps the bluish-black substance represents the corrosion of copper solder. For the gold amygdaloid from Pylos-Routsi T. 2 with granulation at the string-holes: CMS I no. 274 (not massive as stated).

³⁸ *Tonplomben* 37, 88, pl. 28 (cat. no. 64).



Selected LB I-II gold seals from mainland Greece. **458-461** Cushions from Mycenae Circle A, Grave III. Backs (**458**), impressions (**459-460**), face and impression (**461a-b**). **462a-b** Amygdaloid with facetting and cloisonné decoration on the back from the tholos tomb at Pylos-Routsi. **463a-b** Cushion with net pattern on the back from Pylos-Englianos T. IV. **458** not to scale; the remainder at ca 3:2. All of the seals illustrated here are not massive (solid), but are made of sheet gold.

used for the most of the signet rings found on the mainland. Several massive (i.e. solid) rings do exist, but they are far fewer than commonly supposed.

Although hollow signet rings vary a good deal in quality, size and hoop decoration, all are assembled from several components made of gold sheet. These include the hoop, the concave finger-bed, and a convex oval bezel plate, which bears the motif.³⁹ Sometimes the gold sheet is fairly robust (Th. 0.5 mm or more), often it is decidedly flimsy. In any case, there is no support for the view that hollow bezels were filled with sand. Likewise erroneous is the belief that bezels were cast in moulds. Instead, the motifs were invariably executed with gravers, punches and mallets, before assembly, as in the case of gold seals (above) or classic LM I signets. In general, the bezels range from L. 2.0–3.0 cm, although several well-known examples – including the pair from Shaft Grave IV (464, 478) – measure up to 3.5 cm in length.⁴⁰ None, however, remotely approaches the Tiryns ring, an enormous 5.6 x 3.3 cm (457); scant wonder that its authenticity was once questioned.⁴¹ In fact, its size calls to mind the huge lentoids that were also produced in LB II (e.g. 455–456). Whether the Tiryns ring was made on Crete or the mainland is another matter.

As one might expect, the hoop of the Tiryns ring is sizeable: the inner diameter measures 1.8 x 2.3 cm. In fact, rings from the mainland tend to have large hoops (inner D. ca. 1.5–2.0 cm) and would fit comfortably on a modern hand. The same also applies to the hoop of a decorated finger-ring from the Vapheio floor cist, which has an inner diameter of 1.59–1.66 cm and is clearly battered from wear.⁴² By contrast, neo-palatial signets have notoriously small hoops (1.2–1.4 cm), only suitable for wearing on the finger if the individual were of slim build (Chapter 6). The few surviving LM II–III rings, including the Ashmolean bull-leaper (379) have larger hoops, comparable to those from the mainland (Chapter 8).

As it happens, hoop size and decoration provide useful, if not infallible, ways of singling out LM I signet rings on the mainland. Neo-palatial hollow signets regularly have simple transverse ribbing on their hoops (Chapter 6). The Isopata ring (215) is a classic example, so too is the famous signet ring from Vapheio (221). On other counts – iconography, composition and style – the Vapheio ring also stands out as a LM I product, although it was found in the main chamber of the tholos, used during LH II–III A.⁴³ A second example comes from a LH III A–C chamber tomb at Elateia-Alonaki in Phthiotis, while a third Minoan ring is now attested at nearby Kalapodi.⁴⁴ Another likely candidate now in the Benaki Museum is said to come from Thebes.⁴⁵ Whether this represents the sum total of LM I rings on the mainland is hard to say. Several hollow signet rings with plain angular hoops do look suspiciously Minoan in style and iconography.⁴⁶ This hoop variety is not yet attested on Crete, but our extant repertoire is pitifully small.

³⁹ Müller (n. 35) 476–77, pl. 101c (hollow ring with finger-bed plate). See also Chapter 6 (pp. 128–130) with references. This type accounts for ca 50% of all extant Minoan and Mycenaean gold rings. Another variety, far less common, is the hollow ring with tub-like lower part (ibid. 477, pl. 101d). It, too, is attested on the mainland (e.g. *CMS* I no. 119: here 485) and Crete: e.g. the LM I ring from Sellopoulo T. 4 (Chapter 6 n. 37).

⁴⁰ Müller (n. 35) 476–77, pl. 103a–b and table 2 (bezel plates ca 0.8 mm thick).

⁴¹ See Chapter 11. The ring weighs 82.9 gr.: Müller (n. 35) pl. 104d, table 2.

⁴² ANM 1803: I. Pini, *BICS* 42 (1997–98) 211.

⁴³ For the LM I date: I. Pini, *TUAS* 8 (1983) 39–49; also Chapter 6 (esp. p. 131). For LM I rings in LM II–III contexts, see Chapter 8 nn. 8–9, 72, 126.

⁴⁴ *CMS* V Suppl. 2 no. 106 (here 593) and V Suppl. 3 no. 68. See also Chapter 10.

⁴⁵ *CMS* V no. 199.

⁴⁶ E.g. *CMS* I nos. 101 and 191 (engraving on bezel very worn).

Rings found on the mainland vary considerably in hoop decoration (457, 464-470). There is the plain angular type, just mentioned, and another with simple longitudinal ribbing (466).⁴⁷ Granulation is very popular indeed and occurs on the two rings from Shaft Grave IV, our earliest securely dated examples from the mainland. On these the granules are confined to a single row along each edge of the hoop (464b). One of the rings from Mycenae CT 91 is much more elaborate: five rows of granulation in all, graduated in size (467). This ring, which bears a well-known cult scene, probably dates to LB II (cf. 494). More or less contemporary is the ring from Prosymna CT 44 depicting antithetical griffins (529). Here the attractive hoop decoration comprises three strands of twisted wire (468), a technique which also occurs on a finger-ring from Vapheio (see above). By far the most lavish decoration occurs on two rings from Aidonia CT 7. Both are provided with cloisonné decoration around the hoop and also on the outer edge of the finger-bed (469). The individual cloisons, made from thin strips of gold sheet, were soldered in place and originally filled with coloured glass. On stylistic grounds, the first ring (491) must belong within LB II, but the second (492) has no remote parallels in glyptic and is harder to date (see p. 254). Perhaps it is a trifle later. A third ring from the same tomb, also depicting a procession (490), has a rather flimsy hoop decorated with granulation. Granulation and cloisonné are not confined to the mainland: in LM II-III Crete they occur on signets (e.g. 379) and decorated finger-rings.⁴⁸

The hoops of massive rings (i.e. made of solid gold) are undecorated. The best known example was found with the so-called Acropolis Treasure at Mycenae and depicts an elaborate – some might say over-elaborate – cult scene (465). The ring is not easy to date, but LB II seems appropriate on grounds of style and iconography (see pp. 254-56). Here the bezel consists of a single flat plate of gold sheet to which is soldered an undecorated hoop with angular section.⁴⁹ A second ring from the Treasure, depicting frontal animal heads, is similar in construction. Another massive signet is the so-called Danicourt Ring in Péronne, France (497). This was one of the first Aegean signet rings to surface in the 19th century and its authenticity was long doubted.⁵⁰ In fact, the motif has good parallels among the Pylos sealings (498) and, on stylistic grounds, can be dated to LB II-III A1. Several massive rings have been found in late contexts, including two from a LH IIIC chamber tomb at Perati, but their bezels are very worn and they are certainly heirlooms.⁵¹

Very different in construction is a ring now in the Benaki Museum and believed to come from Thebes. It consists of a bronze core set into a cup of flimsy gold sheet and covered with an equally thin gold bezel, here decorated with a couchant bull (470).⁵²

⁴⁷ For hoop varieties see: J. G. Younger, in *Aux origines de l'hellénisme* 88, fig. 6; A. Xenaki-Sakellariou, in *CMS Beiheft* 3 (1989) 334, fig. 10. A study detailing hoop decoration and construction is in preparation by W. Müller of the *CMS* team. This confirms my own observations that hoops with simple *transverse* ribbing and narrow diameters are diagnostic features of LM I signet rings: see above p. 243 and Chapter 6 (pp. 128-30).

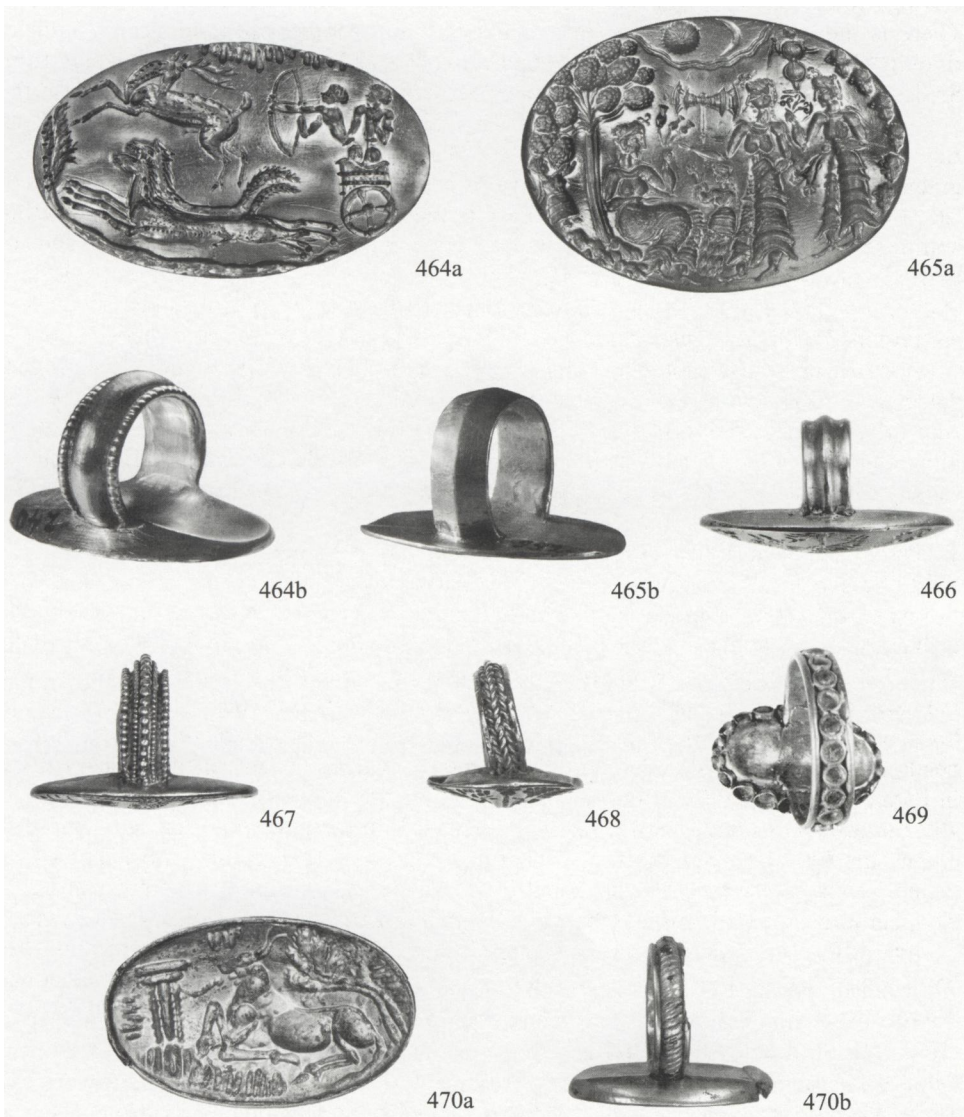
⁴⁸ Pini (n. 42) 210-11; see also Chapter 8 n. 26.

⁴⁹ Müller (n. 35) 476, pl. 101a (solid ring), table 2 (bezel ca 2–2.6 mm thick).

⁵⁰ *CMS* XI no. 272. First published in *RA* 27 (1874) 238-39, pl. 4 no. 44; said to have been found in Salonika in 1867. Rehabilitated by J. Boardman, *RA* (1970) 3-8; dated LH I or II (cf. *GGFR*² 383, 397, pl. 1016: erroneously described as the first Bronze Age gold ring found in Greece). This honour goes to the Burgon Ring (214 and C22); see Chapters 6, 11. Pini has re-dated the Danicourt Ring to LH II-III A: *Tonplomben* 87-88. See also below pp. 257-58.

⁵¹ E.g. *CMS* I no. 390. Somewhat different in construction is *CMS* I no. 391, a single-sheet ring, i.e. bezel and hoop cut from one piece of gold: Müller (n. 35) 476, pl. 101b, 104c, table 2. For Perati, see also Chapter 10.

⁵² Müller (n. 35) 477, pl. 101e (hollow ring with gold-plated bezel), table 2 (gold ca 0.1 mm thick).



Selected LB I-III gold signet rings from mainland Greece. **464a-b** Ring with hollow bezel from Mycenae Circle A, Grave IV; face and hoop. **465a-b** Massive (solid) ring from Mycenae Acropolis Treasure; face and hoop. Hoops of signet rings from Anthia (**466**), Mycenae CT 126 (**467**), Prosymna T. XVIII (**468**) and Aidonia T. 7 (**469**). **470a-b** Signet ring from 'Thebes', with gold-plated bezel (covering a bronze core, set into a flimsy gold cup); face and hoop. Faces at ca 3:2; hoops at ca 1:1.



471a-b Lead ring from Tiryns cast in a mould; face and reverse. Scale ca 3:2. **472** Steatite matrix from Eleusis, with motifs executed in intaglio, perhaps for making decorative finger-rings in lead with relief bezels, which were covered with thin gold foil. Scale ca 1:1.

Similar rings have been found in LM III contexts (Chapter 8) and the *floruit* of this variety probably lies in LB II-III. The same seems to be true of ‘bi-metallic’ rings, consisting of a bronze core, covered with thin sheets of gold and iron – an exceptionally rare metal in the Bronze Age. Examples come from tombs in the Argolid and from Kalyvia on Crete.⁵³ One seems to have been used to impress a sealing at Pylos (572).

Rings (and seals) made of lead have an exceptionally poor survival rate in the Aegean (cf. Chapters 3, 6). Happily, an example from the Unterburg at Tiryns is fairly well preserved and confirms the view that lead rings were cast in moulds (471).⁵⁴ The bezel, which is flat rather than convex, bears a geometric design; so too does a fragmentary example from Olympia.⁵⁵ Both rings were found in late contexts (LH IIIB-C) and they are likely to be late products too, since their motifs are vaguely reminiscent of the fluorite group, made during LH IIIA-B (see pp. 270-71). Whether rings of this kind were ever used to make impressions on clay remains an open question. On closer scrutiny, their designs seem to be cast in relief and this is certainly true of a ring from Kallithea near Patras, which bears a pictorial motif.⁵⁶ Presumably it served as a decorated finger-ring. These lead rings might, however, help to explain the steatite matrix from Eleusis, sometimes thought to have been used for casting (gold) signet rings (472). But since the motifs on the matrix are executed in intaglio, they could only produce relief images, as on the Kallithea ring.⁵⁷ Gold foil pressed over the matrix would replicate the design and could be used to cover lead bezels.

⁵³ Müller (n. 35) 477-78, pl. 101f (gold-iron ring), table 2. Only two rings of this variety were tested: *CMS* I no. 91 (Mycenae) and II.3 no. 113 (Kalyvia). For the latter see also Müller’s x-ray analyses: (n. 35) 150, pl. 32g-j and here 380, Chapter 8 (pp. 199-200).

⁵⁴ See also Chapter 6 (p. 130) with references.

⁵⁵ *CMS* V no. 614

⁵⁶ Either a dog or lion in right profile: I. Pini, in *CMS* V Suppl. 1B p. xxi, fig. 1.

⁵⁷ Younger (n. 47) 89; J. A. Sakellarakis, in *CMS* Beiheft 1 (1981) 170-71, figs. 7-9.

MOTIF, COMPOSITION, STYLE

Time and again during the past century, scholars have tried to characterize Mycenaean glyptic style. But distinctions between Mycenaean ‘stiffness’, ‘repetition’ or ‘formality’ and the flowing forms, sense of movement and impressionism of Minoan glyptic are often too vague to be of help and, more seriously, do not always stand up to scrutiny.⁵⁸ Attempts to isolate defining principles of composition are equally limited in value.⁵⁹ While antithetical compositions that divide the field into balanced parts are sometimes regarded as typically Mycenaean, examples can found in LM II-III Crete too, and their roots certainly lie in neo-palatial glyptic (e.g. 275-276, 330). For the most part changes in composition represent developments through time and offer few insights as to where seals were made. The same also applies to pose. Iconography offers another line of inquiry, and it is certainly true that some elements from the Minoan repertoire do not transplant successfully. But the popular notion that hunt and combat scenes are archetypal Mycenaean themes can be safely discounted, for they occur in neo-palatial glyptic too and, in any case, they constitute a tiny proportion of the repertoire. Yet another approach is to consider stylistic conventions.⁶⁰ For instance, are anatomical forms richly modelled or left as smooth planes; how are eyes, joints and other details rendered? In this way we might be able to isolate – and even localize – groups of seals with shared features, or even pieces engraved by the same hand (below and Chapter 11).

On one level this desire to define Mycenaean glyptic style may seem fruitless, if not misguided. For just as there is no such thing as a ‘Minoan style’ (above and Chapter 6), nor is there a single Mycenaean or mainland style. Should we not simply accept that during the LBA there existed a glyptic *koine* throughout the entire Aegean? One cannot help feeling that it scarcely mattered to a Mycenaean where his seal was made, much less when. And yet if we wish to delve deeper into the social aspect of seals, the ability to separate local products from imports would certainly be of value. Equally, we know next to nothing about workshops and their location. How many centres were actually involved? As it happens, most seals of hard stone and precious metal *antedate* the palatial period on the mainland (LH IIIA2-B). Could it be that the fall of Knossos sometime in LM IIIA2 was the death knell for hard stone output in the Aegean? Last, but perhaps not least, there is the role of glyptic in religious iconography. How are we to make progress in this field if we cannot distinguish Minoan from Mycenaean, or rather make no attempt to do so? How can the very same signet ring – say that from Vapheio – be used as evidence for Minoan beliefs *and* for Mycenaean?⁶¹ Such an indiscriminate approach merely serves to obscure differences that are potentially significant and hampers our ability to pinpoint genuine areas of religious syncretism. An explicit and dispassionate framework for evaluating these issues is badly needed. Ideally, the genesis and evolution of glyptic on the mainland should be subjected to a wholesale (and systematic) re-appraisal. Here we can do little more than summarize the current state of knowledge and highlight areas for future study.

⁵⁸ For this approach: A. Sakellariou, *Μυκηναϊκή Σφραγιδογλυφία* (Athens 1966). For criticisms: J. H. Betts & J. G. Younger, *Kadmos* 21 (1982) 104-21, esp. 107-08; I. Pini, in *Tonplomben* 85.

⁵⁹ E.g. H. Biesantz *Kretisch-mykenische Siegelbilder* (Marburg 1954). Cf. Betts & Younger (n. 58) 107-08; Pini (n. 58) 85; also Chapter 11.

⁶⁰ Betts & Younger (n. 58) 104-21, esp. 117-19.

⁶¹ For the Vapheio ring (here 221) as Mycenaean: e.g. J. T. Hooker, in *Minoan Society* 140-41 (taken as evidence for religious syncretism). For LM I rings on the mainland see above and Chapter 10. There is (still) a tendency in some quarters to regard most (if not all) seals found on the mainland *ipso facto* as Mycenaean products.

'Talismanic' seals and the Cut Style

With over 900 examples, the so-called 'talismanic' style forms the largest definable group in Aegean glyptic. Produced during MM III-LM I, the style favoured motifs that could be effectively rendered with a few deft applications of the cutting wheel or drill and without laborious modelling (Chapter 6). While some are seemingly drawn from the realm of cult (e.g. amphorae, jugs and double-axes), many more are inspired by the natural world: plant motifs, wild goats, insects, birds and, above all, creatures of the sea. In iconography, then, 'talismanic' seals are firmly wedded to Minoan Crete. Their distribution also bears this out. In addition to pieces recovered from controlled excavations on Crete or handed in to museums as stray finds, a great many 'talismanic' seals were acquired on the island by early travellers and collectors (see Chapter 11). Some have also been found on islands such as Melos, Thera and Rhodes, which fell under Minoan influence during the early LBA (Chapter 10). About a dozen come from LH I-II burials, chiefly in the Argolid; *in toto* fewer than 40 examples are attested from secure Mycenaean contexts.⁶²

Whether any 'talismanic' seals were made on the mainland is open to question. While the Minoan 'dragon' on an amethyst three-sided prism from Kazarma (474) may seem a trifle unusual (the motif is indeed rare), there is really no means of telling where the seal was made.⁶³ The same applies to several exuberant renderings of talismanic 'bundles' on carnelian amygdaloids from Thorikos (473), Vapheio and Nichoria.⁶⁴ To argue that these are in any way out of the ordinary would be risky indeed. In spite of our exceptionally large corpus, the style scarcely allows us to trace developments through time, much less isolate the output of individual workshops or production centres. My own feeling is that most if not all 'talismanic' seals on the mainland are indeed imports from Crete.⁶⁵ It is hard to see Mycenaean craftsmen taking up a style that was probably on the wane by the end of LM IA (Chapter 6).

The Cut Style is less straightforward. As we have seen, the earliest examples antedate the LM IB destructions, but the *floruit* apparently lies within LM II.⁶⁶ To judge from seals that have a reasonably secure provenance, the distribution is again biased in favour of Crete, in this case by about 2:1. For its effects, the Cut Style relies chiefly on cutting wheels, with drill-work usually limited to eyes and wing-markings. Bodies are smooth with no modelling. The repertoire of motifs is restricted – running goats, usually with bristly backs, recumbent lions with shaggy manes (sometimes paired back-to-back), griffins with wings displayed, and birds in various poses (475-477).⁶⁷ While the view that the Cut Style was developed on Crete with an eye to the mainland 'market' can be

⁶² To the examples listed in *DtS* one must add those published in *CMS V Suppl.* 1A–B, V Suppl. 2, V Suppl. 3. For 'talismanics' from Circle B and from Grave 0π4 at Eleusis see above n. 8. Some have been found in late graves (LH IIIA-C) and sanctuaries of the EIA (Chapter 10). For further discussion, see: O. H. Krzyszkowska, in *Emporia* (forthcoming).

⁶³ The LH I-II tholos at Kazarma contained ten seals, four of them 'talismanics'.

⁶⁴ *CMS I* no. 261 (Vapheio main chamber); V no. 430 (Nichoria, with gold caps); V Suppl. 1B no. 186 (Thorikos, here 473).

⁶⁵ For the opposite view see I. Pini, in *CMS V Suppl.* 1B p. xxxiii.

⁶⁶ See Chapters 6 (p. 147) and 8 (pp. 210-03). The Cut Style was first identified by Boardman (*GGFR*² 47-48, 412). For a thorough appraisal and earlier references, see now: I. Pini, in T. Mattern & D. Korol (eds.), *Munus: Festschrift für Hans Wiegartz (Scriptorium 2000)* 209-20. New examples appear in *CMS V Suppl.* 3. See also below n. 71.

⁶⁷ For further examples, from Cretan contexts, see: 40, 341, 381-386.



Selected 'talismanic' seals from the tholos tombs at Thorikos (**473** carnelian) and Kazarma (**474** amethyst). Cut Style seals from the tholos at Nichoria (**475-476** carnelian and agate) and Ialysos on Rhodes (**477** carnelian). Impressions. Scale ca 3:2.

safely discounted,⁶⁸ we have made no headway in identifying production centres. At best we can occasionally see how a handful of seals clusters together and, in one or two cases, tentatively isolate pairs that *might* be attributed to a single hand. But when we try to factor in provenance, progress grinds to a halt. One 'cluster' includes a seal apiece from Tragana in Messenia and Phylaki Apokoronou in western Crete, another acquired at Ayia Pelagia outside Herakleion, and two without provenance (but conceivably obtained on the island).⁶⁹ The plundered tholos at Phylaki was used during LH IIIA2-B, though it contained many earlier seals; tholos 1 at Tragana cannot be dated. A possible 'pair' comprises one seal from Ialysos on Rhodes (tomb unknown) and another from a LH IIIC context at Kamini on Naxos.⁷⁰ Considering that we have around 170 examples to work with – excluding birds with outstretched wings, which are sometimes seen as 'talismanic' – this is a deeply depressing result.

Cut Style seals have an astonishingly wide distribution on the mainland, from Messenia in the south-west, to Phokis in central Greece and Thessaly in the north, with a scattering throughout the central and eastern Aegean (e.g. Naxos, Melos, Tinos, Rhodes: **477**). Curiously, most come from late graves, used between LH IIIA-C. For instance, among the twelve seals (all heirlooms) found in the LH IIIA2-B tholos at Nichoria, three belong to the Cut Style (e.g. **475-476**). This pattern is in marked contrast to Crete, with its clutch from LM II contexts at Knossos, not to mention the impressions on LM IB sealings at

⁶⁸ Suggested by V. E. G. Kenna, in *CMS* VII p. 187.

⁶⁹ *CMS* V no. 208; V Suppl. 1A nos. 203, 347; X no. 134; *CS* no. 15P: Pini (n. 66) 217 n. 67.

⁷⁰ *CMS* V no. 604 (Naxos); VII no. 151 (Ialysos): Pini (n. 66) 217. For the circulation of Cut Style seals in LB III, see now: Krzyszkowska (n. 62).

Ayia Triada and Khania or the newly published Cut Style seals from LM IB Mochlos.⁷¹ Perhaps production really was centred on Crete and the apparent spread of the style is a mere illusion, created by seals that travelled with their owners, that were passed on to others, deposited in tombs and then removed, or simply lost and found by chance, taking on a new and equally serendipitous life before reaching their final resting place (Chapter 10). Or were Mycenaean craftsmen prompted to copy the style *exactly* in one or more centres on the mainland? For the present – and indeed for the foreseeable future – all we can do is speculate.

‘Naturalistic’ motifs

Our lack of success with the Cut Style should give us pause for thought. If we face such imponderables with a fairly large and coherent group of seals, what chance have we of unravelling developments among ‘naturalistic’ seals,⁷² where there is far more diversity in motif, pose and composition, not to mention those subtle variations in technique that help to define style. Furthermore, unlike the Cut Style, which seems to have been fairly short-lived, our ‘naturalistic’ types in hard stone and metal span LB I-III A. This translates to 200 years or so and encompasses an unknown number of craftsmen, who were presumably based in several production centres. Even isolating major trends represents a serious challenge.

Human figures

Representations of human figures constitute a small but undeniably prominent part of the glyptic repertoire during the LBA.⁷³ Most examples from the mainland date to LB I-II, tapering off noticeably during LB II-III A. In iconography we find clear links to neo-palatial glyptic, though the range of activities in which humans engage is less varied and very few themes can be identified as genuinely new to the mainland. While combats and hunts have long been regarded as archetypal Mycenaean subjects, they are actually more common on Crete (see Chapter 6). It is true that the famous signet rings and cushions from Grave Circle A (our earliest examples from the mainland) antedate the sealings preserved in the LM IB destructions on Crete. But there is little difference in style between the combat from Ayia Triada (371) and the ‘Battle of the Glen’ from Mycenae (478). And, of course, now the Thera sealings demonstrate that signet rings used during LM IB – notably the famous chariot scene – were already in existence in LM IA (322; 370). The hunt ring from Mycenae is undoubtedly a more ambitious composition, though this has resulted in some distinctly curious features (464). The horses in flying gallop are not harnessed to the chariot; above them appears the fallow deer in so-called cavalier

⁷¹ Chapter 6 n. 90 for Mochlos; Chapter 7 (e.g. 341); Chapter 8 for examples from LM II contexts. Pini (n. 66) places the *floruit* of the Cut Style in LM / LH II. But the increasing number of examples from secure LM IB contexts raises the distinct possibility that those in LM II Knossian contexts (i.e. graves and the Unexplored Mansion) are heirlooms.

⁷² As observed in Chapter 8 (n. 37), naturalistic is hardly an apt description for the artificial poses and conventions used in LB II-III, but suitable alternatives are hard to muster; hence the use of inverted commas.

⁷³ Younger estimates that humans occur on 15% of LBA seal-types (*Iconography* x, 119-86); since his catalogue excludes ‘talismanic’ seals, the true figure must be under 10%. See also Younger’s *Kadmos* articles on ‘Masters and Workshops’ and ‘Stylistic Groups’ (his concordance in *Kadmos* 28 [1989] 101-36 will allow readers to pursue specific seals discussed in the following sections). For Attribution Studies see Chapter 11.



Selected LB I-II seals and signet rings depicting male figures from Mycenae Grave Circle A (478), Pylos-Vagena (480), Vapheio (480, 482-483), Kazarma (481) and chamber tombs at Mycenae (484-485). All examples made of hard stone, except 478 and 485 (gold). Impressions. Scale ca 3:2.



486-487 Gold signet rings with hollow bezels from the tholos tomb at Anthia in Messenia. Impressions. Scale ca 3:2. So close are the rings in style and in construction that they are probably by the same hand. **466** illustrates the hoop of **486**.

perspective.⁷⁴ Below a wavy ground line turns into a plant-like filler at the left (on the original), while above the composition is framed by hanging rock-work. The same convention for landscape recurs on the 'Battle of the Glen' – a *tour de force* of ambitious action poses (**478**). The strong diagonals created by the weaponry, limbs and shield find parallels on the three gold cushions from Circle A (**458-461**). Taken together these almost read like narrative, telling of the warrior's mastery over human and animal foe alike.⁷⁵ In this they compare to the contemporary Lion Hunt dagger from Shaft Grave IV.

Beyond the Shaft Graves we have only seven or eight more LB I-II hunt and combat scenes from the mainland.⁷⁶ An exceptionally fine example is the lion hunt engraved on a cylinder seal from Kakovatos, now in Munich, where the huntsman is assisted or protected by a Minoan genius (**450**). The arrangement of the scene, at right angles to the axis of the cylinder, is unique. Very different in style is the lion (or rather lioness) hunt on the large amethyst amygdaloid with ribbed back from Pylos-Englianos Tomb IV (**451**). From the nearby Vagena tomb comes a lentoid on which hunter and dog race round the periphery of the seal face to attack a bristly boar (**479**). In a scene reminiscent of a seal-type from Zakros (**350**), two hunters bind the legs of a fallen lion on a seal from Vapheio (**480**). The same tomb provides us with two chariot scenes, one from the floor cist and a large agate lentoid with gold caps from the main chamber (**483**). Curiously, chariots played a very limited role in glyptic iconography and all but vanish after LB II (cf. Chapter 6). Horse-drawn examples aside, we have a unique lion chariot from Kazarma (**481**) and a griffin chariot on a gold ring from Anthia probably dating to LB II-III A (**486**).⁷⁷ The imagery surely relates to the tethering of powerful beasts as a form of mastery over the natural and supernatural world, exemplified by the scene on a red jasper lentoid from Vapheio (**482**).

⁷⁴ Where above = further away: G. Walberg, *Tradition and Innovation: Essays in Minoan Art* (Mainz 1986) 116-32.

⁷⁵ See L. Morgan, in C. Morris (ed.), *Klados: Essays in Honour of J. N. Coldstream*. BICS Suppl. 63 (London 1995) 171-84.

⁷⁶ I. Pini, in *CMS Beiheft 3* (1989) 201-17 provides a convenient list, with dates. For *CMS* I no. 263 (Tragana) and VII no. 130 (probably Crete) see **614-615**, Chapter 11.

⁷⁷ Ring construction, hoop decoration and style suggest that the two rings from Anthia (*CMS* V Suppl. 1B nos. 136-137, here **487** and **486**) are by the same hand; cf. **466** for the hoop of no. 137). For further examples of griffin chariots see Chapter 6 n. 98.

Figures wearing priestly robes are all but unknown on the Greek mainland, save at Vapheio, and there is a very real possibility that the seals in question are imports. In any case, the theme of standing male and tethered beast – usually a lion – has good Minoan credentials and survives into LB II-III A on both Crete and the mainland (cf. Chapters 6, 8). Symmetrical compositions with a central Master or Mistress of Animals, flanked by lions, griffins or other creatures, gain popularity during LB II.⁷⁸ Ordinarily engraved on lentoids, the subject also appears on a remarkable ring of red jasper from CT 58 at Mycenae (484). Here the bearded male grasps one lion by its hind-leg, the other by its neck, thus injecting the scene with more life than is often the case (e.g. 410). Also noteworthy is the rendering of anatomical detail and rich modelling on male and lions alike. By contrast, the lions flanking the *Potnia* on a pair of carnelian lentoids from Mycenae CT 515 have an almost toy-like quality (33-34). Here the *Potnia* wears an elaborate head-dress, known as a ‘snake-frame’, surmounted by a double-axe, features which are firmly rooted in Minoan iconography (cf. 373).⁷⁹ Symmetrical compositions also have good antecedents in Minoan glyptic and cannot be considered a purely Mycenaean fashion (cf. Chapter 8).

In neo-palatial glyptic the repertoire of female figures, mostly drawn from the realm of cult, was especially rich. There were processions, offering scenes and epiphanies, usually on signet rings, and single figures with various attributes on seals of hard or soft stone (Chapter 6). Sometimes a particular subject recurs on numerous seals, with only minor variations in detail. For instance, the female figure in profile carrying an animal (usually a goat) over her shoulder was especially popular; about a dozen examples exist, mostly lentoids of soft stone (252). As it happens, this subject also appears on the mainland. One example comes from the sanctuary of Apollo Maleatas near Epidaurus, where offerings of Minoan type were found,⁸⁰ and there is another at Vapheio (488). Whether the seals are Minoan imports or close copies of Minoan originals is impossible to say. Two more versions of the theme occur at Vapheio, while a pair of similar seals – one known from its impression at Pylos, the other an agate lentoid now in Berlin – depicts a female grasping a goat by the horns.⁸¹ But aside from this clutch of seals dating to LB I-II, the theme has no lasting impact on Mycenaean glyptic. And other popular neo-palatial subjects – females holding birds or other attributes and interacting with hybrid creatures – do not take root at all or at best exist only as singletons (e.g. 489).⁸² The iconography of cult as translated to the mainland is very restricted indeed.

⁷⁸ W. Müller, in *CMS Beiheft* 6 (2000) 181-94. Cf. Chapters 6 and 8.

⁷⁹ Though no seals depicting the *Potnia* wearing a ‘snake-frame’ can be dated before LM / LH II on grounds of context or style, R. Hägg and Y. Lindau argue that the ‘snake-frame’ had developed into an emblem of the goddess by LM IB: *OpAth* 15 (1984) 67-77, esp. 75-77. But the extent to which it was adopted on the mainland is an open question. We cannot be sure where *CMS* I nos. 144-145 (33-34) were engraved. Other examples from the mainland include a ring impression from Pylos (*CMS* I no. 379 = *Tonplomben* no. 12) and *CMS* XI no. 112 (Menidi). There is also a curious ring from Dendra (*CMS* I no. 189) combining ‘snake-frames’ and horned animals.

⁸⁰ V. Lambrinudakis, in *SCABA* 59-65; R. Hägg, in R. Hägg & N. Marinatos (eds.), *The Minoan Thalassocracy: Myth and Reality* (Stockholm 1984) 120-21. The seal is *CMS* V Suppl. 1A no. 369. For the motif: I. A. Sakellarakis, *AE* (1972) 245-58.

⁸¹ See Chapter 10 and 585-586. For the examples from Vapheio: *CMS* I nos. 220, 222.

⁸² For the ‘goddess’ and ‘dragon’ on *CMS* I no. 167 (here 489) cf. LM I ring impressions *CMS* II.6 nos. 33 (Ayia Triada) and 262 (Sklavokambos, here 366, without female). The Minoan ‘dragon’ – rare on Crete itself – also occurs on *CMS* V no. 581 (amethyst three-sided prism, Kazarma: here 474), *CMS* V Suppl. 1B no. 76 (green jasper lentoid, Mycenae) and the ‘Ring of Nestor’ (624; Chapter 11). For hybrids generally, see below pp. 265-67.

This is certainly apparent on gold signet rings, which are dominated by anodyne processions of female figures bearing flowers, for which no convincing parallels occur in the Minoan repertoire.⁸³ Flowers, trees and built shrines surmounted by horns of consecration do, of course, figure in many Minoan cult scenes and so when they reappear on the mainland we are probably witnessing selective borrowing and adaptation. But three rings from CT 7 at Aidonia, clearly executed by different engravers,⁸⁴ highlight the difficulties we face (490-492). The first looks closest in style to our Minoan rings. The small and supple figures have aniconic heads, the shrine is set in a rocky landscape flanked by a bush and tree, a wavy line above indicates the sky (490). Also noteworthy is the amount of free space in the composition, seen also on the Vapheio ring (221) and others of LM I date (Chapter 6). But if a Cretan had been responsible for engraving this ring, we cannot prove it. Another ring from Aidonia vividly illustrates how little we really know about glyptic style in the LBA (492). Indeed a group of specialists initially condemned this ring as a forgery, until they learnt it came from a perfectly respectable context!⁸⁵ The nearest parallels for the female figures (and they are far from close) occur on painted larnakes from Tanagra in Boeotia.⁸⁶

More typical are the ill-proportioned females on a ring from Mycenae CT 55 (493). Their upright figures, filling the entire field and marching in step, seem static and curiously lifeless. The same could be said of the male figure touching a leafy altar on a ring from Mycenae CT 84; following behind is a remarkably docile wild goat (485). One wonders whether the inspiration comes from Minoan scenes that show goats approaching seated 'goddesses' (e.g. 334). If so, the original meaning may have been lost or diluted in transmission. Another ring that must have been inspired by Minoan prototypes was found in Mycenae CT 91 (494). Here a dancing female (with feet firmly set on the ground) is flanked by a male, tugging at a sacred tree on the right, and by a second female, who bends over an altar on the left. This is one of very few Mycenaean rings to show a ritual scene that is non-processional. But to what extent does it reflect actual Mycenaean cult practices, much less religious beliefs?

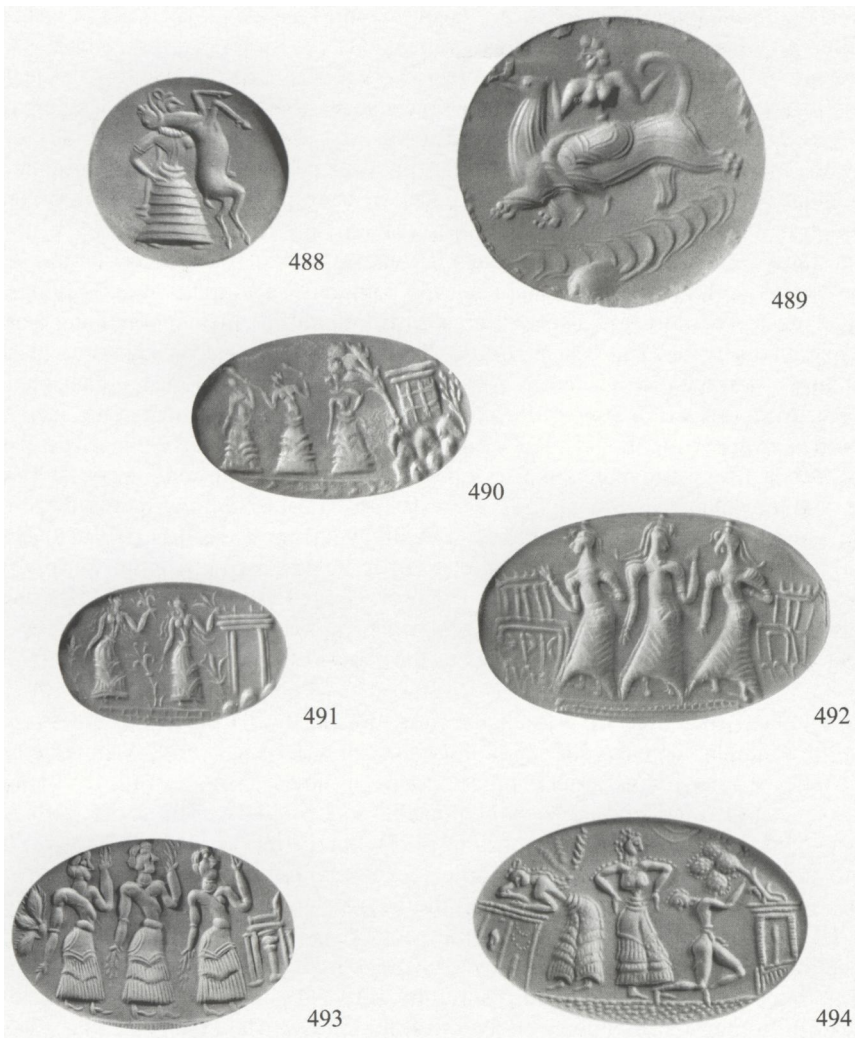
We face the same questions with the so-called Great Goddess ring from the Acropolis Treasure (465; above p. 244). Here we find a superfluity of elements familiar from Minoan iconography. There are sun and sky, sacred tree and double-axe, and flowers borne by buxom females. Two children take part in the event: one shaking the tree, the other presenting poppies to the seated 'goddess'. Just for good measure, from the heavens descends a small figure holding a figure-of-eight shield and a staff, while along one edge is a row of frontal lions' heads! Few other rings manage to cram in so much religious

⁸³ For cult scenes: W.-D. Niemeier, *CMS Beiheft 3* (1989) 163-86; esp. 167-69, fig. 1 for processions. Here he makes no distinction between Minoan and Mycenaean representations; in part remedied by his article in R. Hägg & G. C. Nordquist (eds.), *Celebrations of Death and Divinity in the Bronze Age Argolid* (Stockholm 1990) 165-70. See also Chapter 6.

⁸⁴ Pace K. Krystalli-Votsi, in *Φίλια Έπη εις Γεώργιον Ε. Μυλωνάν* (Athens 1989) Γ' 34-43 who asserts that all three are by the same hand. While *CMS V Suppl.* 1B nos. 113 and 115 (491-492) share the same elaborate hoop decoration (cf. 469), we cannot be absolutely certain that both were made in the same workshop (*CMS V Suppl.* 1B p. xxi). And the differences in style of engraving are so great that we cannot be sure that the rings are contemporary. Pini dates them to LB I-II and LB II-III A1(?) respectively (ibid. p. xlvii).

⁸⁵ At the 1985 seal symposium in Marburg: I. Pini, in *CMS V Suppl.* 1B p. xxxii; H. Hughes-Brock, in *CMS Beiheft 6* (2000) 114.

⁸⁶ E.g. *Aegean Painting* 155-56, fig. 41.



Selected LB I-III seals and signet rings depicting female figures from Vapheio (488), Mycenae (489, 493-494) and Aidonia T. 7 (490-492). Impressions. Scale ca 3:2. 488-489 are made of hard stone, the remainder are gold. For the hoops of 491 and 494 see 469 and 467, respectively.

symbolism.⁸⁷ And this, surely, should cause suspicion. Not that the ring is a modern forgery, but that it might be a skilful pastiche by an ancient engraver, eager to include as many significant elements of Minoan iconography as possible, whether he (or his patron) truly understood their significance. In fact, horns of consecration and leafy shrines aside, the paraphernalia of Minoan cult and elements of religious imagery simply do not recur in Mycenaean glyptic. Ordinarily excluded are double-axes, 'sacral knots' and baetyls.

⁸⁷ See Niemeier 1990 (n. 83) 167-68 for cogent remarks on the *horror vacui* and the un-Minoan way in which the Minoan symbols are combined.

Similarly absent are signs that herald epiphanies: birds and butterflies, shooting stars and floating figures.⁸⁸ If we look again at the ring from Mycenae CT 91 (494), superficially modelled on Minoan scenes of ecstatic dancing, we are struck by the complete lack of symbolism relating to epiphany.⁸⁹ In other words, this looks like a case of selective borrowing, with elements irrelevant to Mycenaean practice and belief being quietly jettisoned. By the same token, we note that male processions are conspicuous by their absence,⁹⁰ as are hide skirts and capes, hats and other Minoan-style head gear (e.g. 22, 324, 349, 354-355). As already noted, males wearing priestly robes are confined to two examples at Vapheio (above pp. 252-53).

What then are we to make of the great Tiryns ring (457; p. 243), the largest Aegean signet to survive and one that is replete with religious symbolism? Four Minoan genii carrying jugs process toward a seated female, with upraised chalice, robed and wearing a flat cap called a *polos*. She is seated on a cross-legged chair – from the struts dangles a sacral knot – while under her feet is a foot-stool. Behind hovers a bird, perhaps an eagle, to judge by its long tail. Above the procession a wavy line delineates the heavens, in which sun, crescent moon and ‘ears of grain’ appear; in the lower register is a frieze of demi-rosettes. The Minoan genius first appears on the mainland in the Vapheio floor cist (528) and transplants to other crafts as well (pp. 265-66). Similarly the demi-rosette frieze, which goes back to LM I, persists virtually unchanged until LH IIIB in a variety of media. For the robed female we have no close parallels in glyptic, though her *polos* calls to mind LH IIIA-B terracotta figures.⁹¹ The cross-legged chair and sacral knot find their nearest parallels in the Camp-stool Fresco from Knossos, datable to LM II-III.⁹² On stylistic grounds the Tiryns ring belongs to the same period, but where it was made and for whom remains a mystery.

During LB II-IIIa there is a gradual contraction in the iconographic repertoire. The Master of Animals survives (532, 563), but cult scenes *per se* are rare. And while hunting scenes enjoy a brief revival, few combats can be assigned to this period. Bull-leaping is found on several rings (and impressions) datable to LB II-IIIa. The scene from Anthia, showing a pair of leapers, is a trifle curious (495); but the late sealings at Knossos and the Ashmolean ring (379) provide good parallels for its style. Indeed it is conceivable that the Anthia ring and other examples found on the mainland were Cretan-made.⁹³ On seals of LB II-IIIa date, leapers adopt ever-more artificial poses (cf. Chapter 8). For instance, an unusual half-cylinder from Thebes shows a leaper clinging precariously to the bull’s neck (496). Other leapers seem to float unnaturally above the bulls’ backs, with their limbs disposed to fit the field. A fine agate lentoid from the Cult Centre at Mycenae provides a good example (499; C44).

⁸⁸ Aside from the Acropolis Treasure ring (*CMS* I no. 17), floating figures also occur on *CMS* I no. 292 from Pylos-Englianos T. IV (Niemeier 1990 [n. 83] 167) and the ring from Elateia, *CMS* V Suppl. 2 no. 106 (593), which is certainly Minoan: above and Chapter 10.

⁸⁹ Niemeier 1990 (n. 83) 168-69 reaches a similar conclusion. For epiphanies see Chapter 6 n. 78.

⁹⁰ Though see the ‘uni-sex’ figures on a ring impression from Mycenae (567).

⁹¹ E. French, *BSA* 66 (1971) 124 (tau), 128 (psi).

⁹² *PM* IV 379-96, fig. 323, pl. 31; *Aegean Painting* 176 (Kn no. 26); O. H. Krzyszkowska, in G. Herrmann (ed.), *The Furniture of Western Asia: Ancient and Traditional* (Mainz 1996) 93-94, fig. 3. The footstool closely resembles the Linear B ideogram *ta-ra-nu*, thus helping to confirm the ring’s authenticity: *Docs*² 332-33; also Chapter 11.

⁹³ I. Pini, in *CMS* V Suppl. 1B pp. xxxii-iii. Other rings / ring impressions from the mainland include: *CMS* I nos. 200, 201(?); nos. 305, 370 (= *Tonplomben* nos. 23-24). For bull-leaping and bull-games generally: J. G. Younger, in *Politeia* 507-45.



Selected LB II-III seals and signet rings depicting male figures from Anthia (495), Thebes (496), unknown provenance (497), Pylos (498), Mycenae (499) and Ialysos on Rhodes (500). Impressions, except 498 (drawing of seal-type). Scale ca 3:2. The Anthia ring (495) has a hollow bezel; the Danicourt Ring (497) is massive. The seals are made of agate.

Finally we return to hunting scenes, where the general LB II-III trend toward artificial compositions is much in evidence. The famous Danicourt Ring presents an almost symmetrical arrangement of two hunters attacking lions (497). Legs, knees, torsos and heads appear in mirror image; only the sword-arms differ in position. A sense of *horror vacui* pervades the scene (just a small triangle of space is left free), while the plant fillers and spiral ground-line merely heighten its artificiality. Once regarded as a LH I-II ring, the monumental figures and wasp-waisted lions suggest a somewhat later date, say LB II-III A1. The ring has a rather curious pedigree: having surfaced in Salonika in 1867, it was then held in suspicion for many years.⁹⁴ In fact, the Pylos sealings provide us with two parallels (e.g. 498), though the original rings were considerably smaller and there are

⁹⁴ For authenticity and dating see above and n. 50.

clear differences in detail.⁹⁵ Another ring used at Pylos bears an even more elaborate scene, combining the themes of hunt and animal attack in a symmetrical arrangement (573). In the upper part of the field a large hunter, brandishing a spear, is flanked by wasp-waisted griffins; below are their prey – a pair of deer, which are attacked by a smaller hunter, running to the left. No parallels exist for such a complex scene, though a powerful griffin attack is attested among the late sealings at Knossos (416). Both rings must date to LB IIIA1/2 and make the demise of Aegean ring engraving (shortly thereafter) all the more difficult to comprehend.⁹⁶ Several seals attributed to the ‘Rhodian Hunt Group’ provide our latest hunting scenes in glyptic.⁹⁷ One found at Ialysos itself shows a slender goat, attacked by hunting dog and dot-eyed huntsman wielding a sword (500). Svelte animals with dotted joints are typical of LB IIIA glyptic in the years before hard stone output ceased (see also below pp. 264-65).

Animals and hybrids

Animal scenes were the stock-in-trade of the LBA seal engraver. Naturally enough examples found on the mainland owe a debt to Cretan glyptic in style and iconography, though subtle differences can be found. During LB I-II lions and cattle were the most common subjects, and are usually depicted singly or in pairs. They also figure in attacks and suckling scenes. Sheep and goats lag far behind, and graceful Cretan *agrimia* are very rare indeed. Fallow deer and boar are found occasionally. Birds are largely absent outside the Cut Style and creatures of the sea make little impact. Hybrid creatures inherited from the neo-palatial repertoire include the Minoan genius, the griffin and the sphinx. Minoan ‘dragons’, never common, make only an occasional appearance. The monkey, which had played a special role in Minoan religious iconography, is limited to a single example at Pylos; the original seal was surely a LM I heirloom.⁹⁸

On the whole, animals offer better scope for studying stylistic development than do humans. Not only is the repertoire much larger, there is also an abundance of features that are potentially diagnostic.⁹⁹ Heads, horns, eyes, muzzles, tongues, manes, necks, shoulders, bellies, rumps, tails, legs, tendons, hoofs, and claws – all can offer clues. We can also consider whether anatomical forms are well integrated and richly modelled or treated as a series of smooth planes with internal details kept to a minimum. Pose and composition offer further lines of inquiry. Are they inspired by living creatures or disposed on the seal face in artificial arrangements? But complications can set in when (as sometimes happens) conflicting tendencies appear in a single animal, or indeed when we try to compare different species in the same pose, or the same species in different poses! In broad terms, however, we can observe that the naturalistic depictions of LB I-II gradually give way toward more artificial renderings in LB II-III A. A similar trend can also be seen in Cretan seals, though it manifests itself in a distinctive way (see p. 262).

⁹⁵ *Tonplomben* nos. 21 (here 498; also 562) and 22; see also remarks by Pini (ibid. 87-88) and in *Pepragmena* 9 (forthcoming).

⁹⁶ Pini dates *Tonplomben* no. 10 (here 573) to ‘LB II late-III A early’ (ibid. 89) and *CMS* II.8 no. 192 (here 416) to LM IIIA2 (*CMS* II.8 p. 13).

⁹⁷ For the ‘Rhodian Hunt Group’: J. G. Younger, *Kadmos* 26 (1987) 61-62; 63-64, where dated to 1350–1300 BC. Pini (*Tonplomben* 90) regards this as somewhat too late. See also below for the ‘Island Sanctuaries Group’ and Chapters 10-11.

⁹⁸ *CMS* I no. 377 = *Tonplomben* no. 17. For the monkey in LM I glyptic, see Chapter 6.

⁹⁹ See Betts & Younger (n. 58) 104-21, esp. 117-19; also Younger’s *Kadmos* articles on ‘Master and Workshops’ and ‘Stylistic Groups’ (concordance in *Kadmos* 28 [1989] 101-36), but see Chapter 11 for Attribution Studies. *Iconography* provides a catalogue arranged by pose and subject.

Closest in style to Cretan models are seals of LB I-II date and indeed some examples might well be imports. The running bull from Vapheio (502) attracts our attention because the lentoid is made from green jasper, exceptionally rare on the mainland, but popular in neo-palatial Crete (above p. 237). The famous Vapheio ring is certainly an import and, as already noted, other possible candidates lurk among the seals in this tomb (e.g. 488). From the Pylos area we also have a number of LB I-II seals, which at the very least were inspired by Minoan originals. A wounded bull from Gouvalari calls to mind two seal-types from Khania (338-339), though on this amygdaloid the space seems to have been misjudged (501). Another amygdaloid, used to impress a sealing at Pylos, depicts a deer in flying gallop attacked by a dog (569). The subject has good Minoan antecedents, usually involving *agrimia* rather than deer.¹⁰⁰ But since the flying gallop is better suited to elongated fields – amygdaloids and ring bezels – it has only a limited life on the mainland. Outside the Cut Style amygdaloids are rare and only a few LB II-III ring bezels carry bull-leaping scenes (above p. 256).

Lions and lion attacks are often seen as archetypal Mycenaean subjects, though their origins lie in proto-palatial glyptic.¹⁰¹ LB I-II attack scenes show considerable variety: some poses and compositions are clearly inspired by nature, others decidedly artificial. Two lentoids from the Vapheio floor cist provide good examples (31-32). On the first, the engraver demonstrates a clear understanding of how lions behave in the wild – attacking from the side and biting their prey in the neck.¹⁰² The hint of rocky ground below adds to the naturalistic effect, as does the powerful modelling of the bull. The attack on the second lentoid is unashamedly artificial, since the animals are disposed in a chiasmic composition.¹⁰³ The engraver has also created a striking contrast between the spiky mane of the lion and the smooth bodies of the animals. On an exceptionally fine lentoid in Boston (506), well-modelled animals are combined in an artificial composition, complete with conventional ground-line. This seal, once part of the Lewes House Collection, is said to come from Mycenae (see Chapter 11). By common consent the finest LB I-II animal attack to survive is now in Berlin, though here too we find a curious interplay between the naturalistic and the artificial (1). While the fallow deer has all the hallmarks of a stricken beast – head upturned in terror, howling in pain – the pose of the outsized lion is anything but realistic. Certainly the awkward treatment of the shoulders contrasts markedly with the finely rendered hindquarters. Enormous attention is lavished on anatomical detail: the patterned mane and prominent tendons, the protruding tongue of the deer and the delicate tips of its antlers. Indeed so fine are many details that they can only be appreciated fully if an impression of the seal is placed under the microscope. As a technical *tour de force*, this carnelian lentoid has no equal.

During LB I-II lions also figure in scenes with human protagonists, where they are fought and bound by hunters (e.g. 450-451, 460, 480) or are controlled by a Master or Mistress of Animals (e.g. 33-34, 484: above p. 253). In addition, lions appear singly or in pairs and though some are majestic beasts, often they are tame and toy-like. Conventions for rendering anatomical details are too varied to summarize succinctly. On manes, for

¹⁰⁰ E.g. here 149a; cf. 255.

¹⁰¹ See Chapter 5 and 183, 203 for MM II-III lions, though attack scenes of that date usually involve dogs (or wolves), e.g. *CMS* II. 5 no. 284. For LM I lion attacks see Chapter 6 and 233, 273, 367. I. Pini, in *L'iconographie minoenne* 153-66 provides a thorough discussion of attack scenes; for lions generally see: M. Ballintijn, in *CMS Beiheft* 5 (1995) 23-37.

¹⁰² Compare Pini (n. 101) 159, figs. 10 (*CMS* I no. 252, here 31) and 11 (lion attacking wildebeest); see also his figs. 2, 7, 12 for other attacks in the wild.

¹⁰³ For other examples, see here 377, 515; Pini (n. 101) 162-63, fig. 20 and n. 46.

instance, the tufts of fur may be rendered by short even strokes, arranged into tidy flame patterns, or treated as random spikes. Distinctive details of this sort have sometimes been marshalled in attribution studies (Chapter 11). Here we can only focus on a few examples, culled from tombs at Mycenae. On the famous lentoid depicting a pair of lions with conjoined head (**505**), the tufts of fur are neat and drop-like, the shoulders prominent and hind-quarters carefully modelled. A LM I parallel for the composition (without the conjoined head) occurs at Ayia Triada, where monkeys flank a Minoan altar (**276**); a seal-type from Knossos provides a later version of the subject (**411**).

Another familiar lion from Mycenae is the shaggy creature prancing archly across a lentoid found in CT 11 (**507**). The object in the field resembles a Minoan flounced skirt, an element that sometimes appears as filling ornament in LM II-III glyptic, but is rare on the mainland.¹⁰⁴ As it happens, fillers can sometimes provide extremely useful clues in dating. For instance, palm trees are especially popular on the mainland (less so on Crete) during LB II. We find them on a gold signet ring from Anthia, which curiously combines a suckling scene with an attack (**487**). The lion here is hardly likely to instil much fear, and the same can be said of the two toy-like creatures backed by palm trees on a lentoid from Mycenae (**510**). Here we see that the lions have almond-shaped eyes, swollen cheeks and smooth bodies. Stylized palms are also employed on two lentoids of identical size from Mycenae, which depict standing bulls. Though these smooth-bodied animals adopt much the same pose, they display clear differences in anatomical detail. For instance, on **508** the bull's head is shown frontally, its neck is striated and dots are used to indicate joints. None of these features appears on **509**, where instead a contour line has been used to outline the neck and back.¹⁰⁵ Far more naturalistic is the sacrificial bull on a lentoid now in Berlin, but said to be from Mycenae (**504**). A short sword or dagger pierces the animal's neck and a stylized palm fills the field above its back.¹⁰⁶ Scenes depicting animals on offering tables, occasionally accompanied by a human protagonist, are found on both Crete and the mainland during LB II-III. It is impossible to say where the motif or the practice originated (cf. Chapter 8).

By contrast, suckling scenes have an exceptionally long history in Aegean glyptic, stretching back to the proto-palatial period, and many fine naturalistic representations were produced during MM III-LM I (e.g. **272**, **317**). Although the subject remains popular in LB II-III, the scenes are increasingly divorced from nature, as demonstrated by the antithetical arrangement on a chalcedony ring from Mycenae (**503**) and on an agate lentoid from Krisa (**516**). Sometimes suckling lionesses are even shown with full manes, as if the engraver had never observed the animal in the wild.

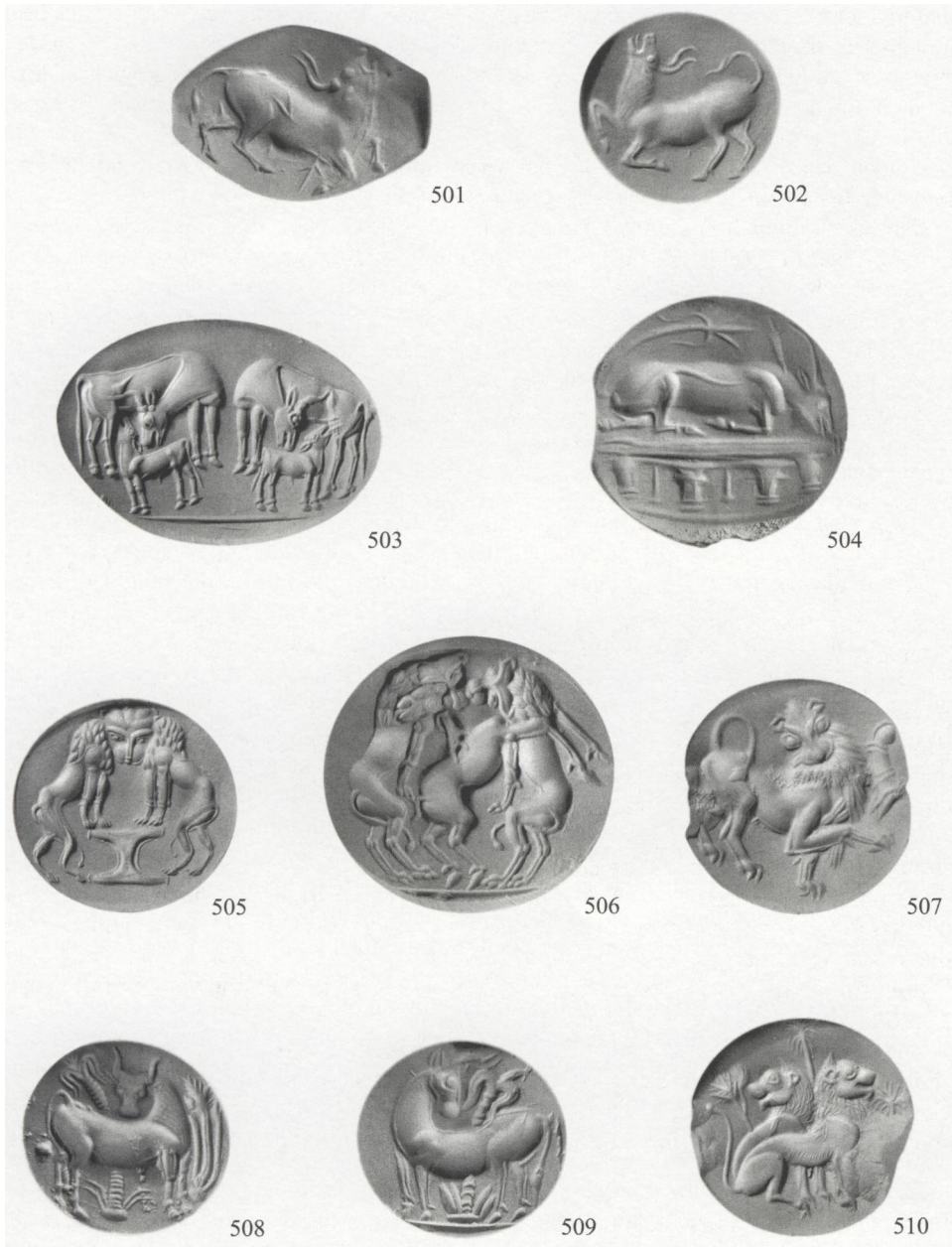
One of the most popular subjects in LB II-III glyptic, namely the pair of couchant bulls shown back-to-back, also has good Minoan credentials. Altogether we have about thirty examples, including several from secure LM I contexts.¹⁰⁷ During LB II couchant bulls spread to the mainland, where some tombs even contain two seals depicting this subject.

¹⁰⁴ See Chapter 8 n. 31; also **603**; **C35**. The element is often called a 'sacral knot'. L. Morgan sees it a sacrificial symbol and (somewhat improbably) believes that all 'frontal face' representations (including *CMS* I no. 54, here **507**) symbolize death: *CMS* Beiheft 5 (1995) 135-49. See also below n. 106 (for date palms) and n. 110 for *bucrania*.

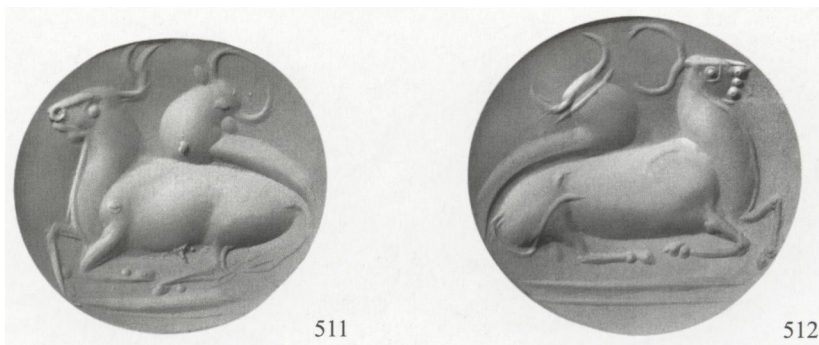
¹⁰⁵ For another version of this subject see *CMS* VII no. 113 from Ialysos (**606**; **C40**).

¹⁰⁶ N. Marinatos, *OpAth* 15 (1984) 115-22 sees an association between date-palms and sacrifice, but whether this holds good for all examples (e.g. here **486-487**, **508-510**, **606**) is debatable.

¹⁰⁷ For a thorough appraisal of this motif: I. Pini, in *CMS* Beiheft 6 (2000) 245-55; 246-47 and figs. 3-4 for LM I examples, including an unfinished seal made of chlorite from Poros. For a LB II example from New Hospital T. III at Knossos see here Chapter 8 and **374**.



Selected LB I-II hard stone seals depicting animals from Gouvalari (501), Vapheio (502), and Mycenae (503, 505, 507-510). 504 and 506, acquired in Athens, were said to come from Mycenae. Impressions. Scale ca 3:2.



511-512 Agate lentoids depicting couchant bulls back-to-back found in the tholos tomb at Nichoria. Impressions. Scale ca 3:2. Although the motifs are similar, the two seals cannot be ascribed to the same hand. Date LB II-III A.

Though superficially similar, the ‘pairs’ in question were certainly not engraved by the same craftsmen, for they differ in detail and style.¹⁰⁸ On a ‘pair’ from Nichoria we can see immediately that one seal depicts the bulls facing to the right, the other to the left. The differences in detail are even more telling. On **512** we find an irregular contour line along the neck, three dots for nose, mouth and muzzle, a dot within a circle for the eye. The principal bull on **511**, an altogether beefier animal, has a tiny dotted eye, ringed nose and a firm contour along the neck. Although the two seals were found together in the Nichoria tholos, we cannot say whether they were produced in the same place or even at the same time. However, both certainly date to LB II-III A1 and, in consequence, they were heirlooms when deposited in the Nichoria tholos, sometime during LH III A2-B1.¹⁰⁹

Throughout the Aegean, representations inspired by nature give way to more artificial renderings in LB II-III glyptic. We observe this trend in composition, pose and, perhaps above all, in the way anatomical features are treated. Rich modelling gives way to smoother bodies, delineated wholly or in part with contour lines (e.g. **513**, **515**). More often than not, individual features are dealt with in a summary fashion and the work of rotary tools – especially drills – is plain to see (**513-520**). Dotted eyes, noses and joints are common, though the tubular drill so frequently employed in LM II-III glyptic makes little impact on the mainland (cf. Chapter 8). Plant motifs take the form of splayed fronds, sometimes inserted willy-nilly to fill available space, sometimes seeming to pierce the animals’ backs as earlier darts had done (e.g. **513-514**). But attempts to trace stylistic developments are hampered by several interrelated factors. First and foremost few seals come from narrowly dated contexts and many occur in contexts demonstrably later than their date of manufacture. The circulation of heirloom seals adds a further twist to the story, since their find-spots are often far removed from likely centres of production (cf. Chapters 10-11). For instance, **516-517** illustrate two seals (very different in style) found in late graves at Krisa in Phokis, while the striking lentoid depicting bulls with conjoined

¹⁰⁸ *CMS* I nos. 240-241 (Vapheio); *CMS* V nos. 432-433 (here **511-512**). See Pini (n. 107) 251-53.

¹⁰⁹ Although the motif seems most common in LB II, Pini believes that it persisted into LB III A1, citing the Nichoria seals as examples: (n. 107) 253 n. 51. For the spread of motifs (*Bildthemen*), such as the couchant bulls, see also Pini, in *Pepragmena* 9 (forthcoming) and here Chapter 11.



Selected LB II-III A hard stone seals depicting animals from Orchomenos (513), Pylos-Routsi (514), Nichoria (515), Krisa (516-517), Aidonia T. 2 (518), Kamini on Naxos (519) and Mycenae (520). Impressions. Scale ca 3:2.

head comes from a LH III C grave at Kamini on Naxos (519).¹¹⁰ This dispersal of seals may well account for the fact that sometimes only a handful of pieces share stylistic features. It is also worth remembering that well under 5% of the original output survives and retrieval is patchy in the extreme.

¹¹⁰ The *bucrania* on 519 (CMS V no. 607) – and other frontal-face animal heads – undoubtedly have their roots in Minoan iconography: Dickers 44, fig. 13; see also here 406 and the *bucrania* on 413-414 (where the link with death and sacrifice suggested by Morgan [n. 104] is more plausible).



Selected LB IIIA hard stone seals depicting animals from Mycenae (521), Delos (522), 'Corinth' (523), Perati (524, 526), and unknown provenance (525). 527 from Stavros in central Greece is made of medium-hard stone (Mohs 4-5). Impressions. Scale ca 3:2.

The trend toward smooth-bodied animals already observed in LB II-IIIa culminates in the sleek and slender animals produced during LB IIIa. Legs are often stick-like, punctuated by dotted joints; dots are also used to mark eyes and noses (521-526). The iconographic repertoire contracts markedly. Lions have long since vanished, except in attack and hunting scenes (cf. pp. 257-58). These late lions are ordinarily wasp-waisted and only their thickened necks hint at the existence of manes. They are certainly far removed from the proud beasts of LB I-II. Many quadrupeds are so lean that only tails and horns allow us to identify them as bulls (522-526; 577; 607-608; cf. 499). Multi-figure compositions are still produced and, while many are rooted in the past, oddities also occur. For instance, the griffins tethered to a central column on a lentoid from Mycenae may be conventional enough, but the floating figure beneath is frankly inexplicable (521; cf. 520, 529). On a seal in London we find *tête-bêche* quadrupeds

accompanied by a *bucranium* and what may be a fish or dolphin (525; C46; cf. also C47). There are also some remarkably elegant single animal studies, e.g. 526 from the LH III C cemetery at Perati in Attica, another from the acropolis at Mycenae (608; Chapter 11). Curiously, these sometimes appear on amygdaloids, a shape that is otherwise rare in LB II-III A. The Perati seal has a grooved back and traces of a groove appear on the face of the Mycenae piece; both are almost certainly re-cycled beads.¹¹¹ Several lentoids bearing slender quadrupeds were made of medium-hard stones (Mohs 4-5). This applies to a pair found in the Temple at Ayia Irini, another from the East Shrine at Phylakopi on Melos and a fourth from a grave near Lamia (527).¹¹² Although these late seals depicting sleek animals have been attributed to the 'Island Sanctuaries Group', there is no telling where they were made (Chapters 10-11).

With this group we reach the end of hard stone seals in the Aegean. At any rate, seals with later stylistic features cannot be identified. It is almost as if engravers had exhausted the many avenues offered by material, technique, motif, pose and composition, which they had been exploring for the past 400 years. But pinpointing the demise of hard stone glyptic is not easy and a date toward the end of LB III A is about as close as we can get.¹¹³ Several seal-types in the late palace at Knossos can be related to the LB III A seals just described. One depicts a svelte pair of antithetical griffins (415), the other is an impressive ring depicting a griffin attack (416). Sadly, the uncertainty over the date of the Knossos sealings deprives us of a secure *terminus post quem non*. Nevertheless, if the fall of Knossos happened sometime during LM III A2 – whether early or late – glyptic output may have suffered a serious blow (Chapter 8). This is unlikely to be the whole story, however, for mainland workshops had long since developed a life of their own. Also to be factored in is the emergence during LH III A-B of new varieties of seals made from pressed glass, fluorite and steatite (see below and Chapter 10).

Before we consider output in soft stone, the fate of hybrid creatures in Mycenaean glyptic merits comment. As already mentioned, the Minoan 'dragon', genius, sphinx and griffin are inherited from the neo-palatial repertoire.¹¹⁴ But the 'dragon' is confined to a few examples and the sphinx also plays only a limited role, usually appearing singly or in pairs on gold signets.¹¹⁵ A ring from Mycenae CT 91 provides a good example (530). The Minoan genius is harder to evaluate. The creature famously appears in procession on the Tiryns ring (457), and on LB I-II seals at Kakovatos and Vapheio (450, 528). We cannot be certain where these examples were made. The involvement of the genius in hunting and sacrifice led to the creation of new imagery during LM II-III.¹¹⁶ The genius is shown controlling live animals, in compositions reminiscent of tethering scenes, and apparently standing in for a human protagonist when it carries dead animals on poles or across its

¹¹¹ Whether this applies to other examples is unclear: early volumes of the *CMS* (esp. I) did not always illustrate or describe such features. For re-cycled beads see above p. 239 and Chapter 6.

¹¹² Ayia Irini: *CMS* V nos. 499-500 (here 553-554); Phylakopi: V Suppl. 1B no. 40 (here 555); Stavros: V Suppl. 1B no. 13 (here 527). See also J. G. Younger, in C. Renfrew, *The Archaeology of Cult*. *BSA* Suppl. 18 (London 1985) 286-87, 290-91, pl. 50a-c, no. 2; idem, *Kadmos* 26 (1987) 61-64 ('Island Sanctuaries Group'); and now Dickers 100-04.

¹¹³ See above n. 97.

¹¹⁴ For examples and literature see: Chapter 5-6 and, for LM II-II, Chapter 8.

¹¹⁵ For the Minoan 'dragon' see here 474, 489 and above n. 82. That the sphinx played a more active role than the published repertoire indicates is suggested by three unpublished seal-types from Thebes: C. Piteros et al., *BCH* 114 (1990) 109-10 types B, H, K (each depicting a male figure + sphinx; B also having horns of consecration). For the Thebes sealings see Chapter 10.

¹¹⁶ P. Rehak, in *CMS* Beiheft 5 (1995) 215-31; see also Chapter 8.



Selected LB I-III seals and signet rings depicting hybrid creatures from Vapheio (528), Prosymna (529), Mycenae (530), Patras (531) and 'Phigaleia' (532). Impressions. Scale ca 3:2. 529-530 are gold signet rings with hollow bezels; the remainder are hard stone seals.

shoulders (389-391, 599-600). Compositions of this kind are very rare indeed on the mainland and one cannot help wondering whether the few examples are imports.¹¹⁷ Suspicion is also raised by the fact that the seals in question are made from lapis lacedaimonius and rock crystal, materials that were not much favoured in Mycenaean workshops. A lentoid from Patras, made of lapis lacedaimonius, is especially striking (531). Though the composition is familiar enough, the inclusion of a human figure – whether alive or dead – is unparalleled and hard to fathom. Another interesting seal is a rock crystal lentoid, now in Berlin, but said to come from Phigaleia in the central Peloponnese (532). This shows a pair of genii flanking a human figure, in what is presumably a late variation on the Master of Animals theme.¹¹⁸

It remains to be established whether the genius was fully adopted into the Mycenaean glyptic repertoire, and seals depicting 'minotaurs' were surely Cretan products.¹¹⁹ Indeed the only hybrid creature to be taken up seriously on the mainland was the griffin. From LB I-II we have some exceptionally fine single-figure studies from the Pylos area (e.g. 449, 463). As noted already, a griffin appears tethered at Vapheio (482) and one is carried by a female figure on an unusual cushion of LB II-III A date from Tiryns (453), while a griffin-drawn chariot is shown on a gold ring from Anthia (486). The creatures form pleasing antithetical compositions, sometimes flanking a central column, as on a signet

¹¹⁷ See also 568a for the impression on an imported stopper at Mycenae (Chapter 10). This is not to deny that the genius was adopted in Mycenaean iconography, see: Rehak (n. 116) 215-31 for other media (e.g. glass jewellery mould, ivory, frescoes).

¹¹⁸ See also the partial impressions of a large LB II-III A ring at Pylos depicting the *Potnia*, wearing a 'snake-frame', flanked by a pair of bulls and genii bearing swords (?): *Tonplomben* no. 12 (= *CMS* I no. 379). An unpublished ring impression from Thebes depicts an enthroned 'goddess' flanked by genii bearing pitchers and also by griffins: Rehak (n. 116) 23 no. 74.

¹¹⁹ See Chapter 8 n. 55 for examples found on the mainland.

ring from Prosymna (529; cf. 521). Among the Pylos sealings we find impressions of a remarkable signet ring, probably of LB II-III A date, depicting a pair of griffins and their offspring (576). Another LB II-III ring used at Pylos is more curious, for the scene is divided horizontally into two registers (574). Above we find a recumbent griffin, lion(s) and sun symbol (?); below are dolphins and nautili – rare examples of marine creatures in this period.¹²⁰ Pylos also provides us with the most elaborate griffin attack known from the Aegean Bronze Age (573). As we have already noted, this ring and another griffin attack from Knossos (416) must date to LB IIIA1/2 and therefore are among the latest metal signet rings to have been produced. On hard stone seals, griffins also survive almost until output ceased (see above). Whether the key to the creature's prolonged popularity lay in its physical characteristics – combining the characteristics of lion and eagle – or its symbolic role is hard to say.

The Mainland Popular Group and other late seals

On the mainland seals are not made of soft stones until LH IIIA, suspiciously close to the date when we believe that production of hard stone seals declined and came to an end. The so-called Mainland Popular Group (MPG) consists of seals made of soft shiny steatite, decorated with schematic quadrupeds (C50) and various ornamental motifs. More than 650 examples have been published to date. A smaller group, mostly bearing geometric designs, is made of fluorite, a milky-white stone (Mohs 4) that is sometimes mistaken for rock crystal (C49; cf. C40). Other late seals are made of glass, pressed in moulds; they invariably depict animals (C48). The first examples go back to LH IIIA1 and production overlapped with the Mainland Popular and fluorite groups. In distribution and function too, these three groups of late seals show remarkable similarity.¹²¹

Glass seals

Blue glass had been known in the Aegean from the beginning of the LBA, though we do not know where it originated or how it travelled.¹²² None the less, on arrival it was clearly treated as an exotic semi-precious stone. Sometimes small amounts were used to embellish gold jewellery, sometimes glass was carved into seals, using techniques similar to those employed on hard stone. Examples in the Cut Style make this clear (e.g. 381, 385; C32). In all we have about 50 engraved glass seals from Crete and the mainland, spanning LB I-III A1. Most are lentoids, but amygdaloids and cushions also exist.¹²³

During LB II?-III A new techniques were developed for producing jewellery in moulds. In essence, this involved pouring a molten substance – gold or glass – into a steatite mould with designs cut in intaglio.¹²⁴ The decoration on finished pieces was, therefore, in relief. The glass ornaments come in all manner of shapes and sizes, favourites being

¹²⁰ *Tonplomben* no. 39 (= *CMS* I no. 329); also no. 40 (= *CMS* I no. 312, here 575). For dating: Pini, in *Tonplomben* 90. Compare the LH IIIB frescoes from Pylos: *Aegean Painting* 142, 198-99, pl. 82 (nautilus frieze); *PN* I 211-14, pls. 163-66 (dolphin floor).

¹²¹ See below and Chapter 10. The following account of the pressed glass, fluorite and MPG seals draws heavily on the exhaustive study by Dickers; see also my review in *AJA* 106 (2002) 483-84.

¹²² *AEMT* 195-224 and *AMMI* 189-215 provide good accounts of glass in Egypt and the Near East, respectively.

¹²³ See Chapters 6, 8. I. Pini provides thorough accounts of engraved and pressed glass seals in: *JRGZM* 28 (1981) 48-81; *Periphera* 331-38; *CMS* V Suppl. 3 pp. 23-24.

¹²⁴ For glass jewellery, see: T. E. Haevernick, *JRGZM* 7 (1960) 36-53; eadem *Archaeology* 16 (1963) 190-93.

lilies, rosettes, papyrus, jugs, and figure-of-eight shields. They survive by the thousand, sometimes covered in gold foil. The popularity of glass jewellery during LH IIIA-B is easy enough to understand, for pieces could be replicated at will, almost mass-produced, so long as supplies of glass were available. Dramatic evidence that glass was shipped around the eastern Mediterranean in ingot form during this period now comes from the Uluburun wreck, dating to ca 1300 BC. More than 175 ingots (ca 16 cm in diameter) have been recovered; colours range from cobalt and lavender to turquoise. Analyses reveal that their composition is identical to the glass used for Egyptian core-formed vessels and for Mycenaean jewellery.¹²⁵

Our earliest pressed glass seals probably date to LB IIIA1, because some motifs can be related, through pose or composition, to the hard stone repertoire.¹²⁶ Their subjects are limited: running calves, contorted bulls or lions, standing goats, the occasional antithetical group (533-540). On the moulds the designs had to be executed in relief in order to produce seal faces in intaglio. This could well account for the animals' distinctive, if decidedly curious appearance. Their proportions are certainly very odd: heads seem too large, limbs too short or too long, too few or even too many! Since anatomical detail is kept to a minimum and modelling is very flat, limbs can seem flaccid and bodies doughy. Last, but not least, motifs often crowd the circular fields, as if cutting away the background in the moulds had proved too laborious. But our understanding of technique leaves much to be desired, since only one *possible* mould survives. The object in question is a block of steatite with animal motifs in relief, comparable in style to some of our glass seals (541). Acquired by Richard Seager in the 'harbour town of Knossos', the block is now in New York.¹²⁷

To replicate jewellery in moulds is one thing, to make seals in the same way is a trifle surprising. Duplicates could be readily produced and indeed some have survived to tell their tale. It is certainly an extraordinary one, for not only do they turn up in the same grave, and in the same cemetery, duplicates also travelled considerable distances.¹²⁸ For instance, examples of 536 come from Medeon, Elateia, and Kato Mavrolophos near Volos. More astonishing still is the discovery that a seal in Brussels (apparently from the Argolid) has a mate from Tell Abu Hawam in Israel (Chapter 10). Another interesting group from a single mould (538) is represented by two examples at Ayia Triada in Elis, another at Kato Mavrolophos, and a fourth (without provenance) in the British Museum (C48). These four seals are unusual in that they have flat undersides, rather like relief ornaments.¹²⁹ Ordinarily pressed glass seals have conical backs, with slightly incurving

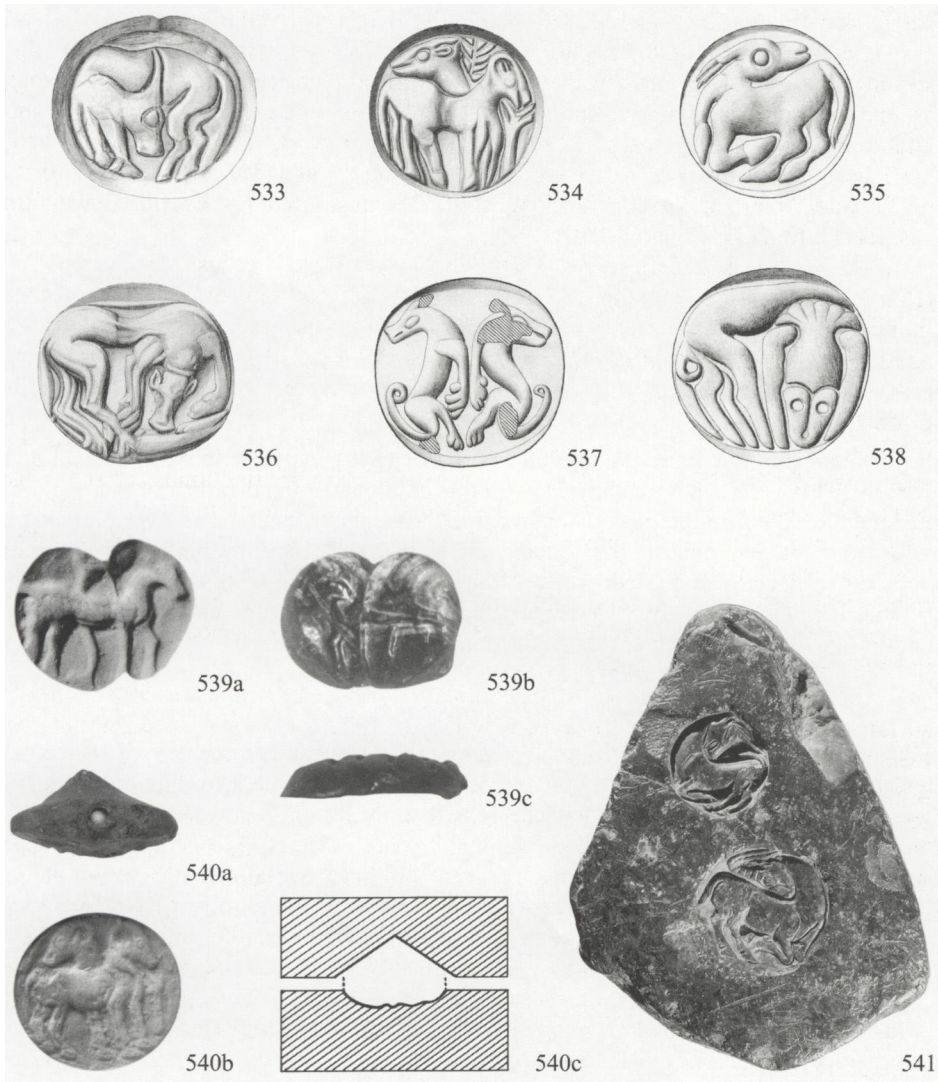
¹²⁵ C. Pulak, *The International Journal of Nautical Archaeology* 27 (1998) 202-03.

¹²⁶ I. Pini, in *Peripheria* 332. Pressed glass seals are also discussed by Dickers 77-86. In all nearly 100 examples are known, including new pieces published in *CMS V Suppl.* 3.

¹²⁷ *CMS XII* no. 262; see also *PM II* 237-38, fig. 134; allegedly from the so-called Lapidaries' Quarter in what is now Poros-Katsambas, the eastern suburbs of Herakleion.

¹²⁸ E.g. *CMS V* nos. 348-350 from Medeon T. 29; also in Ts. 29a and 99 (*CMS V* nos. 380, 392; *V Suppl.* 1A no. 82 (here 534). From Ayia Triada (Elis) T. 11: *CMS V Suppl.* 1B nos. 132 and 133 (here 538). From Kallithea (Patras) T. Θ: *V Suppl.* 1B nos. 168-169 (here 533). Compare also *CMS V* nos. 363-364, 385 (Medeon), *V Suppl.* 1B no. 452 (Kato Mavrolophos) and *V Suppl.* 2 no. 99 (Elateia) here 536. For further matches: Dickers 86; I. Pini, in *Peripheria* 332-34; idem, in *CMS V Suppl.* 3 pp. 23-24.

¹²⁹ *CMS V Suppl.* 1B nos. 132-133 (A. Triada), no. 451 (Kato Mavrolophos), and VII no. 137 (unk. prov.). Other flat-backed seals are *CMS V* no. 629; *V Suppl.* 1B no. 152; *V Suppl.* 3 nos. 281, 430-431 (*Diskoide*). See also Dickers 78-79 (*Plättchen*). For beads or 'buttons' cast in relief: Pini, in *Peripheria* 334-35, figs. 12-16; also now *CMS V Suppl.* 3 nos. 53, 258, 269, 274, 280, 292.



533-538 Selected motifs of LH IIIA-B pressed glass seals. **533** Kallithea T. Theta (2 examples). **534** Medeon (examples from Ts. 29, 29a and 99). **535** Ayia Triada T. 11, Elis. **536** Elateia T. 59, Medeon Ts. 29, 29a and Kato Mavrolophos. **537** Kalapodi. **538** Ayia Triada T.11 (2 examples), Kato Mavrolophos and unknown provenance. Drawings of impressions. **539** Misshapen glass 'discoid' from the Cult Centre at Mycenae; impression, face and profile. **540a-b** Pressed glass lentoid, unknown provenance; profile and impression. **540c** Hypothetical section drawing of two-part mould for pressed glass seals. **541** Irregular block of dark reddish steatite (?) with circular matrices carved in relief, perhaps for making pressed glass seals, from the 'Harbour Town of Knossos', now in New York. Drawings of motifs, profiles and impressions at ca 3:2; **540c** at ca 1:1 and **541** at ca 3:4.



542-543 Fluorite seals from Medeon and Volos; impressions. **544** Abraded fluorite seal from Tiryns; profile and face. Scale ca 3:2.

profiles, apparently created by two-piece moulds (**540**). Another flat-backed seal comes from the Cult Centre at Mycenae (**539**). In this case something clearly went wrong during manufacture, because the piece is misshapen.¹³⁰ But this is one of very few pressed glass seals from the Mycenaean ‘heartland’. Their greatest concentration occurs in central Greece – especially the Medeon and Elateia cemeteries – with a good sprinkling in Achaia, Elis and Thessaly.¹³¹ Whether this reflects archaeological chance or reality is hard to say, as we have fewer than 100 examples to work with.

Fluorite seals

Altogether we have about 100 seals made of fluorite and decorated with geometric designs; around a third come from Crete, in particular from the Armeni cemetery.¹³² The Cretan examples are decorated with designs that are reminiscent of tectonic motifs and double-axes, as well as angle-filled diagonal crosses (**425**; cf. **223**). It may be that they were inspired by earlier Minoan seals that were still in circulation. While precise dating is difficult, production was probably short-lived, perhaps confined to LM IIIA. In any case, an example from a LM IIIB2 grave is clearly abraded, while another found in a LM IIIA1 burial is virtually ‘workshop fresh’.¹³³ From this, it seems certain that fluorite seals on Crete were made to be worn.

On all counts the mainland presents a very different picture. Here fluorite seals are decorated with linear designs, such as diamond patterns and stylized branches (**542-544**; **C49**). They generally have sharply pointed conical backs, unlike the Cretan examples, which are biconvex or gently pointed. Many of the mainland fluorite seals are in mint condition even when found in very late contexts (e.g. LH IIIB-IIIC Advanced) and one

¹³⁰ *CMS V* no. 598. See also A. Tamvaki, *BSA* 69 (1974) 261-62, esp. n. 27. For context and associated finds see Chapter 10 (p. 276)

¹³¹ Dickers 79 (map 8), 85 and n. 566 (suggesting that a workshop was located near Medeon).

¹³² See Chapter 8. For a thorough account of fluorite seals, and the distinction between Cretan and mainland designs, see Dickers 87-95, figs. 22-25, map 10. Some seals assigned to the ‘fluorite group’ are made of medium-hard stones that are opaque rather than translucent. In decoration, however, they compare closely to those made of fluorite: Dickers 87 n. 576. During LB II-III, fluorite was also sometimes used for seals bearing pictorial motifs: Dickers 100-01; also J. G. Younger, *Kadmos* 26 (1987) 71-73.

¹³³ *CMS V Suppl.* 1B nos. 217, 220; Dickers 87.

cannot help wondering if some were made explicitly as grave goods. However, an example from the Unterburg at Tiryns (context LH IIIC Early) is abraded and damaged (544). So far this is the only fluorite seal to be found in a settlement context on the mainland. Indeed, like the pressed glass seals, fluorite seals are concentrated in the late cemeteries of central Greece (notably Elateia) and Thessaly. Since Cretan-type fluorite seals occasionally crop up on the mainland, imports may have triggered mainland output. In turn a few seals with characteristic mainland decoration occur on Crete and two have been found on Rhodes.¹³⁴

The Mainland Popular Group

While our late seals made of fluorite and pressed glass form relatively small and homogeneous groups, the Mainland Popular Group (MPG) comprises around 650 examples and shows considerable diversity in shape, motif and quality of execution.¹³⁵ Likewise MPG seals occur in a very wide range of contexts, including palatial centres and settlements in the Mycenaean ‘heartland’, graves in peripheral areas, and sanctuaries on the islands. A few travelled further afield – to Cyprus, Troy, and even aboard the Uluburun wreck.¹³⁶ As far as we can tell, production began sometime during LH IIIA and continued through LH IIIB, if not later.¹³⁷ Indeed one or two examples from LH IIIC graves are ‘workshop fresh’, hinting that some MPG seals could have been made following the collapse of the palaces. This should not cause undue surprise, for they played little part in palatial administration (Chapter 10).

MPG seals are ordinarily made of soft shiny steatite (Mohs 2), which could be worked with knives, burins or hand-turned drills.¹³⁸ The stones are usually dark in colour – black, brown, deep purplish red, olive-green (C50) – more rarely light green. Barring a few exceptions, all are lentoids, ranging in diameter from about 1.1–2.4 cm (545–552). Profiles show astonishing variety: seal faces are flat, convex or even slightly conical, while reverses are flat, convex, conical with slightly incurved sides, sharply pointed or gable-shaped. Some variations seem to be linked to specific regions or even sites. For instance, MPG seals from Medeon and eastern Thessaly often have sharply pointed backs, as do fluorite seals in these areas. By contrast, rounded backs occur chiefly in the Argolid and Corinthia. But steatite is a very soft stone and prolonged use could well account for the gentler profiles. Certainly, MPG seals in the ‘heartland’ are often abraded,

¹³⁴ E.g. *CMS* II.4 no. 120 (Knossos), J. Boardman, *The Cretan Collection in Oxford* (Oxford 1961) 70, no. 312, pl. 24 (Dictaeon Cave); two unpublished seals in Herakleion Museum. From Rhodes: *CMS* VII no. 194 (here C49) and XI no. 253. Cretan-type fluorite seals on the mainland include: *CMS* V nos. 735, 739; V Suppl. 1B no. 7: see Dickers 95. See also Chapter 10.

¹³⁵ The MPG was initially defined by J. G. Younger, *Kadmos* 26 (1987) 65–71; Dickers *passim* now provides a detailed account and catalogue (see also n. 121). My figure of 650 includes ca 50 examples from Elateia published in *CMS* V Suppl. 2 (discussed but not catalogued by Dickers) plus a further 100 pieces which now appear in *CMS* V Suppl. 3.

¹³⁶ *CMS* V Suppl. 1B nos. 473 (Uluburun); no. 474 (Troy: Beşik Tepe cemetery); no. 481 (Enkomi). Add *CMS* V Suppl. 3 no. 454 (Uluburun). See also Chapter 10.

¹³⁷ The inception of the MPG should probably be placed in LH IIIA2, as Younger (n. 135) suggested; Dickers is curiously non-committal on this point, but notes that so far no pure LH IIIA1 contexts have yielded MPG seals. *CMS* V no. 616, from a LH IIIC grave near Olympia and described as *nahezu werkstattfrisch* (Dickers 190, no. 211), suggests that production *might* have continued after LH IIIB. Other MPG seals in mint condition come from graves used for longer periods of time, e.g. LH IIIB-C: Dickers 16.

¹³⁸ For material, technique, shapes and regional variations: Dickers 10–19, esp. figs. 1–4.



545-546 Mainland Popular seals from Elateia and Tiryns; faces and profile drawings. **547-552** Selected Mainland Popular seals from Kato Almyri (**547**), Medeon (**548**, **552**), Aphaia on Aigina (**549**), Mycenae (**550**), and Ayia Triada in Elis (**551**), Impressions. All shown at ca 3:2.

sometimes to the point where motifs are completely illegible and string-holes are worn through (**546**), whereas MPG seals from certain sites in central and northern Greece are often in mint condition (**545**).¹³⁹

Nearly half our MPG seals are decorated with quadrupeds.¹⁴⁰ Sometimes the shape of horns and length of tails allows us to recognize them as bulls (**545**, **547**; **C50**) or goats (**44**), but all too often the animals are rendered so schematically that they defy identification (**548-549**). We should not, however, make the mistake of condemning all MPG seals as poorly executed or crude, though some undoubtedly were. Rather we are seeing

¹³⁹ 'Workshop-fresh' seals are especially common in the Medeon cemetery and also at Olympos-Ayios Dimitrios: Dickers 16, 76. Dickers notes that ca 50% of MPG seals are heavily abraded; 27% are slightly abraded; and 23% are 'workshop fresh'. Only six seals from the Argolid, Attica, Elis and Messenia fell into the last category: *ibid.* 16 n. 6.

¹⁴⁰ Dickers 22-42, figs. 5-6 (poses), fig. 7 (filling ornaments).

the typical effects of working steatite with knives, burins and hand-turned drills – in other words, much the same tool-kit as used for our MM II steatite prisms, which are also sometimes derided as crude or primitive in style (Chapters 1, 5). As for motif and composition, these distantly reflect trends in hard stone seals, especially those produced during LB IIIA. Single animals predominate, usually standing, less often running, depicted in profile or with heads *regardant* (545, 547-549; C50). More ambitious compositions are rare: a few representing animals back-to-back or antithetically, an occasional suckling scene or attack.¹⁴¹ Filling ornaments are used liberally and include a variety of twig-like elements, comb-like borders, dots, gouges and figure-of-eight shields (better known from LM II-III glyptic: see Chapter 8). Only a handful of MPG seals depict humans, perhaps harking back to earlier processions and cult scenes (550).¹⁴² Ornamental types include stylized *bucrania* (551), rosettes, trefoils, spirals, volutes (546), centred circles (552), and linear designs.¹⁴³ Although similar motifs occur on much earlier Cretan seals, their appearance in the MPG comes as something of a surprise, as they have no clear antecedents in the LB II-III hard stone repertoire. In fact, the ornamental types might well represent a late innovation, since all our datable examples come from LH IIIB-C contexts. Beyond that, it proves immensely difficult to trace developments within the MPG either through time or space. This is certainly disappointing, inasmuch as the group is sizeable and many pieces have a known provenance. In practice, the schematic motifs, the likelihood of travelling seals, and our inability to date individual pieces closely – all conspire against us. And if we remember that our 650 seals probably span more than 150 years, the corpus no longer seems unduly large. As for patterns of distribution, these are prey to our familiar foe – archaeological chance. Until a few years ago, MPG seals with standing animals were unknown throughout much of central Greece. Now thanks to recent excavations at Elateia, they are firmly on the map.¹⁴⁴ That said, we must guard against the assumption that production and ownership of MPG seals was universal throughout the mainland and islands during LH IIIA2-B. We will return to this issue – and the relationship of the MPG to heirloom seals of hard stone and precious metal – in our next chapter.

¹⁴¹ E.g. *CMS* V no. 361; V Suppl. 1B no. 129; also Dickers 26-27.

¹⁴² See also *CMS* I no. 195 from Midea; *Tonplomben* no. 4 and p. 90; Dickers 40-41.

¹⁴³ Dickers 43-64.

¹⁴⁴ Dickers 23 n. 131.

CHAPTER 10 SEAL USE IN MYCENAEAN GREECE AND THE ISLANDS IN LB II-III

The precise role played by seals in Mycenaean society remains perplexing, despite a wealth of evidence from graves, sanctuaries, and sealing deposits in the palaces. The increasing use of heirlooms and their widespread circulation during LB II-III is also difficult to explain. That seals served as status markers and, sometimes, as bureaucratic tools is clear enough. Harder to grasp are subtle variations through space and time. Progress may come through meticulous analysis of the glyptic evidence, in tandem with a rigorous re-appraisal of context, both archaeological and cultural.

On the face of it, studying seals deposited in tombs should be an ideal way to pursue the individual or the family and, in so doing, bring our shadowy elites into sharper focus. In practice, however, the re-use of tombs in Mycenaean Greece and the disturbance or deliberate clearance of earlier burials usually thwarts our analyses. Destruction and plundering in modern times, along with poor standards of recording and publication also take their toll; for around 80% of Mycenaean graves containing seals we have only short summary accounts.¹ Against this lamentable backdrop, hopes of making significant progress on questions of seal ownership and social status in Mycenaean Greece seem very poor indeed. A broad picture can, however, be sketched with caution.

From the outset the role of seals in Mycenaean Greece seems to have been limited. Acquired by emerging elites in the early LBA along with other high-status exotica of foreign and, in particular, Minoan origin, seals remained largely in the hands of the great and the few throughout the Mycenaean period. Certainly during LH I-II / IIIA1, seals and signet rings on the mainland – whether Cretan imports or local products – were almost exclusively made in semi-precious stones and precious metals, sometimes further embellished with granulation and cloisonné decoration. In central and southern Greece they are confined to rich burials, and the same also holds good for central Crete during LM II-IIIA1/2, where a Mycenaean presence seems probable (Chapter 8). Only sometime during LH IIIA do we see an appreciable widening of seal ownership with the creation of the Mainland Popular Group (MPG) in steatite, along with other late types in fluorite and pressed glass (Chapter 9). But to see these sub-elite products as the possessions of the humble masses is surely incorrect.² Their prevalence in ‘peripheral’ areas, sometimes still in mint condition when deposited in graves (occasionally alongside seals of hard stone or precious metal), suggests that their owners used them to negotiate status at local level by emulating perceived norms of behaviour in the Mycenaean heartland.³ Within the heartland itself, few MPG seals have been found in graves, making it harder to identify the social group(s) to whom they belonged. There is, however, little sign that ownership of MPG seals was universal or even very widespread.⁴ On the contrary, seals never seem to have permeated Mycenaean society to the same extent as on Minoan Crete.

¹ Dickers 109 n. 753; see also Chapter 9.

² For MPG seals as the possessions of the ‘humble’ see: J. G. Younger, *Kadmos* 26 (1987) 65-71. For sub-elite and substitute elite products: S. Sherratt, in J.-P. Crielaard et al. (eds.), *The Complex Past of Pottery* (Amsterdam 1999) 163-211.

³ Which areas should be considered ‘peripheral’ is an open question: see papers in *Peripheria*. Modern development accounts for increasing discoveries western, central and northern Greece.

⁴ So far Lakonia has not yielded any MPG seals and Messenia less than 20; it is unclear whether this is solely archaeological chance or reflects genuine differences in social practice (below p. 307).

Can the creation of the MPG help to explain that great mystery of Mycenaean glyptic, namely the demise of hard stone engraving around the end of LH IIIA2? Indirectly it might. Whatever the underlying impetus for the first MPG seals – and this remains an open question – once created, their production could hardly be controlled or curtailed, for they were made in local materials, using simple non-specialized tools. However, palace-based elites *were* in a position to curtail production of new seals in hard stone or precious metal, thereby ensuring that the remaining seals in circulation would acquire greater value as status markers.⁵ Whether ownership was ever restricted in a more formal sense – confined to specific individuals or offices – remains an open question. We can, however, safely observe that heirloom seals and signet rings were extensively used for sealing purposes in LH IIIB. At any rate, among the 114 types represented on the Pylos sealings, not a single example was made of fluorite or pressed glass, and the few of soft stone do not seem typical of the MPG.⁶ This too represents a notable divergence from Cretan practices, where soft stone seals had figured prominently in neo-palatial sealing deposits; they are also found among the late sealings at Knossos (Chapters 7-8).

SANCTUARIES

One of the largest concentrations of Mainland Popular seals in southern Greece occurs at the site of the later Aphaia Temple on the island of Aigina. In all more than 25 MPG seals have been recovered (e.g. 549), as well as a few heirloom seals of hard stone.⁷ Other finds include beads, pendants, ‘spindle-whorls’, sherds, and an exceptionally large number of terracotta figurines, clearly indicating that the Aphaia site served as an open-air sanctuary during LH IIIA2-B.⁸ The seals are certainly consistent with this interpretation: almost all of the Mainland Popular seals are abraded, which suggests they were personal possessions dedicated by visitors to the sanctuary and were not made explicitly as offerings.⁹

⁵ Cf. T. G. Palaima, in P. H. Ilievski & L. Crepajac (eds.), *Tractata Mycenaea* (Skopje 1987) 264-265 for the suggestion that decline in seal manufacture and quality after LH IIIA1 might have been due to an intentional restriction by Mycenaean administrators seeking closer control of economic activities.

⁶ Closest are *Tonplomben* nos. 4, 70-71: see I. Pini, *ibid.* 90; Dickers 39, fig. 12. A newly published sealing from Thebes was definitely impressed by a MPG seal: *CMS V Suppl.* 3 no. 373 (see also below n. 92). Pini (in *Peripheria* 333) doubts that pressed glass seals were ever used sphragistically, not least because exact duplicates have been found in distant locations: see Chapter 9 and below p. 306. Moreover, their faces produce impressions of poor quality, while their conical backs cause discomfort when making impressions. The latter also applies to many examples of the MPG and fluorite seals from the mainland (Chapter 9).

⁷ I. Pini, *AA* (1987) 413-33 presents the seals from the Aphaia sanctuary, including those of Geometric and Archaic date. For the BA seals see also: *CMS V* nos. 2-5; *V Suppl.* 1A nos. 3-28 (nos. 29-32 are four-sided beads with engraving). *CMS V* nos. 6-7, 9, 12 may also come from the Aphaia site. A few seals are EBA-MBA in date; when they were deposited is an open question: *CMS V* no. 1; *V Suppl.* 1A nos. 1-2. See also Dickers 71-72 (nos. 1-33: MPG) and 95-98 (engraved ‘beads’). For principal sites mentioned in the present chapter see MAPS 2-3.

⁸ K. Pilafidis-Williams, *The Sanctuary of Aphaia on Aigina in the Bronze Age* (Munich 1998) esp. 116-18 (seals), 128-34 (summary of finds and character of site).

⁹ *CMS V Suppl.* 1A no. 21 is described as ‘workshop fresh’: Dickers 153 no. 22. Obviously, since none of the seals comes from a stratified context, we cannot exclude the possibility that some reached the site after the BA (see also below).

Most other LBA sanctuaries on the mainland and islands have also yielded Mainland Popular seals, sometimes alongside hard stone heirlooms. Patterns of deposition do, however, show subtle differences, in keeping with the general lack of uniformity in Mycenaean cult practices. For instance, only three seals came to light in Room 19 of the Temple Complex at Mycenae: a misshapen glass seal, a tiny lentoid of lapis lazuli, and an abraded example of the MPG.¹⁰ The glass seal was found in an undecorated bowl, along with numerous beads of glass and semi-precious stones, a scarab of Queen Tiy, and several small ivories. The deposit in Room 19 also included a few small items of metal, two sealings, three tripod offering tables, terracotta snakes and many large anthropomorphic figures. All of this material was deposited and sealed in Room 19 following a destruction in the middle of LH IIIB.¹¹ Thus we are dealing with articles used or dedicated in the Temple Complex during LH IIIB1. A fine agate lentoid depicting bull-leaping and an unfinished seal, also of agate, were found elsewhere in the Cult Centre, but were not necessarily offerings.¹²

The exact nature of the Mycenae Cult Centre is open to debate, and so too is the broader issue of palatial cult in Mycenaean Greece. At nearby Tiryns, Casemate Room 7 in the Unterburg apparently served as a shrine in LH IIIB2, to judge from the quantities of figurines found outside in the courtyard, and a possible 'house-shrine' was also identified in Building VI opposite. Although several seals were found here, we cannot be sure that any were offerings.¹³ No seals came to light in the post-palatial shrines. At Midea the discovery of a fine Type A figure and numerous terracotta figurines near the West Gate suggests cult activity somewhere in the vicinity, but sadly few items come from a primary context.¹⁴ Since no shrine as such can be identified, any seals from this area count as little more than strays. The same applies to Pylos and Thebes, which have yet to yield convincing evidence for built shrines *per se*.

For further examples of seals in sanctuaries we must turn to non-palatial settings. The LH IIIA-B shrine at Ayios Konstantinos on Methana, notable for its fine array of terracotta bovinds, has also yielded several seals, including two examples of the MPG in 'workshop-fresh' condition.¹⁵ From the Temple at Ayia Irini on Kea, which received sporadic offerings throughout LH IIIA-C, we have four seals: an abraded lentoid of serpentine, an agate lentoid datable to LB II-III A, and a pair of lentoids made from translucent limestone (553-554).¹⁶ This rather unusual material was also used for one of

¹⁰ CMS V no. 598 (here 539), no. 600 (here 452), and Mycenae inv. no. 68-1634. For the last: A. Tamvaki, *BSA* 69 (1974) 270, pl. 44f. For the Room 19 deposit: A. D. Moore & W. D. Taylour, *Well Built Mycenae 10: The Temple Complex* (Oxford 1999) 17-21, 23-24, 111; note that inv. no. 68-1517 of lapis lazuli is a bead. For two sealings from Room 19 see also below p. 287.

¹¹ For chronology of the site: Moore & Taylour (n. 10) 1-3, table 1.

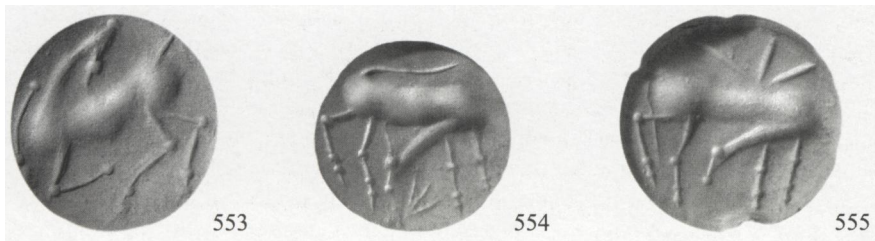
¹² CMS V no. 597 (here 499, C44; from Passage 34, adjacent to the Temple Complex phase VIII, i.e. LH IIIB2) and no. 599 (here 27, from phase VIII fill in Room 31, i.e. Room of the Fresco). For a MPG seal from Room T4 (Mylonas excavations) see now CMS V Suppl. 3 no. 216.

¹³ CMS V Suppl. 1B nos. 428, 430 (both broken, hard stone) and 435 (lead ring, here 471) from Room 121; nos. 441-442 (both MPG) from Rooms 120 and 123; see also Dickers 72. Preliminary reports: K. Kilian, *AA* (1979) 400-05; *AA* (1981) 178-80; *AA* (1988) 142-45; *SCABA* 49-58.

¹⁴ K. Demakopoulou, in *Meletemata* 197-205; Demakopoulou & N. Divari-Valakou, in *Potnia* 181-191. Seals from the West Gate area include: CMS V Suppl. 1B no. 71; V Suppl. 3 nos. 222-233.

¹⁵ CMS V Suppl. 3 nos. 311-312 (MPG), also nos. 313-316. For the site: E. Konsolaki, *BICS* 40 (1995) 242; eadem, in R. Hägg (ed.), *Peloponnesian Sanctuaries and Cults* (Stockholm 2002) 25-36; E. Konsolaki-Yannopoulou, in *Potnia* 213-17.

¹⁶ CMS V nos. 497-500; for nos. 499-500 (here 553-554) see also Chapter 9. For the contexts: J. G. Younger, in C. Renfrew, *The Archaeology of Cult. BSA Suppl.* 18 (London 1985) 294-95.



LB IIIA lentoids of limestone from the Temple at Ayia Irini on Kea (553-554) and from the East Shrine at Phylakopi on Melos (555). Impressions. Scale ca 3:2. Material and style suggest that all three were products of the same workshop, perhaps even by a single hand.

the seals found in the East Shrine at Phylakopi (555), which was associated with the phase 2b collapse in early – mid LH IIIC.¹⁷ So close are these three seals in style that they may well have been produced in the same workshop, if not by a single hand. On stylistic grounds they can be associated with the latest products in hard stone, dating to LH IIIA2, though where they were made is open to question. Certainly there is nothing to support the notion that seals of the so-called Island Sanctuaries Group were made in the Cyclades by itinerant craftsmen.¹⁸ By the time the Phylakopi seal was finally deposited in the East Shrine during LH IIIC it was obviously an heirloom and the same was perhaps true of the Kea seals too. The East Shrine yielded a total of ten seals, including five examples of the MPG.¹⁹ All were found on or above the earliest floor, near the platform, in association with several bovine figures and animal figurines, a few items of metal, beads of glass and fragments of tortoise-shell, perhaps from a lyre. There is little doubt that the seals were offerings at the shrine (perhaps placed on the platform itself) prior to the phase 2 collapse. The West Shrine at Phylakopi contained a single seal, a fine Cut Style goat, found in the phase 1b / 2a stratum, datable to LH IIIB.²⁰

All of the seals so far discussed – with the exception of those from the Aphaia sanctuary – come from pure LBA contexts; in most cases an association with cult activity in the later Mycenaean period is also clear. Less straightforward are sites that became sanctuaries in the Geometric and Archaic periods, but which also contain material of Bronze Age date. With little or no stratigraphy to guide us, each site must be assessed with care – first and foremost to establish whether it truly served as a cult place during the LBA and, secondly, whether the seals can plausibly be associated with that use. The sanctuary of Apollo Maleatas at Epidauros certainly passes the first of these tests and it seems likely that most, if not all, of the seals were also deposited during the LBA.²¹

¹⁷ *CMS V Suppl.* 1B no. 40. Younger (n. 16) 286-87, 293-94. For associated finds and dating: Renfrew (n. 16) 117-20, 378-79, 404 table 10.2.

¹⁸ Younger (n. 16) 290-95, esp. 294. He also supposes that all the seals found in the East Shrine were originally dedicated in the West Shrine, at roughly the time they were made (i.e. LH IIIA2), and were later removed for storage in the East. Their condition (i.e. broken, chipped, heavily abraded) makes this unlikely, as does the history of the two shrines. See Chapters 9 and 11.

¹⁹ *CMS V Suppl.* 1B nos. 38-47; Younger (n. 16) 281-90; for the MPG seals see also Dickers 72.

²⁰ *CMS V Suppl.* 1B no. 37; Younger (n. 16) 283-84. For the Cut Style see Chapters 8-9 with references. For associated finds and dating: Renfrew (n. 16) 99-100, 377-78, 404 table 10.2.

²¹ *CMS I Suppl.* no. 32; V nos. 221-222; V Suppl. 1A nos. 368-369. For the site: Chapter 9 n. 80.

The same also holds true for the Aphaia sanctuary, discussed above. At Kalapodi in Phthiotis, careful excavation has revealed that the later sanctuary of Artemis and Apollo Hyambolis was first used for cult purposes in LH IIIC; an abraded MPG seal comes from a level dated LH IIIC Late to sub-Mycenaean.²² By contrast, the so-called Mycenaean sanctuary at Delphi is shrouded in mystery. Here quantities of terracotta figures, some beads, spindle-whorls and at least three Mainland Popular seals were found near the later Temple of Athena Pronaia at Marmaria.²³ But the material is not in a primary context and we cannot be certain that it reflects LBA cult activity. Indeed it has been suggested that the finds come from Mycenaean tombs in the vicinity, perhaps disturbed and plundered in the EIA.²⁴ That said, the range of material is strikingly similar to that from the Aphaia sanctuary, albeit smaller in quantity. LBA cult activity does seem assured at the Amyklaion near Sparta in Lakonia, but as there is no stratification whatsoever, it is impossible to say when the two seals of LBA date were actually deposited.²⁵

The chance disturbance (if not deliberate plundering) of LBA tombs probably accounts for the majority of seals recovered during the Geometric and Archaic periods and deposited in sanctuaries of that date. This is the most likely explanation for the presence of LBA seals at the Argive Heraion, conveniently close to the Mycenaean cemetery of Prosymna.²⁶ Tombs of LH III date are also reported in the vicinity of the later sanctuary of Artemis at Brauron, which yielded three Bronze Age seals.²⁷ Other sanctuaries with LBA seals include: Artemis Mounychia (Piraeus), Artemis Orthia near Sparta, the Artemision on Delos, Artemis at Ano Mazaraki in Achaia, Artemis and Apollo at Kato Syme, Demeter at Dion, Demeter at Knossos, Demeter and Kore at Tocra in Libya, Hera Akraia and Hera Limenia at Perachora, Poseidon at Sounion, and the newly discovered shrines at Kephala Vasilikis in eastern Crete and Vryokastro on Kythnos.²⁸ For the most part, the seals in question are made of hard stone and sometimes are damaged or broken.

²² *CMS V Suppl.* 1A no. 382; R. C. S. Felsch, in *SCABA* 81-89; idem, in *Potnia* 193-99. See also Dickers 72.

²³ *CMS V Suppl.* 3 nos. 157-159; possibly 160-164 (without provenance). The last is a four-sided bead with engraving; the remainder are MPG. See also Dickers 71-72. S. Müller, *BCH* 116 (1992) 481-86 provides a thorough account of the context and finds.

²⁴ Müller (n. 23) 484-86. While doubting the existence of cult activity at Marmaria, Müller seems happy to accept the existence of a LBA sanctuary (perhaps open-air) elsewhere at Delphi, e.g. in the vicinity of the later sanctuary of Apollo (ibid. 475-81).

²⁵ *CMS I Suppl.* nos. 37-38 (both hard stone). The terracotta figurines and sherds are LH IIIB-C, while the metal finds are EIA: K. Demakopoulou, *Το μυκηναϊκό ιερό στο Αμυκλαίο και η ΥΕ IIIΓ περίοδος στη Λακωνία* (Athens 1982) 172-77 (English summary).

²⁶ *CMS I Suppl.* nos. 23-24 (MPG), no. 25 (haematite), no. 26 (carnelian lentoid: tiny fragment only). J. Sakellarakis, in U. Jantzen (ed.), *Neue Forschungen in griechischen Heiligtümern* (Tübingen 1976) 307-08 offers the fanciful suggestion that seals deposited in later sanctuaries were heirlooms passed down in priestly families from the LBA!

²⁷ *CMS V* nos. 213, 215, 216 (here **598**) are hard stone; no. 214 resembles the 'talismanic' style but is Archaic in date: I. Pini, *Marburger Winckelmann-Programm* (1975) 1-10; see also below p. 310.

²⁸ See also below pp. 308-09. Mounychia: Sakellarakis (n. 26) 288, fig. 16. Orthia: ibid. 294-95, figs. 35-36, 38? (fig. 37 is Archaic). Ano Mazaraki: *CMS V Suppl.* 1B no. 165. Delos: *CMS V* no. 312 (Artemision 'deposit'); nos. 313 (here **522**), 314-316. Dion: *CMS V Suppl.* 3 no. 165. Kephala Vasilikis: *CMS V Suppl.* 3 no. 42. Knossos: *CMS II.3* nos. 77, 78 (here **596**), 79-85, II. 4 nos. 8, 135. Perachora: *CMS I Suppl.* nos. 39-41, 45-46 (nos. 42-44 are Archaic, cf. FIGURE 10.5d-e). Sounion: *CMS I Suppl.* no. 53 (**597**). Tocra: *CMS V Suppl.* 1B no. 472. Vryokastro: *AR* 49 (2002-03) 75-76, fig. 126 (dedication uncertain). For Kato Syme see Chapter 8 n. 78; offerings in the Dictaeon and Idaean Caves are unstratified; perhaps BA seals were also deposited there in the EIA (Chapter 8 nn. 76-77).

The presence of MPG seals on the Athenian acropolis and a carnelian amygdaloid from the vicinity of the Erechtheion could be explained by the disturbance of Mycenaean habitation deposits in the course of later temple construction.²⁹ Other instances of Bronze Age seals in later contexts are mentioned at the end of this chapter.

SEALING PRACTICES

The origins of Mycenaean sealing practices are shrouded in mystery, because no sealings survive on the mainland before the middle of LH IIIB. As usual, prolonged occupation, levelling and re-building on sites that became palatial centres – especially Mycenae, Pylos, Tiryns and Thebes – contribute to this unfortunate state of affairs. In any case, we have no idea when the Mycenaean first used seals for sealing purposes, much less what form those sealings may have taken. One school of thought maintains that seals were used sphragistically from the outset, in other words, from LB I onwards, when they were first acquired by the Shaft Grave dynasts and other early elites.³⁰ Whether Mycenaean society had yet reached the stage where a sealing system was necessary is, of course, a matter for debate. Nevertheless, if we remember that sealings are the oldest and simplest means of ensuring the integrity of goods or raw materials, then arguments regarding social complexity may be inappropriate (cf. Chapter 2). That said, without any form of corroborative evidence, the case for an ‘early’ origin remains difficult to sustain. The same is also true for the origins of the Linear B script and tablet administration.³¹

The administrative practices employed in the mainland palaces during LH IIIB bear an uncanny resemblance to those used in the late palace at Knossos. The similarities in tablet administration have long been noted and the types of nodules also prove to be virtually identical (see below). Unfortunately, as we have already seen, the date of the latest sealings (and tablets) at Knossos is still a matter of controversy (Chapter 8). If, however, we accept the traditional date, namely sometime during LM IIIA1/2, then we still have a gap of around a century until our earliest sealings on the mainland.³² Were it much longer, then practices might well have diverged. There is, of course, no law dictating how long specific sealing practices should remain in use. Rather, one might expect them to remain unaltered until there was a significant change in administrative requirements.

²⁹ *CMS* I nos. 397–403 (MPG) come from excavations carried out by P. Kavvadias (1885–89) but cannot be conclusively linked to the bronze hoard. Cf. P. A. Mountjoy, *Mycenaean Athens*. *SIMA Pocket-book* 127 (Jonsered 1995) 10–11 (Kavvadias), 40–41 (LH IIIB acropolis), 50–51 (bronze hoard). The Erechtheion seal is *CMS* I no. 404.

³⁰ I. Pini, in R. Hägg & N. Marinatos, *The Minoan Thalassocracy: Myth and Reality* (Stockholm 1984) 130–31. Later (*SMEA* 28 [1990] 109–110) Pini seemingly softened his stance, stating that ‘soon – possibly not later than LH II Late’ seals on the mainland were being used sphragistically [my italics]. But this is at least a century after seals had first appeared in Mycenaean contexts.

³¹ T. G. Palaima, in J.-P. Olivier & T. G. Palaima (eds.), *Texts, Tablets and Scribes. Minos Suppl.* 10 (Salamanca 1988) 269–342, esp. 269–77, 336–42.

³² An acceptance of Hood’s ‘compromise’ date of LM IIIA2 / B1 for the final destruction at Knossos would narrow the gap appreciably (see Chapter 8) and new discoveries might well eliminate it altogether. A fragmentary Linear B tablet has now been recovered from a secure LH IIIA2 context at Petsas House, Mycenae: *Ergon* (2000) 51; K. Shelton, *BICS* 47 (2004) 181–82. Five tablet fragments found outside the SW Building at Pylos evidently antedate the destruction and may date to LH IIIB1, or even LH IIIA2, and seem close to Knossian examples: T. G. Palaima, in P. Oliva & A. Frolíková (eds.), *Concilium Eirene XVI* (Prague 1983) vol. 3, 80–84; idem, *The Scribes of Pylos*. *Incunabula Graeca* 87 (Rome 1988) 162–65. Two gable-shaped nodules (*Tonplomben* nos. 4 and 34) come from the same area.

All in all, this leads one to surmise that the basic sealing system used during LH IIIB originated no earlier than LH IIB / LM II-III A1, that is, when palatial structures are first attested on the mainland and when a Mycenaean presence at Knossos seems probable.

SEALING TYPES

The varieties of sealings used on the mainland in LH IIIB closely resemble those found in the late palace at Knossos, and the few examples known from LM IIIB Khania and Mallia. They are described again here as a convenient introduction to our site-based survey. It is important to remember that there is no universally accepted typology for sealings and that the terminology used is often more confusing than enlightening.³³ In reality, however, most Mycenaean sealings fall into the following categories: gable-shaped hanging nodules (with or without Linear B inscriptions), irregular hanging nodules (without inscriptions and usually broken), combination sealings, direct object sealings, stoppers, and *noduli*. Typical neo-palatial varieties, such as flat-based nodules ('packets'), single-hole hanging nodules and roundels, are not found (Chapter 7).

Gable-shaped hanging nodules

These lumps of clay are usually gable-shaped in section, formed carefully around a knotted cord that passed through the nodule lengthwise.³⁴ They bear a single seal impression and some also carry Linear B inscriptions. Ordinarily, an ideogram is placed on the impression itself (i. e. *supra sigillum*), while further information may spread to the second and third faces of the nodule (556; also 563, 582-584). Inscribed sealings have been found at Knossos (428; Chapter 8) and on the mainland at Midea, Mycenae, Pylos, and Thebes. Gable-shaped nodules, with or without inscriptions, are usually found intact, in marked contrast to so-called irregular nodules, which (more often than not) are broken. This suggests that gable-shaped nodules served to label or identify commodities and to provide a convenient record of deliveries (see below). Support for this idea comes from the groups of inscribed nodules from Mycenae and Thebes, as well as from a few 'clay labels', which resemble elongated nodules but have only Linear B inscriptions.³⁵

Irregular hanging nodules

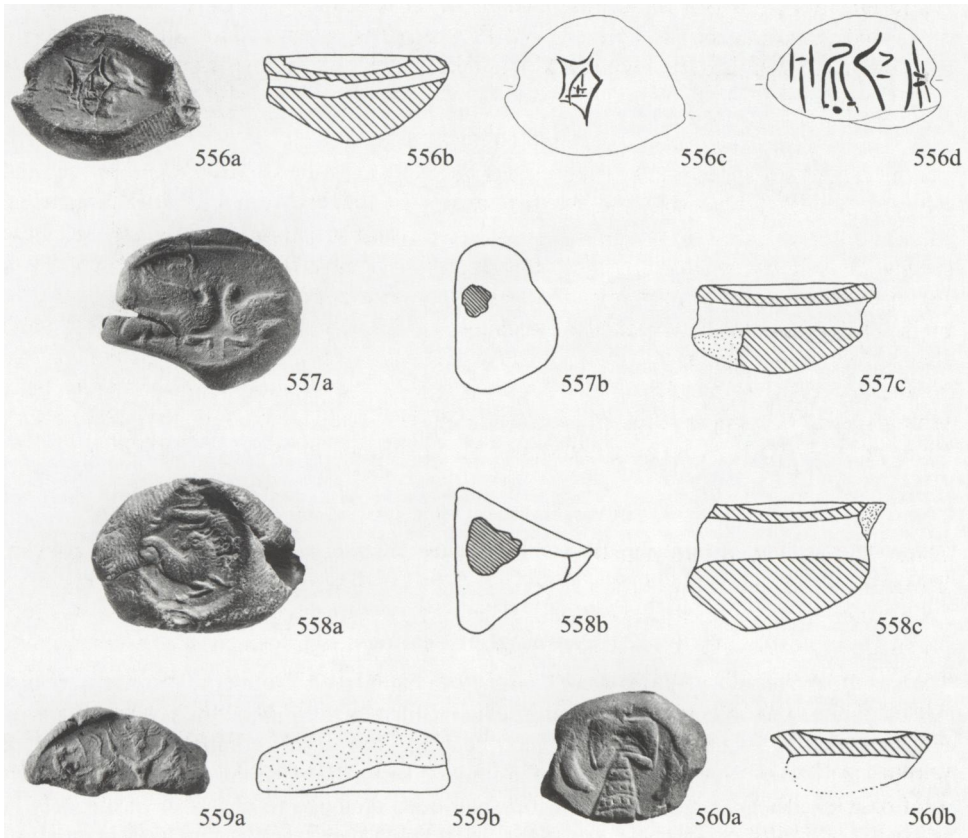
These lumps of clay were not formed with the same care as gable-shaped nodules and their shapes vary considerably.³⁶ Some have a domed back and a flat front created by the seal impression; others resemble irregular pyramids (557-558). Fairly thick cord passed through the centre of the nodule and out each end. Fragmentary examples – and they are fairly common – sometimes preserve the imprints of two separate cords that had been

³³ Here I follow the new *CMS* typologies by W. Müller, in *Tonplomben* 53-66 (Pylos), in Müller et al., *AA* (1998) 8-13 (Mycenae), and in *CMS* II.8 pp. 24-93 (late Knossos sealings). As in previous chapters I have substituted English terms (notably those devised by Erik Hallager) for the difficult German expressions used by the *CMS* team. See also the Glossary (Appendix 2).

³⁴ *Tonplomben* 56-58, fig. 1 (*Schnurplomben mit giebelförmiger Rückseite*).

³⁵ Three from Knossos (Müller, in *CMS* II.8 pp. 53-55, fig. 15) and two from Pylos (J.-P. Olivier, in *Tonplomben* 80, pl. 36); see also Palaima (n. 5) 259-60.

³⁶ Müller, in *Tonplomben* (55-58, 60, figs. 1, 4) and in *CMS* II.8 (pp. 52-69) sub-divides *Schnurplomben* (i.e. hanging nodules) into various categories according to profile and condition (i.e. broken on the string-hole or having an open reverse). Here I follow E. Hallager, in T. G. Palaima et al. (eds.), *Proceedings of the 11th International Mycenaean Colloquium* (forthcoming) by grouping all together as irregular nodules. Cf. Chapter 8.

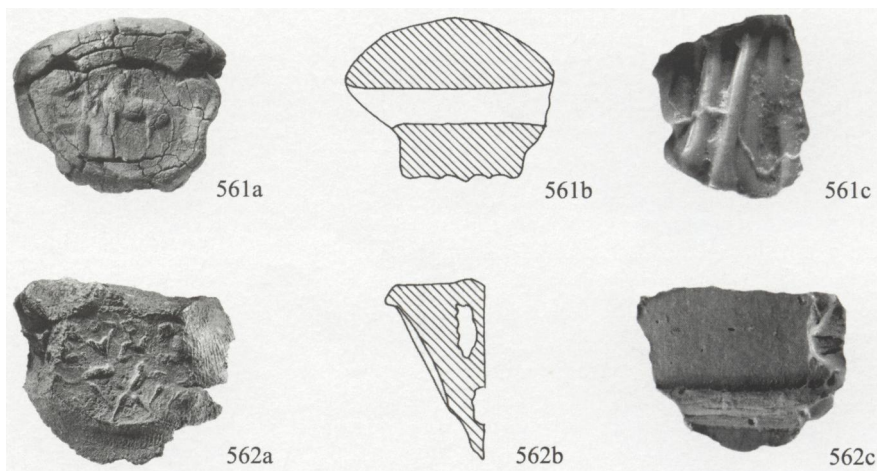


Principal varieties of two-hole hanging nodules from LH IIIB Pylos. **556a-d** Inscribed gable-shaped nodule; face a, longitudinal section, and drawings of faces a and b. **557-560** Irregular two-hole nodules: with rounded back (**557a-c**), with pyramidal back (**558a-c**), broken along string-hole (**559a-b**), and open-backed (**560a-b**). Faces and drawings of profiles (**557b**, **558b**) and longitudinal sections. Scale ca 1:1.

twisted together inside the nodule. This suggests that irregular nodules actually sealed the items to which they were attached. Indeed, closer scrutiny of the fragmentary nodules reveals that many had been broken deliberately, i.e. when they were pulled away from the cord.³⁷ Some are broken transversely and have an open back; others are broken lengthwise along the line of the cord (**559-560**). Studies carried out by the *CMS* team suggest that cords were made of leather, gut, or vegetal fibre (cf. **19-20**).³⁸ Irregular nodules constitute the most common type among the late sealings at Knossos (**430-432**). On the mainland, examples occur at Mycenae, Pylos and Thebes.

³⁷ Pace R. Palmer, *Wine in the Mycenaean Palace Economy*. *Aegaeum* 10 (Liège & Austin 1994) 148-50, who believed that irregular nodules (her Types II-III) were simply less well made, thus introducing a natural line of weakness along which they broke in the fire and falling debris of the destruction. See also below n. 86.

³⁸ *Tonplomben* 67-69, pls. 40-45.



Combination sealing (**561a-c**) and direct object sealing (**562a-c**) from Archives Room 8 at Pylos. Faces, section drawings and silicones of reverses. Scale ca 1:1.

Combination sealings

Whereas most irregular nodules were designed to hang freely from cords, some were also pressed against the object that was being sealed. Since they combine the characteristics of hanging nodules with those of object sealing, the term combination sealing is appropriate.³⁹ Sometimes imprints on the undersides of the sealing allow us to identify wood or wickerwork, suggesting that they had been attached to chests or baskets (**561**). Nearly 50 examples occur at Knossos (e.g. **18**, **433-434**), but only a few have been found on the mainland: they include a pair from Mycenae and a singleton from Pylos.

Direct object sealings

Several sealings at Pylos, including three from Archive Room 8, have been classified as direct object sealings⁴⁰ One had been placed directly onto knotted leather; two more had been pressed against flat (wooden?) objects that had been bound with cord (**562**; cf. **21**). To help keep the sealing in place, one end of the cord also ran through the lump of clay. Various kinds of direct object sealings are also known from LM III Knossos (Chapter 8).

Stoppers

Essentially a form of direct object sealing, clay stoppers were sometimes used to plug large stirrup jars, thereby ensuring that the contents – oil or wine – remained airtight. The fine array of stoppers from Mycenae provides useful insights into how these sealings

³⁹ *Tonplomben* 58, fig. 2: *Objektschnurplomben*; Müller 1998 (n. 33) 9.

⁴⁰ *Tonplomben* 58-59, fig. 2: *Objektplomben* (nos. 21A, 21B; 23A). See also below pp. 291-92. A sealing from Thebes pressed over a piece of leather, bound with a narrow strip of gut (?), should also be classed as an object sealing (**21**). Although *CMS V Suppl.* 1B no. 354 calls it a *Päckchenplombe*, in no way does this sealing resemble neo-palatial 'packets' (e.g. **10-14**, **283-290**), or even the variants found in the Room of the Chariot Tablets at Knossos (**426-427**). W. Müller of the *CMS* team concurs. For 'packets' see Chapters 7 and 8.

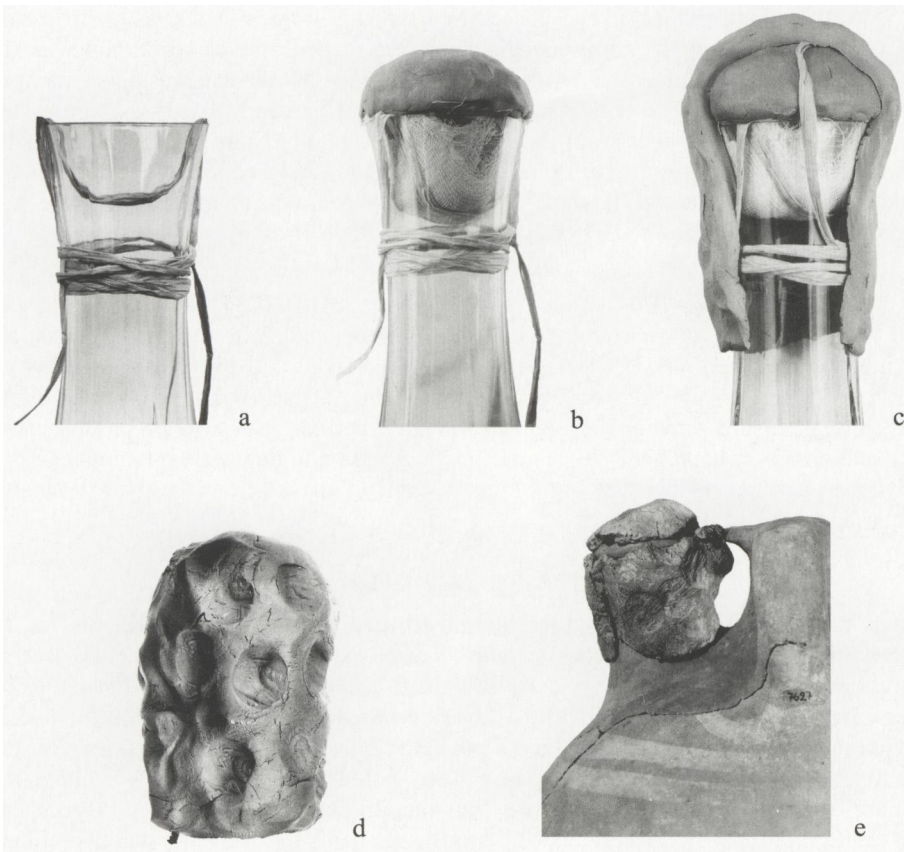


FIGURE 10.1 Modern replica illustrating how stirrup jars were provided with stoppers. Initially a kind of sling was created by binding the neck of the jar with cord and allowing a length to hang inside (a). A clay plug, similar in shape to a champagne stopper, was then placed in the mouth; the lower end covered in cloth to prevent the contents being contaminated (b). Finally the plug was covered with a layer of clay, which could be stamped repeatedly with one or more seals (c-d). For comparison a detail of a jar from the House of the Oil Merchant at Mycenae with sealed stopper still *in situ* (e).

were made.⁴¹ The first step involved making a kind of sling for the clay plug by binding the neck of the jar with cord and then allowing a length to hang loosely across, or rather into, the mouth (FIGURE 10.1a). The cord not only helped to secure the sealing, but also made removal easier. To prevent bits of clay contaminating the contents of the vase, the lower end of the plug was usually covered with cloth. Once these preliminary stages were complete, the plug itself – similar in shape to a champagne stopper – could be inserted into the neck, with the loose end of the cord being wound into the clay (FIGURE 10.1b).

⁴¹ Müller 1998 (n. 33) 10-13, fig. 13 (reproduced here as FIGURE 10.1). Müller uses the terms *Stopperkern* + *Kalotte* (lit. 'skull-cap') for the mushroom-shaped plug and *Tüllenummantelung* ('spout covering') for what is here called the cap, i.e. clay covering for spout and plug, which bears the seal impressions. On some stoppers, e.g. from Mallia (here 447) seal impressions are made directly onto the *Kalotte* (i.e. cap-like part of plug).

Finally, the entire neck of the vase and the top of the plug were covered with a layer of clay; it was this outer layer or cap that carried the seal impressions (FIGURE 10.1c-d). Multiple impressions are the norm, using a single seal.⁴² On some stoppers, however, the seal impressions are illegible and, in other cases, it seems that the cap was never stamped at all. Although isolated examples are known from Khania, Knossos, Kommos and Mallia, our best series comes from the House of the Oil Merchant at Mycenae, mostly associated with large transport stirrup jars (FIGURE 10.1e; **564-565**, **568b**).⁴³ Stoppers are also known from Sparta and Tiryns. Although many complete transport jars were also found in the 'Old Kadmeion' at Thebes, none contained a stopper.⁴⁴

Noduli

Small lumps of clay that lack any means of attachment, but bear seal impressions, are known as *noduli*.⁴⁵ The basic type is extremely long-lived and widespread: a MM IA context at Mallia provides our earliest example in the Aegean (Chapter 4). *Noduli* are found throughout the proto-palatial and neo-palatial periods, and also occur in the late palace at Knossos (Chapters 5, 7-8). So far few have come to light on the mainland – one at Mycenae and seven at Pylos – making it difficult to see how they functioned in Mycenaean administration.

SEALING 'DEPOSITS'

Sealings have now been recovered from almost every major Mycenaean centre on the mainland. Our most significant finds come from Mycenae, Pylos and Thebes. Recent excavations at Midea in the Argolid have yielded a handful of sealings, but only two stoppers have been found at Tiryns. Two stoppers were also found on the Menelaion hill near Sparta in the early 20th century, and a possible sealing fragment came to light during recent campaigns. Important centres that have failed to yield sealings include the Athenian acropolis, where later temple construction inevitably disturbed Mycenaean levels, and Gla in Boeotia, where exposure to the elements has proved a major problem. Other sites which may have had administrative functions are Orchomenos in Boeotia, Volos (ancient Iolkos) in Thessaly, and perhaps Phylakopi on Melos. Although each possessed a megaron, no sealings or tablets have been found. The overwhelming impression is that Mycenaean administration was a highly centralized affair, similar to central Crete under the late palace at Knossos, but very different from neo-palatial Crete, where sealings and tablets were sometimes used at so-called second-order centres. Naturally future excavations at non-palatial sites on the mainland might change our views. It is worth stressing, though, that Mycenaean sealing practices show striking uniformity – from the late palace at Knossos to each and every one of our mainland centres. There is nothing comparable to the diversity of sealing practices, sometimes varying from one palace to the next, that we know from Minoan Crete (Chapters 5, 7).

⁴² A stopper from LM III Mallia is dual-stamped, see here **447**, Chapter 8.

⁴³ Two stoppers with seal impressions have now been discovered in a LH IIIB deposit at Petsas House, Mycenae: *Ergon* (2001) 43; Shelton (n. 32) 181-82.

⁴⁴ Five stirrup jars in Room I contained no trace of soil or debris and so may have been stoppered in some way at the time of the destruction: A. Dakouri-Hild, *BSA* 96 (2001) 86 n. 21, citing A. D. Keramopoulos, *AE* (1909) 57-122, esp. 75. A stopper fragment (D. 9.5 cm), belonging to a small-mouthed (D. ca 8-9 cm) vessel, comes from the 'Archive': *CMS* V no. 669; T. G. Spyropoulos & J. Chadwick, *The Thebes Tablets II. Minos* Suppl. 4 (Salamanca 1975) 40, 52, pl. 23.101-101a.

⁴⁵ *Tonplomben* 59-60, fig. 3. For definition see here Chapter 5 esp. n. 62.

Inevitably archaeological chance plays a crucial role in our ability to assess how sealings were employed at different centres and to what extent they were integrated with tablet administration. This is certainly true for Mycenaean Greece. For the most part, the term sealing ‘deposit’ is a misnomer; even our most productive site – Pylos – has only yielded 165 sealings, scattered throughout the palatial buildings on the Englianos Ridge. Mycenae trails well behind with barely 40 sealings; Thebes is better endowed, with nearly 70 examples, but few are fully published. We will begin our survey with these three sites and conclude with a summary of material from Midea, Sparta and Tiryns.

Mycenae

Although Mycenae has conferred its name on an entire civilization, when it comes to administration the site leaves much to the imagination.⁴⁶ No trace of an archive has survived, notwithstanding fire destructions on the acropolis at the end of LH IIIB2. If tablets and sealings existed – and surely there must have been some – then perhaps they were lost in later levelling and erosion or missed in early excavations. When eight tablets came to light in the Citadel House Area on the south-west slope in 1960, they were so embedded in hard calcined material and fused mud-brick that they were only recognized and extracted with difficulty.⁴⁷ Even today, few sealings are known from the acropolis itself: a stray *nodulus* found by A. J. B. Wace in the so-called Rhyton Well, a stopper from his excavations in the House of Columns, and a handful of nodules from the Citadel House Area (FIGURE 10.2).⁴⁸ Outside the acropolis, we have a fine array of stoppers from Wace’s excavations in the House of the Oil Merchant, an important group of inscribed gable-shaped nodules from the House of the Sphinxes, and a single sealing from the House of the Shields. Since this group of buildings was destroyed in LH IIIB1, these sealings constitute our earliest examples from the mainland. Three gable-shaped nodules were found in House II on the Panagia Ridge, datable to LH IIIB1-2. The grand total, including a stray from the vicinity of the Cyclopean Terrace Building, stands at 38 sealings and 28 seal-types – of which only 15 are legible.⁴⁹ Though numerically unimpressive, the Mycenae sealings do have a remarkably wide distribution. Indeed sealings (and tablets) are sometimes found at a considerable distance from the acropolis. Moreover, the recent re-publication of the Mycenae sealings by the *CMS* team, hard on the heels of their major study of the Pylos sealings, means that we are now better placed to assess this small collection.⁵⁰

Of special interest are the seven gable-shaped nodules, impressed by the same seal, which were discovered in the entrance to Room 1 in the House of the Sphinxes. Each bears a short inscription naming one or two kinds of vases (563). As it happens, Room 1 itself contained a large number of vases, mostly unpainted, arranged in an orderly fashion according to shape and size, while barely 10 m away in Room 6 was a tablet (Ue 611)

⁴⁶ A salutary warning to those who would reconstruct political geography on the strength of clay tablets and sealings, preserved by chance: cf. Chapter 7 and below.

⁴⁷ W. D. Taylour, in J. Chadwick (ed.), *The Mycenae Tablets III*. Transactions of the American Philological Society NS 52 pt 7 (Philadelphia 1962) 40-41, figs. 81-82.

⁴⁸ For find-spots and dating of examples mentioned here, see: Müller et al. (n. 33) 17-43.

⁴⁹ Excluding the new stoppers from Petsas House: see above n. 43.

⁵⁰ As in *Tonplomben*, the Mycenae sealings have been re-published as complete artefacts, in each case illustrating the whole nodule / stopper, seal impression, and inscription (if any). The new descriptions are supplemented by commentaries on motifs and dating (Pini), sealing types (Müller) and inscriptions (Olivier): see n. 33.

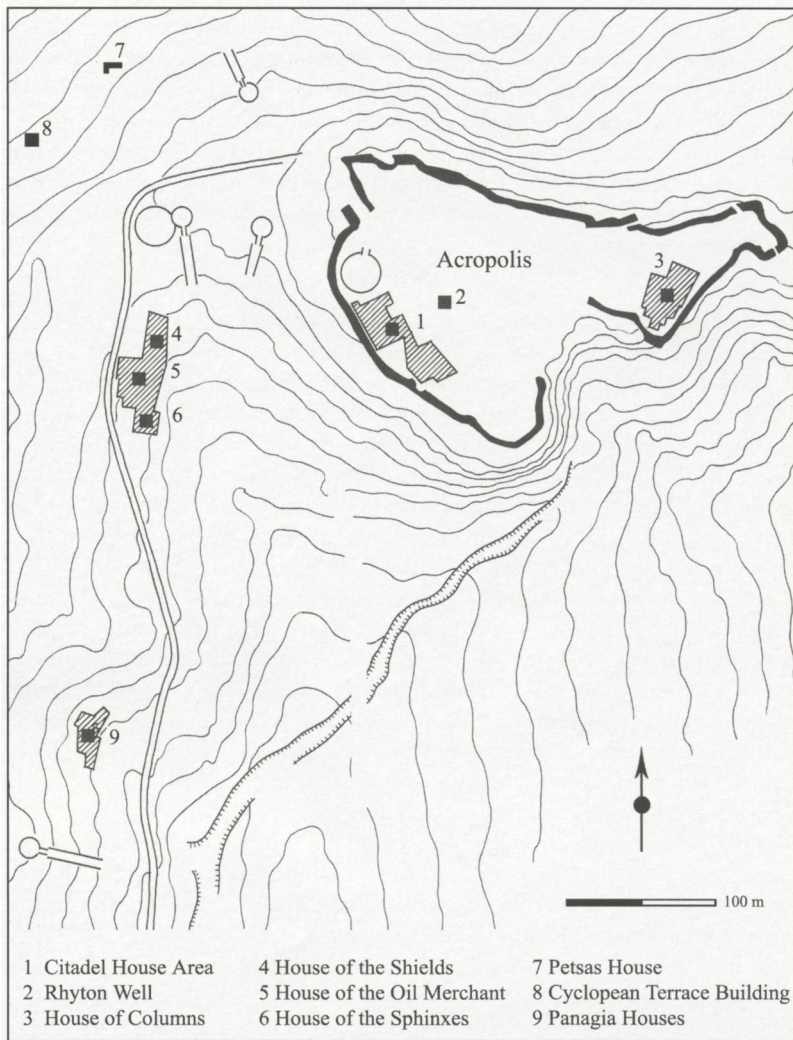


FIGURE 10.2 Map of Mycenae, showing find-spots of sealings.

listing twelve types of vases, totalling 30 in all.⁵¹ More intriguing still is the fact that some of the vases named on the tablet also appear on the nodules. It is certainly tempting to think that information from the nodules had been transferred to the tablet. But this neat and attractive solution presents very real problems. No quantities are given on the nodules, though on the tablet some vase types are listed in the plural. There is also a discrepancy in vase types: exact matches occur in only three cases, four appear in a different form and, most glaring of all, five varieties mentioned on the tablet are not represented by nodules. Either some nodules are missing or, as seems more likely, tablet

⁵¹ For the excavation: E. B. Wace, in E. L. Bennett, Jr. (ed.), *The Mycenae Tablets II*. Transactions of the American Philosophical Society NS 48, pt. 1 (Philadelphia 1958) 9-13. My account of the sealings and tablet draws heavily on that of J.-P. Olivier, in Müller et al. (n. 33) 14-16. For the tablet (Ue 611) see also *Docs*² 331-32 no. 234.



563a-d Inscribed gable-shaped nodule from the House of the Sphinxes, Mycenae. Drawing of seal-type (scale ca 3:2), face a and drawings of faces b-c (scale ca 1:1).

Ue 611 was not compiled from our group of seven. Nevertheless, we *can* see that inscribed nodules provided a convenient means of keeping track of commodities and, presumably, this kind of information was sometimes transferred to tablets. Whether any of our inscribed nodules from the House of the Sphinxes had been attached to vases remains an open question. Nor can we be certain when (or where) they were written: at the point of production, shipment, or delivery? The inscribed nodules from Pylos and Thebes raise similar questions (see below).

Our other nodules from Mycenae are less informative. The sealing from the House of the Shields was apparently pressed against a metal object with relief decoration.⁵² One of the gable-shaped nodules from Panagia House II may bear a place name; two more are uninscribed, but impressed by the same seal. A surface find from the Citadel House Area bears a known, but undeciphered, ideogram *supra sigillum*, i.e. over the impression. The same ideogram *190 (perhaps a foodstuff) also occurs on the tablets found nearby, which record offerings to *Potnia* (Oi 701-704).⁵³ Another room yielded a pair of combination sealings, impressed by the same seal, which had been attached to a smooth flat surface; though datable to LH IIIB2, their context is uninformative. Nor can we say much about the two irregular nodules found in Room 19 of the so-called Temple Complex (e.g. 20). The room also contained many large anthropomorphic figures and snakes made of clay, numerous beads of glass and semi-precious stones, some ivories and a few seals (e.g. 452, 539). All the material had apparently belonged to the shrine and was deposited in Room 19 (and an adjacent alcove) following a catastrophe in the middle of LH IIIB.⁵⁴

If we feel a trifle frustrated by the Mycenae nodules, the dramatic evidence from the House of the Oil Merchant is sure to raise our spirits.⁵⁵ In the main corridor just outside Room 1, Wace's team found 30 large stirrup jars, some still plugged and greasy to the touch. Room 1 itself contained seven large pithoi set into the floor, while in the centre of the room was an installation designed to catch oil that was spilt. A tablet (Fo 101) found on the floor records quantities of olive oil.⁵⁶ As in the neighbouring House of the Sphinxes, there seemed to be a remarkable connexion between archaeological and textual evidence. And yet, when we begin to examine that evidence in greater detail, some distinctly troubling points emerge. First we may consider the vases themselves. Three of the vases count as semi-fine ware stirrup jars (FS 167) decorated with plain bands, which

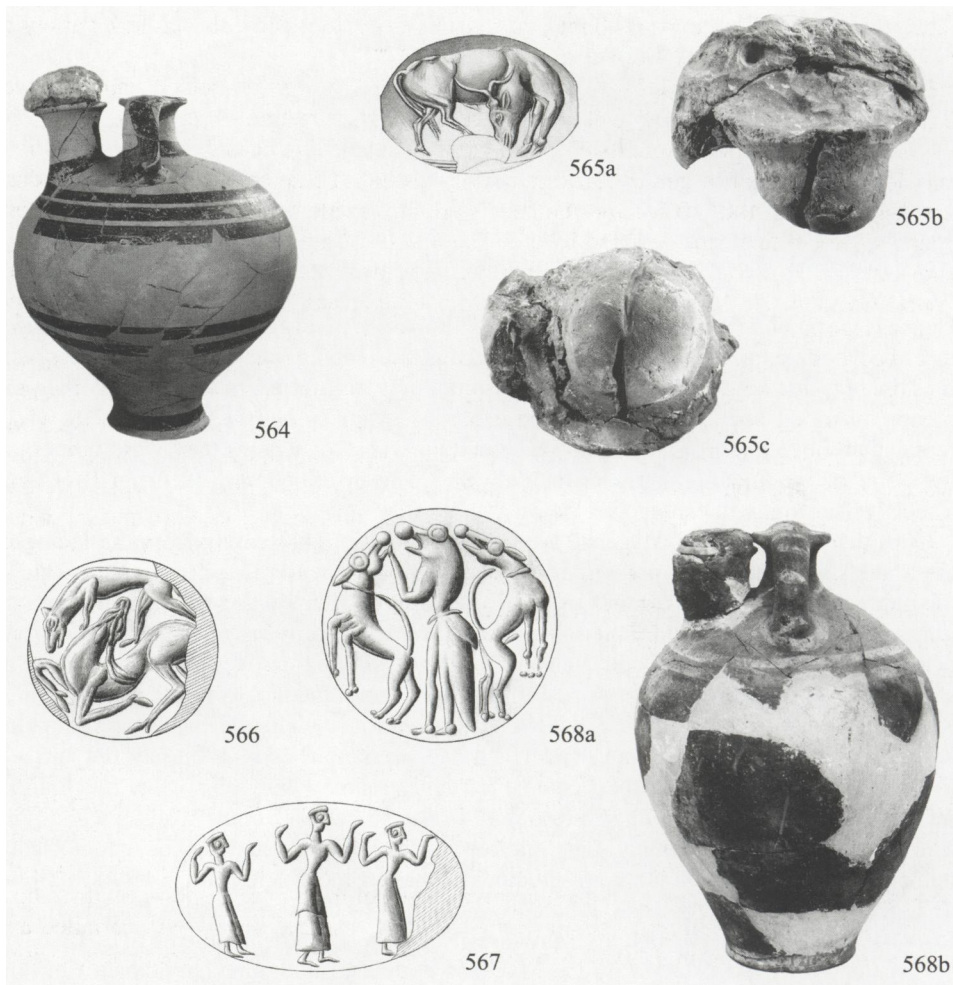
⁵² Müller et al. (n. 33) 23 no. 10, fig. 12; however, as Müller notes, since the imprint was caused accidentally, the nodule is better seen as a *Schnurplombe* not an *Objektschnurplombe* (ibid. p. 9).

⁵³ J.-P. Olivier, in Müller et al. (n. 33) 14 (cat. no. 6).

⁵⁴ Moore & Taylour (n. 10) 17, 110-11; Müller et al. (n. 33) 21 nos. 4-5, fig. 2.

⁵⁵ For the excavation, see: A. J. B. Wace, in Bennett (n. 51) 6-9.

⁵⁶ Wace (n. 55) 7. *Docs*² 218 no. 93



Selected stopper sealings from the House of the Oil Merchant, Mycenae. **564** Stirrup jar (FS 167) with stopper *in situ*. **565a-c** Stopper preserving plug and part of spout covering. Drawing of seal-type, profile and underside of stopper. **566-567** Drawings of seal-types attested on stoppers. **568a-b** Light-on-dark stirrup jar with stopper *in situ*. Drawing of seal-type and vase. Drawings of seal-types shown at 3:2. Stopper and vases not to scale.

could well be of local manufacture, although clay analysis proves inconclusive (e.g. **564**).⁵⁷ The remaining 27 are large coarse-ware jars (FS 164), normally used for long-distance transport. Some bear light-on-dark decoration, ordinarily associated with western Crete; others are decorated with dark-on-light plain or wavy bands and have parallels on both Crete and the mainland. Analyses of the transport jars have yielded

⁵⁷ J. E. Tomlinson, in I. Tournavitou, *The 'Ivory Houses' at Mycenae*. *BSA Suppl.* 24 (London 1995) 305-08; also H. W. Haskell, *BSA* 76 (1981) 232-37. Two have stoppers: ANM 7626 (50-229) and Mycenae 29216 (50-227; here **564**); see Müller et al. (n. 33) 12-13, nos. 11A and 16.

mixed results. Since no clear distinction can be made between central Cretan and Argive clays, the origin of the dark-on-light jars remains uncertain; the light-on-dark variety is confirmed as west Cretan (**568b**; also FIGURE 10.1e).⁵⁸

But where were the jars filled, plugged and sealed? Eighteen sealed caps survive, although only ten preserve legible impressions and sometimes the same seal was responsible for stamping more than one cap. For instance, five caps were stamped with a seal depicting a Minoan genius flanked by dogs (**568a**). These belonged to light-on-dark jars (**568b** and FIGURE 10.1e) and the caps were also made of west Cretan clay.⁵⁹ More troublesome are two caps stamped by the same damaged amygdaloid; one belonged to a semi-fine jar (FS 167), the other to a dark-on-light jar with wavy bands, either made in central Crete or the Argolid. Although the first stopper has not been tested, the second proved to originate in western Crete (**565**).⁶⁰ Since both were obviously stamped in the same place, the situation is remarkably complicated, with jars that originated on the mainland (or central Crete) travelling to western Crete, where they were (re)-filled, sealed and sent (back) to the mainland. Several other stoppers or plugs have also been tested and are also consistent with a west Cretan origin.⁶¹ If these analyses are to be trusted, then Wace's interpretation – namely, that the jars had just been filled and were awaiting despatch – has been completely turned on its head.⁶² Instead we are apparently dealing with a consignment of west Cretan oil which had just arrived at Mycenae. As for the seal-types, the bull on the damaged amygdaloid is hard to place, as is the ring bezel with its processional scene (**565a**, **567**). But **566** could be a LM II-III soft stone seal (this stopper was not analysed) and another lentoid, with a Minoan genius flanked by dogs, recalls the prominent eyes and muzzles found on many LM II-III hard stone seals (**568a**).⁶³

Pylos

The 'Palace of Nestor' at Pylos still provides our best evidence for the workings of a Mycenaean palace. Systematic excavations on the Englianos Ridge, located about 10 km from the Bay of Navarino in south-western Messenia, began in April 1939, under the direction of Carl Blegen from the University of Cincinnati. Within days, his team hit upon what later proved to be the main archive rooms of the palace, which contained both Linear B tablets and sealings. Owing to the threat of war, the season was curtailed and excavations suspended until 1952. Meanwhile work on Linear B gathered pace, leading

⁵⁸ Haskell (n. 57) 232-37 (HOM groups 1-3: W. Cretan, incl. Nauplia 5337, **568b**; HOM groups 4-5: C. Crete or Argolid). For further analyses see reports by R. E. Jones, J. E. Tomlinson and P. M. Day in Tournvitu (n. 57) 301-20. See also now Müller et al. (n. 33) 12-13.

⁵⁹ Müller et al. (n. 33) 12-13, 25-29 nos. 12B-E (with references), figs. 4, 18. Analyses included OES, AAS and petrography, but not NAA (which is unsuitable for clay that is not deliberately fired: see also Tomlinson [n. 57] 308). Cap 12A (with jar ANM 7627 = 50-207) was not tested, but was obviously made and stamped in the same place.

⁶⁰ Müller et al. (n. 33) 12-13, 23-25 nos. 11A-B, figs. 3, 14. Stopper 11A (with jar ANM 7626 = 50-229) was not tested. See above n. 57 for Nauplia 5363 (= 50-227) another semi-fine ware jar with cap (not tested and motif illegible: here **564**).

⁶¹ Müller et al. (n. 33) 12-13, 30-33 nos. 15, 17, 21.

⁶² A possibility already suggested by Haskell (n. 57) 236. See also H. Haskell, in C. Gillis et al. (eds.), *Trade and Production in Premonetary Greece: Production and the Craftsman*. SIMA Pocket-book 143 (Jonsered 1997) 101-11.

⁶³ See Chapter 8 (**421** shows a LM II-III attack scene in soft stone). Pini, in Müller et al. (n. 33) 8, regards all the seals as mainland products, though admits that complete certainty is impossible. In any case, we need not assume (as Pini seemingly does) that the jars were checked and sealed by Mycenaean officials (from the mainland?) based in Khania.

to a transcription of the Pylos tablets by Emmett L. Bennett Jr in 1951 and the dramatic announcement by Michael Ventris in June 1952 that the Knossos tablets were written in an early form of Greek.⁶⁴ Once excavations at Pylos resumed and new tablets began to emerge, these pioneering achievements could be tested and consolidated. During subsequent campaigns (1952–1964) Blegen's team uncovered a series of palatial buildings on the Englianos Ridge and also investigated nearby tombs; the results were published with commendable speed.⁶⁵ The palace complex proved to consist of four separate buildings, which were constructed during LH IIIB and destroyed at the end of LH IIIB2 or perhaps a trifle later.⁶⁶ New soundings by the University of Minnesota have augmented our knowledge of earlier structures on the hilltop and re-study of finds from Blegen's excavations is proceeding apace.⁶⁷ A major publication by the *CMS* team (1997) now allows us to study every sealing as a complete artefact, along with its seal-type and inscription, if any. This ground-breaking approach, and new data on how nodules were made, puts our knowledge of the Pylos sealings on a much firmer footing.⁶⁸

Pylos has yielded nearly 1200 Linear B tablets, our largest collection from any mainland palace, but only 165 sealings. Many are fragmentary and of the 114 seal-types only about 85 are legible (see below). Concentrations occur in the following areas: 18 sealings from the Archive Rooms (7-8) in the Main Building, 48 from the Wine Magazine (104-105) and 59 from the North Eastern Building; a further 20 were found outside the South-western Building (FIGURE 10.3). These figures sound promising enough – until, that is, we break them down by sealing type.⁶⁹ *Altogether* we have only 36 gable-shaped nodules, of which 22 are inscribed, a single combination sealing, a few direct sealings, and seven *noduli*. Irregular nodules constitute the overwhelming majority, but these were often deliberately broken and had surely been discarded. For the most part, the gable-shaped nodules also seem to be discards (see below). All in all, our ability to understand how sealings were used and when they were integrated with tablet administration is limited.

Unlike Mycenae (House of the Sphinxes) or Thebes, the inscribed sealings at Pylos do not seem to occur in definable sets, saved until such time as their information could be collated and transferred to tablets.⁷⁰ Rather, they seem to be little more than stray survivors from earlier stages in the administrative process. A good example of this

⁶⁴ *Docs*² pp. xxx, 14-23.

⁶⁵ *PN I* (1966); *PN II* (1969); *PN III* (1973).

⁶⁶ P. A. Mountjoy, *BSA* 92 (1997) 109-35 dates the destruction to the Transitional LH IIIB2 / C Early phase. Thus Pini's date of LH IIIC1, 'towards the end of the 12th century' is rather too late (*Tonplomben* 82-83). Five tablet fragments found outside the SW building evidently antedate the final destruction, see above n. 32. The same may also apply to two gable-shaped nodules, *Tonplomben* nos. 4 and 34; see also *PN I* 285.

⁶⁷ C. W. Shelmerdine, in *Review* 337-39, 378; recent reports in *AR* 45 (1998-99) 47-54, *AR* 46 (1999-2000) 52-54; *AR* 48 (2001-02) 48. See also contributions in J. L. Davis (ed.), *Sandy Pylos: An Archaeological History from Nestor to Navarino* (Austin 1998).

⁶⁸ *Tonplomben* supersedes earlier coverage in *CMS I* and *I Suppl.* The new descriptions and drawings are accompanied by commentaries on sealing types (Müller), inscriptions (Olivier), motifs, dating and archaeological summary (Pini). Cf. similar coverage of the Mycenae sealings: Müller et al. (n. 33). Earlier accounts of the Pylos sealings and Mycenaean administration include: V. Aravantinos, in C. W. Shelmerdine & T. G. Palaima (eds.), *Pylos Comes Alive* (New York 1984) 41-48; Palaima (n. 5) 261-62; and Palmer (n. 37) 143-69 for sealings from the Wine Magazine. For the inscribed nodules see now: G. S. Flouda, *SMEA* 42 (2000) 213-45.

⁶⁹ For convenient lists: *Tonplomben* 97-110 (tables 3-5).

⁷⁰ Olivier, in *Tonplomben* 70. See above for Mycenae and below for Thebes.

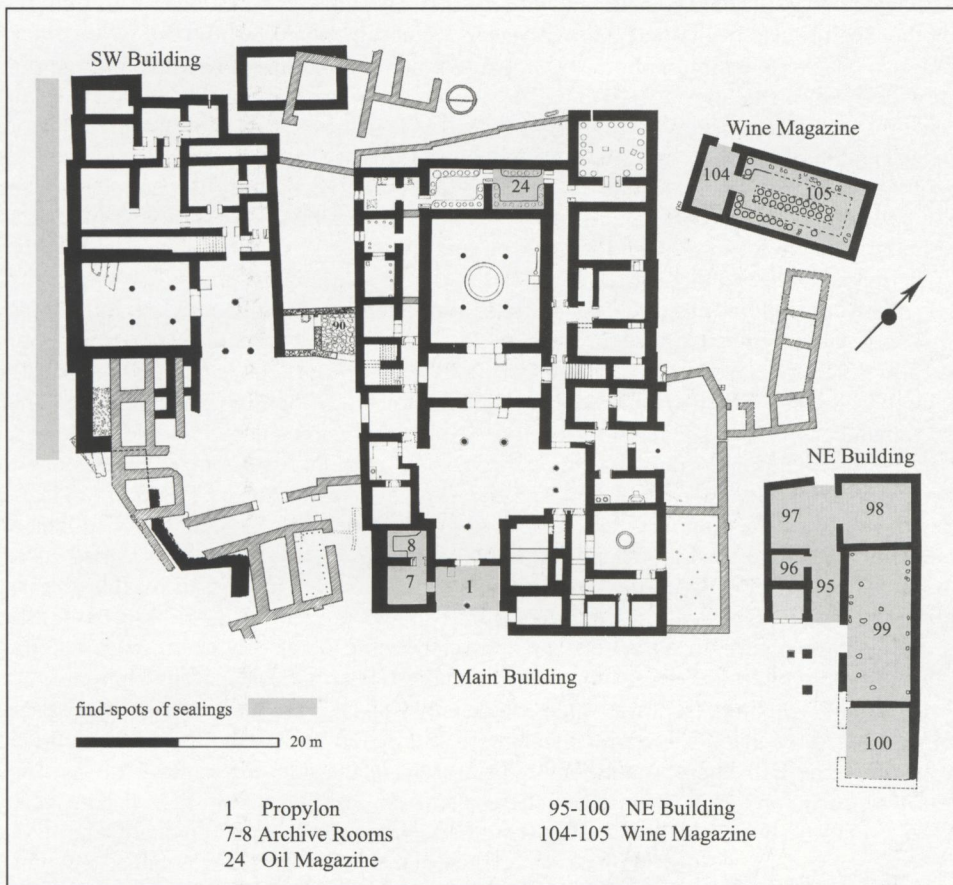


FIGURE 10.3 The 'Palace of Nestor' at Pylos-Englianos, showing principal find-spots of sealings.

unfortunate state of affairs is the single inscribed nodule from Room 8, which bears the ideogram *152 (an animal hide) *supra sigillum* and the expression *a-pu-do-si* (contribution owing) on side β (556; 569).⁷¹ The same terms recur on tablets of the Ma series (records of proportional tax), which were also found in the Archive Rooms and which were written by the same administrator (Hand 2). Assuming the connexion is genuine, then we must be missing 23 nodules, since the Ma series documents 24 cases of *a-pu-do-si*. However, if inscribed nodules served as primary records of transactions, then there would be little sense in retaining them once the corresponding tablets had been compiled. In short, the survival of this single nodule is a complete mystery.

Altogether 18 sealings of various kinds were found in Rooms 7-8, though it is difficult to make much sense of them. Indeed the new study by the CMS team means that sometimes we have to modify or even abandon received views on how specific sealings had been used. A pair of direct object sealings, impressed by the same signet ring, is a case in point (562; cf. 498). These were thought to have sealed tablets or chests containing them; but, in truth, all we can say is that their backs preserve the imprints of a

⁷¹ Olivier, in *Tonplomben* 71-72; also T. G. Palaima, in *CMS Beiheft* 6 (2000) 228.

flat object, which had been bound with leather strips (562c).⁷² Blegen believed that another sealing had been attached to a basket containing tablets and served to label it. In fact, this is a combination sealing, with a string-hole running through it, showing imprints of wicker on the underside (561).⁷³ The idea that it labelled, or identified, a basket containing tablets is speculative at best. Indeed if it had been common practice to store and seal tablets in baskets and chests, then why are so few sealings remotely suited to this purpose? The remaining sealings in Rooms 7 and 8 are mostly irregular nodules – some almost complete, others tiny fragments – making it impossible to guess how they came to be in the Archive Rooms, much less their original purpose.

The largest concentration of sealings – from the NE Building – proves, on scrutiny, to be equally disappointing, although initially our attention is drawn to the 17 nodules impressed by two metal signet rings (574-575).⁷⁴ Five inscribed nodules found in Room 99, all written by Hand S 1331-Ci, record an obligation (*o-pa*) connected with animals or animal products.⁷⁵ One nodule had been impressed by the octopus and dolphin ring (575), the remainder by 574. The latter also impressed another gable-shaped nodule (lacking an inscription) found in Corridor 95. In addition, there is a link to Room 98, where one of the two inscribed nodules also bears the term *o-pa* and was written by Hand S 1331-Ci; the second bears the enigmatic term *de-mi-ni-jo* (bed / bedding / couch?).⁷⁶ This nodule had been impressed by the octopus and dolphin ring (575), as was an unscribed gable-shaped nodule from Room 100. And a further eight nodules impressed by this ring are attributed to Rooms 98-100, but no precise find-spots were recorded.⁷⁷ In any case, there is really nothing to help us understand the relationship between the irregular nodules, gable-shaped nodules that were unscribed and those bearing Linear B inscriptions.

Even the 48 sealings from the Wine Magazine (104-105) are less informative than we might like.⁷⁸ Five gable-shaped nodules, impressed by the same seal (581), were found in front of pithos I,1. Appropriately enough, three have the wine ideogram VIN inscribed *supra sigillum* (582-584) and two of these also bear inscriptions on face β. One reads *me-ri-ti-jo*, usually translated as honey-flavoured, but conceivably a personal name (582); the other, *e-ti-wa-i*, is also perhaps a personal name (583). If these nodules record an obligation or delivery by named individuals, how do we interpret the two nodules that were unscribed? A fourth inscribed nodule also bears the ideogram VIN *supra sigillum*, but had been impressed by a different seal.⁷⁹ Most of the nodules in the Wine Magazine

⁷² *Tonplomben* 12-13, 59, 67, 94, fig. 2, pls. 7, 39 (nos. 21A-B).

⁷³ *Tonplomben* 13, 58, 69, 94, fig. 2, pls. 8, 45 (no. 22). See Chapter 8 (p. 220 and n. 93) for combination sealings at Knossos (e.g. 433-434) and similar assumptions regarding their association with containers of tablets.

⁷⁴ *Tonplomben* 22-26, 72-76, 95-96, pls. 17-20 (nos. 39-40). For a thorough re-evaluation of the NE building, see now: L. M. Bendall, *AJA* 107 (2003) 181-231. Flouda (n. 68) 219-32 discusses the inscribed nodules.

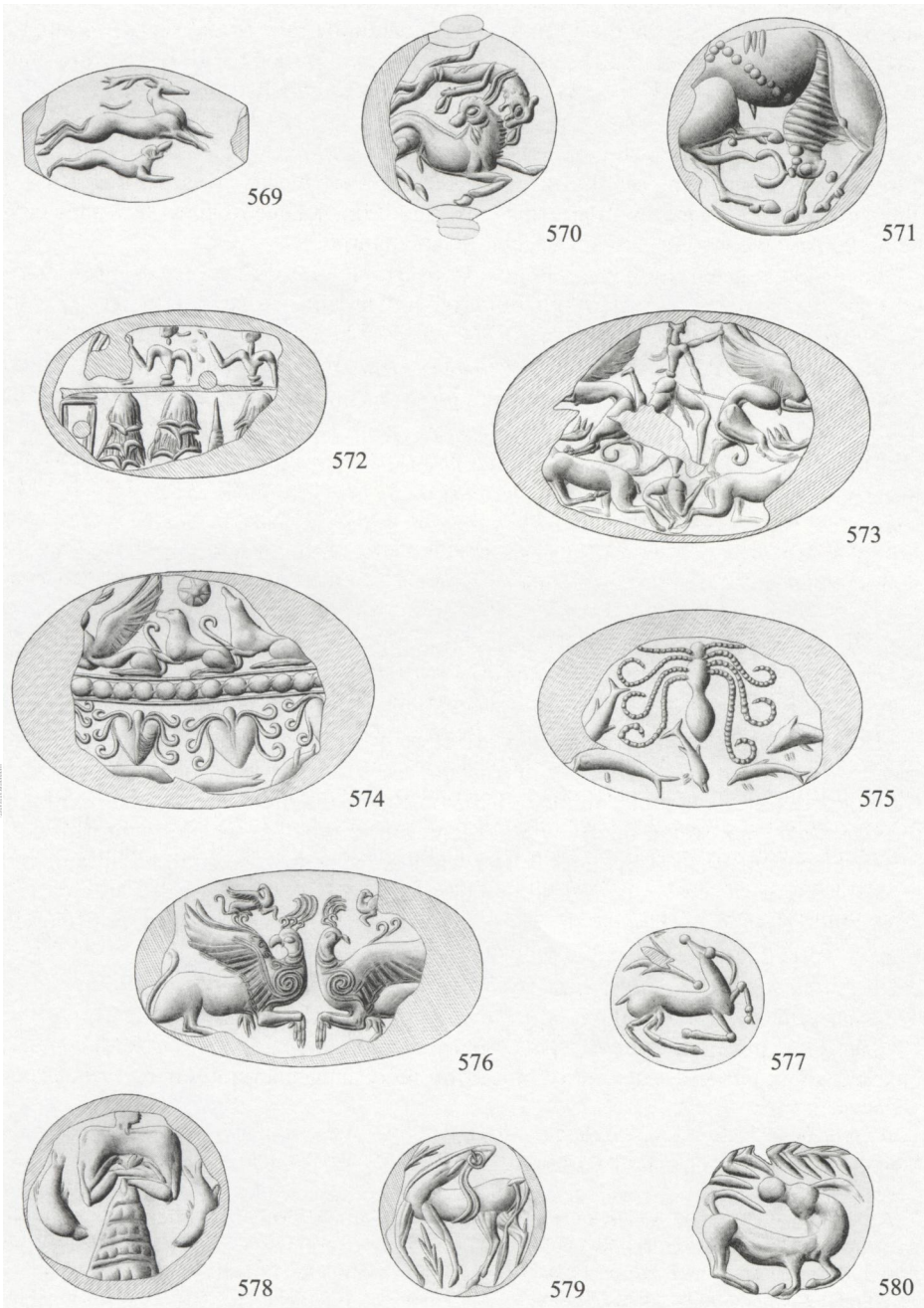
⁷⁵ As Olivier argues, the nodules do not necessarily relate to hides (*Tonplomben* 75 and n. 40). Two more inscribed nodules from Room 99 are illegible: Wr 1458, 1459 (nos. 39G, E). Olivier (*ibid.* 71) expresses reservations regarding the identification of scribal hands on sealings (given constraints imposed by size and shape of nodules and length of inscriptions). For the opposite view: Palaima (n. 71) 226-37 with examples.

⁷⁶ Olivier, in *Tonplomben* 73-75: Wr 1325 (no. 42) and Wr 1326 (no. 40A).

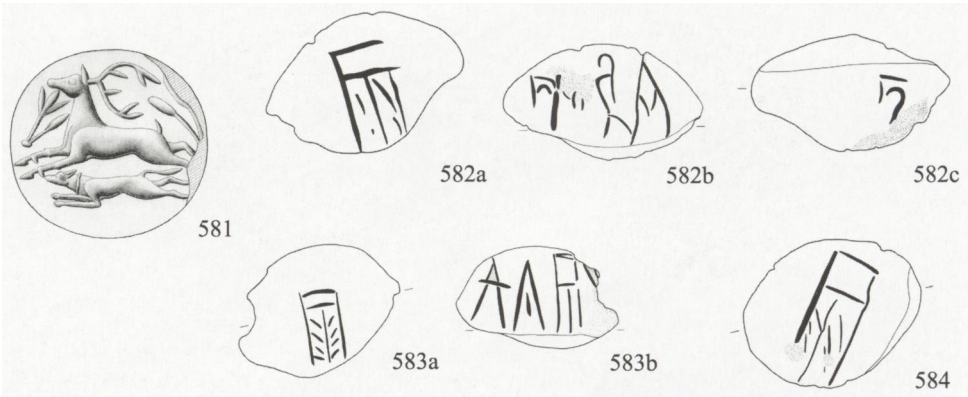
⁷⁷ *Tonplomben* 25-26, pl. 20 (nos. 40D-K; no. 40C is from Room 100).

⁷⁸ *Tonplomben* 103-04 (table 4) provides a list. For the inscribed examples: Olivier, *ibid.* 76-77; and most recently Flouda (n. 68) 232-33. See also the earlier account by Palmer (n. 37) 143-65.

⁷⁹ *Tonplomben* 1-2, pl. 1 (no. 1A: Wr 1361) found behind pithos I, 6. From the same spot came an unscribed gable-shaped nodule impressed by the same ring (*ibid.*, no. 1B).



569-580 Drawings of selected seal-types from Pylos. Scale ca 3:2.



581 Drawing of seal-type found on five gable-shaped nodules from the Wine Magazine, Room 105, at Pylos. Two of the nodules were uninscribed (not shown). Three carried inscriptions, apparently made by three different hands. **582a-c** Drawings of Wr 1360: VIN *supra sigillum* (a), *me-ri-ti-* (b) and *-jo* (c). **583a-b** Drawings of Wr 1359: VIN *supra sigillum* (a) and *e-ti-wa-i* (b). **584** Drawing of Wr 1358: VIN *supra sigillum* (the other faces were uninscribed). Drawing of seal-type at ca 3:2; drawings of nodules at ca 1:1.

belong to the irregular variety and about 30 had been deliberately broken, i.e. along the string-holes or back-to-front (e.g. **560**; also **19**). The CMS silicones suggest that they had sealed twisted cords made of hide or gut.⁸⁰ But what did these bind – covers on the pithoi themselves or wineskins brought into the storeroom to replenish stocks? Were broken nodules ever retained as a means of keeping track of deliveries or disbursements? Or were they discards pure and simple? The gable-shaped nodules – inscribed or not – need to be remembered; so too the five *noduli* found in Room 105, which might well indicate disbursements made to individuals.⁸¹ The sealings we possess seem to be little more than chance survivors: they do not constitute an archive or even a ‘discarded archive’.⁸² And so, for all the clues available in the Wine Magazine, our understanding of how the sealing system worked is still shaky.

One interesting point to emerge from the Wine Magazine concerns the use of seals. Three inscribed nodules impressed by the same seal (**581-584**) were clearly written by two or three different hands.⁸³ This might corroborate the view (hazarded in earlier chapters) that a single seal could be used by more than one individual.⁸⁴ And from the

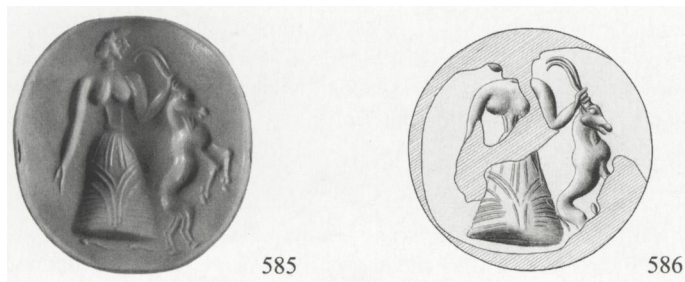
⁸⁰ Müller & Pini, in *Tonplomben* 67-69.

⁸¹ For possible functions of *noduli* in neo-palatial Crete see Chapter 7.

⁸² For hypothetical cases of ‘living archives’ and ‘discarded archives’ in the Near East and the Aegean, see J. Driessen, in *Minos* 29-30 (1994-95) 239-56; idem in S. Deger-Jalkotzy et al. (eds.), *Florent Studia Mycenaea* (Vienna 1999) 206-09 (for information processing).

⁸³ Hands 13 and S628-Ciii: Olivier in *Tonplomben* 76; Palaima (n. 71) 228-30. For the identification of scribal hands on sealings see above n. 75.

⁸⁴ Palaima (n. 5) 262 suggests that the seal belonged to the scribes’ superior or to the bureau where they worked; whether the personal names on the sealings belong to the scribes is another matter; cf. Pini, in *Tonplomben* 94. Palmer (n. 37, 161) believes that the names relate to the producers of the wine and suggests all five inscribed nodules in the Wine Magazine were made ‘at the same time upon delivery of the wine’. If so, how does one explain uninscribed nodules stamped with the same seal, e.g. *Tonplomben* nos. 1B and 31A in the Wine Magazine or those in the NE Workshop.



Not a single surviving seal can be matched to an ancient impression. The closest pair is a LB I-II agate seal, now in Berlin, but said to come from Elis (585) and a seal-type from Pylos (586). Impression and drawing. Scale ca 2:1.

NE Building we may have proof that a given individual could make use of several seals, since Hand S 1331-C1 inscribed sealings that had been impressed by two different signet rings (574-575). One could, of course, argue that he who stamped the seal did not wield the stylus too.⁸⁵ But evidence from graves certainly suggests that some individuals possessed more than one seal. Whether any were ‘scribes’ or, better, literate administrators, is impossible to say. And hopes of establishing the precise status of seal-users at Pylos are doubly thwarted. First of all we must consider the pattern of seal use. Curiously enough, seal-types represented in one part of the palace never recur in another. This could, of course, simply indicate that the responsibilities of individual administrators were highly circumscribed. Noteworthy is the fact that most seal-types occur only once; our 165 sealings were impressed by 114 different seals. The figures for the Wine Magazine are even more striking: 48 sealings and 40 seals! A non-intensive pattern of seal use normally indicates the shipment of commodities from outlying areas to the palace, not internal control of stores. Incoming shipments certainly make sense for the Wine Magazine and the high proportion of broken and discarded irregular nodules throughout the palace also fits this picture. Could it be that the producers themselves were responsible for these sealings, rather than palace-based officials? The idea is certainly attractive, but as usual conclusive proof is hard to muster.⁸⁶

Another obstacle to identifying the status of seal-users at Pylos is also all too familiar, namely our inability to find seals to match the sealings. The closest we come is a fine agate lentoid, now in Berlin but said to be from ‘Elis’, and an incomplete impression from Pylos (585-586). But there are minor differences and we may be dealing with two seals, albeit very similar.⁸⁷ We can date the original seal(s) to LB I – some 300 years

⁸⁵ Compare Hallager’s view (*Roundel* I 94, 171) that scribe and seal-user were not one and the same with Palaima’s (above n. 84). Pini concludes that the scribe made the nodule himself and probably also sealed it: *Tonplomben* 96.

⁸⁶ Palmer (n. 37) 148-50, 163-64 believed that the carelessly made irregular nodules in the Wine Magazine were made by ‘non-professionals’ and thus the seal-types represent producers, whereas the neat, inscribed nodules reflect ‘collectors’ acting as intermediaries for landholders. See nn. 37 and 84. If ‘non-professionals’ were involved, how is it that irregular nodules show so little variation from one mainland centre to the next and that examples from Knossos and Pylos are virtually indistinguishable? The pattern of seal use in LM III Knossos is also non-intensive: Chapter 8.

⁸⁷ See *Tonplomben* 9, 88, no. 15 pl. 5 (where *CMS* XI no. 27 is also illustrated).

earlier than the Pylos sealings. Indeed a number of seal-types at Pylos are datable to LB I-II, while others fall within LB II-III A.⁸⁸ A remarkably high proportion (ca 25%) are signet rings, presumably of gold (e.g. 498, 573-576), in one case apparently bi-metallic (572). But impressions from soft stone seals are very rare indeed (e.g. 578-580) and only a few are related to the Mainland Popular Group.⁸⁹

Thebes

The Kadmeia Hill, heart of modern and ancient Thebes, has been occupied almost continuously since the EBA. Unlike the acropolis at Mycenae where undisturbed deposits are few and far between, the catalogue of rich finds from Mycenaean Thebes grows longer by the year (FIGURE 10.4). There is, inevitably, a price to pay for material safely hidden beneath more than three millennia of habitation – most excavations have to be carried out on a rescue basis, whenever new construction is planned.⁹⁰ This makes for a patchwork of small, often unconnected plots, and even today we cannot reconstruct a convincing plan of the LH IIIB palace and its dependencies. Part of a sizeable palatial building was uncovered in the early 20th century by A. D. Keramopoulos, who also investigated cemeteries on the surrounding hills. Among the finds from the so-called Old Kadmeion was debris from jewellery working (Chapter 9) and numerous transport stirrup jars, though no stoppers were reported. The date of this building is open to question, although LH IIIA2 / B1 is plausible, since its alignment differs markedly from parts of the palace uncovered in rescue excavations, which are datable to LH IIIB1 or IIIB2.⁹¹ Collectively these structures are known as the ‘New Kadmeion’ although, so far, the megaron and residential quarters have not been located. Nevertheless, several workshops producing jewellery, ivories and semi-precious stones have come to light, as well as a ‘Treasure Room’ containing imported beads and cylinders seals (see p. 304). Last, but not least, we have ample evidence for administration: at the latest count over 300 tablets and fragments and nearly 70 sealings.⁹² These include a group of 60 gable-shaped nodules found in the Lianga plot on the eastern flank of the Kadmeia.

According to preliminary reports, the 60 nodules came to light in a long narrow building, which shows no signs of normal domestic use.⁹³ The nodules were apparently spread across an area roughly 5.60 m² and so may have fallen from above into Room Za. The associated pottery has not yet been published, but is said to be LH IIIB1. Four of the nodules were uninscribed; the other 56 bore Linear B inscriptions on two or three faces.

⁸⁸ Pini in *Tomplomben* 83-91. See Chapter 8 n. 126 for the use of heirlooms at LM III Knossos.

⁸⁹ See above and n. 6.

⁹⁰ For convenient summaries, with references: K. Demakopoulou & D. Konsola, *Archaeological Museum of Thebes: Guide* (Athens 1981) 18-27; V. Aravantinos, in S. Deger-Jalkotzy et al. (eds.), *Florent Studia Mycenaea* (Vienna 1999) 45-52.

⁹¹ For the date of the ‘Old Kadmeion’ and its relationship to other (later) structures, see: A. Dakouri-Hild, *BSA* 96 (2001) 81-122, esp. 95-107.

⁹² For a useful summary of tablet finds, with references, see Aravantinos (n. 90) 45-52. The tablets from recent excavations in Odos Pelopidou are now published in V. L. Aravantinos, L. Godart & A. Sacconi, *Thebes: Fouilles de la Cadmée I* (Pisa & Rome 2001). Sealings include: *CMS* V no. 669, a stopper (above n. 44); V Suppl. 1B nos. 353, 354 (here 21, and above n. 40), 356; also now V Suppl. 3 nos. 369-373 (six nodules: three inscribed, three irregular). One irregular nodule was impressed by a typical Mainland Popular seal (V Suppl. 3 no. 373): our first secure example on a sealing (cf. above n. 6). For the nodules from the Lianga plot see below.

⁹³ For excavation of the Lianga plot on Oedipus St: *AD* 38 B1 (1983) 131-34; C. Piteros et al., *BCH* 114 (1990) 103-07. The context appears to be LH IIIB1: Aravantinos (n. 90) 51.

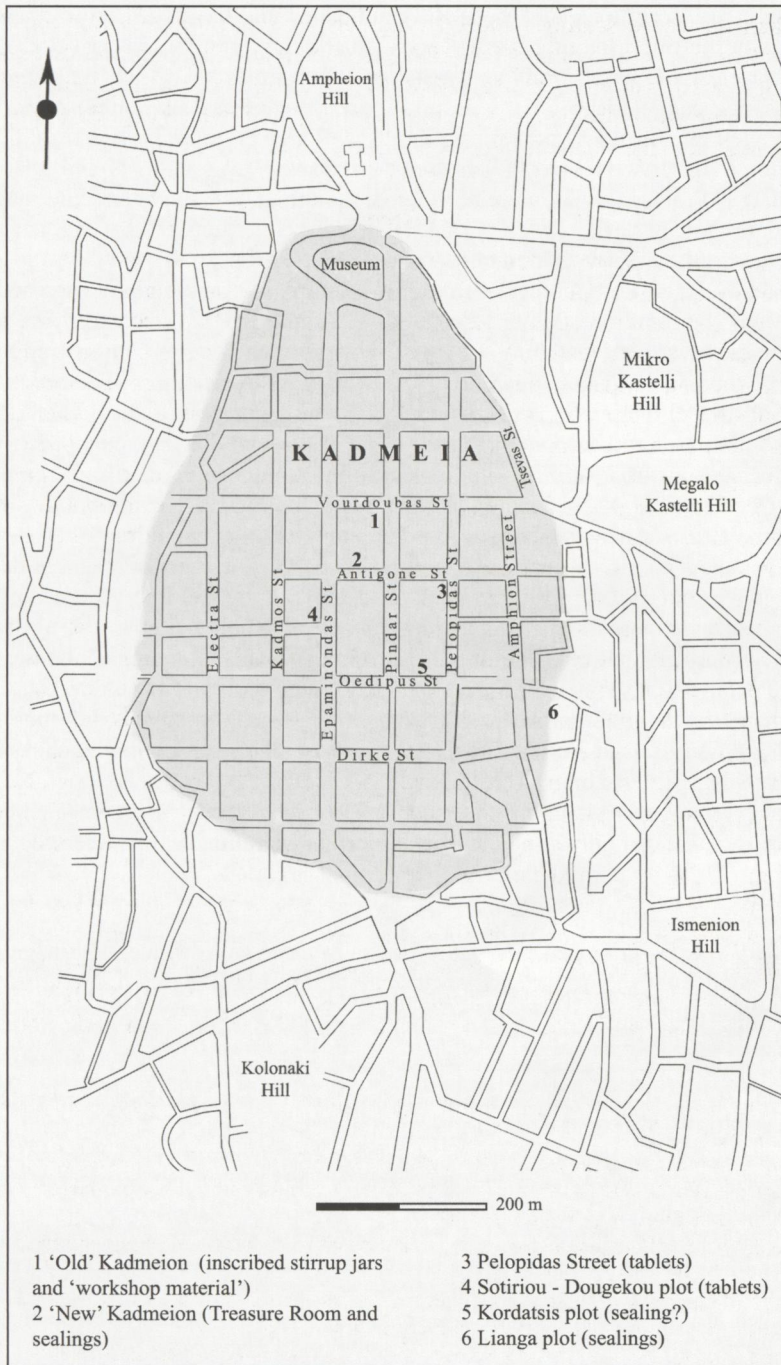


FIGURE 10.4 Map of Thebes, showing the Kadmeia Hill (shaded) and the location of selected excavations. Mycenaean chamber tomb cemeteries are located on the surrounding hills (Kolonaki, Megalo and Mikro Kastelli).

Although the inscriptions have been fully published and have attracted much scholarly debate, sadly the impressions have not been illustrated.⁹⁴ For the 23 seal-types we have only the briefest of descriptions and a list of the nodules on which they were found. Insofar as one can judge from the descriptions, most of the seal-types depict subjects which are well attested in glyptic during the LBA. There are impressions from one or two signet rings – a cult scene and bull-leaping; among the seals animals and attack scenes predominate.⁹⁵ Presumably all were heirlooms, though of course we have no idea of their style or date. Nor is our knowledge of LBA glyptic so extensive that we can afford to write off any new evidence that comes to light.

The nodules appear to document deliveries of animals – sheep, goats, pigs and cattle – or less often other commodities or foodstuffs (*171 and *190), indicated by an ideogram inscribed *supra sigillum*. On some we find the expression *o-pa* in conjunction with what seems to be a personal name, apparently identifying the ‘owner’ or ‘collector’ responsible for meeting the obligation in question. Point of origin seems to be indicated on two nodules, which bear the toponyms *a-ma-ry-to* (Amarynthos) and *ka-ry-to* (Karystos), perhaps located on the island of Euboea as are their modern namesakes. Three nodules are designated *te-qa-de* – ‘to Thebes’. Comparisons with tablets from Pylos (notably Un 718) and the C(2) set from Knossos provide a convincing explanation for these nodules, namely that they record deliveries of animals (not animal products) and foodstuffs to Thebes for consumption in a ceremonial banquet.⁹⁶ Of course many questions remain. Were the beasts delivered on the hoof or as carcasses? When were the sealings inscribed: on despatch or on arrival? It is certainly hard to imagine them hanging round the animals’ necks! A detailed analysis by impression, hand and inscription would certainly yield further insights and makes full publication of the seal-types all the more crucial. Moreover, if non-destructive clay analyses could be devised, we might gain additional clues as to where the sealings were made.⁹⁷ All in all, the Thebes sealings offer us the best chance yet of understanding the role that inscribed nodules played in Mycenaean administration; one can only hope that the opportunity will not be squandered.

Midea

Greek-Swedish excavations carried out at Midea in the Argolid since 1983 have provided growing evidence for the importance of this site during LH IIIB. Owing to erosion on the summit, investigations have centred on the East Gate, the deep deposits in the West Gate

⁹⁴ Piteros et al. (n. 93) 103-84; J. L. Melena & J.-P. Olivier, *TITHEMY. Minos Suppl.* 12 (Salamanca 1991) 41-50. See also discussions by Aravantinos (n. 68) 47-48; idem, in P. H. Ilievski & L. Crepajac (eds.), *Tractata Mycenaea* (Skopje 1987) 13-27; idem, in *ASSA* 149-67. The sealings remain under study by the excavator and, unfortunately, the *CMS* has not been granted permission to publish the seal-types.

⁹⁵ For the cult scene see Chapter 9 n. 118. Three intriguing and otherwise unparalleled seal-types depict male figures and sphinxes; one also includes a horns of consecration: Piteros et al. (n. 93) 109-10, types B, H, K. See also Chapter 9 n. 115.

⁹⁶ J. T. Killen, in J.-P. Olivier (ed.), *Mykenaiika. BCH Suppl.* 25 (Athens & Paris 1992) 365-80; idem, *BICS* 39 (1994) 67-84; idem, in *Atti del II° congresso di micenologia* 71-82.

⁹⁷ Aravantinos states that the sealings can be divided into 11 homogeneous ‘groups’ or ‘sets’, so defined as having the same seal impression, same physical form, same clay composition / colour, same scribe, similar subject, etc. (n. 68, 47-48; n. 94 [1987] 22-23). But Piteros et al. (n. 93) 137 stress the difficulty of identifying scribal hands on nodules, and indeed limit their groupings (ten in all) to nodules with identical signs (ibid. 146). Palaima (n. 71) 236-37 takes a more optimistic view; see also above n. 75.

area, and a megaron-like structure on the Lower Terraces.⁹⁸ North of this building in Room 7, three gable-shaped nodules came to light; two bear inscriptions.⁹⁹ Room VIB in the West Gate area has also yielded an inscribed nodule; yet another emerged in a trial trench some distance away.¹⁰⁰ Although we now have a number of transport stirrup jars from the site, similar to those at Mycenae, no stoppers have been recovered so far.¹⁰¹ Among the seals from Midea are abraded examples of the Mainland Popular Group and a number of hard stone heirlooms.¹⁰² That we are dealing with a palatial centre seems beyond doubt; the glyptic evidence, a rich array of other finds, and undeniably impressive architecture all contribute to this view. There is also enough material of LH I/II-III A2 date to lend credence to the long-suspected link between the citadel of Midea and the important LH II-III A tombs in the Dendra cemetery nearby (cf. 455-456).

Sparta: Menelaion

Two stoppers – only one of which bears a seal impression – were found in excavations led by R. M. Dawkins on the Menelaion hill outside Sparta in 1910.¹⁰³ Unfortunately, no precise find-spot was recorded, though systematic investigations undertaken by the British School at Athens (1973–76) have shed a great deal of light on the site's history.¹⁰⁴ Dawkins's work centred on what we now call Mansion 3, the third successive building complex on the site. This was destroyed by fire at the end of LH IIIB2, whereas Mansion 2 was simply abandoned sometime during LH IIIA1 and Mansion 1 was damaged beyond repair when the eastern flank collapsed down the hillside in late 15th century BC. Since the site was apparently unoccupied during LH IIIA2-B1, the most likely date for the stoppers is LH IIIB2. But as no inscribed nodules or Linear B tablets have been recovered, it is hard to say whether the site had an administrative role.¹⁰⁵

Tiryns

Absence of evidence is not, of course, evidence for absence. That Tiryns was a major palatial centre in the LH IIIB period could scarcely be questioned and yet, until recently, evidence for administration was non-existent. Even today, we have barely two dozen fragments of Linear B tablets from the site, and all are horribly scrappy.¹⁰⁶ These came to

⁹⁸ For summaries of work (to ca 1991): K. Demakopoulou, *Atti del II° congresso di micenologia* 979-94, G. Walberg, *ibid.* 1333-38. Later campaigns are reported in *OpAth* 19 (1992) 11-22; 20 (1994) 19-41; 21 (1996) 13-32; 22-23 (1997-98) 57-90; 25-26 (2000-01) 35-52; 27 (2002) 27-58.

⁹⁹ *CMS V Suppl.* 3 nos. 238-240; no. 238 was originally thought to be a clay label (cf. above n. 35) without seal impression: Walberg (n. 98) 1336-37.

¹⁰⁰ *CMS V Suppl.* 3 nos. 236-237. No parallels exist for 236 (impression of a soft stone lentoid depicting an insect with two feelers and eight legs: a spider?); 237 is a LB IIIA1 animal attack.

¹⁰¹ *OpAth* 22-23 (1997-98) 59, 62, 72, figs. 18-19, 61 (both light-on-dark and dark-on-light with wavy bands / stylized octopods). A large lump of clay (not illustrated) without seal impressions possibly served as a stopper: *ibid.* 62.

¹⁰² *CMS V Suppl.* 1B nos. 71-72; V Suppl. 3 nos. 222-235 (not included are a Cut Style seal and unfinished lentoid, with traces of engraving, both from the Lower Terraces: *OpAth* 21 [1996] 25, figs. 45, 55).

¹⁰³ *CMS V Suppl.* 1B no. 348; for the unimpressed stopper *ibid.* p. 335 and R. M. Dawkins, *BSA* 16 (1909-10) 9-11, pl. 3.

¹⁰⁴ H. W. Catling, *AR* 23 (1976-77) 24-34, esp. 32-33 for building sequence and Mansion 3; the final report is now in preparation.

¹⁰⁵ A possible sealing fragment found in the 1970s will be published by H. Hughes-Brock in the final site report. I cordially thank the excavator, H. W. Catling, for permission to mention it here.

¹⁰⁶ Melena & Olivier (n. 94) 15-16, 25-32.

light in the Unterburg (Lower Citadel), which remained largely unscathed until the campaigns carried out by the German Archaeological Institute from 1976 to 1983. One cannot help wondering if tablets and sealings were missed (or destroyed) during excavations carried out in the 19th and early 20th centuries elsewhere on the acropolis. As for sealings, we have only two examples – both stoppers, impressed by the same seal.¹⁰⁷ One came to light in the Unterburg, on a floor dated to LH IIIC Late, the other was apparently picked up on the surface some distance beyond the walls. It has to be said that the LH IIIC Late context is deeply worrying.¹⁰⁸ Our stoppers from Mycenae are securely dated to LH IIIB1 and a date within LH IIIB is likely for two from the Menelaion (see above). On Crete the examples from Khania cannot be later than LM IIIB1 and the same seems to be true for Knossos, Kommos and Mallia (Chapter 8). Since the Mycenae stoppers seem to originate in Crete, we have no concrete evidence that stirrup jars were also plugged and sealed on the mainland – apart (perhaps) from the examples from Sparta and Tiryns. But one of the Tiryns stoppers is certainly out of context, and one wonders if the same applies to the stopper from the Unterburg. Re-deposited debris is always a problem.¹⁰⁹ We certainly need further evidence before we can state with confidence that sealings – even so basic as stoppers – were still used on the mainland at the very end of the post-palatial period.¹¹⁰

TRAVELLING SEALS

Small, portable and virtually indestructible seals could easily travel with their original owners or pass through many hands before reaching their final resting place. They could be lost and found by the wayside, be discovered in the clearing of tombs, be pressed into service again and embark on further journeys through space and time. While seals of foreign origin sometimes reached the Aegean and on occasion were used for sealing purposes,¹¹¹ few Minoan or Mycenaean seals travelled beyond the shores of the Aegean itself. Only eight pieces reached Cyprus and there is but a single firm example from the central Mediterranean (see p. 308). Within the Aegean, however, the circulation of seals gathered pace throughout the second millennium and by the LBA was a widespread phenomenon. This presents the modern student of glyptic with serious challenges, since many seals are demonstrably older than the contexts in which they were found and are likely to be far removed from the centres where they were originally made (see Chapter 9 and below pp. 305-07). Some seals of Bronze Age date were deposited in graves during the EIA, others re-surfaced in the Archaic period and were dedicated in sanctuaries (see pp. 277-79). They also seemingly inspired the production of so-called Island Gems in the seventh and sixth centuries BC (see pp. 308-10).

¹⁰⁷ *CMS V Suppl.* 1B no. 427 (the seal-type is datable to LB II-III A1). For a fragmentary neck of a stirrup jar with remains of clay plug inside, but no cap or seal impressions, see: E. von Mercklin, *AA* (1935) 75, fig. 8 (from a mixed level; find-spot not given).

¹⁰⁸ For dating see *CMS V Suppl.* 1B p. 367; for context: K. Kilian, *AA* (1979) 383-85.

¹⁰⁹ Among the ivories from LH IIIC contexts in the Unterburg are clear examples of earlier products: O. H. Krzyszkowska, in *Tiryns XIII* (forthcoming) 194.

¹¹⁰ Pini (in Müller et al. [n. 33] 8) seemingly accepts without qualms the date in LH IIIC Late, in spite of his observation that the Mycenae stoppers are ca 200 years earlier!

¹¹¹ *CMS II.6* nos. 144 (Akkadian cylinder), 249 (Cypro-Levantine stamp); *II. 8* nos. 267 (Levantine? stamp), 719 (Cypriot or 'Cypro-Aegean' cylinder), 720 (scarab). See also Chapter 2 n. 27.

FOREIGN SEALS IN THE AEGEAN

During the third millennium and into the early second, foreign seals in the Aegean amounted to scarcely more than a trickle and their impact on Aegean glyptic was correspondingly slight.¹¹² Even in the LBA the number of imports is not large: just over 100 examples in all – mostly scarabs and cylinders – usually occurring as singletons.¹¹³ A few are more or less contemporary with their contexts, some evidently arrived as heirlooms, others may have circulated within the Aegean for generations before their final deposition. The scarabs of Amenhotep III and his wife Tiy offer an interesting case.¹¹⁴ One well-known example was found in virtually mint condition with LM IIIA1 pottery in Sellopoulo Tomb 3 at Knossos, a second came to light in a LM IIIA2 tomb at Ayia Triada, while a third reached Ayios Elias in Aitolia, where it was deposited in a tomb used from LH IIB-III A2 Early. By contrast, two scarabs of Tiy found their way into LH IIIB contexts in the Cult Centre at Mycenae and may, along with three faience plaques of Amenhotep III, reflect material housed at Mycenae following a diplomatic mission to the Aegean a century or so earlier.¹¹⁵ Other Amenhotep III scarabs occur at Khania (LM IIIA-B context) and Ialysos on Rhodes (LB III).

The most striking concentration of scarabs in the Aegean occurs at Perati in eastern Attica. Altogether the cemetery yielded ten of 18-19th Dynasty date, with five examples in Tomb 13 alone.¹¹⁶ Nor were these the only foreign seals at Perati. The list also includes two haematite cylinder seals – one Mitannian, the other Cypriot – as well as a stamp seal and a *bullā*, both perhaps from Cyprus.¹¹⁷ Although several examples come from tombs dated to the LH IIIB / C1 transition, most of the foreign seals are from LH IIIC Early-Middle tombs. More remarkable still is that they outnumber Aegean seals and signet rings.¹¹⁸ And yet, taken with the other *orientalia* at Perati – chiefly small and highly portable items like amulets, earrings and weights – the foreign seals scarcely look out of place. Together with the distinctive LH IIIC octopus stirrup jars from the central Cyclades and Dodecanese, the foreign exotica attest to lively exchange networks linking the Aegean and eastern Mediterranean in the mid-12th century. Thus it seems reasonable to infer that most (if not all) of the foreign seals arrived at Perati shortly before their deposition, irrespective of when they were actually made. Whether the same is also true of the Aegean seals is harder to judge (see also below).

¹¹² See Chapters 3 (EH rollers) and 4 (early scarabs and Cretan ‘white pieces’); also Chapter 5-6 and 9 for possible re-working of imported cylinders or beads. Note: some foreign seals appear in the *CMS*, but not all (e.g. excluded is the Thebes hoard, see below).

¹¹³ Convenient lists for the LBA in E. H. Cline, *Sailing the Wine-Dark Sea*. BAR-IS 591 (Oxford 1994). See also J. Phillips, *Aegyptiaca* (forthcoming) for scarabs in MBA – LBA Crete; a selection is illustrated in *Crete – Egypt Catalogue* pp. 302-29.

¹¹⁴ Cline (n.113) nos. 119-120 (Tiy); nos. 123, 125, 128, 132 (Amenhotep III); no. 142 (Tiy) at Ayia Triada; see also V. La Rosa, in *Crete – Egypt Studies* 86-93.

¹¹⁵ E. H. Cline, in W. V. Davies and L. Schofield (eds.), *Egypt, the Aegean and the Levant* (London 1995) 94-95, pl. 6.3 (faience plaques).

¹¹⁶ Cline (n. 113) nos. 106-107; nos. 108-112 (T. 13), nos. 113-115. Including the Perati examples there are about 25 scarabs from LBA contexts in the Aegean. For the site and dating of tombs: Sp. E. Iakovides, *Περατή. το νεκροταφείον* (Athens 1969-1970) B 391-416; B 419-70 (English summary).

¹¹⁷ Cline (n. 113) nos. 176-177 (= *CMS* I Suppl. nos. 54, 57); no. 224 (= *CMS* I no. 396); no. 235 (*bullā*, not included in the *CMS*).

¹¹⁸ *CMS* I nos. 390-391 (gold rings), 392-395; *CMS* I Suppl. nos. 55-56, 58. For *CMS* I no. 391 (single-sheet ring) see now: W. Müller, in *Metron* 476, table 2, pl. 101b. *CMS* I no. 392 is an abraded MPG seal (Dickers 159 no. 51); the remainder are heirlooms of LB IIIA date.

Mitannian Cylinder Seals of the Common Style

Most of the cylinder seals found in the Aegean are effectively singletons, with diverse origins, styles and dates of manufacture – Early Dynastic, Old Babylonian, Syrian, Mitannian, Hittite, and Cypriot. Against this backdrop the so-called Common Style Mitannian cylinder seals, made of vitreous materials, are especially interesting.¹¹⁹ These seals were apparently made in several production centres (identified largely on stylistic grounds) in Syro-Palestine from the 15th to 13th centuries. They are very widely dispersed indeed, found not only in the Levant, Cyprus and the Aegean, but also in Mesopotamia, Falaika Island in the Persian Gulf, the Caucasus and western Iran. More than 20 have been discovered in the Aegean, chiefly in graves on the mainland, but a few are also known from Crete and Rhodes.¹²⁰ The earliest confirmed example in the Aegean seems to be that from Mycenae CT 517 (**587**: associated with LH I-II pottery), which has parallels at Ras Shamra.¹²¹ Popular motifs in the Common Style include human figures, fish, birds and antelopes. Although the treatment of the bird and antelope on a seal from Armeni Tomb 108 (**588**) is otherwise unparalleled, there is no reason to suppose that Common Style cylinders were copied in the Aegean. Nor is there any reason to suppose that the owners of these cylinders had themselves voyaged to the eastern Mediterranean.¹²²

Cypro-Aegean seals

An even more intriguing example of the diverse paths taken by seals is offered by the Cypro-Aegean group, comprising about 20 cylinders made of haematite.¹²³ Some employ motifs that are mostly Aegean in origin, executed in an Aegean manner, but deployed in a 'Cypro-Oriental' syntax. A large cylinder found at Astraki east of Knossos provides a good example (**589**). Recognizably Aegean in iconography are the two chariots – one drawn by a horse, the other by a griffin – and a symmetrical Master of Animals flanked by lions in the lower register. The style, with its heavy use of tubular and solid drills, calls to mind conventions of LM II-III glyptic (Chapter 8). But the division of the field into two registers has no parallels on genuine Aegean cylinders and several specific elements (e.g. crossed lions standing on hind legs) add to the foreign air. Another Master of Animals appears on a cylinder from Golgoi in Cyprus, now in the British Museum (**591**). Unusual here is the way that the lions are grasped by their hind-legs. A similar convention can be found on an agate cylinder from the Treasure Room at Thebes, generally taken to be an Aegean product, though clearly connected somehow to the Cypro-Aegean group (**592**). More distantly related to Aegean prototypes is a cylinder now in the Ashmolean Museum, but said to come from Crete (**590**). The Minoan genius

¹¹⁹ B. Salje, *Der „Common Style“ der Mitanni-Glyptik* (Mainz 1990); eadem, in A. Caubet (ed.), *De Chypre à la Bactriane, les sceaux dur Proche-Orient ancien* (Paris 1997) 249-67.

¹²⁰ I. Pini, *PZ* 58 (1983) 114-26 for list and commentary. List updated by Pini in *CMS V Suppl.* 1B p. xxxv n. 69; to which add *CMS V Suppl.* 3 nos. 108?, 276, 332.

¹²¹ *CMS I Suppl.* no. 6; Salje 1997 (n. 119) 254. *CMS V Suppl.* 3 no. 108, from an LM IB context at Khania, seems to be a Mitannian Common Style seal (it is very friable).

¹²² As maintained by Salje 1997 (n. 119) 259 (also 259-60 for the equally unlikely notion that they were copied in the Aegean).

¹²³ I. Pini, *Jdl* 95 (1980) 77-108 for list and commentary. My examples are taken from his groups A, B and C (here **589**, **591** and **590** respectively). For two 'Cypro-Levantine' cylinders from Pylos-Routsi (*CMS I* nos. 284-285) and a new example from Patras-Voundeni, see recent comments by I. Pini, in *CMS V Suppl.* 3 pp. 39-40, fig. 3 (the Routsi seals are now in the Chora Museum, not Pylos Museum, as stated).



587



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Mitannian Common Style cylinder seals of faience from Mycenae T. 517 (**587**) and Armeni T. 108 (**588**). 'Cypro-Aegean' cylinder seals of haematite from 'Astraki' on Crete (**589**), 'Crete' (**590**) and 'Golgoi' on Cyprus (**591**). Agate cylinder seal from Thebes (**592**). Impressions. Scale ca 3:2.

may be familiar enough, but the human figures (and their garb), not to mention the animals processing on their hind-legs, are taken from the Eastern repertoire. Other seals, also defined as Cypro-Aegean, have even slighter links to mainstream Aegean glyptic, retaining only a few iconographic elements disposed in a wholly Eastern syntax. The genesis of this group may be seen as part of the international style of the 14th century, witnessed in ivories and other crafts. But individually the pieces are diverse and it is quite impossible to identify a likely production centre.¹²⁴ Of the 20 examples, three come from Crete, two from the mainland, eight from Cyprus; the rest have no known provenance.

The Thebes hoard

A few purely Cypriot cylinders are also found in the Aegean, as are Near Eastern cylinders that were partly or substantially re-cut in Cyprus. Several examples are included among the Thebes hoard, a remarkable collection of cylinder seals and jewellery, found in the so-called Treasure Room on the Kadmeia Hill (FIGURE 10.4).¹²⁵ Many of the objects were made of lapis lazuli: 36 cylinder seals, several more that were too badly worn to read, nine unengraved cylinders, quantities of beads and scrap jewellery. In addition there were 66 beads of banded agate, cylindrical or barrel-shaped in form, perhaps imported ready-made. The tally also includes three imported faience cylinders and several Aegean seals. One is a lentoid with gold caps, two are curious half-cylinders, perhaps made from re-cycled beads (454, 496). There is also an agate cylinder related in style to the Cypro-Aegean group (see above: 592). Elsewhere in the room quantities of Mycenaean gold relief beads came to light, as well as glass figure-of-eight beads and ornaments of lapis lazuli, perhaps made locally from imported scrap. Unfortunately, this major discovery, made 40 years ago, remains unpublished *in corpore*, although the imported cylinder seals have been studied by Edith Porada. They include 12 exceptionally fine Kassite cylinders, 11 seals that were wholly or substantially re-worked on Cyprus, seven cylinders (several badly abraded) ranging in date from Early Dynastic to Old Babylonian, six Elaborate Style Mitannian cylinders, one Hittite cylinder, and another of uncertain origin. Since even scrap lapis was greatly prized and sought after by rulers in antiquity, it may well be that some (if not all) of the Thebes cylinders and jewellery represent a lavish gift from an Eastern potentate. Porada has suggested that this might have been Tukulti-Ninurti I of Assyria, who pillaged the Marduk temple at Babylon in 1225 BC.¹²⁶ The latest Kassite seals at Thebes, some with inscribed dedications to Marduk, date to the mid-13th century. While this just about fits with the recently proposed LH IIIB1 destruction date for the Treasure Room, it naturally remains debatable as to whether an Assyrian ruler would indeed have sought to establish a special relationship with Mycenaean Thebes, by sending such a lavish gift.¹²⁷

¹²⁴ J. Weingarten, in *Minotaur – Centaur 79-86* believes that some were carved on Rhodes or that Rhodes served as a kind of glyptic staging-post between Crete and Cyprus after the fall of Knossos. J. Aruz, in A. Caubet (ed.), *De Chypre à la Bactriane, les sceaux du Proche-Orient ancien* (Paris 1997) 269-88 expresses the same idea. Both draw on Younger's 'Rhodian Hunt Group', itself an artificial construct which has the most tenuous of links to Rhodes (see below and Chapters 9, 11).

¹²⁵ E. Porada, *Archiv für Orientforschung* 28 (1981) 1-70 provides a convenient summary of the finds, as well as a detailed catalogue and commentary on the cylinders. Selected finds illustrated in: Demakopoulou & Konsola (n. 90) 52-53, figs. 11-14, pls. 18, 23; see also *CMS V* nos. 672-675.

¹²⁶ Porada (n. 125) 68-70. By contrast, she believed that the Cypriot cylinder seals (and those re-engraved on Cyprus) may have arrived over a period of time, not as a single lot.

¹²⁷ For the LH IIIB1 date, based on soundings in made in 1996: Aravantinos (n. 90) 51.



Selected Cretan seals found on the Greek mainland. **593** Gold signet ring with hollow bezel and hoop with simple transverse ribbing from Elateia T. 62; face. **594-595** Seals of soft stone from Panaritis T. 1 (near Midea) and Pefkakia in Thessaly; impressions. Scale ca 3:2. **593-594** are LM I in date; **595** finds good parallels among LM III seals in the Armeni cemetery.

AEGEAN SEALS AT HOME AND ABROAD

While the circulation of seals within the Aegean begins in a very small way as early as EB II, it is only with the spread of Minoan influence from the MBA onwards that this becomes a significant phenomenon. Indeed there is a striking correlation between finds of Minoan seals and locations where Minoan pottery and other cultural features occur: Ayios Stephanos in Lakonia, the islands of Aigina, Karpathos, Kea, Kythera, Melos, Naxos, Rhodes, Thera, and Miletus on the Anatolian coast.¹²⁸ By MM III Minoan administrative practices are also attested at Kea, Miletus and Samothrace; Minoan flat-based nodules were sent to Akrotiri in LM IA (Chapters 5, 7). But not all of the seals are in secure MBA or LB I contexts and conceivably some did their travelling at a later date.

In order to evaluate patterns of circulation in the LBA, systematic study is a *sine qua non*.¹²⁹ Yet here we are hampered by several factors. First and foremost is our inability to distinguish between mainland and Cretan seals of hard stone (Chapter 9). As a result, it is impossible to gauge how many examples travelled between these areas. So far we have managed to identify with certainty only three LM I gold signet rings on the mainland; one comes from the main chamber of the Vapheio tholos (221), a second from the large Elateia cemetery in Phthiotis (593), a third from nearby Kalopodi.¹³⁰ We are also on reasonably secure grounds when it comes to soft stone seals and the few Cretan examples on the mainland readily proclaim their origin. For instance, a LM I lentoid depicting *tête-bêche* lions came to light in the Panaritis cemetery near Midea in the Argolid (594), while a distinctive LM II-III seal (595) was found at Pefkakia in Thessaly, in virtually mint condition.¹³¹ Similarly, a few Cretan-made fluorite seals can be identified on the mainland and, in turn, several made on the mainland reached Crete (Chapter 9). We can also isolate about a dozen examples of the Mainland Popular Group on Crete, notably in

¹²⁸ See Chapter 5 n. 97 for references. The seals said to come from Kythera and Rhodes are not from controlled excavations; those from Aigina are not stratified, see above n. 7.

¹²⁹ See O. H. Krzyszkowska, in *Emporia* (forthcoming) for further discussion.

¹³⁰ *CMS* I no. 219 (Vapheio main chamber: pottery LH II-III A1); V Suppl. 2 no. 106 (Elateia T. 62, pit e: LH III A-C); V Suppl. 3 no. 68 (Kalopodi T. 4: date unstated).

¹³¹ Cf. Chapter 6 (e.g. 269-270) and Chapter 8 (e.g. 418-419; also 43). See also Dickers 105-06; exclude *CMS* V no. 424 (scaraboid of lapis lazuli not soft stone).

the Armeni cemetery.¹³² From this fairly modest list, we might be tempted to conclude that the circulation of seals was only limited in scale. Yet it would be very risky indeed to base any firm conclusions on gold signet rings, which have an exceptionally poor survival rate, or soft stone seals, which arguably had less *cachet* than those made of hard stone. It is worth remembering that Mycenaean workshops shunned soft stones entirely until LH IIIA, and presumably imported examples would have held little attraction.

Within the mainland itself, interesting patterns of circulation emerge through studies of pressed glass seals. As already noted, seals from the same mould sometimes turn up in cemeteries separated by a considerable distance.¹³³ Matches occur as far apart as Ayia Triada in Elis and Kato Mavrolophos in Thessaly (538); another set occurs at Medeon on the Gulf of Corinth, Elateia in Phthiotis, and Kato Mavrolophos (536). Mainland Popular Group (MPG) seals along this route also display interesting affinities in motif and filling ornament. That we are seeing a genuine exchange network linking the north-western Peloponnese with central and northern Greece seems to be confirmed by other finds, such as glass jewellery, pottery and weaponry.¹³⁴

These late cemeteries in 'peripheral' areas also offer intriguing glimpses of the circulation of hard stone seals during LB II-III. Elateia provides an ideal example. Here the 84 chamber tombs remained in use from LH IIIA1 until the ninth century BC, but most burials date to LH IIIC Middle and Advanced.¹³⁵ All told 121 seals came to light in 38 graves, though few were found *in situ* with primary burials. Many came from secondary pits into which earlier burials and grave goods were swept. This was the fate of the LM I signet ring (593). While MPG, fluorite and pressed glass account for the vast majority of seals, eight hard stone heirlooms were found.¹³⁶ These include a 'talismanic' seal, a fine example of the Cut Style and a striking LH II-IIIa seal depicting a 'minotaur'. The last could well be a Cretan product, but where the others were made and when they embarked on their travels is a matter for speculation. The date when they reached Elateia is equally uncertain, as none was found with pottery earlier than LH IIIB / C and several were associated with LH IIIC Late and Protogeometric vases.

Some of the seals from Ialysos on Rhodes were also found in graves that were used (or re-used) in LH IIIC. The seals vary in date and, presumably, in origin, though few can be localized with any confidence.¹³⁷ There is a LB I 'talismanic', two examples of the Cut Style, two more dating to LB II, and four dating to LB IIIA. There is also a fluorite seal of mainland type (C49), three imported cylinder seals, and three scarabs (one of Amenhotep III). Since Rhodes had been in the Minoan sphere of influence from the MBA onwards and later became part of the Mycenaean *koine*, it is entirely possible that the seals reached the island at roughly their time of manufacture. Once there, they may have remained in circulation until their final deposition or could have been 're-cycled'

¹³² See Chapter 8; also Dickers 225-27 for MPG seals on Crete; *ibid.* 88, 95 for fluorite.

¹³³ See Chapter 9 for specific examples and references.

¹³⁴ B. Eder, in *Polemos* 443-47, esp. 446 (swords).

¹³⁵ For a convenient summary of the Elateia cemetery and contents of the graves: Ph. Dakoronia & S. Deger-Jalkotzy, in *CMS Suppl.* 2 pp. x-xx; also *BICS* 47 (2004) 185-88.

¹³⁶ *CMS V Suppl.* 2 nos. 2-3, 25, 32, 102-103, 112-113; for 'minotaurs' see Chapter 8.

¹³⁷ *CMS V* nos. 654, 655-656 (here 477, 500), 658-659; VII nos. 113 (here 606; C40), 151, 154, 179, 194 (here C49 = mainland fluorite: Dickers 88, 92-93, fig. 24). Two hard stone seals are lost: M. Benzi, *Rodi e la civiltà micenea*. Incunabula Graeca 94 (Rome 1992) 206-07, 338, 346; nos. T50 / (A) and T53 / (A7). Scarabs: Cline (n. 113) nos. 130-132; imported cylinders: nos. 220, 227 (= *CMS V* no. 657) and 230. See also Krzyszkowska (n. 129).

after the clearing of earlier burials.¹³⁸ There is no evidence to suggest that any were engraved on Rhodes itself or the islands (see above and Chapter 11).

Our lack of progress in identifying workshops and production centres has clear implications when it comes to evaluating the circulation of seals during LB II-III. A further pitfall is the marked lack of uniformity in mortuary display throughout the Mycenaean *koine* and beyond.¹³⁹ In the so-called heartland, a decline in rich burials during LH IIIA2-B may be partly linked to a greater investment of resources in palatial building programmes. But much more work is needed to investigate the varying patterns of consumption and display on a regional and intra-regional basis. Seals clearly form part of the picture, though simple numerical comparisons can be deeply misleading. For so prominent a site the eleven Aegean seals (including one of fluorite) at Ialysos may strike us as a meagre collection, especially when set against the 121 seals at Elateia. And yet most of the latter prove to be examples of the Mainland Popular, fluorite or pressed glass groups – some of which were probably made locally (Chapters 9-10).

If we turn our eyes further afield we find that Aegean seals rarely travelled beyond the Minoan and Mycenaean spheres of influences. So far, not a single example has been reported from Epirus or Macedonia, though naturally future excavations might change the picture. Turning to the Anatolian coast, we may note the recent discovery of a Cut Style amygdaloid at Troy and two Mainland Popular seals at the nearby Beşik Tepe cemetery.¹⁴⁰ Further south at Bakla Tepe, near Izmir, a rather battered LB II-III lentoid depicting an animal attack came to light in a rich grave containing ivories, gold jewellery and Mycenaean pottery of LH IIIA1-III B / C date, both imported and locally-made.¹⁴¹ From Miletus we now have six Aegean seals ranging in date from MM IA to LB IIIA, as well as several sealings – finds that are wholly in keeping with the Minoan and, later, the Mycenaean character of the site.¹⁴² Whether the existence of this important Aegean centre on the Anatolian coast might account for the seals reportedly acquired at Ephesus, Smyrna (Izmir) and Sardis in the 19th century is open to question.¹⁴³ Some were purchased by the Reverend Greville Chester – an indefatigable traveller the length and breadth of the Mediterranean – and the ‘provenances’ of his purchases are often deeply suspicious.¹⁴⁴ This applies to several seals from ‘the coast of Syria’ and ‘Egypt’ now in London and Oxford. At best these locations may indicate where the seal was purchased, and should not be taken as evidence for the circulation of seals in the LBA.

That said, some Aegean seals did indeed reach the eastern Mediterranean in the second millennium BC. Two Mainland Popular seals were found in the Uluburun wreck and a pressed glass lentoid came to light at Tell Abu Hawam on the coast of Israel (MAP 6).

¹³⁸ But perhaps some arrived during LH IIIC, since newcomers may account for the LH IIIC re-use of tombs: C. Mee, *Rhodes in the Bronze Age* (Warminster 1982) 89-90.

¹³⁹ See S. Voutsaki, in *Cemetery – Society* 41-58 for differences between the Argolid and Messenia; W. Cavanagh, *ibid.* 103-14 considers variations within a given area (Attica).

¹⁴⁰ Troy: *CMS V Suppl.* 3 no. 455. Beşik Tepe: *CMS V Suppl.* 1B nos. 474-475; nos. 476-478 possibly local copies; cf. Dickers 228-29.

¹⁴¹ *CMS V Suppl.* 3 no. 456. For the site: A. Erkanal-Öktü, in *CMS Beiheft* 6 (2000) 76-77. See here MAP 3 for the location.

¹⁴² *CMS V Suppl.* 3 nos. 476-483. See Chapter 5 n. 97 for further references.

¹⁴³ See *CS* 160 (index) for examples, most acquired from the Rev. Greville Chester (see n. 144). The famous ‘bull at the trough’ (*CS* no. 202, here **206, C24**) formerly in the Tyszkiewicz Collection was acquired at Smyrna, but said to come from Priene.

¹⁴⁴ See O. H. Krzyszkowska, in *CMS Beiheft* 6 (2000) 150-51 nn. 3, 5; 162 n. 50.



Bronze Age seals are sometimes found in sanctuaries or graves of later date. **596** is a LM I glass (?) lentoid from the Demeter Sanctuary on the Lower Gypsades Hill at Knossos. **597**, a LM I haematite lentoid, came to light in the Sanctuary of Poseidon at Sounion in Attica. The large LB II-III A agate lentoid (**598**) was found in the Sanctuary of Artemis at Brauron in Attica. Impressions. Scale ca 3:2.

The latter was associated with LHIII A2-B1 pottery.¹⁴⁵ Remarkably, the seal proves to have been made in the same mould as a lentoid now in Brussels, but apparently found in the Argolid. Cyprus has yielded surprisingly few Aegean seals: no more than eight in all.¹⁴⁶ Three are 'talismanics', one is a fine haematite lentoid depicting a Minoan genius (**400**), another is a cushion of lapis lazuli encased in gold (**C42**). The tally also includes two hard stone lentoids of LB III date and a Mainland Popular seal. At first sight the list seems extremely slight, given the long connexions between the Aegean and Cyprus from the MBA onwards. In fact, the paucity of Aegean seals fits well with current thinking that there was no significant Aegean settlement on the island until the 12–11th centuries BC. Aegean involvement in the central Mediterranean likewise has more to do with exchange than settlement. A 'talismanic' recently found in southern Italy represents the sole Aegean seal from an excavated context in the central Mediterranean.¹⁴⁷

TIME TRAVELLERS

During the past two centuries the chance discovery and deliberate looting of Bronze Age tombs have proved a rich source of Aegean seals. One imagines that the same applied in the more distant past, notably the first millennium BC, when Aegean seals were sometimes placed in graves or dedicated in sanctuaries. The evidence from sanctuaries needs

¹⁴⁵ Uluburun: *CMS V Suppl.* 1B no. 473; V Suppl. 3 no. 454. Tell Abu Hawam: *CMS V Suppl.* 1B no. 471, matched by *CMS XI* no. 4 ('Argos').

¹⁴⁶ I. Pini, in G. C. Ioannides (ed.), *Studies in Honour of Vassos Karageorghis. Kypriakai Spoudai* 1990–91 (Leukosia 1992) 207–10 for list and commentary. Three come from Enkomi (*CMS V Suppl.* 1B no. 481; VII no. 168; BM G&R 1897.4-1.620); *CMS V Suppl.* 1 B no. 480 is from a late Roman grave at Paphos; the rest have no provenance.

¹⁴⁷ M. Pacciarelli, *Dal villaggio alla città: la svolta protourbana del 1000 a. C. nell'Italia terrena* (Florence 2000) 185–87, 279, fig. 109.8: carnelian cushion from a MBA 1-2 (i.e. ca 1550/1500–1400 BC) dolium burial at Gallo di Briatico on the Calabrian coast. Cf. L. Vagnetti, in N. C. Stampolidis & V. Karageorghis (eds.), *Πλόες ... Sea Routes. Interconnections in the Mediterranean 16th–6th c BC* (Athens 2003) 54–55, fig. 1.8. 'Provenances' of seals acquired in Italy by the Rev. Greville Chester (e.g. *CMS VII* no. 160) or from old Italian collections (e.g. *CMS VII* no. 176; XI nos. 273, 290) should be treated with suspicion, see: Krzyszkowska (n. 144) 150 n. 3, 159 n. 33.

to be assessed with special rigour, since some were used in both the Bronze Age and the Archaic period (see pp. 275-79). As already noted, the seals found the sanctuaries of Aphaia on Aigina, Apollo Maleatas at Epidauros, the Amyklaion in Lakonia and probably Athena Pronaia at Delphi are likely to represent LBA dedications. By contrast, at Ano Mazaraki, Brauron (598), Dion, Perachora, Sounion (597), Vryokastro on Kythnos, and Artemis Orthia in Lakonia, Aegean seals came to light in reasonably well-defined levels of the Geometric, Archaic or Classical periods (see p. 278). Some of these travellers through time prove to be Minoan seals, such as 'talismanics' or the LM I lentoid depicting a netted bull from Sounion shown in 597. These probably reached the mainland sometime during the LBA. On Crete the incidence of Minoan seals in post-Bronze Age contexts is considerable, especially in the Knossos area. The glass (?) lentoid depicting water-birds shown in 596 is one of several LM I seals dedicated in the Sanctuary of Demeter on the Gypsades Hill. Throughout the Aegean, Bronze Age seals also occasionally come to light in Geometric and Archaic graves; a few have even been reported from Roman contexts.¹⁴⁸ Thereafter, the trail finally runs cold and remains so until the 18th century of our own era.

ISLAND GEMS

The chance discovery of Bronze Age seals also had an impact on two groups of seals produced during the Archaic period. The first diverse group are known as Island Gems, since many were acquired by early travellers and collectors in the Cyclades.¹⁴⁹ As a result, they came to be closely bound up with 19th century attempts to understand the early gems of the Aegean, when few Bronze Age sites had yet been excavated (Chapter 11). Island Gems are ordinarily made of soft stone – usually a pale green or greyish variety found in the islands – and were engraved with hand tools (FIGURE 10.5a-b). Amygdaloids and lentoids are popular and indeed the shapes may have been inspired by Bronze Age seals. In subject their debt is slighter, for in addition to contorted animals, fabulous beasts from Greek mythology loom large. Although several hundred examples have been identified, their production centre(s) have not been localized.¹⁵⁰

¹⁴⁸ Examples from Knossos include: *CMS* II.3 nos. 72-75, II.4 nos. 7, 132-134 ('Geometric Graves 1900' = 'Hogarth's Tombs'; apparently LM graves re-used in EIA); *CMS* II.3 no. 76 (Gypsades); also a fine ring-stone re-set in the EIA from the North Cemetery (see Chapter 6 n. 87). A sub-Minoan – PG tomb near Chamaizi contained *CMS* V no. 22 and V Suppl. 1A no. 49. Other Cretan examples include: *CMS* II.3 nos. 228-230 (Vrokastro: LH IIIC–Geometric); II.3 no. 271 (Praisos: Hellenistic bath); *CMS* V no. 300 (Aptera: stray find; 'talismanic' in Archaic / Classical setting); *CMS* V Suppl. 1A no. 50 (Elounda: sub-Minoan grave); *CMS* V Suppl. 3 no. 116 (Kastelli Kissamou: late Roman grave); nos. 328-329 (Eleutherna: late 8th century cremation burial); no. 359 (Tripito Siteias: Hellenistic settlement). On Euboea two pressed glass seals were found in Lefkandi-Toumba T. 12B (late 11th century): see M. R. Popham et al., *Lefkandi* I. BSA Suppl. 11 (London 1980) 174, 225, pls. 173, 235b; cf. I. Pini, *JRGZM* 28 (1981) 61-62 nos. 77-78. Also *CMS* V Suppl. 1B no. 34 (Limnos: 8–7th century urn burial); no. 88 (Tiryas: Geometric grave). For BA seals from Archaic graves on Melos: below and Chapter 11; for sanctuaries above n. 28.

¹⁴⁹ J. Boardman, *Island Gems* (Oxford 1963) remains the standard account; cf. *GGFR*² 107-23. Thomas Burgon possessed three Island Gems, conceivably acquired while excavating tombs on Melos in 1819 and 1828: Krzyszkowska (n. 144) 154 n. 22. L. Ross, published several examples in *Reisen auf den griechischen Inseln* III 1843 (1845) xi-xii, 21 (one is 'talismanic' amygdaloid: *CMS* XI no. 315). See also Chapter 11.

¹⁵⁰ Boardman (n. 148) 96-101 for production centres; of the 360 examples in his catalogue well over 100 are from Melos.

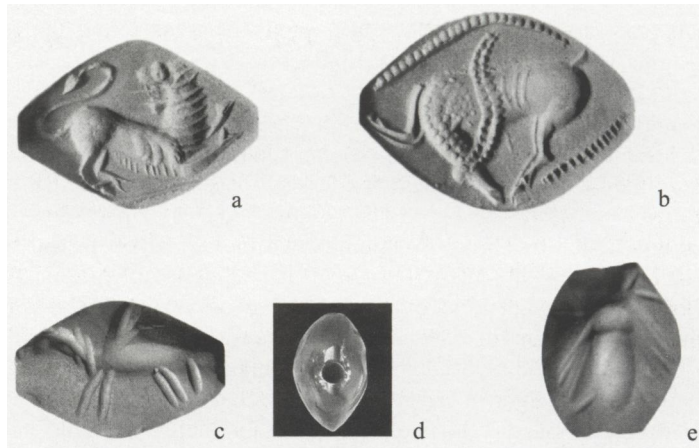


FIGURE 10.2 Island Gems produced during the Archaic period may have been inspired by the chance discovery of Bronze Age seals. Lentoids and amygdaloids are popular; most are made of soft stone found in the Cycladic islands, though few examples have a known provenance (a-b). Plump amygdaloids made of hard stone bear a superficial resemblance to LBA seals of the ‘talismanic’ or Cut Style: c-d) from the sanctuary of Hera Limenia at Perachora and (e) unknown provenance. Impressions and profile (d). Scale ca 3:2.

A smaller but equally intriguing group are plump amygdaloids of hard stone, which superficially resemble seals of the ‘talismanic’ or Cut Style.¹⁵¹ Winged creatures predominate, though often the execution is too sketchy for us to guess the species intended (e.g. FIGURE 10.5c-e). Some have been found in Archaic sanctuaries on the Greek mainland, others are said to come from Melos. But this designation needs to be regarded with caution, for many gems that reached European collections in the 19th century were described as ‘Melian’, irrespective of their origin or date.

¹⁵¹ This group was defined by I. Pini, in *Marburger Winckelmann-Programm* (1975) 1-10. Note that older volumes of the *CMS* series wrongly identify these as ‘talismanics’. Boardman identified several as Cut Style (*GGFR*² 394). By contrast, Furtwängler realized they differed in shape from Mycenaean (i.e. Bronze Age) seals and correctly dated them to the 7th century (*AG III* 70). See above n. 28 for examples from Archaic sanctuaries.

CHAPTER 11 THE STUDY OF AEGEAN GLYPHTIC

For more than a century now, the study of Aegean glyptic has been closely bound up with the development of Aegean archaeology as an independent discipline. At times seals or sealings have led to breakthroughs in our understanding of the Aegean Bronze Age; at times new approaches in Aegean archaeology – be they practical or theoretical – have encouraged a reappraisal of glyptic evidence. Obviously, new discoveries in the field can also prompt dramatic revision of prevailing opinions. In this ever-changing discipline, intellectual fashion and prejudice have played (and continue to play) a crucial role too. Indeed, since the only real facts in archaeology are the artefacts themselves,¹ all interpretations must be regularly subjected to rigorous reappraisal. Perhaps the most important lesson that historiographical studies can teach us is that no generation has a monopoly on the truth.² In this chapter we will survey some of the milestones in the study of Aegean glyptic and also consider related issues such as attribution studies and questions of authenticity. The chapter concludes with some thoughts on the challenges faced by Aegean glyptic in the 21st century.

RE-DISCOVERY AND THE FORMATION OF EARLY COLLECTIONS

In 1809 the Society of Dilettanti in London published a large folio volume entitled *Specimens of Antient Sculpture*. Sir William Gell's view of the Lion Gate at Mycenae was accompanied by engravings of a three-sided prism, which he had acquired on his travels through the Peloponnese in 1805 (FIGURE 11.1). The gem was included, so the text explains, to elucidate the details and style of the monument – a truly remarkable insight for its day. The perceptive author was a leading connoisseur, essayist and collector, Richard Payne Knight (1751–1824). In due course he acquired Gell's prism for his own collection and, in his handwritten catalogue, praised it as *omnia pereleganti, antiquissimo licet opificio*. A second Aegean seal in his possession was described as ... *atque artem, qua fuerit sub Pelopidarum imperio elegantia, plane exhibens*.³

But this promising start to the study of Aegean glyptic was not sustained and, for the most part, Minoan or Mycenaean seals that strayed into private and public collections in the West were regarded as crude and primitive. Often lacking any provenance whatsoever, they were described as Persepolitan, Persian or Pehlevi – effectively catch-all terms for gems that were obviously neither Greco-Roman nor Egyptian in style.⁴

¹ E. S. Higgs (Faculty of Archaeology and Anthropology, University of Cambridge).

² General accounts of the history of Aegean archaeology include: W. A. McDonald & C. G. Thomas, *Progress into the Past* (2nd ed., Bloomington & Indianapolis 1990); J. L. Fitton, *The Discovery of the Greek Bronze Age* (London 1995). T. Cullen, in *Review* 1-18 provides a good overview of the current state of the discipline, as do individual articles in that volume. For the early history of Aegean glyptic, see: J. Boardman, *Island Gems* (Oxford 1963) 12-14; *GGFR*² 16-19; O. Krzyszkowska, in *CMS Beiheft* 6 (2000) 149-63 (focusing on the British Museum).

³ The seals and manuscript catalogue are in the British Museum, Department of Greek and Roman Antiquities, see: Krzyszkowska (n. 2) 152-54; *CMS* VII nos. 114 and 115 (prism).

⁴ Similarly *CMS* IX nos. 19D, 108 were described as *travaille de l'Inde* in A. Chabouillet, *Catalogue général et raisonné des Camées et Pierres gravées de la Bibliothèque Impériale* (Paris 1861) 182, nos. 1218-1219; see also Krzyszkowska (n. 2) 151-52.

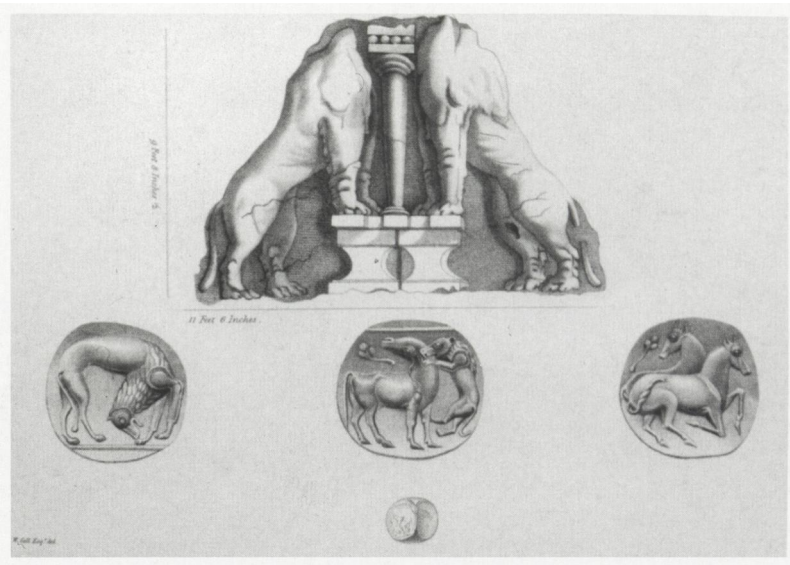


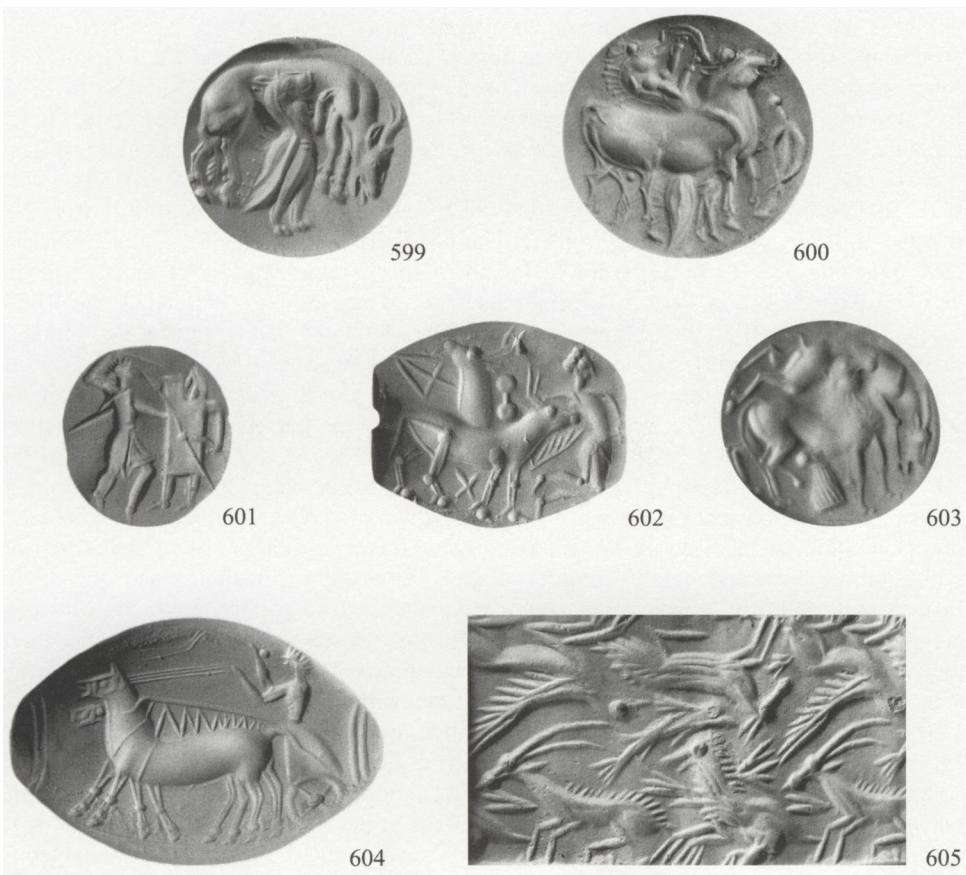
FIGURE 11.1 One of the earliest illustrations of an Aegean seal occurs in *Specimens of Antient Sculpture* (1809) LXXXI, where William Gell's engraving of the Lion Gate at Mycenae is compared to the red jasper three-sided prism which Gell had acquired in the Peloponnese (perhaps when he was at Mycenae in 1805). The seal later passed to Richard Payne Knight (author of *Specimens*) and on his death in 1824 entered the British Museum.

In the 18th and early 19th centuries, collectors augmented their Cabinets of Gems with 'intaglio pastes', and some Aegean seals are first attested in catalogues of these plaster casts. For instance, a haematite lentoid in the Townley Collection, acquired by the British Museum in 1814, was first documented in the Raspe-Tassie Catalogue of 1791.⁵ And two remarkable seals depicting the Minoan genius were among the casts prepared by Tommaso Cades in Rome during the 1830s; one was later acquired by the Louvre (599), the other by Sir Arthur Evans (600).⁶ But the original sources of the Townley and Cades seals cannot be traced and, sadly, this holds good for many pieces which entered collections in the 19th century. All too often even acquisition date is unrecorded.

Seals in the British Museum have fared better than most, thanks to an unrivalled collection of archival material, in the form of early manuscript catalogues, inventories, correspondence books and reports. Used in tandem with biographical studies of collectors and museum personnel, these sources can provide tantalizing insights into contemporary

⁵ Krzyszkowska (n. 2) 151-52, fig. 1: *CMS* VII no. 116.

⁶ The handwritten original of T. Cades, 'Catalogo di una collezione di impronte in stucco . . .' exists in the DAI Rome and a transcript made in the 1880s by Furtwängler for the Berlin Antiquarium is still extant, cf. *AG* III 426. The Beazley Archive in Oxford possesses a partial photocopy; also copies of photographs with casts arranged in catalogue order. Both casts were included in Libro 54 ('Lavori Persiani') without information as to owner / provenance. Cades 54 no. 75 = *CMS* IX no. 129, ex-Montigny Collection 1887. Cades 54 no. 76 = *CS* no. 307 (where wrongly described as 'from Taygetos' based on a misreading of *AG* I, pl. 2 no. 33, II 12, III 29). Evans bought the seal from the collection of Joseph Mayer: *PM* IV 443 n. 2, fig. 368a. Cades 54 no. 70 is a cast of *CMS* VII no. 68, the Burgon Ring, shown upside-down (see below and n. 8).



Casts prepared by Tommaso Cades in Rome during the 1830s included two Aegean seals depicting the Minoan genius. One seal is now in Paris (599); the other in Oxford (600). About a dozen Cretan seals, including 601-603, were purchased by the British Museum from Dr Nicolas Petrides in the 1870s. In 1880 A. W. Franks presented two carnelian seals (604-605) from 'Gnossus, Krete' to the British Museum. Impressions. Scale ca 3:2.

attitudes toward early gems from the Aegean.⁷ So it is that Sir Charles Newton, Keeper of Greek and Roman Antiquities from 1861 to 1886, emerges as a key figure in the history of Aegean glyptic. A leading authority on Classical sculpture, Newton nevertheless realized that minor antiquities played an important role in the appreciation of the past. During the 1870s he seems to have made a concerted attempt to augment the museum's holdings of early gems from the Greek islands. Some had already been bequeathed to the museum as part of private collections; into that category fell the Townley and Payne Knight seals, as well as the outstanding Minoan signet ring owned by Thomas Burgon, an

⁷ For further information on points raised in this paragraph, see: Krzyszkowska (n. 2) *passim*; figs. 4-6 illustrate the seals acquired up to 1877 arranged by year / source.

English merchant based in Smyrna and Athens from 1809 to 1814 (214; C22).⁸ Sir Alfred Biliotti's excavations had also brought a handful of Aegean seals to the museum (e.g. 606; C40, C43, C49), together with a scarab of Amenhotep III and a fine array of Mycenaean pottery and jewellery from chamber tombs at Ialysos on Rhodes. In 1872, following lengthy and ill-tempered negotiations with Charles Merlin, British consul in the Piraeus, Newton managed to buy a sizeable collection of early gems – including pieces that we now recognize as Island Gems of the Archaic period (FIGURE 10.2b), along with seals of Bronze Age date (e.g. 263, 404, 525; C46).⁹ More significant still were the purchases of Cretan seals made from Dr Nicolas Petrides between 1873 and 1877 (36, 392, 398, 601-603, 615; C9, C35, C37-C38). Other Cretan seals were donated in the early 1880s, including two striking pieces from 'Gnossus' (FRONTISPIECE; 604-605; C30). Thus by the time the first catalogue of Greco-Roman gems was published in 1886, the British Museum possessed an astonishing collection of some 70 Aegean seals.

But true progress in understanding Aegean glyptic demanded nothing less than the wholesale discovery of the Aegean Bronze Age. Only the haziest notions of an heroic, pre-Classical past existed until systematic excavations began in the last quarter of the 19th century. Not surprisingly, Schliemann's extraordinary finds at Mycenae prompted swift reaction in the scholarly world. Although Sir Charles Newton condemned the death masks as 'hideous libels on the human face divine', he nevertheless provided Schliemann with sound advice and helpful glyptic parallels.¹⁰ Indeed Schliemann used one of the Ialysos seals (606) as a comparison for the gems depicting animals from the Mycenae acropolis (e.g. 607-608). Nowadays, of course, we can readily see how different these pieces really are; in the 1870s knowledge of glyptic style was still in its infancy.

In the wake of Schliemann's excavations further milestones were achieved in the late 1870s and 1880s: specifically the enlargement of collections through purchase or excavation and the first serious attempts to date the early gems and to evaluate their style. These were undeniably shaky and most commentators found it difficult to distinguish between seals of Bronze Age date and Island Gems of the Archaic period (see Chapter 10 and FIGURE 10.5). This was true of Sir Charles Newton, who thought they all belonged to a period before 'Hellenic art had any style of its own'. Indeed, in his view, their subjects had been 'taken direct from nature by a semi-barbarous people' and demonstrated the 'shortcomings of Mycenaean art', when complex compositions were attempted.¹¹

⁸ Krzyszkowska (n. 2) 154-55. He also excavated tombs on Melos in 1819 and 1828. Burgon's Valuation List (compiled prior to the sale of his collection to the Museum in 1842) lists it as 'gold ring with engraving of two goats (from Candia) £4.' Unfortunately, his travel diary with hand-list of antiquities acquired, held in King's College London as recently as 1977, cannot now be traced. Thus we do not know precisely when – or where – he obtained the ring. Nor does its inclusion in the Cades Catalogo (Libro 54 no. 70) provide much enlightenment (n. 6).

⁹ Consul Merlin's purchases were made from two Athenian collectors, Lambros and Rhusopoulos, from whom Furtwängler also bought seals in the 1880s for the Berlin Antiquarium (see below). Rhusopoulos, Professor of Archaeology at Athens University and influential in the establishment of the National Archaeological Museum, owned an especially rich collection of antiquities and continued to deal in them through the 1890s, when he sold items to Evans. These included the notorious Kapros D Group (to which the stamp cylinder, here 93, may or may not belong): see Chapter 3. For an excellent resumé of Rhusopoulos's activities, see S. Sherratt, *The Captive Spirit: Catalogue of Cycladic Antiquities in the Ashmolean Museum* (Oxford 2000) 25-31, esp. n. 1.

¹⁰ Krzyszkowska (n. 2) 149-50, 161-63; also J. L. Fitton, in C. Morris (ed.), *Klados: Essays in Honour of J. N. Coldstream*. BICS Suppl. 63 (London 1995) 73-78.

¹¹ Krzyszkowska (n. 2) 161-62 with references.



A rock crystal lentoid from Ialysos in the British Museum (606) was used by Schliemann as a comparison for seals that he had found on the acropolis at Mycenae (607-608). Nowadays we can appreciate the differences in style; in the 1870s knowledge of Aegean glyptic was still rudimentary. Impressions. Scale ca 3:2.

He dated the finds from Mycenae and Ialysos no earlier than 1100 BC. A. S. Murray, responsible for compiling the 1886 gem catalogue, had even hazier notions on chronology. He also displayed a tendency (common enough at the time) to interpret the motifs on seals in light of Classical mythology. For instance, writing in 1878, he saw the *Potnia theron* flanked by water-birds on a green jasper lentoid as Leto rising from the waves just before the birth of the island of Delos (3).¹² In much the same vein, the museum register for 1873 described the scene on one of the Petrides seals (602) as ‘two bulls following a figure of Hermes?’.

German scholarship provided a major boost to glyptic studies in the late 19th century. During the 1880s Adolf Furtwängler augmented the collection of early gems in the Berlin Antiquarium by purchasing seals in Athens, mostly from the collectors Rhusopoulos and Lambros.¹³ About 50 proved to be seals of Bronze Age date, including a few important examples of MM II-III glyptic, as well as some exceptionally fine pieces of LBA date, mostly from the Greek mainland.¹⁴ Over the next few years accounts of so-called *Inselsteine* were published by Milchhöfer, Rossbach and Dümmler, presenting new material and drawing on comparanda from Berlin and London.¹⁵ Milchhöfer was even prompted to suggest that Crete was the one of the prime centres of early Greek gem engraving, an idea later developed more fully by Arthur Evans. As more Bronze Age seals came to light in the 1880s and 1890s – especially from the excavations carried out by Christos Tsountas at Vapheio and Mycenae – the stylistic distinctions between Aegean

¹² A. S. Murray, *RA* 36 (1878) 202, pl. 20.3. The seal entered the Museum’s collection sometime before 1834: Krzyszkowska (n. 2) 152, 161.

¹³ For these collectors, see above n. 9. Here 1, 26, 390-391, 523, 532, C41 are Rhusopoulos seals purchased in 1880; 145 (= C10), 159, 250 were bought from Lambros in 1882 ‘from Crete’. 57 and 270 (= C2, C29) were purchased separately in 1889 and 1884, respectively. Source and purchase date are not given in *CMS* XI: for this information I am indebted to Dr Getrud Platz of the Berlin Antikensammlung.

¹⁴ ‘Provenances’ are invariably imprecise and some may be doubted, cf. Chapter 9 n. 13.

¹⁵ A. Milchhoefer, *Die Anfänge der Kunst in Griechenland* (Leipzig 1883); O. Rossbach, *Archäologische Zeitung* (1883) 311-48 (publishing Schaubert’s Collection, which was bequeathed to the Breslau Museum in 1861; the seals were lost in the Second World War, e.g. here 228); F. Dümmler, *AM* 11 (1886) 170-79 (pieces mostly now in Kassel). The Antiquarium seemingly possessed impressions of the London seals, obtained by von Duhn, to which Milchhöfer and Rossbach refer. A new set was obtained by Furtwängler in 1890: Krzyszkowska (n. 2) 162.

seals and the true Island Gems produced in the Archaic period became clearer. *Inselsteine* found in Archaic graves on Melos also provided crucial insights and enabled Dümmler to contrast the Mycenaean preference for hard semi-precious stones and the later use of soft stone.¹⁶ Thus, by 1896, when Furtwängler published his catalogue of seals in the Berlin Antiquarium, he was able to separate the two varieties of gems with considerable accuracy.¹⁷ In his magisterial three-volume study of ancient glyptic, *Die antiken Gemmen* (1900), Furtwängler further refined the criteria for distinguishing Island Gems from genuine Bronze Age seals. He correctly, if dimly, discerned that Crete had played a special role in gem engraving, especially in the ‘early Mycenaean’ period – though the true significance of the Cretan connexion was yet to be established. None the less, a mere 25 years after Schliemann’s excavations at Mycenae, the foundations for the study of Aegean glyptic had been firmly laid.

ARTHUR EVANS AND THE CRETAN CONNEXION

In March 1900 Arthur Evans and his assistant Duncan Mackenzie began work on the Kephala hill at Knossos, where in time they uncovered what is still the largest palace site in the Aegean. Evans’s interest in Crete was apparently whetted in 1889, when the Reverend Greville Chester (an indefatigable traveller and dealer) presented a four-sided prism bearing ‘pictographic’ or Hieroglyphic signs to the Ashmolean Museum, where Evans was Keeper.¹⁸ In 1893 Evans was able to buy further examples in Athens and the following year he went to Crete in search of more. His very first day in Candia (Herakleion) was marked by a visit to the bazaar, where he bought ‘22 early Cretan stones at about 1½ fr[ancs] apiece’; the next day he ‘secured 21 gems & Myk[enae]an ring’ (216; C25) from the Russian Vice-Consul, J. G. Mitsotakis.¹⁹ On his return to England, he published a lengthy article in *The Times*, recounting his travels and describing the seals that he had obtained, which bore both Hieroglyphic and naturalistic devices.²⁰ Echoing Milchhöfer’s earlier claim, he too observed that ‘Crete was a principal centre of Mycenaean glyptic art’. Then, with remarkable speed, in 1895 he published a more detailed analysis of ‘Mykenae]an’ prism-seals and early writing systems.²¹ By now he had reached the firm conclusion that the origins of Mycenaean civilization were to be found on Crete. Excavation at Knossos was clearly the next step, but negotiations for the

¹⁶ Dümmler (n. 15) 177. Potentially confusing, however, was the fact that Bronze Age seals, especially ‘talismatics’, were sometimes found in Archaic graves, e.g. *ibid.* pl. 6 nos. 15-17; see also Chapter 10 (pp. 309-10).

¹⁷ A. Furtwängler, *Beschreibung der geschnittenen Steine im Antiquarium* (Berlin 1896). Island Gems are described as having shapes typical of the Mycenaean period and motifs whose style relates to Mycenaean, but are later in date (ca 8–7th centuries). Cf. Chapter 10 n. 151.

¹⁸ CS no. 148 (said to be from Sparta); cf. Chapter 5. For Chester see Chapter 10 (p. 307). The standard biography of Evans remains J. E. A. Evans, *Time and Chance* (London 1943). See also: A. Brown, *Arthur Evans and the Palace of Minos* (Oxford 1983); *eadem*, *Before Knossos ... Arthur Evans's Travels in the Balkans and Crete* (Oxford 1993); J. A. MacGillivray, *Minotaur: Sir Arthur Evans and the Archaeology of Minoan Myth* (London 2000). For a succinct evaluation of Evans’s achievements, see: P. M. Warren, *BICS* 44 (2000) 199-211.

¹⁹ A. Brown (ed.), *Arthur Evans's Travels in Crete 1894 – 1899*. BAR-IS 1000 (Oxford 2001) 2-7. Evans later implied that he had acquired the ring at Knossos itself; his diary makes plain it was bought in Candia: ‘from Knōssos’ with ‘Arkadi’ and ‘Vianos’ crossed out. For Mitsotakis, see below n. 33.

²⁰ Conveniently reprinted in Brown (n. 19) 193-98, esp. 195-97.

²¹ A. J. Evans, *Cretan Pictographs and Prae-Phoenician Script* (London 1895).

site were protracted, delayed in part by the Cretan insurrection. In the meantime, Evans continued to travel extensively on Crete, buying seals wherever possible. Known as *galopetres* or milk-stones, they were prized by village women as amulets and were presumably brought to light in the chance re-discovery of tombs. Evans's travel journals, recently published by Ann Brown, contain sketches of the seals and other antiquities that he acquired on his travels throughout the island in the 1890s.²² Most items were eventually donated to the Ashmolean Museum, making this the finest collection of Minoan material outside Crete.

Once Crete gained her independence from Ottoman rule, travellers and archaeologists flocked to the island. Some acquired a handful of seals, others formed sizeable collections, which have passed into European and North American museums. For instance, J. H. Marshall, who briefly worked as architect on British excavations in eastern Crete, acquired about 35 seals, which he sold to the British Museum and the Fitzwilliam Museum, Cambridge.²³ Richard Dawkins, who excavated at Palaikastro and later served as an intelligence officer in eastern Crete, amassed an even larger collection.²⁴ About 40 seals collected on Crete between 1897 and 1905 by Joseph Demargne were bequeathed to the Louvre in 1911. In 1950 the Louvre seals were handed over to the Cabinet des Médailles, which itself included many Cretan seals purchased in the early 1900s, as well as a number of fine LBA gems donated by private collectors in the 19th and 20th centuries (e.g. 599).²⁵ Seals also began to travel to the New World in the 1890s and early 1900s. The Boston Museum of Fine Arts purchased several LBA seals in these years from Edward Perry Warren, a wealthy expatriate Bostonian, who was forming his own renowned collection of gems and antiquities at Lewes House in Sussex between 1892 and 1902 (e.g. 612-613).²⁶ Several more exceptionally fine seals from the Lewes House Collection reached Boston in the 1920s, including 506.²⁷ But sadly, Warren's Aegean

²² Brown (n. 19). Evans also sketched a number of seals which he did not purchase; some of these have been traced, others have not. Some seals bought by Evans were later sold by him (e.g. in 1905 and 1912) and thus entered public and private collections in Europe and North America (see below for New York and n. 25 for Paris).

²³ Most are three-sided prisms and 'talismantics'. See *CMS* VII pp. xv-xvi (concordance under 1901.10-16 for BM accessions and 1901 for the Fitzwilliam Museum). For Marshall's travels and acquisitions: D. W. J. Gill, *BSA* 95 (2000) 517-26. Here 264 (= C19) is a Marshall seal in the BM.

²⁴ Many are published in *CMS* VIII (1966), e.g. nos. 1-99. By this time some had already been purchased by other collectors (e.g. nos. 102-104). Other Dawkins seals were bought by museums in Basel, Boston, Geneva, Liverpool, London and Oxford, also by private collectors: partial list in the *CMS* Archive, Marburg. For seals presumably collected on Crete by R. C. Bosanquet (published in *CMS* VIII) and by R. W. Hutchinson see: C. Mee and J. Doole, *Aegean Antiquities on Merseyside* (Liverpool 1993) x, 35-38. For the de Jong gems in the Ashmolean, see: J. Boardman, in *Antichità cretesi* I (Catania 1973) 115-21.

²⁵ *CMS* IX pp. ix-xii provides a useful history of the collections, but owner / source is rarely indicated for purchases made in the early 1900s (an exception being seals bought from Evans's collection in 1905 and 1912). Only rarely can one trace the history of seals from private collections, e.g. *CMS* IX no. 129 (ex-Montigny, included in the Cades Catalogue: above n. 6 and 599). For *CMS* IX nos. 19D and 108 see above n. 4.

²⁶ D. Sox, *Bachelors of Art: Edward Perry Warren and the Lewes House Brotherhood* (London 1991); also O. Burdett & E. H. Goddard, *Edward Perry Warren: The Biography of a Connoisseur* (London 1941). For Warren as the source of seals purchased in 1892, 1898 and 1901 I thank Dr Mary Comstock of the BMFA.

²⁷ J. D. Beazley, *The Lewes House Collection of Ancient Gems* (Oxford 1920) 1-2 nos. 1-5. The Boston seals appear in *CMS* XIII nos. 14-35, 3D-5D. The bulk of the B. H. Emmett Collection (*CMS* XIII nos. 45-61, 7D-8D), bought on Crete in 1928, was acquired by Boston in 1971.



Selected seals in North American collections. **609-611** New York Metropolitan Museum. **609** from 'Lasithi' was once owned by Sir Arthur Evans; **610-611** are part of the sizeable bequest made by Richard Seager in 1926. **612-613** Boston Museum of Fine Arts, acquired from Edward Perry Warren in 1892 and from his Lewes House Collection in 1923, respectively. Impressions. Scale ca 3:2.

seals were mostly acquired from dealers in Athens or from the sale of other private collections, so information on provenance is not necessarily trustworthy.²⁸

By far the largest North American collection, with nearly 300 seals, is in the New York Metropolitan Museum of Art. Although a few pieces had been purchased in the early 1900s (e.g. the discoid **609** formerly in Evan's possession), most were bequeathed by Richard Seager in 1926.²⁹ There are many seals of MM II-III date (prisms, *Petschafte*, discoids), numerous 'talismanics', and a useful series of LM naturalistic types in both hard and soft stone (e.g. **610-611**). One imagines that many were acquired by Seager in eastern Crete or the bazaars of Herakleion, though almost no concrete information is available.³⁰ Some of Seager's seals also ended up in Evans's hands – apparently swapped for Cretan coins – and vice versa.³¹ The University Museum in Philadelphia also has seals collected by Seager, as well as those bought on Crete in 1912 by Edith Hall.³² But it was

²⁸ Oxford (here **622**) and Paris also obtained seals from E. P. Warren / Lewes House.

²⁹ He loaned his collection to the MMA in 1921, and bought further seals for the museum before his death: M. J. Becker & P. P. Betancourt, *Richard Berry Seager: Pioneer Archaeologist and Proper Gentleman* (Philadelphia 1997) 158-59, 160, 163, 170, 176, 182-83. The MMA seals are published in *CMS* XII (1972).

³⁰ Gisela Richter pressed Seager for information on the 26 seals sent to the MMA in September 1924, but he had 'absolutely no data ... as the local dealers "never by any chance speak the truth"': Becker & Betancourt (n. 29) 176. For a sealing from Zakros and a mould for glass seals (**541**), both allegedly acquired in the 'harbour-town of Knossos': Chapter 7 n. 92 and Chapter 9 n. 127.

³¹ *PM* IV 485 n. 1; Becker & Betancourt (n. 29) 160.

³² *CMS* XIII p. x, nos. 85-138, 14D-21D; Becker & Betancourt (n. 29) 134, 163 n. 24.

not only foreigners who were attracted by this seemingly endless supply of collectables. Approximately 95 Cretan seals, now in the Athens National Museum, originally belonged to the Mitsotakis family of Herakleion.³³ Altogether, at least 1000 seals had been spirited away by the mid-1920s. Happily, though, many Cretan seals, whether chance finds or from controlled excavations, did remain on the island. Long before independence the Society for the Promotion of Learning was established in order to preserve, investigate and collect the island's antiquities. And finally, in 1904, thanks to the tireless efforts of Joseph Hazzidakis and Stephanos Xanthoudides, the Herakleion Museum was founded.³⁴ There was, at last, a safe haven for the thousands of seals and sealings which were to emerge from newly-discovered Minoan sites during the coming years.

It was undoubtedly the systematic excavation of Cretan sites – palaces, towns, villas and tombs – between 1900 and the Second World War that transformed our knowledge of Minoan glyptic. For the pre-palatial period, the tholoi uncovered by Xanthoudides in the Mesara plain and the house tombs excavated by Seager at Mochlos proved a major boon, for hitherto few early Cretan seals had been known.³⁵ Graves of LM II-III date were also coming to light, chiefly in the Knossos area and at Kalyvia near Phaistos (Chapter 8). Last but not least, excavations at Ayia Triada, Knossos and Zakros yielded thousands of clay sealings, which brought further insights into the development of Minoan glyptic, especially in the LBA (Chapters 5, 7-8). Fortunately, most of the major groups were swiftly published and the time was soon ripe for broader assessment and analysis.

Given Evans's long-held passion for seals, sealings and scripts, it was hardly surprising that they should occupy a prominent place in *The Palace of Minos*, his monumental synthesis of Minoan culture, published in four volumes between 1921 and 1935. Indeed a glance at the Index Volume shows that the entries for seal-stones, sealings (clay) and signet-rings stretch on for over 30 pages.³⁶ In Volume I, there is a useful survey of Minoan glyptic in the pre-palatial period and MBA, with special emphasis on comparisons with other arts and crafts. A more wide-ranging account in Volume IV covers the development of shapes and motifs from the beginning until the LBA, though Evans largely ignored the 'decadent' products of his so-called Re-occupation Period. In the same volume he presented a brief summary of the late sealings from Knossos (see Chapter 8). Even today, Evans's discussion of Minoan glyptic has its merits, though several important shortcomings must be recognized. His implicit assumption that Minoan society passed through a series of definable stages – from the primitive to classical and finally to the decadent – inevitably prompted the belief that glyptic development was likewise linear in character. Thus he saw an inexorable progression from the crudest prisms, which he dated to EM I, the pictographic seals of 'EM III-MM I' and the MM II hard stone prisms bearing 'Hieroglyphic Class B', to the acme of Minoan naturalism, which he placed in MM III (cf. Chapter 5). Many LM seals made of soft stone were implicitly relegated to the post-palatial period, since their execution was seen as debased or degenerate. In short, many of Evans's dates for seals and sealings are wide of the mark, a legacy still apparent today in general accounts of Aegean archaeology. Indeed

³³ *CMS* I p. 431. It is unclear if they were bought from / donated by J. G. Mitsotakis (1816–1896), the collector from whom Evans purchased antiquities (n. 19), or G. Mitsotakis, who apparently inherited part of his uncle's collection and donated material to the Herakleion Museum in the 1920s: cf. Brown (n. 19) 390.

³⁴ For the Society, Hazzidakis and Xanthoudides: Brown (n. 19) 387, 396 with references.

³⁵ S. Xanthoudides, *The Vaulted Tombs of Mesará* (London 1924); R. B. Seager, *Explorations in the Island of Mochlos* (Boston & New York 1912). See also Chapter 4.

³⁶ J. and A. Evans, *Index to the Palace of Minos* (London 1936) 164-94, 198-99.

Evans sometimes seems to have ignored ceramic evidence for dating, when it failed to square with his own views. Thus he regarded the sealing deposits at Ayia Triada and Zakros House A as dating to MM III-LM IA, despite the presence of LM IB Marine Style pottery at both sites. Moreover, it would seem that to Evans 'Mycenaean glyptic' was a contradiction in terms, for each and every one of the seals from the mainland discussed in *The Palace of Minos* is implicitly or explicitly seen as Minoan. Happily, few scholars accepted this extreme position and indeed the post-war period has seen repeated attempts to distinguish between Minoan and Mycenaean seals (see below). Also controversial was Evans's strenuous defence of certain gold signet rings, with decidedly murky pasts, and out-and-out forgeries like the Thisbe Treasure (pp. 332, 334-37). It is beyond question that much of Evans's work on glyptic was coloured by connoisseurship, an approach that nowadays is rightly deplored. Yet his positive contribution to the field cannot be overstated. He possessed an encyclopaedic grasp of Aegean glyptic matched by few (if any) of his contemporaries and, through the *The Palace of Minos*, he ensured the subject would enjoy a special place in Aegean archaeology for generations to come.

AEGEAN GLYPTIC SINCE THE SECOND WORLD WAR

The post-war period has seen many specialist studies on aspects of Aegean glyptic; the renewed exploration of archaeological sites, which have added substantially to the extant repertoire; and, most important of all, the far-sighted decision by Friedrich Matz to establish the *Corpus der minoischen und mykenischen Siegel* in the late 1950s (below and Appendix 1). Matz himself had a long-standing interest in Aegean seals and, in 1928, had published an investigation into early Cretan seals and the 'origins of Minoan style'.³⁷ This drew on some 275 seals of Early and Middle Minoan date, plus a number of three-sided prisms and seal impressions. His premise was that style reflected the cultural milieu in which artists worked and, more specifically, their ethnic or racial background. He therefore attempted to isolate Minoan structural principles – such as *rapport* and torsion – and to compare them with those found elsewhere in the eastern Mediterranean and south-eastern Europe. His student, Hagen Biesantz, adopted a similar approach in his attempt to identify the defining principles of composition for the LBA as a means of distinguishing Minoan and Helladic products.³⁸ Not only were these studies based on inadequate samples, but – more crucially – the working hypotheses themselves are now regarded as untenable. Another study of LBA glyptic was published by Agnes Sakellariou in 1966.³⁹ In this she identified a Minoan style (A) characterized by freedom of movement and flowing forms, a Mycenaean style (B) with sketchy details and hard modelling, and a third style (C) found on both the mainland and Crete, in which renderings were schematic and mechanical. Sakellariou, however, chose to ignore the large number of Aegean seals in collections outside Greece, presumably because few came from systematic excavations. Yet ironically these homeless seals might have provided a way of testing her hypotheses, because often information does exist as to where seals were acquired (see above). In any case, like the earlier studies by Matz and Biesantz, Sakellariou's account finds little favour today, for her criteria simply fail to stand up to serious scrutiny.⁴⁰

³⁷ F. Matz, *Die frühkretischen Siegel* (Berlin & Leipzig 1928).

³⁸ H. Biesantz, *Kretisch-mykenische Siegelbilder* (Marburg 1954).

³⁹ A. Sakellariou, *Μυκηναϊκή Σφραγιδογραφία* (Athens 1966).

⁴⁰ For brief critiques of Biesantz and Sakellariou, see: J. H. Betts & J. G. Younger, *Kadmos* 21 (1982) 107-08; I. Pini, in *Tonplomben* 85. For Matz: *ECS* 1-2.

The many contributions on Aegean seals published by Victor Kenna in the 1960s and 1970s are, sad to say, marred by implicit assumptions and shaky connoisseurship. *Cretan Seals* (1960) combines a general account of Minoan glyptic with a catalogue of the substantial collection of seals and sealings in the Ashmolean Museum. He later went on to publish an account of ‘talismanic’ seals and to prepare (wholly or in part) several *CMS* volumes.⁴¹ These suffer from Kenna’s lamentable habit of arbitrarily dating unprovenanced seals to single ceramic periods or even sub-periods. One senses his approach was purely instinctive, since only rarely does he offer any justification for his dating. Objective criteria are conspicuous by their absence. His attitude to seals that he judged to be *gemmae dubitandae* was similarly cavalier. For instance, the Ashmolean bull-leaping ring (379) was consigned to limbo on the grounds of motif and size.⁴² Both objections are frankly incomprehensible and indeed Kenna himself failed to provide any clear explanation for his verdict. In fact, the Ashmolean ring had long been tainted by association with forgeries like the Thisbe Treasure (p. 332) and this, as much as anything, may have swayed Kenna’s opinion. In much else, however, Kenna helped to foster ideas expressed by Evans or that were latent in his work. Thus Kenna perpetuated the myth that most Cretan soft stone seals were the crude and degenerate products of the post-palatial era.⁴³ In fact, many unprovenanced seals assigned by him to LM IIIB or even LM IIIC have secure parallels among stratified seals or sealings of LM I date. Happily, many of the specific failings in Kenna’s work have long since been recognized and rectified by glyptic experts. And, it must be said, that for all his faults, Kenna furthered the cause of Aegean glyptic by his steady stream of scholarly articles and editorship of key volumes in the *CMS* series.⁴⁴

Alongside specialist studies, general syntheses also play a crucial role in stimulating a wider interest in Aegean glyptic. Into this category falls Sir John Boardman’s superbly illustrated chapter on ‘Minoans and Mycenaean’ in *Greek Gems and Finger Rings* (1970, reprinted 2001). Similarly, for students, Sinclair Hood’s short chapter on ‘Seals and Gems’ in *The Arts of Prehistoric Greece* (1978) still remains required reading. Boardman’s chapter not only offers a highly readable overview of glyptic development, but also provides detailed notes on individual pieces and groups or styles. Of these the Cut Style is the most coherent and has stood up well to detailed re-analysis.⁴⁵ Others have failed to gain acceptance, notably his Hoop-and-Line Style or the Fine, Common and Palatial Styles of the LM II-III period. As for Cretan soft stone seals, both Boardman and Hood tended to subscribe to the view that most were decadent products of the post-palatial era. And, since both authors were concerned primarily with art, their accounts largely ignore sealing practices.

By the late 1970s, the benefits of the *CMS* project were beginning to make a substantial impact on glyptic studies (see Appendix 1). For the first time, scholars enjoyed a uniform system of referencing and, most importantly, basic standards of data recording. This, in turn, permitted the systematic study of large numbers of seals and the definition of coherent groups. For instance, Paul Yule’s work on *Early Cretan Seals* (1980) – his title deliberately echoes that of Matz – sought to arrange and classify more than 2500 seals

⁴¹ V. E. G. Kenna, *The Cretan Talismanic Stone in the Late Minoan Age*. SIMA 24 (Lund 1969); *CMS* IV, VII–VIII, XII–XIII. See also Appendix 1.

⁴² CS 154, pl. 20. For Kenna’s *dubitandae*, see H. Hughes-Brock, in *CMS* Beiheft 6 (2000) 107–21.

⁴³ As seen in his arrangement of *CMS* volumes (n. 41); also *BICS* 13 (1966) 68–75.

⁴⁴ For a complete list of Kenna’s glyptic studies, see: *CMS* Beiheft 4 (1991) 33–37.

⁴⁵ By I. Pini, in T. Mattern & D. Korol, *Munus: Festschrift für Hans Wiegartz (Scriptorium 2000)* 209–20. See also Chapters 8–9.

and seal-types from the pre-palatial period down to the Temple Repositories, which he saw as marking the end of the Old Palace Period. He duly considered shape, material, motif, composition and decorative syntax and, in so doing, produced an immensely valuable study. Unfortunately, for the pre-palatial period, Yule was hampered by the scarcity of narrowly dated contexts and, in consequence, many of his shape-classes were assigned on stylistic grounds to EM II-MM IA, virtually the entire span of the pre-palatial period. Bone, ivory and 'white piece material' likewise presented Yule with difficulties. Only subsequently were these materials subjected to detailed scrutiny by myself and by Ingo Pini, leading to a firmer grasp of glyptic development in the pre-palatial period (Chapter 4).⁴⁶ Another fine systematic investigation was that undertaken by Artemis Onassoglou (1985) on 'talismanic' seals, which has done much to dispel Kenna's fantasies.⁴⁷ Meanwhile John Younger (initially in collaboration with John Betts) embarked on the huge task of unravelling the complexities of LBA figural seals in hard and soft stone, later extending his investigations to the so-called Middle Phase of Aegean glyptic. While the attribution of seals to specific 'hands' or 'workshops' remains controversial, some of Younger's larger groupings have stood the test of time.⁴⁸ Indeed, drawing on his large Mainland Popular Group and smaller Fluorite Group, Aurelia Dickers has now provided an exhaustive analysis of LB III seals of soft stone from the Greek mainland, which will serve as a major tool for further research.⁴⁹

One of the abiding fascinations with Aegean glyptic lies in the realm of art and iconography. From the late 19th century onwards, scholars have regularly turned to seals and signet rings for insights into Aegean societies and, especially, into cult practices and religious beliefs. Evans, in particular, stressed the links between glyptic and other arts, such as frescoes and stone vases. In the late 20th century our focus on glyptic iconography was sharpened in several ways. First and foremost, systematic coverage in the *CMS* series brought increasing numbers of seals into play, notably those housed in the small Greek museums (Appendix 1). Secondly, a series of symposia hosted by the *CMS* team encouraged specialists to focus on particular aspects of glyptic iconography.⁵⁰ Some scholars have turned their attention to a closer reading of these 'dumb images' through detailed study of recurring motifs, gestures, compositions, and other conventions peculiar to glyptic. Others have chosen a broader canvas, seeking to combine the glyptic evidence with that provided by other media, as a means of elucidating particular practices or beliefs. The rise of themed international conferences has likewise prompted scholars to reconsider how glyptic can shed new light on perennial problems such as ruler iconography or religion. Last, but perhaps not least, new discoveries have continued to fuel interest in glyptic iconography. Twenty years on, it is hard to imagine life without the famous Master Impression from Khania.⁵¹ And a further boost has come from the extraordinary discoveries at Akrotiri on Thera, which continue to augment our repertoire

⁴⁶ See Chapter 4 n. 11 for recent attempts by Sbonias to refine Yule's dating; also J. G. Younger, *Göttingische Gelehrte Anzeigen* 240 (1988) 188-224 (review of *ECS*).

⁴⁷ *DtS*. For 'talismanics' see also Chapters 6 and 9.

⁴⁸ See Attribution Studies below for further discussion and references.

⁴⁹ A. Dickers, *Die spätmykenischen Siegel aus weichem Stein* (Rahden 2001). Cf. Chapters 9-10.

⁵⁰ Published in *CMS Beihefte* 0 (1975), 1 (1981), 3 (1989), 5 (1995) and 6 (2000): see Appendix 1. So many are the articles on glyptic iconography, published in journals, the *CMS Beihefte* and other conference proceedings, that it would be invidious to single out individual contributions here. *CMS Beiheft* 4 (1991) provides bibliography to 1989.

⁵¹ Discovered in 1983: E. Hallager, *The Master Impression*. SIMA 69 (Göteborg 1985).

of frescoes, figural pottery and sealings, with a concomitant impact on all aspects of Aegean iconography.⁵²

Major discoveries in the field during the 1950s and 1960s provided the impetus for entirely new directions in glyptic studies. Excavations at Mycenae and Pylos on the Greek mainland yielded an important array of sealings from the end of the Mycenaean period, while J. L. Caskey's work at Lerna and Ayia Irini on Kea offered crucial evidence for the EBA on the mainland and islands, which up to then had been virtually *tabulae rasae* as far as glyptic was concerned.⁵³ And, by happy coincidence, to plug the MBA gap, Doro Levi discovered a wealth of sealings in 1955 from closed MM II deposits at Phaistos (Chapter 5). These discoveries not only provided us with hundreds of new firmly dated seal-types on which to base glyptic chronology, they also encouraged the first serious attempts to study the lumps of clay for their own sake, to see what they might reveal about means of securing and authenticating goods. The presentation and analysis of the Lerna sealings and, later, the pithos and hearth impressions by Martha Heath (Wiencke) still remain model publications more than forty years after they first appeared.⁵⁴ At much the same time, Enrica Fiandra grappled with the huge quantity of sealings at Phaistos, though sadly her publications are far less easy to use, and the Phaistos deposit is ripe for wholesale re-appraisal.⁵⁵

From the 1980s onwards, Judith Weingarten and Erik Hallager have been instrumental in bringing home the importance of Minoan sealings to Aegean prehistorians, which has chimed well with growing interest in the workings of palatial economies. While Weingarten's articles undoubtedly paint a vivid picture of sealing practices, they must be read with caution, since her methodology is sometimes shaky and, more seriously, her hypotheses often fail to find support in the primary data: these shortcomings are now apparent with the publication of the relevant *CMS* volumes, which present reliable information on nodule types, first-rate photographs, and accurate drawings.⁵⁶ Indeed Hallager's *The Minoan Roundel* (1996) clearly demonstrates the importance of thorough documentation as the basis for functional analysis. Thanks to his exhaustive investigations our understanding of this distinctive Minoan administrative device has been put on a firm footing.⁵⁷ Furthermore, the new scholarly interest in sealing practices is reflected in the prominent coverage they now receive in volumes of the *CMS* series.⁵⁸

⁵² For the most recent discoveries, see: *Ergon* (1999) 77-80, (2000) 88-95, (2001) 72-79. See also: C. Doumas, *The Wall-Paintings of Thera* (Athens 1992); and L. Morgan's classic study: *The Miniature Wall Paintings of Thera* (Cambridge 1988).

⁵³ See Chapters 3 (Lerna and Ayia Irini) and 10 (Mycenae and Pylos).

⁵⁴ *Hesperia* 27 (1958) 81-121; 38 (1969) 500-21; 39 (1970) 94-110.

⁵⁵ *Pepragmena* 2 (Athens 1968) 383-97; *Bolletino d'Arte* (1975) 1-25; also Chapter 5.

⁵⁶ For instance, compare her account of the *Zakro Master* with coverage in *CMS* II.7 (Chapters 6-7). The same objections apply to her articles dealing with the notoriously difficult late sealings at Knossos (Chapter 8). Cf. also Chapter 5 n. 71 for Phaistos.

⁵⁷ See also Chapter 7 and reviews by W. Müller, *Gnomon* 72 (2000) 698-703; and by I. Schoep, *Minos* 31-32 (1996-97) 401-15. Hallager's inclusion of other sealing types prior to their coverage in *CMS* series has one unfortunate consequence: attempting to correlate his system of classification with the new *CMS* typologies often proves difficult and cross-checking the respective data-bases is an onerous task. In earlier chapters I attempted to mesh Hallager's English terms with the new *CMS* typologies, but for detailed research the *CMS* coverage must be accepted as definitive; cf. my reviews of *CMS* II.6 – II.7 in *AJA* 105 (2001) 118-20 and of *CMS* II.8 in *AJA* 108 (2004) 275-79.

⁵⁸ Compare the adequate, if rather cursory, descriptions of the Khania sealings in *CMS* V Suppl. 1A (1992) with the exemplary coverage of the remaining neo-palatial deposits in *CMS* II.6 (1999) and II.7 (1998) and in *CMS* II.8 (2002) for the Knossos sealings. See above n. 57 and Appendix 1.

A major breakthrough, also initiated by the *CMS* team, has been the re-publication of the Mycenae and Pylos sealings as complete artefacts, illustrating the nodules themselves, and inscriptions (if any), alongside fine new drawings of the seal-types.⁵⁹ X-ray photographs and silicone impressions provide crucial insights into how the nodules were fashioned and used, all serving to improve our understanding of the role played by sealings in Mycenaean bureaucracy.

Style and chronology, iconography and most recently administration have, then, been the main preoccupations of glyptic specialists in the later 20th century. To these we must add a clutch of studies relating to seal engraving as a craft, based chiefly on observation, but augmented by practical experiments.⁶⁰ Scientific methods are increasingly being brought to bear on this issue and offer real hopes for future progress. Other topics recently addressed, at least *en passant*, include the non-sphragistic uses of seals and their role as status markers.⁶¹ These too merit further attention. But before we consider some of the prospects and challenges for glyptic studies in the 21st century, two inter-related topics – attribution studies and authenticity – must first be tackled. Both are closely linked to the issue of glyptic style, but have wider ramifications for our understanding of craft and iconography.

ATTRIBUTION STUDIES

The basic aim of attribution studies is to isolate the products of specific workshops or individual craftsmen and, in so doing, to gain a better understanding of stylistic development, refine chronology and chart regional variations. In Aegean glyptic, this approach has been championed largely by John Younger, initially in collaboration with John Betts, later working independently. The results of his studies on LBA glyptic appeared in a series of articles published in *Kadmos* between 1982 and 1989.⁶² Judith Weingarten's account of the so-called *Zakro Master* (1983) belongs to the same genre, though concentrates on the LM I seal-types represented in House A at Zakros.⁶³ Earlier, Evans and Kenna had occasionally identified the work of individual hands, but did not set out an explicit framework or apply it consistently to large groups of material.⁶⁴

What criteria might then be brought to bear in assigning seals to workshops or individual hands? Betts and Younger have suggested that useful pointers lie in material,

⁵⁹ For Pylos: *Tonplomben* (1997); for Mycenae: W. Müller et al., *AA* (1998) 5-55. See also review by C. W. Shelmerdine, *AJA* 103 (1999) 359-60.

⁶⁰ P. Yule, in *CMS Beiheft* 1 (1981) 273-82; J. G. Younger, *Expedition* 23.4 (1981) 31-38; *Minoan Crafts I* 146-71. The studies by L. Gorelick & A. J. Gwinnett on Near Eastern seals, e.g. *Expedition* 20.2 (1978) 38-47; 22.1 (1979) 17-32; 23.2 (1981) 27-34; 23.4 (1981) 15-16, 17-29, must now be re-assessed following Scanning Electron Microscopy at the British Museum: M. Sax et al., *Antiquity* 74 (2000) 380-87. See also Chapters 2, 5.

⁶¹ J. G. Younger, *Kadmos* 16 (1977) 141-59 (non-sphragistic uses; cf. here Chapter 10). J. G. Younger & P. Rehak, in *Administrative Documents* 288-93; R. Laffineur, *Aegaeum* 6 (1990) 117-160; idem, in *CMS Beiheft* 6 (2000) 165-79; A. Karytinou, in *Cemetery – Society* 78-86.

⁶² *Kadmos* 21 (1982) 104-21; 22 (1983) 109-36; 23 (1984) 38-64; 24 (1985) 34-73; 25 (1986) 119-140; 26 (1987) 44-73; 28 (1989) 101-36. Also J. H. Betts, in *CMS Beiheft* 1 (1981) 1-15; J. G. Younger, *ibid.* 263-72; idem, in *CMS Beiheft* 3 (1989) 339-52.

⁶³ See Chapter 6. Her other attempts to isolate 'schools' and hands are even less plausible, e.g. *Kadmos* 27 (1988) 89-114 and in *Pepragmena* 6 (1990) A2, 365-79.

⁶⁴ E.g. *PM* IV 443; V. E. G. Kenna, in N. Himmelmann-Wildschütz & H. Biesantz (eds.), *Festschrift für Friedrich Matz* (Mainz 1962) 4-13.

motif, pose and composition.⁶⁵ Then there is style – that enigmatic and ill-defined quality on which we pin so much. In large measure style is, of course, bound up with technique, as Betts and Younger rightly indicated. But how do we distinguish between the techniques consistently employed by an individual craftsman to depict (say) a couchant bull, the mannerisms shared by engravers in a single workshop, and *Zeitstil* – the broad conventions of a particular period? It goes without saying that difficulties will arise if one tries to compare bulls with lions or lions with goats.⁶⁶ When composition or pose differ – for instance, heads presented frontally rather than in profile – there is further scope for confusion. On which anatomical features should we focus: horns, heads, eyes, muzzles, manes, shoulders, legs, feet, bellies, rumps, or tails? How many points of similarity are needed for an attribution to be secure? Can the expressions used to describe modelling – rich, harsh, smooth – be defined precisely and applied objectively?

It is certainly possible, on occasion, to find seals that are so close in concept and execution that they might have been engraved by a single craftsman.⁶⁷ Two seals made of carnelian from New Hospital Tomb III at Knossos provide a useful example.⁶⁸ The first is a lentoid depicting couchant bulls back-to-back (374). The bull in the foreground has a well-modelled neck and belly, but the separate parts of the body are not well integrated and the shoulder is especially awkward. There is also an unsightly V-shaped element where the back and rump are joined. The legs (only three are shown) seem far too slender to support the animal's bulk and the head is treated in a summary fashion. The eye is a solid dot within a semi-circle, the profile is rendered as a straight line ending in a dot for the nose, and a minute dot marks the mouth. The bull behind is treated very differently: a smooth egg-shaped element for the neck and an elegant tapering facet for the back. The large bull in the foreground has a close mate, in a similar pose, on a gold-capped prism from the same tomb (372c). Here we find the same awkwardness at the shoulder and rump, a similar treatment of head, eye, and mouth, spindly legs with dotted joints and angular hocks. But to our consternation, the second face of the prism bears a smooth-bodied lion with bulbous nose, over-enthusiastic drilling on the joints and back paws, and undisguised wheel-cutting for the mane (372b). So different are the lion and bull that we are forced to wonder whether we are seeing one engraver working in two styles or two engravers working on the same seal!

Here at any rate the two seals come from the same tomb at Knossos, which is dated to LM II. But we cannot be absolutely certain where the seals were made. Although the couchant bull motif has its roots in LM I glyptic, it is especially common on the mainland during LB II-IIIa.⁶⁹ Since seals certainly travelled and motifs were surely copied or adapted in new locations, it can be difficult, if not impossible to localize workshops and production centres (see pp. 327-28). The wide circulation of heirloom seals during LB IIIa-C offers further challenges.⁷⁰ Seals made in a single production centre during the 15th century may have travelled the length and breadth of the Aegean, while seals made by different hands or in different workshops could serendipitously meet up in a new

⁶⁵ Betts (n. 62) 1-15; Betts & Younger, *Kadmos* 21 (1982) 104-21.

⁶⁶ As Betts & Younger (n. 65) also recognized.

⁶⁷ Examples illustrated here include: 331-332 (Chapter 7 n. 47), 486-487 (Chapter 9 n. 77), 553-555 (Chapter 10, pp. 276-77).

⁶⁸ See also Chapter 8. Younger attributes both seals to his 'Group of Bulls from Ayios Ioannes T. 3 (Knossos?, ca. 1475-1450)': *Kadmos* 24 (1985) 66, fig. 7 nos. 69-71; idem, in *CMS Beiheft* 3 (1989) 339-40, 343-44, figs. 1, 8.

⁶⁹ I. Pini, in *CMS Beiheft* 6 (2000) 245-55. See also Chapter 9, pp. 260-62.

⁷⁰ See Chapters 9-10; also O. H. Krzyszkowska, in *Emporia* (forthcoming).



614 Lentoid of blue chalcedony from Pylos-Tragana T. 1. **615** Burnt agate lentoid from 'Crete', purchased by the British Museum in 1874 from Dr Nicolas Petrides (see also **601-603**). Impressions. Scale ca 2:1.

location. The two couchant bull seals (**511-512**) from the Nichoria tholos, in use during LH IIIA2-B, were certainly heirlooms at the time of deposition and cannot be ascribed to the same hand.⁷¹

To make real progress with glyptic style, we need sizeable groups to work with (see below). As it happens, the couchant bull motif is one of the most widespread in the LBA, with around 30 examples divided between Crete and the Greek mainland (Chapter 9). At the opposite end of the spectrum are singletons or pairs, just conceivably experimental pieces or special commissions, more plausibly rare survivors of a larger group, now missing. As an example we may consider two lentoids that depict a curious scene of armed combat. One, made of blue chalcedony, comes from a looted tholos at Tragana in Messenia; the other, of burnt agate, is now in the British Museum (**614-615**). The London seal was purchased from Dr Nicholas Petrides in the 1870s and there is no reason to doubt that it came from the island.⁷² The two seals are close in composition, but not identical. On the London seal the helmeted male is in the centre (**615**), whereas on the Tragana piece he appears upside-down on the right (**614**). If one seal inspired the other, in which direction did it later travel? Or are both based on a now missing original? Sadly, here we can make no progress at all, because no close parallels exist for the pose, dress or style of the figures.⁷³

Younger's earlier articles, which isolated 'Masters and Workshops' of the LBA, relied on criteria that were rarely defined with sufficient rigour. Some characteristics, which he saw as diagnostic traits of specific craftsmen, are little more than aspects of a broad

⁷¹ Pini (n. 69) 253 suggests that these examples could have been engraved as late as LB IIIA1. See also Chapter 9. Younger assigned *CMS* V no. 434 (here **512**) to his 'Tethered Bull Group' and V no. 433 (here **511**) to his 'Bulls from Ayios Ioannes T. 3', both of which he localizes at Knossos ca 1475-1450: *Kadmos* 24 (1985) 58, 66, fig. 7 no. 66.

⁷² Pace I. Pini, in *CMS Beiheft* 3 (1989) 205-06, where he doubts the Cretan provenance of the London seal and sees both pieces as LH I / II. See above for other Petrides seals and Krzyszkowska (n. 2) 141 n. 41 for Minoan jewellery bought from him. **614** is erroneously described as amethyst in *CMS* I no. 263.

⁷³ The comparanda adduced by Younger in his 'Tragana Duellist Group' are linked by little more than subject matter: *Kadmos* 24 (1985) 63-64. *CMS* II.6 no. 15, V no. 643, VII no. 129 (here **601**) and XII no. 292 depict armed combats; his inclusion of the large *Potnia* seal *CMS* II.3 no. 63 (here **373**) is frankly inexplicable, as is a smaller *Potnia* flanked by birds (*CMS* IX no. 154). For the two cylinders *CMS* I nos. 284-285, see Chapter 10 n. 123.

Zeitstil. A prime example would be his ‘Mycenae-Vapheio Lion Master’, whose fictitious career lasted from ca 1530–1480 BC, beginning in eastern Crete and culminating on the Greek mainland. Ascribed to his early phase were seal-types from Zakros and seals from Mycenae and Vapheio; the gold cushions, ivory sword pommel and niello daggers from Grave Circle A were seen as his later works.⁷⁴ While it is perfectly possible that seal engravers also worked in other media, the features which link these examples are minimal and, at best, reflect common trends in LB I figural art.

Half-way through his survey, Younger abandoned the terms ‘Masters and Workshops’ in favour of more neutral ‘Stylistic Groups’.⁷⁵ His methodology, however, remained largely unchanged and was extended to his so-called Middle Phase of Aegean glyptic (ca 1700–1550 BC). Although no systematic refutation of Younger’s attribution studies has been published, his general approach and certain specific criteria have been challenged in print by members of the *CMS* team. For instance, they have shown that Younger sometimes did not adhere to his own definitions when attributing seals to his large ‘Spectacle Eye’ group of the 14th century BC.⁷⁶ Perhaps he was led astray by published photographs and drawings; for a clear verdict on style, close scrutiny of impressions under the microscope is a *sine qua non*. Nevertheless, the prominent drill-work found on Younger’s ‘Speckies’ can indeed be considered as a broad *Zeitstil* in LM II-III Crete (see Chapter 8). Whether the style spread to the mainland or is merely represented there by travelling seals remains an open question.

Also worthy of special mention is Younger’s work on LBA soft stone seals. With Betts, he greatly helped to dispel the myth that such Cretan products were invariably decadent or post-palatial, but instead had many convincing examples among stratified LM I seals.⁷⁷ This keen observation has been further bolstered by the recent publication of neo-palatial sealings in the *CMS* series and new discoveries. That said, the ‘Cretan Popular Group’, as defined, is cumbersome on two counts. First, examples cover an overly long time-span, i.e. LM I-III, during which clear stylistic developments can be discerned (see p. 329). Secondly, the ‘group’ includes (a trifle perversely) certain seals made of hard stone.⁷⁸ By contrast Younger’s Mainland Popular Group, involving mostly steatite seals produced during LH IIIA2-B, is much more coherent. The recent re-analysis published by Dickers largely confirms his broad grouping and has also made some progress in identifying clusters with shared stylistic features.⁷⁹

The difficulties of identifying the location of hypothetical workshops or production centres are highlighted by Younger’s large ‘Island Sanctuaries Group’ and the associated ‘Rhodian Hunt Group’ of the 14th century.⁸⁰ As defined, the groups portray animals with elongated forms, stick-like legs, and limited use of the solid drill to indicate eyes, noses and joints. The poses are described as ‘mannered’ and ‘artificially graceful’. These features can indeed be recognized in many 14th century seals, which are commonly held

⁷⁴ *Kadmos* 23 (1984) 46-56; cf. 24 (1985) 49. Members of his ‘workshop’ were also seen as producing mould-made glass seals: in truth these were not made before LB IIIA1 (Chapters 8-9).

⁷⁵ *Kadmos* 24 (1985) 48-50.

⁷⁶ W. Müller, in *CMS Beiheft* 6 (2000) 186-88; cf. also Chapter 8. See also remarks by I. Pini, in *Tonplomben* 85-91 and in *CMS Beiheft* 6 (2000) 239-44.

⁷⁷ *Kadmos* 22 (1983) 117-19, 123-27. See also Chapters 6, 8.

⁷⁸ E.g. among his ‘Cretan Popular Women’ is *CMS* VII no. 134 (3) of green jasper, while his CP Deer include *CMS* I no. 13 and II.3 no. 74, both of amethyst. For lists: *Kadmos* 22 (1983) 123-27.

⁷⁹ Dickers (n. 49). See also my review in *AJA* 106 (2002) 483-84 and Chapters 9-10.

⁸⁰ *Kadmos* 26 (1987) 61-64 (with earlier references). Note that Younger’s attempt to ascribe *CMS* VII nos. 111, 160, 176 to Rhodes is demonstrably false: cf. Krzyszkowska (n. 2) 159 n. 33.

to represent the latest output in hard stone.⁸¹ Some are found in the islands and even in island sanctuaries, but there is nothing to support the notion that they were made in the Cyclades by itinerant craftsmen (Chapter 10). In fact, examples are widely distributed throughout the mainland, the islands and Crete; their presence in LH IIIC contexts (e.g. Perati and Phylakopi) is consonant with the circulation of heirloom seals during LB III.⁸² As for the ‘Rhodian Hunt Group’ – only one example was found on the island itself! Others are attested on Crete and the mainland. Yet building on this group, other scholars have gone on to place the production of Cypro-Aegean cylinders on Rhodes also.⁸³ For this not a scrap of evidence exists.

In truth without actual workshop material – rough-outs, mistakes, rejects, partly worked seals and finished products – from secure archaeological contexts, our prospects of localizing ‘stylistic workshops’ seem remote. For LB II-III we have barely a handful of unfinished seals and these are little more than stray finds. For LM IA the Poros workshop may yield further insights, especially on the links between seal and bead production, but seemingly adds little on stylistic issues.⁸⁴ By contrast the *Atelier des sceaux* at Mallia has transformed our picture of MM II steatite prisms and related seals. Thus, we now recognize that the large ‘Malia Workshop Complex’, as defined by Paul Yule,⁸⁵ encompasses many seals not produced in the Atelier. With reasonable certainty those found in the Atelier can be attributed to a single artisan, but other prisms found elsewhere at Mallia itself and further afield display different stylistic traits. Thus we can now posit a broad *Zeitstil* – dubbed by Jean-Claude Poursat ‘le style de Mallia’ – current in a series of workshops, of which the Atelier is but one (Chapter 5). While further research may lead to a better grasp of ‘local’ variations, patterns of distribution alone are insufficient grounds for isolating workshops or production centres. And sadly, the same applies to pre-palatial Crete, where patchy rates of survival and retrieval conspire against us. At best we can observe that certain reasonably well-defined groups – such as the parading lions / spirals or ‘white pieces’ – apparently cluster in particular areas of the Mesara and the adjacent Asterousia Mountains (Chapter 4). But the *precise* location of the ‘workshops’ remains speculative at best.⁸⁶

If, at first sight, the aims of attribution studies seem laudable enough – and who would deny we need a better grasp of glyptic chronology and style – their practical application leaves much to be desired. For the LBA Aegean we have around 6000 seals and seal-types to consider, produced in an unknown number of centres on Crete and the mainland, with output spanning roughly 200-250 years. The ‘talismantics’, accounting for nearly 1000 examples, constitute what is arguably the largest and most coherent group from the entire Aegean Bronze Age, yet offers virtually no scope for stylistic analysis. We cannot

⁸¹ Pini concurs, though dates them a trifle earlier than Younger: *Tonplomben* 86.

⁸² See I. Pini, in *CMS V Suppl.* 3 pp. 28-29 for new examples and brief comments.

⁸³ J. Weingarten, in *Minotaur – Centaur* 79-86; J. Aruz, in A. Caubet (ed.), *De Chypre à la Bactriane, les sceaux du Proche-Orient ancien* (Paris 1997) 269-88. See Krzyszkowska n. 70 and Chapter 10.

⁸⁴ For the workshop generally: N. Dimopoulou, in *TEXNH* 436-37; eadem, in *CMS Beiheft* 6 (2000) 27-38 for selected unfinished seals.

⁸⁵ *ECS* 212-13. See Chapter 5 for further discussion and references.

⁸⁶ E.g. ‘Mesara / Asterousia / Moni Odigitria’, is suggested by Pini *apropos* the ‘white pieces’ (*Pepramena* 6 [1990] A2, 126; *Crete – Egypt Studies* 111). Their greatest ‘concentration’ – *thought* to come from plundered tholoi at Moni Odigitria – occurs in the Mitsotakis Collection, Khania (*CMS V Suppl.* 1A p. xxi). See also K. Sbonias, in *CMS Beiheft* 6 (2000) 277-93 with references to his more detailed account in *FkS*.

even determine, with certainty, whether any ‘talismatics’ found on the mainland, were actually made there (Chapter 9). Seals with ornamental motifs are similarly unreceptive to stylistic analysis and many figural soft stone seals are simply too abraded to evaluate. As for the impressions on clay sealings, some are imperfectly made, others are too incomplete for any sensible judgement. And so, the total number of motifs available for analysis is swiftly reduced. Furthermore, estimates place our extant repertoire at *no more than 3–5%* of the original output and there is no guarantee we are dealing with a representative sample.⁸⁷ By contrast, the student of Attic Black Figure and Red Figure vases has well in excess of 50,000 examples to work from – the output of a single *polis* over some 200–250 years. Some potters and painters helpfully signed their vases, sometimes inscriptions refer to known Athenian favourites. More to the point, the vases themselves are of sufficient size and bear sufficient detail to permit attributions to individual hands. Sadly Aegean seals do not.⁸⁸

If our extant corpus is arguably too slight and the seals themselves present well nigh insuperable hurdles, is there any hope for attribution studies in Aegean glyptic? The short answer is probably not. Indeed one might legitimately question any attempt to isolate ‘masters’ in a prehistoric culture. To refine our understanding of glyptic style and chronology is, however, inherently desirable. In this respect, the contributions made by Betts and Younger in highlighting major stylistic trends must be acknowledged. And several recent studies by the *CMS* team have offered a step forward.⁸⁹ They have assembled groups of soft stone seals bearing similar motifs – goats, bulls, lions – and have attempted to isolate diagnostic features on well-dated examples. As a result the distinctions between LM I-II and LM II-III output are becoming a trifle clearer. More recently, they have focused on hard stone seals, concentrating on two popular LBA themes, the couchant bulls and Master of Animals. Their painstaking analyses, carried out with the full benefit of the *CMS* Archive, reveal useful pointers for stylistic development and dating. But even their attempts are halting and imperfect; one cannot help feeling that progress will be painfully slow for the foreseeable future.

AUTHENTICITY

Although the number of seals from excavated contexts grows by the year, they are still outnumbered by pieces which lack a secure provenance.⁹⁰ Many entered private collections in the 19th or early 20th centuries and passed into the museums of western Europe or North America (see above). The large collections formed on Crete by Dr Stylianos Giamalakis (1899–1962) and Nicholas Metaxas (1915–) were donated to the Herakleion Museum and, in 2000, the collection established by Konstantinos and Marika

⁸⁷ Indeed new discoveries, e.g. presented in *CMS* V Suppl. 3 (2004), suggest we are not.

⁸⁸ Pace J. F. Cherry, in *EIKQN* 135. Cf. *GGFR*² 16. Working with a relatively large and readily definable group (the Cut Style) Pini was able to isolate no more than one or two instances where a pair of seals could conceivably be attributed to a single hand and these shed no light at all on possible production centres (see Chapter 9).

⁸⁹ Soft stone: W. Müller, in *CMS* Beiheft 5 (1995) 151–67; I. Pini, *ibid.* 193–207. Hard stone: W. Müller, in *CMS* Beiheft 6 (2000) 181–94 (Master of Animals); I. Pini, *ibid.* 239–44 (value of *Bildthema* generally), 245–55 (couchant bulls).

⁹⁰ At a rough estimate just over half of the surviving repertoire does not come from a secure excavated context. These include stray finds from known locales, seals with a vague or presumed provenance (e.g. ‘Crete’, ‘Mycenae’, ‘Athens’) acquired by early collectors, and others for which no information on origin survives.

Mitsotakis was given to the Khania Museum.⁹¹ Another sizeable collection, built up by H. and M.-L. Erlenmeyer in Basel, was sold in 1989 and the seals have been dispersed throughout public and private collections across the world.⁹² To exclude all of these lost souls from our study of Aegean glyptic would be foolhardy indeed. And stray finds of more recent date are also regularly accessioned by Greek museums large and small. Moreover, the dispersal of seals during the LBA means that many excavated seals are far removed from their original homes (Chapter 10).

When a seal or signet ring lacks a secure provenance *and* displays unusual or unexpected features, doubts as to its authenticity may arise. But passing judgement on unusual pieces should not be undertaken lightly and, insofar as possible, objective criteria must be brought to bear on the problem. Material, shape and technique can sometimes offer clues, more often we have to fall back on an assessment of motif, composition and style. It goes without saying that questions of authenticity are best left to glyptic specialists, who have the requisite knowledge of the repertoire and expertise to make judgements. But our knowledge of Aegean glyptic is ever changing and what one generation might reject outright as a forgery or consign to the limbo of doubtful pieces, the next generation will rehabilitate.⁹³ And even today experts are fallible. The specialist participants at a symposium hosted by the *CMS* in 1985 notoriously condemned the gold ring shown in 492 as a fake, until they were told it came to light in the controlled excavation of CT 7 at Aidonia near Nemea (see Chapter 9).

Singletons inevitably create the most difficulties, but sometimes we can isolate a group of seals which apparently came from the same (modern) workshop or hand. One such group, studied by John Betts, seems to have been produced in the early 20th century by an engraver working in hard stone, with a penchant for pseudo-amygdaloids.⁹⁴ Some approximate the shape of genuine LBA seals, but others are oval or even egg-shaped. The forger was fond of animal attacks and suckling scenes, and these show some familiarity with the LBA repertoire (e.g. 616). But his style seems to draw on features of Classical or Greco-Persian gems and he also introduced idiosyncrasies of his own: camel-like muzzles, cloven hooves, and smooth sausage-like bodies. Taken together, these features today seem so 'wrong' that we marvel at how collectors (and the dealers who originally handled these pieces) were ever taken in.

Materials can also help us judge authenticity, as recent work on bone and ivory demonstrates. Before 1986 it was generally assumed that pre-palatial 'ivory' seals were made of elephant tusk. In reality, only hippopotamus ivory reached the island during the

⁹¹ *CMS* III covering the Giamalakis Collection is currently in preparation, meanwhile see *CM*; *CMS* IV covers the Metaxas Collection. Most of the Mitsotakis seals are included in *CMS* V Suppl. 1A nos. 206-344, with further examples in V Suppl. 3 nos. 120-155.

⁹² The Erlenmeyer seals appear in *CMS* X nos. 3-210. For the sale, see: Christie's London, 'The Erlenmeyer Collection of Cretan Seals. Monday 5 June 1989 at 2.30 p.m.' Only limited information exists in the *CMS* Archive as to the present whereabouts of seals: some were purchased by the Ashmolean Museum; certain 'left-overs' from the original sale were bought by the Fitzwilliam Museum, Cambridge, in 2001.

⁹³ Attitudes as to how or whether *dubitandae* should be included in *CMS* volumes have changed over the years. For instance, in *CMS* IV, IX, XII-XIII they were included, but numbered separately and designated 'D'. *Dubitandae* were excluded altogether from *CMS* VII-VIII. In *CMS* X, seals that gave cause for doubt are simply marked with an asterisk. Some *dubitandae* were included in *CMS* XI, the commentary indicating that they are probably or certainly modern; the same applies to certain Mitsotakis seals in *CMS* V Suppl. 1A (e.g. nos. 290-291) and V Suppl. 3 (e.g. nos. 130-131, 134). For *CS* see Hughes-Brock (n. 42).

⁹⁴ J. H. Betts, in *CMS* Beiheft 1 (1981) 17-35 (the 'Sangiorgi Group').



Selected forgeries. **616** Pseudo-amygdaloid attributed to the Sangiorgi Master. Impression. **617-618** Cushion and amygdaloid with battered back from the 'Thisbe Treasure'. **619** Gold ring in the Herakleion Museum. **620a-b** 'Ivory half-cylinder' (in reality a plano-convex plaque of bone) which allegedly surfaced in the 1903 season at Knossos. **620** shown at 1:1 the remainder at 3:2.

pre-palatial period and many seals published as 'ivory' are actually made of bone or boar's tusk (Chapter 4). Since material and shape are inextricably linked, firm criteria were available for assessing unprovenanced seals and these were duly applied to examples in the Mitsotakis Collection. The *CMS* team and I agreed that it was highly improbable that forgers working prior to 1988 (when my initial findings were published) could have selected the correct materials so consistently.⁹⁵ By contrast, a number of seals bought by the Ashmolean Museum in 1968–70 as 'pre-palatial' have spectacularly failed

⁹⁵ O. H. Krzyszkowska, *BSA* 83 (1988) 215-16; eadem, in *CMS Beiheft* 3 (1989) 111-26; *Ivory Guide* 7, 38-47, 76-78, fig. 28, pl. 10; cf. I. Pini, in *CMS V Suppl.* 1A p. xviii, xx-xxi.

these tests. Pieces by the same forger were purchased by Boston, more cropped up in Herakleion and Salonika.⁹⁶ Material and shape also offer important insights into the unique 'ivory' half-cylinder in the Ashmolean Museum (**620a-b**). The piece apparently surfaced during the 1903 season at Knossos and was widely illustrated by Evans and other authors. Kenna, however, relegated it to his *dubitandae* in *Cretan Seals* (1960) and condemned the piece again in 1968, following Margaret Gill's attempt to defend it.⁹⁷ In truth, it is a re-worked plano-convex inlay of bone, for which good parallels exist from Evans's excavations; it seems likely that the piece was planted.⁹⁸

As Kenna rightly observed, the nuptial scene on the half-cylinder owes more to *The Golden Bough* than to Aegean iconography and this is also true of many pieces in the infamous 'Thisbe Treasure', allegedly acquired near Thebes in Boeotia. First published by Evans in 1925 and vigorously defended by him in later volumes of *The Palace of Minos*,⁹⁹ the gold cushions, amygdaloids and rings are replete with anachronistic motifs drawn from Classical mythology, such as Oedipus and the sphinx shown in **618**. The battered rear lends an air of spurious authenticity. And while the bull-game on the gold cushion (**617**) is at any rate an Aegean motif, the double sacral knot in the field seems to be misunderstood.¹⁰⁰ An even more unhappy mix of fantasy and misunderstood elements borrowed from genuine pieces mar the two signet rings in the Treasure. Although we might rush to condemn Evans for his gullibility in acquiring such a hotpotch, the 13 gold gems were acquired with perfectly authentic Mycenaean jewellery.

Evans and his contemporaries were, of course, alert to the possibility that fakes might be insinuated into groups of genuine material. Fascinating insights are offered by a letter from A. J. B. Wace to Evans, discussing the Tiryns Treasure, which comprised material of Geometric date, as well as two gold signet rings.¹⁰¹ The great ring (**457**) was singled out for special condemnation. Wace comments on its 'bad style & vulgarity' and believed the sun and moon had been borrowed from the Mycenae 'Great Goddess' ring (**465**). He was relieved that Evans too denounced it and suggested that the ring was a plant, perhaps fabricated by 'Christodoulou the well known maker of coins'. But these initial doubts seem to have dissipated and both scholars later accepted the ring as genuine. Unknown to them (or to any potential forger) is the fact that the footstool under the feet of the

⁹⁶ H. Hughes-Brock, *CMS Beiheft* 3 (1989) 84-86, fig. 1 (middle and lower rows).

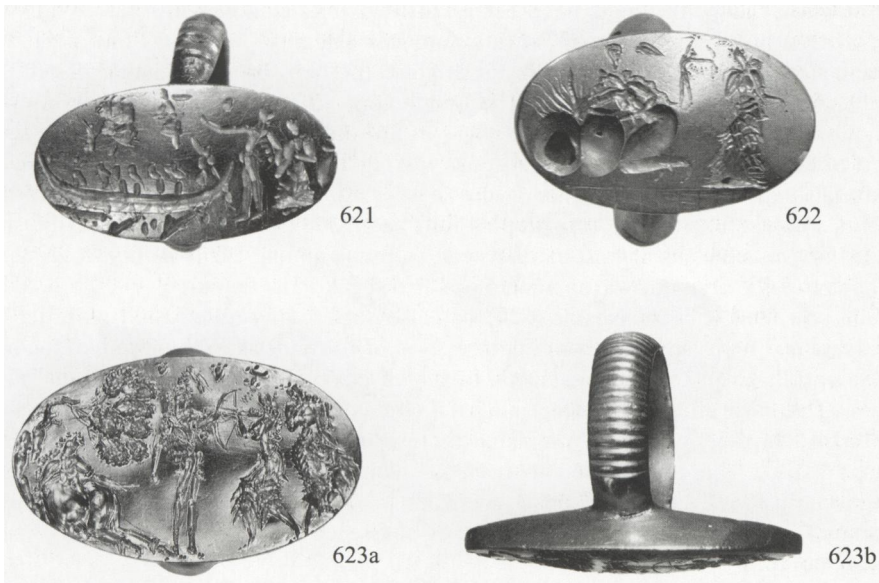
⁹⁷ *CS* pl. 20; M. A. V. Gill, *Kadmos* 6 (1967) 114-18 (see p. 117 for Mackenzie's 1903 daybook of work in the N. W. Area, probably referring to this piece); V. E. G. Kenna, *Kadmos* 7 (1968) 175-176. See also Hughes-Brock (n. 96) 84.

⁹⁸ For unpublished inlays in the Stratigraphical Museum, Knossos, Box 1878 (Evans Unknown Provenance): see O. H. Krzyszkowska, 'The bone and ivory industries of the Aegean Bronze Age' (Unpublished PhD, Bristol 1981) II 363-64, III pl. 3a. Whether Evans rewarded his workmen for special finds is not clear. At Gournia, seals (and only seals) attracted a bounty of 5 francs each: M. Allsebrook, *Born to Rebel: The Life of Harriet Boyd Hawes* (Oxford 1992) 104.

⁹⁹ A. J. Evans, *JHS* 45 (1925) 1-42; *PM* IV 515-17 (authenticity); cf. *PM Index* for further references. Condemned as forgeries almost at once, e.g. by M. P. Nilsson, *The Minoan-Mycenaean Religion* (Lund 1927) 304 n. 5; cf. *MMR*² 40-42. See also *CS* 154, pl. 21.

¹⁰⁰ Moreover, the faces of the cushions are flat, a feature otherwise unparalleled on genuine LBA examples made of gold. Yet the engraver clearly had some knowledge of technical features, e.g. that gold cushions, amygdaloids and rings should be hollow. Betts (n. 94) 32-34 attributes them to the 'Sangiorgi Group' forger: this seems doubtful.

¹⁰¹ Now in the Evans Archive, Ashmolean Museum: written from the British Legation, Athens, May 2nd 1918. I cordially thank Elizabeth French for help in deciphering her father's handwriting. For the Tiryns Treasure, see G. Karo, *AM* 55 (1930) 119-40.



Two rings in Oxford (**621-622**) and one in Berlin (**623**) were previously regarded as forgeries, but have now been rehabilitated on technical and stylistic grounds. All have hollow bezels and hoops with simple transverse ribbing typical of LM I signet rings. Scale ca 2:1.

‘goddess’ is identical to the Linear B ideogram used on the furniture tablets at Pylos, where tables, chairs and footstools are listed.¹⁰²

Most if not all gold rings lacking a secure provenance have come under suspicion at one time or another.¹⁰³ Some can be rehabilitated on grounds of iconography, since they correctly incorporate details which no forger could have known in the early 20th century. Increasingly, we can use technical details to lend weight to our observations. A pair of rings – one in Oxford, the other in Berlin – was condemned by H.-G. Buchholz, who thought they came from the same (modern) workshop, not least because both had hollow bezels (**622-623**).¹⁰⁴ In fact, we now realize that hollow bezels were the norm in the LBA and, moreover, the Oxford and Berlin rings both have simple hoops with transverse ribbing, typical of LM I signets (Chapter 6). Another ring in Oxford, once in Evans’s possession, displays similar features, yet was unaccountably consigned to limbo by Kenna (**621**).¹⁰⁵ An even more objective means of evaluating signet rings is now offered by ultra-sound and X-ray photography. These techniques, applied to the ring shown in **619**, reveal methods of construction wholly unparalleled in genuine LBA rings, thus neatly confirming earlier doubts concerning the composition and use of space.¹⁰⁶

¹⁰² *Docs*² 332-33.

¹⁰³ For the Danicourt Ring in Péronne (*CMS* XI no. 272, here **497**) see Chapter 9 n. 50.

¹⁰⁴ See I. Pini, *CMS* Beiheft 1 (1981) 145-49 (with references). Cf. C. Sourvinou-Inwood, *Kadmos* 10 (1971) 60-69.

¹⁰⁵ *CS* pl. 20 (1938.1129). Cf. *PM* II 250, fig. 147b; IV 953-95, fig. 923. Evans states it was originally ‘acquired by an archaeological traveller in 1927’ near Candia.

¹⁰⁶ Cf. also *CMS* I no. 514: W. Müller, in 4th *International Conference Non-Destructive Testing of Works of Art*. Deutsche Gesellschaft für Zerstörungsfreie Prüfung e.V., *Berichtsband* 45.1 (1994) 706-07. C. Sourvinou-Inwood, *JHS* 110 (1990) 192-98.

Sometimes authentic rings have been tainted by association with 'bad' material. The Ashmolean bull-leaping ring (379) falls into this category, for it was first illustrated by Evans alongside a poor forgery 'from Smyrna' (perhaps by the Thisbe 'master') in his article on the Thisbe Treasure.¹⁰⁷ The Ashmolean ring suffered a further blow when scholars realized that an identical ring was in St Louis, Missouri.¹⁰⁸ In fact, this seems to be a gold-plated electrotype and not a gold ring as initially claimed. The style of the Oxford ring was also questioned, since it seemed far removed from the bull-leaping scenes known from LM I ring impressions (e.g. 368-369). In fact, the criticisms are unjust, inasmuch as its nearest parallels can be found among LB II-III bull-leaping scenes (Chapters 8-9). Construction and condition also speak in its favour.

The so-called Ring of Nestor (624) has also suffered by association with the Thisbe Treasure and by Evans's fanciful interpretation of its motif as a 'glimpse into the Minoan after-world'. Even the circumstances of its 'discovery' have an air of unreality about them. The ring allegedly surfaced at Kakovatos in the western Peloponnese, where Wilhelm Dörpfeld excavated plundered tholos tombs in 1906-07. After the peasant who found it died, the ring passed to his son, who in turn 'ceded it to the owner of a neighbouring vineyard'.¹⁰⁹ Evans states that in order to secure it, he made a special journey to that 'somewhat inaccessible part of Greece'. When this supposedly happened we are not told.

Doubts as to its authenticity seem to have arisen swiftly. M. P. Nilsson, writing in 1927, expressed reservations as to whether the symbolism was really Minoan, but stopped short of condemning it outright. Later he concluded that it had been made by someone who 'knew not a little of things Minoan and Greek and had a lively imagination which sometimes led him astray'.¹¹⁰ The (living) lion enthroned on a sacrificial offering table, supported by small human figures, struck him as a fundamental misunderstanding of Aegean iconography. Equally bizarre is the griffin perched on a two-legged table, surrounded by the worshippers of its 'court'. In attempting to rehabilitate the ring, some scholars have tried to identify details of iconography or technique which no forger working in the early 20th century could have known. None of the arguments so far offered is wholly compelling.¹¹¹ And further qualms are introduced by the fact that the ring was initially offered to the National Museum in Athens – a point never mentioned by Evans – and was duly rejected as a forgery by Georg Karo and a committee of foreign experts.¹¹²

¹⁰⁷ Evans (n. 99) 6 figs. 4-5. The 'Smyrna' ring was once in Evan's own collection (cf. *PM* I 431 n. 2, fig. 310a); its present whereabouts are unknown.

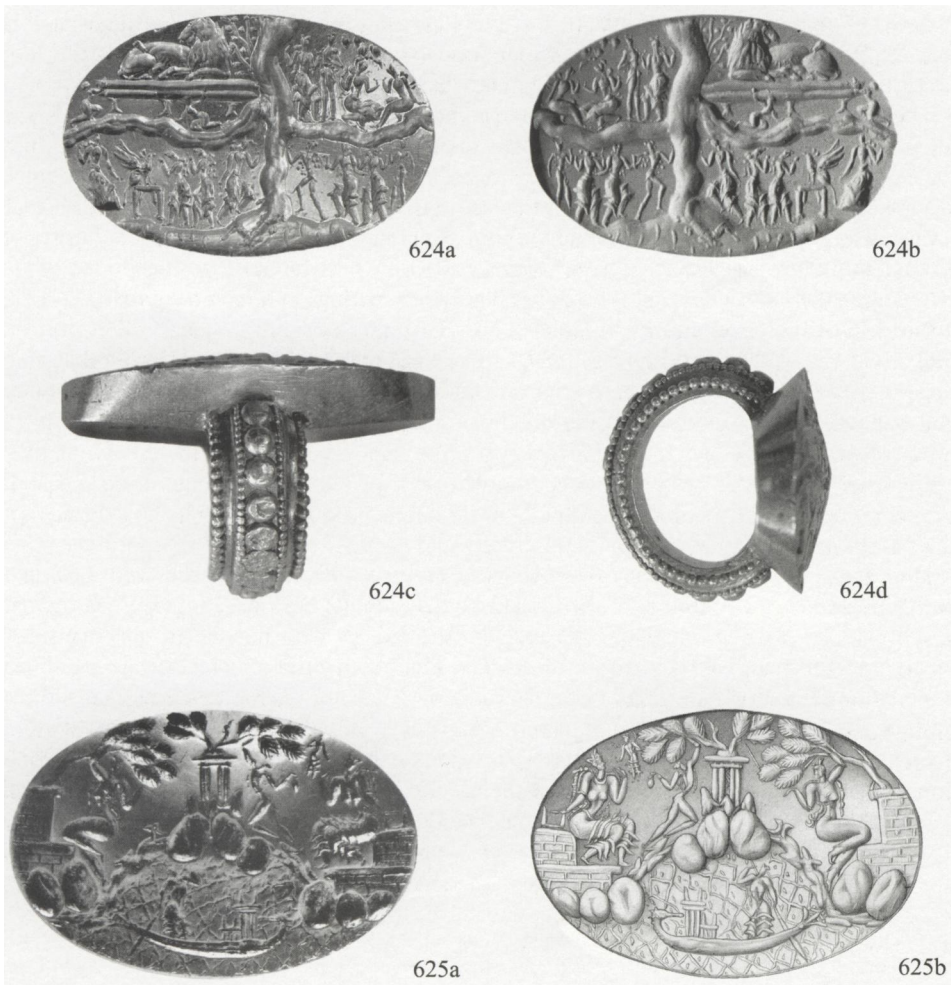
¹⁰⁸ J. G. Younger, *Kadmos* 24 (1985) 56. The Missouri ring was bought from Jacob Hirsch and published as an original by T. T. Hoopes, *Bulletin of the City Art Museum of St. Louis* 32 (1947) 99-103; subsequently included as an original in *A Land Called Crete* (Smith College Exhibition Catalogue 1967) no. 53.

¹⁰⁹ Evans (n. 99) 43-74; *PM* II 482, fig. 289; *PM* III 145-57, figs. 94-95, 104, pl. XXA. Cf. *PM Index* for further references.

¹¹⁰ *MMR*² 43-50, esp. 49-50; cf. Nilsson (n. 99) 549ff, esp. 551-52 and 554.

¹¹¹ The most recent attempt to rehabilitate the ring is by I. Pini, *OJA* 17 (1998) 1-13 (with earlier literature). He rightly observes that the ring has suffered from poor illustrations, especially the colour rendering (as if a miniature fresco) by Gilliéron *filis*. Ultra-sound tests by W. Müller revealed that the ring is not massive (as often claimed) but hollow, as normal for genuine LBA rings. Unfortunately, X-ray photographs, which can provide important information on ring construction, were not taken (cf. above n. 106).

¹¹² G. Karo, *Greifen am Thron. Erinnerung an Knossos* (Baden-Baden 1959) 111. Cf. R. Hägg, in *Kolloquium zur Ägäischen Vorgeschichte* (Mannheim 20.-22.2.1986). *Schriften des Deutschen Archäologen-Verbandes* 9 (Mannheim 1987) 57 (summary).



624a-d The 'Ring of Nestor': face, impression and profiles. **625** The 'Ring of Minos': **a)** face of an electrotype made for Evans; **b)** drawing based on the cast made when the ring originally surfaced. Scholarly opinion remains divided over the authenticity of these famous rings. The elaborate multi-figured scene on the 'Ring of Nestor' raises suspicions, although the technique of construction matches that on rings from excavated contexts (note the battered semi-globules on the hoop). Until recently, the 'Ring of Minos' was difficult to judge, since the original mysteriously vanished soon after it was discovered. The original ring has now re-surfaced and has been displayed in the Herakleion Museum since 2002. Scale ca 3:2.

There are also unsubstantiated reports that Evans's restorer, Émile Gilliéron *fils*, had boasted of making the ring himself. Certainly, he and his father (Émile Gilliéron *père*) had the necessary skill to make legitimate copies and ample inspiration from the large collections in Athens and Herakleion to make the occasional pastiche.¹¹³

The so-called Ring of Minos (**625**) has an even more tortured history.¹¹⁴ It was allegedly found in 1928 by a boy who was taking lunch to his father in a vineyard, near the spot where the Temple Tomb was later discovered. Initially sold to a resident of Knossos, it was later acquired by the priest from nearby Fortetsa, who tried to sell it on to Evans. The price demanded was evidently too high and the ring was offered in turn to the Herakleion Museum. Rejected as a forgery, the ring was returned to the priest, whose wife supposedly buried it and then duly forgot the location! While in the museum, a cast was made of the bezel and Evans relates how he himself commissioned Gilliéron *fils* to make two electrotypes of the ring. In 1942 Axel Persson trenchantly observed that all of the principal elements were derived from known signet rings, i.e. those from Isopata, Kalyvia and Vapheio, while the curious boat scene seems to have been inspired by the now lost ring from Mochlos.¹¹⁵ Moreover, like the Nestor ring, the involvement of Gilliéron *fils* in its forgery has been mooted. In 1987, however, Ingo Pini and Peter Warren independently published articles in its defence, though without the original ring their arguments rested largely on iconography and style.¹¹⁶ Now, in an extraordinary twist to the tale, the original Ring of Minos seems to have re-surfaced and has been authenticated by a committee of the Greek Archaeological Service. Press reports indicate that it had been valued at €400,000 and that the citizen who handed in the ring would receive an (unspecified) reward.¹¹⁷ In 2002 it was given pride-of-place in an exhibition devoted to Minoan signet rings in the Herakleion Museum. So far it seems that the ring has not been subjected to ultra-sound and X-ray analysis, which could help to establish its ancient (or modern) origin. In other words, we may now have the original Ring of Minos once again, but is it truly an original of the second millennium BC? Unless and until this can be established, it might be wiser to exclude it (and the Ring of Nestor) from our discussions of Aegean iconography. Yet our scepticism must always be tempered by the

¹¹³ For the activities of the Gilliérons, see K. Lapatin, *Mysteries of the Snake Goddess* (Boston & New York 2002) 120-39. Curiously, in *An Illustrative Selection of Greek and Greco-Roman Gems* (Oxford 1938) 3-4 fig. 3, no. 9, Evans includes what he describes as a 'replica' of the Ring of Nestor, 'the original of which, a massive gold signet, was found in the larger beehive tomb, Pylos (Kakovatos)'. He further states: 'One of two electrotypes of original, executed for A. E.' Was this merely the slip of an elderly man or a further attempt to muddy the waters? Unlike the Ring of Minos (see below), no additional Ring(s) of Nestor can be now be traced.

¹¹⁴ *PM* IV 947-59.

¹¹⁵ A. W. Persson, *The Religion of Greece in Prehistoric Times* (Berkeley & Los Angeles 1942) 101-04. Nilsson (*MMR*² 42-43) concurred with these objections.

¹¹⁶ I. Pini, in *Ευλαπίνη. Τόμος τιμητικός για τον Καθηγητή Νικολάο Πλάτωνα* (Herakleion 1987) 441-55; P. M. Warren, *ibid.* 485-500; also I. Pini, *AA* (1989) 1-4. Two copies exist in the Ashmolean Museum: 1938.1110 (here **625a**) is an electrotype (i.e. copying all features, including the hoop decoration exactly); AE 585 is a much cruder version (especially as regards hoop and finger-bed). In his 1938 catalogue (n. 113) 4-5, fig. 4 no. 10, Evans states that the illustrated replica is an 'electrotype executed by Monsieur Gilliéron (with another) when the ring was temporarily in the hands of A. E.'. Is he referring to electrotype 1938.1110 plus copy AE 585 (= *op. cit.* fig. 4), or is there another (electrotype) still at large? The drawing **625b** is based on the cast taken by the Herakleion Museum when ring first surfaced.

¹¹⁷ See e.g. T. T. Cevoli, *Archeo* 18 / 9 (211) September 2002, 32-33; Cf. *AR* 48 (2001-02) 1 and cover illustration (in both the image is reversed).

knowledge that the extant repertoire includes many motifs that are wholly unparalleled, while others simply seem ‘too good to be true’, combining familiar elements in unfamiliar ways. This would surely be our reaction had the original ring responsible for the Master Impression (247) come to light in suspicious circumstances.

SOME CHALLENGES FOR THE FUTURE

As observed at the outset, until now there has been no easy way for a student or, for that matter, for a senior Aegean prehistorian to gain a good working knowledge of Aegean glyptic. If the present volume serves any purpose at all, I hope it will provide a basic grounding and encourage future research in the field. For notwithstanding its size, this book is no more than an introduction, treating some topics in a cursory fashion, ignoring others almost entirely. There are, naturally, many dangers in attempting to present a broad overview or general synthesis. First and foremost, new discoveries or research methods may render one’s work *passé*, almost before the ink has dried.¹¹⁸ But this is a risk all authors must face. The second pitfall is perhaps more sinister, namely, that readers will assume that a subject has been worked over so thoroughly that little scope remains for further investigation. This is certainly not true of Aegean glyptic. Indeed there is scarcely a topic presented here which would not profit from detailed re-analysis.

It is impossible to predict what directions future research might take. As we have seen sometimes new breakthroughs in Aegean archaeology – whether practical or theoretical – stimulate a reappraisal of glyptic evidence; sometimes the opposite holds true. And glyptic research itself inevitably comprises many strands. Today, it is the application of glyptic evidence to a range of social issues that appears most relevant. After all, seals seemingly bring us closer to the individual than is usually possible in the Aegean Bronze Age. To ignore this legacy would be foolhardy in the extreme. Moreover, from the first hesitant attempts in the 19th century, there has been a long and honourable tradition of using glyptic evidence to shed light on the Aegean Bronze Age. Certainly, without glyptic, our knowledge of Aegean art and iconography, craft and technology, exchange and trade, administration and social status would be infinitely poorer. And yet, if we are entirely honest with ourselves, we must admit that for the most part our insights are limited and rest as much on conjecture as on concrete fact. Thus the question is not only *how* to apply glyptic evidence to broader social questions in the future, but also *whether* we are sufficiently well-equipped to do so.

This remark may seem unduly pessimistic, if not downright perverse. Yet the sad fact is that all too often our progress is thwarted by lack of evidence or rather by lack of corroborative evidence. No amount of systematic study – a *sine qua non* for work on glyptic – can conjure up proof where none exists. For this reason, many intriguing questions still remain unresolved. These include the genesis of motifs and their meaning, the role of motifs as insignia, the spread and transformation of motifs (i.e. through copies, ‘replicas’ and ‘look-alikes’). The role of seals as status indicators and as bureaucratic tools both demand much more detailed scrutiny. For progress to be made on these and other applied topics, we must formulate hypotheses with care, devise suitable research strategies, and evaluate the evidence with rigour. In so doing we must be alert to the

¹¹⁸ Indeed during the writing of this book, major revisions had to be made in light of new data on the Knossos sealings, published in *CMS* II.8 (2002), and new finds presented in *CMS* V Suppl. 3 (2004). That said, one cannot help but note that general syntheses of Aegean glyptic have appeared at roughly 35-year intervals: i.e. in *AG* (1900), *PM* IV (1935) and in *GGFR* (1st edition: 1970).



FIGURE 11.2 Professor Ingo Pini and Dr Walter Müller at work in the *CMS* Archive in Marburg.

dangers of *a priori* assumptions and the projection of our own values onto the past. Yet due scholarly caution must always be balanced by bold ideas. In time, some may be quietly jettisoned, others will certainly lead to major breakthroughs. Without imagination and enthusiasm the subject has no future.

Even more traditional lines of inquiry can benefit from renewed investigations. Nowadays, the study of style may seem hopelessly outmoded, yet it alone provides a firm basis for charting glyptic development through time and space. In short, style is fundamental to all our inquiries. Moreover, a better grasp of stylistic development, coupled with new discoveries may, in time, lead to a surer identification of workshops and production centres. Our understanding of materials and techniques is still woefully imperfect; progress may now come through scientific applications, such as Electron Microscopy. Collaboration with modern gem engravers would also be illuminating. Interdisciplinary studies – involving geologists and mineralogists – could also yield important insights regarding the sources of stones and their exploitation. Since some surely came from beyond the Aegean, dialogue with colleagues working in adjacent areas is essential. And if non-destructive clay analyses could be applied to sealings, the reward would be a firmer understanding of supply networks and inter-site relationships.

Advances in computer technology can also boost the study of Aegean glyptic in the 21st century. In the past few years, the *CMS* team has been systematically scanning the tens of thousands of images which have appeared in volumes of the series.¹¹⁹ The aim is to make these as widely available as possible, presumably in electronic format, when the *CMS* project closes in 2010. Before then, the team also hopes to complete work on their database, correcting and updating information which has appeared in the published volumes.

¹¹⁹ This major undertaking has been funded through generous grants from the Institute for Aegean Prehistory (INSTAP). Some unpublished photographs have also been scanned to replace poor quality images that appeared in earlier volumes of the series (see Appendix 1 for details).

This alone will be a major boon to glyptic studies. Moreover, the ability to sort and search in designated fields should enable students and scholars to explore a range of topics, now only accessible through time-consuming and often mind-numbing trawls through the *CMS* volumes.¹²⁰

For the past 50 years the *CMS* project has underpinned all research into Aegean glyptic by providing a systematic record of seals and sealings held in museums around the world (Appendix 1). Necessarily, the *CMS* team has been largely preoccupied with documentation and description, in order to present an accurate and lasting record of the thousands of seals and sealings that survive from the Aegean Bronze Age. Deliberately, they keep interpretation to a minimum, for they above all recognize how our knowledge can be transformed from one decade to the next.¹²¹ The output of the present editors, Ingo Pini and Walter Müller, has been truly prodigious in recent years. In addition to the *CMS* volumes, they have prepared many specialist studies on aspects of style and dating, materials and techniques, and sealing practices. These have evolved directly from their painstaking work with the primary material held in museums around the world or in the Marburg Archive. Yet Pini and Müller freely admit that their own efforts are halting and unsure, that our overall knowledge of Aegean glyptic still leaves much to be desired.

In the year 2010 the *CMS* project will draw to a close. The many thousands of casts and impressions collected in museums the world over, currently held in the Marburg Archive, will be carefully packed and crated, ready for shipment.¹²² With them will go countless thousands of photographs and drawings published in the *CMS* volumes, and many unpublished negatives besides. After some 50 years as a 'living archive' involved in the collecting, recording, processing and publishing of data in permanent form,¹²³ it will become a mere fossil archive, a remnant of this once mighty project. In short, the powerhouse of Aegean glyptic will be no more. For the future of the discipline – and by extension for Aegean archaeology – this is an undeniably gloomy prospect.

Currently some 80% of Aegean seals and sealings have been covered in the *CMS* series. With the publication of *CMS* III and VI, covering the Giamalakis Collection and the Ashmolean Museum, this figure will rise to 90% by the time the project ceases. On the face of it, research prospects have never been better. But there is a less rosy side to the picture too. The demise of the *CMS* project in 2010 will leave the study of Aegean glyptic in limbo. How and where will future generations acquire the requisite skills to work with impressions and casts – to handle them correctly, in both the literal and metaphorical sense? These things cannot be learnt from books or electronic data-bases.

But the end of the *CMS* project has even more profound ramifications. Notwithstanding the Herculean efforts of the present team, significant groups of seals and sealings will not be covered in the *CMS* series. Prospects do not look good for the hundreds of seals

¹²⁰ At the time of writing, the Iconaean Project, designed by J. L. Crowley, has not materialized. Its aim was to provide an illustrated data-base and search engine encompassing approximately 1000 images, selected for their relevance to iconographic studies, see: J. L. Crowley, in *CMS* Beiheft 6 (2000) 15-26; eadem, in *Metron* 421-23.

¹²¹ Even so, it is a salutary exercise to read the introductions to volumes edited by Ingo Pini from 1975 onwards, tracing how his opinions have subtly changed and how he has been forced to revise his own cautious interpretations.

¹²² At the time of writing, no decision has been taken as to where the Archive will be housed, much less if it will be readily accessible for study (see also below). Since its inception the project has been largely funded by the Akademie der Wissenschaften und Literatur, Mainz.

¹²³ For 'living archives' and other hypothetical stages of the archival process in the Near East and the Aegean, see: J. Driessen, *Minos* 29-30 (1994-95) 239-56.

which entered the Herakleion Museum after 1960. Among these are major finds from Archanes and the Knossos area. Several sizeable groups of sealings will certainly not appear in the series, as they remain under study by their excavators. These include the important EH II sealings from Petri near Nemea, the MM II deposits from Monastiraki and Petras and, last but not least, the LH III B sealings from the Lianga plot in Thebes.¹²⁴ These gaps are not insignificant. And what of the seals and sealings that will surely continue to emerge from the soil of Greece in decades to come. What will become of them? Will we revert to the pre-*CMS* days when seals were recorded in the most haphazard of fashions? Will we be forced to glean our information from preliminary reports, with inadequate data on size, material and technique? Will the illustrations be good, bad or altogether lacking?

At the time of writing, the *CMS* project has barely six more years to run. Thus, in the immediate future, the biggest and most pressing challenges for Aegean prehistorians are to safeguard the future of the Archive as a teaching and research facility *and* to seek a means whereby new discoveries can be collected and disseminated in a systematic format, perhaps electronically. With commitment, ingenuity, and appropriate funding both should be possible. Excavators, museum personnel and university-based researchers would all benefit. And, it is our collective duty to ensure that the legacy of the *CMS* is not squandered. Only then can future generations build on the past and discover anew the endless fascination of Aegean glyptic.

¹²⁴ For details and references to preliminary reports see Chapter 3 (Petri), Chapter 5 (Monastiraki and Petras) and Chapter 10 (Thebes).

APPENDIX 1 THE *CMS* SERIES: A USER'S GUIDE

To the student of Aegean glyptic there can be no more welcome sight than the distinctive burgundy and black volumes of the *CMS* series. Since their cost is considerable, ordinarily the volumes are confined to major research libraries. And unfortunately, even when the series can be found, the volumes and data which they contain can seem inaccessible, especially to those without a command of German. Here I provide a range of information supplementing the brief introduction in Chapter 1 and specific comments in footnotes. The aim is to help Aegean prehistorians of all levels understand the arrangement of the series and individual volumes, and thus make better use of this unparalleled resource.

Since the appearance of *CMS* I (1964) devoted to seals and sealings in the National Museum, Athens, more than 20 volumes have been published and several more are in preparation. During the past 40 years there have been marked improvements in the standards of drawing, photography and the presentation of data, although the basic format of the volumes has remained constant, ensuring that every seal (or seal-type) has its own unique *CMS* catalogue number and set of illustrations. These ordinarily include a drawing of the impression and a series of photographs showing the impression, seal face and (as appropriate) the profile or reverse of the seal. Although most of the volumes are in German, the catalogue is presented in such a way that even those with a rudimentary knowledge of the language can extract information from it. First comes basic data on the seal: its *CMS* and museum numbers, the material, dimensions, shape and state of preservation. This is followed by a description of the motif, bibliography and, in recent volumes, comparanda for the shape, motif or style.

Sealings are handled in a slightly different fashion. First it is important to realize that the *CMS* is primarily concerned with documenting seal-types (or *Motive* as they are termed) and thus makes no attempt to illustrate all the individual sealings impressed by a given seal. In many cases this would simply be impractical, although the inventory numbers of all relevant sealings are included (see also below). Instead one finds a drawing of the seal-type (often a composite based on several incomplete impressions) and one or more photographs of the ancient impression(s). The most recent volumes (*CMS* II.6–II.8) also document the type(s) of sealing on which the impression(s) occur, the colour and consistency of the clay, the dimension(s) of the sealing(s) and impression(s). Also indicated, whenever possible, is the shape and material of the original seal face (e.g. amygdaloid or hard stone) and the quality of the impressions (e.g. excellent, good, poor).

The indices in *CMS* volumes – listing seals by provenance, material, shape, subject and date – are also immensely helpful research tools, especially for readers with limited German. As a rule dating is best ignored, or at any rate regarded with suspicion, except in volumes prepared by Ingo Pini, general editor of the series since 1975 (see also below).

When the *CMS* project was established in the late 1950s by Friedrich Matz, scholars with an interest in glyptic were recruited to prepare individual volumes of the series, with final editing being undertaken in the *CMS* Archive in Marburg.¹ The huge collection of

¹ The project has been largely funded by the Akademie der Wissenschaften und Literatur, Mainz, with other bodies providing additional support for specific schemes (e.g. the INSTAP-funded scanning project: see below) and the publication of individual volumes.

seals and sealings in Herakleion was to be the preserve of the museum's director, Nicolas Platon. While the contributors were required to adhere to the basic *CMS* format, the quality of individual volumes varies a good deal. Needless to say, when the first volumes were compiled our general knowledge of Aegean glyptic was considerably less than today.² Thus we can now recognize that much information published in *CMS* I and II.1 – especially in respect of materials, dimensions and techniques – is simply incorrect. The copies of these volumes held in the Marburg Archive are heavily annotated, with numerous corrections and new observations by the *CMS* team. Before the project draws to a close in 2010, the present team hopes to prepare a data-base on Aegean glyptic to correct and augment information already published in the series.

The personal views of contributors on dating and glyptic development have also sometimes led to deficiencies in the treatment of individual pieces or whole collections. Thus, as already noted, the volumes prepared by Victor Kenna are marred by his predilection for assigning unprovenanced seals to single ceramic sub-periods (e.g. MM IIIA or LM IB) and by his belief that most if not all Cretan seals of soft stone were products of the post-palatial era (Chapter 11). By contrast Henri and Micheline van Effenterre simply divided the Paris seals into four broad groups – pre-palatial, proto-palatial, neo-palatial and Mycenaean (sub-titled *Crète et Continent*). The last grouping in fact contains certain Cretan seals of soft stone which are now recognizable as LM I.

Obviously the sizeable, but largely unprovenanced, collections of England, Europe and North America pose special problems, inasmuch as those seals can only be dated on stylistic grounds. Yet even the arrangement of *CMS* II.1–II.4, covering seals in the Herakleion museum (many from controlled excavations) has serious shortcomings. While *CMS* II.1 is ostensibly devoted to the pre-palatial period, some seals are demonstrably later in date. As it happens, they were found in 'pre-palatial' tombs that remained in use well into the proto-palatial period: Platanos is a prime example. For the most part, the arrangement of *CMS* II.2, devoted to seals of the Old Palace Period is uncontentious, but sadly, the same cannot be said of *CMS* II.3–II.4, which were also compiled by Nicolas Platon. The first presents seals that he assigned to the neo-palatial period. An unsuspecting reader might well assume this meant MM III-LM IB, whereas Platon seemingly regarded the fall of Knossos in LM IIIA1 as the end of the neo-palatial period. *CMS* II.4 includes seals which Platon identified as 'post-palatial' as well as 'undatable' Late Minoan seals. Most are seals of soft stone, datable to MM III-LM I or LM II-III. As we have noted, the very concept of 'post-palatial glyptic' is a contradiction in terms (Chapter 8). In his capacity of general editor of the *CMS* series, Ingo Pini provided lengthy and detailed introductions to both *CMS* II.3 and II.4, in which he endeavoured to rectify the many factual errors in Platon's catalogue and to counter the confusing arrangement of the volumes (see also below). Sadly, one suspects that few English-speaking readers take the time – or trouble – to consult Pini's sections, and so fail to realize the many pitfalls in these two important volumes.

The most reliable volumes in the entire *CMS* series are those prepared largely or wholly by Pini himself. In *CMS* II.5 (1970) he broke new ground by attempting to identify the original material and seal shape responsible for impressions on some of the Phaistos sealings; nowadays such information is supplied as a matter of course. However, nearly thirty years were to elapse before the *CMS* team published the next volume

² Note that the numbering of the *CMS* volumes (I–XIII) reflects the original plan for the series and not the date of publication. Thus among the last volumes to appear will be *CMS* III (Giamalakis Collection) and VI (Ashmolean Museum) both now in preparation.

devoted to sealings in Herakleion. This delay, while undoubtedly frustrating to Aegean prehistorians, had its positive aspects too. In the intervening years interest in sealings and ancient administration had grown apace and this surely encouraged the *CMS* team to devote more attention to specific nodule types and sealing practices than might otherwise have been the case.³ On numerous study-trips to the Herakleion Museum, the team made thousands of silicones and casts from the sealings and also carried out experimental replications. Their many years of painstaking work have resulted in *the* definite publication of sealings from Ayia Triada, Zakros and Knossos (*CMS* II.6–II.8).⁴ In tandem with this work, the team has also re-published the sealings from Mycenae and Pylos, which had suffered hopelessly unsatisfactory treatment in *CMS* I.⁵ In addition to exemplary standards of data recording, these publications include detailed accounts by Walter Müller on sealing types, supported by numerous charts and superb photographs of silicone impressions. Pini's contributions are no less significant; drawing on his encyclopaedic knowledge of the glyptic repertoire and a keen appreciation of style, he offers crucial insights into 1500 seal-types represented in these major groups from Crete and the mainland.

Pini's volumes on the small Greek museums have also set new standards. The results are presented in a series of volumes spanning the past thirty years: *CMS* V (1975), V Suppl. 1A (1992), V Suppl. 1B (1993), V Suppl. 2 (1996) and V Suppl. 3 (2004). The actual collecting of the material itself was no small achievement and often entailed lengthy negotiations with excavators, so that unpublished seals or sealings could be included in the series. The excavators themselves have been encouraged to contribute short descriptions of their sites, with detailed information on the contexts and dating, sometimes accompanied by specially commissioned plans. In many instances, these accounts constitute the most convenient (and sometimes the sole) record of unpublished excavations in Greece. As to the seals and sealings themselves, these have all been studied by Pini himself, usually accompanied by a member of his team, to ensure that the required standards of data recording were met. During these collecting trips, the *CMS* vehicle, loaded with photographic equipment, microscope and quantities of silicone and plasticine for impressions, has clocked up several hundred thousand kilometres on the road. The resulting volumes – documenting some 2250 seals and seal-types – are a lasting tribute to Pini's determination and his commitment to the cause of Aegean glyptic.

In recent years there have also been marked improvements in standards of drawing and photography. Certainly the illustrations in early volumes left much to be desired: photographs that were dark or indistinct and drawings marred by unnecessary 'petticoats' around the seal-faces. The frilled petticoats in *CMS* I are especially unsightly; more to the point, many drawings are demonstrably inaccurate (see Chapter 1). In these early volumes there was little or no attempt to alter drawing style to reflect the material from which a seal is made. This is now a regular feature of the fine drawings prepared by the present *CMS* draughtswoman, Susanne Lieberknecht. Moreover, Pini and his team regularly check all drawings against the impressions or casts, returning them for

³ Compare the adequate but cursory presentation of the Khania sealings in *CMS* V Suppl. 1A (1992) with the high standards achieved in *CMS* II.6–II.8 and V Suppl. 3.

⁴ See my review article in *AJA* 108 (2004) 275–79.

⁵ W. Müller, J.-P. Olivier, I. Pini, *AA* (1998) 5–55 (Mycenae); *Tonplomben* (Pylos). Both publications break new ground by presenting the sealings as complete artefacts, with illustrations of each individual nodule, inscription (if any) and seal-type. While such an approach is feasible for these small groups from the mainland, it would be impractical for the huge Cretan assemblages.

correction as necessary.⁶ Similarly under Pini's direction, standards of photography have been utterly transformed. The numerous photographs taken by Carl Albiker in the 1960s and 1970s are blemished by far too much contrast and deep shadow, often to the point where the seal shape is obliterated or parts of the impression are illegible.⁷ Since the mid-1970s Pini himself has undertaken an ever-increasing share of the photography, including developing and printing, in order to guarantee that seals and impressions (ancient or modern) are accorded uniformly high quality illustrations. Furthermore, to ensure that these standards are maintained in the actual volumes, all plates are carefully checked at proof stage for printing quality, contrast and tone.

In the year 2010, the *CMS* project will draw to a close. Thanks to modern technology and funding by INSTAP, drawings and photographs published in the *CMS* series are being scanned and will eventually be available electronically. However, with the end of the project, 50 years of collecting, recording and publishing will cease; even the future of the Archive remains uncertain. Sadly, despite the prodigious efforts of the present team, not all extant Aegean seals and sealings will be covered in the series. At the time of writing the fate of hundreds of seals which entered the Herakleion Museum after ca 1960 hangs in the balance. Among these are major finds from Archanes and the Knossos area. Several important groups of sealings, still under study by their excavators, will certainly not appear in the series. These include the EH II sealings from Petri near Nemea, MM II deposits from Monastiraki and Petras, and the LH III B sealings from the Lianga plot in Thebes.⁸ These are serious gaps indeed and, naturally, they will be joined by a growing number of seals and sealings from new excavations. Whether Aegean prehistorians can rise to the challenge of life beyond the *CMS* remains to be seen (Chapter 11).

ANNOTATED LIST OF *CMS* VOLUMES

Unless otherwise specified, volumes are in German. A perennial problem when preparing bibliographies is whether to cite the compiler(s) of individual volumes or, for sake of simplicity, the general editor(s) of the series, as named on the left title page. In the list below I provide information on compilers as given on the main (or right) title page. General editors were F. Matz and H. Biesantz for *CMS* I, VII–VIII; Matz for *CMS* IV; Matz and Pini for *CMS* II.1, IX, XII–XIII. For all volumes published between 1975 and 2002, Pini has been sole editor; from 2004 the editorship is jointly held by Pini and W. Müller. Finally, note that in 2002 the *CMS* changed publishers from Gebr. Mann (Berlin) to von Zabern (Mainz).

CMS I. *Die minoischen und mykenischen Siegel des Nationalmuseums in Athen* (Berlin 1964).
Bearbeitet von Agnes Sakellariou.

Covers seals and sealings in the ANM. Data often erroneous (e.g. materials, dimensions, ring construction) or incomplete (e.g. orientation and diameter of string-hole not given). Drawings marred by unnecessary 'petticoats' and are sometimes inaccurate in detail. Photographs generally poor. For sealings from Mycenae and Pylos see re-publication by the *CMS* team: W. Müller et al., *AA* (1998) 5–55 and *Tonplomben*.

⁶ Even so, Pini estimates that only 80% of drawings are completely accurate; see also Chapter 1. The inclusion of charts with profile drawings for lentoids, amygdaloids and cushions was another of Pini's innovations (in *CMS* V).

⁷ Albiker photographs appear in *CMS* I, II.1, VII–VIII, XII–XIII. Those by Gautel and Tessmann (*CMS* II.2, IV, V) are somewhat better. When using *CMS* scans from these volumes for the present book, I have digitally enhanced them using Photoshop 7.0.

⁸ For details and references to preliminary reports, see: Chapter 3 (Petri), Chapter 5 (Monastiraki and Petras) and Chapter 10 (Thebes).

CMS I Suppl. Athen. Nationalmuseum (Berlin 1982). Bearbeitet von J. A. Sakellarakis.

Includes seals and sealings in the ANM which came to light after the publication of *CMS I* (e.g. in re-organizing of storerooms). Note that certain pieces from Archaic sanctuaries published as Bronze Age seals by Sakellarakis are, in reality, Archaic in date (see Chapter 10). For the Pylos sealings see now *Tonplomben*.

CMS II.1 Iraklion Archäologisches Museum. Die Siegel der Vorpalastzeit (Berlin 1969).

Bearbeitet von N. Platon.

Devoted to pre-palatial seals that entered the HM before ca 1965. Note that some seals of MM II-III or later are included, since they were found in tombs of pre-palatial date (e.g. the Mesara tholoi). Materials' identification frequently unreliable, especially bone / ivory seals described as *Elfenbein* (lit. = elephant ivory). Illustrations poor.

CMS II.2 Iraklion Archäologisches Museum. Die Siegel der Altpalastzeit (Berlin 1977).

Bearbeitet von N. Platon – I. Pini – G. Salies.

Covers seals assigned to the Old Palace Period that entered the HM before ca 1960, thus included is most of the Mallia *Atelier*; further examples appear in *Quartier Mu III*. Some identification of materials inaccurate; illustrations mediocre.

CMS II.3 Iraklion Archäologisches Museum. Die Siegel der Neupalastzeit (Berlin 1984).

Bearbeitet von N. Platon – I. Pini.

Covers seals dated by Platon to MM III-LM IIIA1 (see above) which entered the HM before ca 1960. Thus excluded are important finds from Knossos (e.g. Royal Road, Sellopoulo Ts. 3-4, Unexplored Mansion) and Archanes-*Phourni*. Essential reading is Pini's detailed introduction, which corrects errors in Platon's catalogue (e.g. on materials, motifs, techniques) and comments on seals from datable contexts. Illustrations good.

CMS II.4 Iraklion Archäologisches Museum. A. Die Siegel der Nachpalastzeit. B. Undatierte spätminoische Siegel. (Berlin 1985). Bearbeitet von N. Platon – I. Pini.

Mostly includes soft stone seals, now recognizable as MM III-LM I or LM II-III date and not (as title suggests) post-palatial or undatable. Pini's introduction is essential reading, with important comments on stylistic development, seals from datable contexts, and corrections to factual errors in Platon's catalogue. Only seals that entered the HM before ca 1960 are included. Illustrations good.

CMS II.5 Iraklion Archäologisches Museum. Die Siegelabdrücke von Phästos (Berlin 1970).

Bearbeitet von I. Pini.

Presents 326 seal-types from Phaistos, mostly impressions on sealings found in *vano 25* (context MM IIB). Illustrations adequate. Limited information on sealing variety provided, with references to Fiandra's typology (*Pepragmena 2* [1968] 383-97). Cf. selected silicones now illustrated in *CMS II.6* pp. 374-76, fig. 24; see also here **9, 184-188**).

CMS II.6 Iraklion Archäologisches Museum. Die Siegelabdrücke von Aj. Triada und anderen zentral- und ostkretischen Fundorten unter Einbeziehung von Funden aus anderen Museen (Berlin 1999). Nach Vorarbeiten von N. Platon, bearbeitet von W. Müller – I. Pini.

Covers ca 150 seal-types from Ayia Triada plus smaller groups from other neo-palatial sites (e.g. Gournia, Palaikastro, Pyrgos, Sklavokambos, Tylissos). Also included are sealings of pre-palatial and proto-palatial date from eastern and central Crete (e.g. Mallia). Most are housed in the HM, some in smaller museums or excavation storerooms. In a notable departure from *CMS* traditions a lengthy and well-illustrated chapter on sealings by Müller is included; also clear typological charts and tables presenting data on find-spots etc. Site plans a valuable innovation; illustrations excellent.

CMS II.7 Iraklion Archäologisches Museum. Die Siegelabdrücke von Kato Zakros unter Einbeziehung von Funden aus anderen Museen (Berlin 1998). Nach Vorarbeiten von N. Platon, bearbeitet von W. Müller – I. Pini.

Devoted entirely to the 262 seal-types from Zakros (chiefly House A), mostly housed in the HM. This supersedes all earlier accounts (e.g. Weingarten, *Zakro Master*). Note that catalogue entries scrupulously avoid the common ‘nicknames’ applied to Zakros hybrids, and instead carefully describe individual elements of the fantasy combinations. Illustrations excellent. Müller provides a brief section on sealing types with typographical charts (cf. *CMS II.6*, where silicones of Zakros *Päckchenplomben* are illustrated). A more detailed study of the Zakros workshop and sealing practices is promised.

CMS II.8 Iraklion Archäologisches Museum. Die Siegelabdrücke von Knossos unter Einbeziehung von Funden aus anderen Museen (Mainz 2002). Nach Vorarbeiten von N. Platon, bearbeitet von M. A. V. Gill – W. Müller – I. Pini.

Presents 720 seal-types from Knossos (though many very fragmentary or illegible) ranging in date from pre-palatial to LM III. Lengthy introduction by Pini on contexts and dating, the original seals used, their iconography, style and composition. Müller presents an exhaustive account of sealing practices (numerous photographs of silicones and charts) and clay types. M. A. V. Gill summarizes information on the find-spots (superseding her earlier accounts, *KSPI* and in *Latest Sealings*). Data on sealing types, find-spots and inventory numbers presented in tabular form. Illustrations superb.

CMS III Iraklion Archäologisches Museum. Sammlung Giamalakis
In preparation by the CMS team. Meanwhile see *CM*.

CMS IV Iraklion Archäologisches Museum. Sammlung Metaxas (Berlin 1969).

Bearbeitet von J. A. Sakellarakis – V. E. G. Kenna.

Publishes ca 375 seals from the Metaxas Collection (many pre-palatial bone / ivory seals, ‘white pieces’, numerous ‘talismanics’). Not included are certain genuine seals regarded as forgeries by Kenna, plus later acquisitions by Metaxas. Presentation suffers from Kenna’s lamentable practice of over-fine dating. Descriptions of motifs terse in the extreme; illustrations adequate. English text.

CMS V.1-2 Kleinere griechische Sammlungen (Berlin 1975). Bearbeitet von I. Pini mit Beiträgen von J. L. Caskey, M. Caskey, O. Pelon, M. H. Wiencke, J. G. Younger.

Presents 751 seals (and seal-types) from the smaller Greek museums (i.e. other than the ANM and HM) known up to 1973, ranging in date from Neolithic to LB III. Material arranged alphabetically by museum and thereafter chronologically. Contributions on sites and contexts by selected excavators (e.g. for Lerna and Kea). Data and impressions collected by the CMS team. Volume breaks new ground: profile drawings of seals and indicating direction of string-hole. Illustrations fair to good. A few errors in materials’ identification (e.g. fluorite misidentified as rock crystal).

CMS V Suppl. 1A Kleinere griechische Sammlungen. Ägina – Korinth (Berlin 1992).

CMS V Suppl. 1B Kleinere griechische Sammlungen. Lamia – Zakynthos und weitere Länder des Ostmittelsmeerraums (Berlin 1993).

Bearbeitet von I. Pini mit Beiträgen zahlreicher weiterer Autoren.

All told, this pair of volumes contains nearly 900 seals / seal-types which entered Greek museums between 1973 and 1990 (plus a few which had been missed from *CMS V* and others found on East Mediterranean sites). Material ranges from Neolithic (stamps) to LB III. Sealings from Khania appear in V Suppl. 1A; also the large Mitsotakis Collection (further examples in V Suppl. 3; see Chapter 11). Data presentation, photography (by Pini) and drawings (chiefly by S. Lieberknecht) are excellent. Pini’s introductions provide important insights and include trustworthy information on dating. Site summaries by excavators offer crucial information, especially for unpublished sites (e.g. Armeni).

CMS V Suppl. 2 Kleinere griechische Sammlungen. Die Siegel aus der Nekropole von Elatia-Alonaki (Berlin 1996). Bearbeitet von Ph. Dakoronia – S. Deger-Jalkotzy – A. Sakellariou (†) unter Mitwirkung von I. Pini.

Publishes 121 seals in the Lamia Museum from the Elateia cemetery. Fine standard of presentation somewhat marred by Sakellariou's observations on style (largely counter-balanced by Pini's introduction). Valuable summary of graves and their contents supplied by the excavators. Illustrations excellent.

CMS V Suppl. 3 Neufunde aus Griechenland und der Westliche Türkei.

Bearbeitet von I. Pini mit Beiträgen zahlreicher weiterer Autoren (Mainz 2004).

Contains 483 seals (and seal-types) documented in Greece and western Turkey by the CMS team since 1990. Material ranges in date from Neolithic to LB III and includes sealings from Akrotiri and many MPG seals from cemeteries in Achaia and Elis. Site summaries (and selected plans) supplied by excavators. Detailed commentary by Pini on material, shapes, techniques, iconography, style, composition, social aspects, seal use and dating; also Neolithic stamps. Müller contributes a section on impressed objects and sealings. Illustrations superb. No further volumes on the Greek museums are planned.

CMS VI Oxford, The Ashmolean Museum

In preparation by J. Boardman and H. Hughes-Brock, meanwhile see CS.

CMS VII Die englischen Museen II (Berlin 1967). Bearbeitet von V. E. G. Kenna.

Covers large collection in the British Museum, plus smaller groups in the Fitzwilliam Museum (Cambridge), Manchester University Museum, Liverpool City Museum and Birmingham. As usual, Kenna's dating is best ignored (see above). NB also many errors in British Museum register numbers. Descriptions of motifs extremely terse. Photographs and drawings poor. English text.

CMS VIII Die englischen Privatsammlungen (Berlin 1966). Bearbeitet von V. E. G. Kenna.

Publishes seals collected by Dawkins, Bosanquet and others on Crete, as well as smaller groups presumably acquired through auction. Most of the large collections now sold: some seals purchased by Oxford, Liverpool etc. The usual remarks on Kenna's volumes apply. Illustrations mediocre.

CMS IX Cabinet des Médailles de la Bibliothèque Nationale, Paris (Berlin 1972). Bearbeitet von Henri et Micheline van Effenterre.

Presents ca 230 seals in Paris (many from Crete: see Chapter 11). For arrangement of volume, see above. Photographs and drawings indifferent. Typology of lentoids and amygdaloids confusing (cf. profile drawings in volumes prepared by Pini, e.g. CMS V). Illustrations adequate. French text.

CMS X Die schweizer Sammlung (Berlin 1980). Bearbeitet von J. H. Betts.

Covers ca 320 seals in Swiss collections – public (e.g. Geneva) and private – as well as those held by dealers. After the volume was compiled the large Erlenmeyer Collection was sold; pieces are now dispersed among private and public collections (e.g. Oxford, Cambridge; partial lists in CMS Archive: cf. Chapter 11). Good introduction by Betts on chronology, materials, authenticity. Photographs adequate; no drawings. English text.

CMS XI Kleinere Europäische Sammlungen (Berlin 1988). Bearbeitet von I. Pini mit Beiträgen von J. H. Betts, M. A. V. Gill, D. Sürenhagen, H. Waetzoldt.

Contains 354 seals in European museums not covered in CMS I–IX. Important collections in Berlin and Munich, smaller groups elsewhere in Germany; also Austria, Belgium, Denmark, France (Danicourt Ring), Hungary, Soviet Union. NB the Berlin seals (from East and West) are now reunited in the Antikensammlung (Museen-Inseln). Data, photographs and most drawings excellent. Useful introduction by Pini on materials, authenticity, iconography, style and dating.

CMS XII Nordamerika I. New York, The Metropolitan Museum of Art (Berlin 1972). Bearbeitet von V. E. G. Kenna

Presents ca 335 seals in the MMA, mostly collected on Crete by R. B. Seager (see Chapter 11). Some inaccurate materials' identifications; descriptions exceptionally terse; the usual *caveats* on Kenna's dating apply. Illustrations adequate. English text.

CMS XIII Nordamerika II. Kleinere Sammlungen (Berlin 1974). Bearbeitet von V. E. G. Kenna – E. Thomas

Contains ca 165 seals in small US and Canadian collections, including Boston and Philadelphia (mostly Cretan seals acquired by Seager and Hall: see Chapter 11). NB most seals in Emmet Collection (Hannover, Mass.) acquired by Boston in 1971. Present whereabouts of other privately owned seals (e.g. Velay) not known. Data presentation and illustrations adequate, descriptions very brief. Though dating much simplified (i.e. EM, MM, LM / LH), not necessarily trustworthy (i.e. steatite prisms now seen as MM II not EM: Chapter 5).

CMS Beihefte

Published as Beihefte (supplementary volumes) are two monographs and the proceedings of five international symposia. By common convention the first Marburg symposium is designated *CMS Beiheft 0*, though not actually published in the *CMS* series. As with the main catalogue volumes, it can be hard to decide whether Beihefte should be cited under the general editor of the *CMS* series (Ingo Pini), the symposium organizers (Pini and J.-C. Poursat for Beiheft 5) or the *Redaktor* (editor) of individual volumes.

CMS Beiheft 0. Die kretisch-mykenische Glyptik und ihre gegenwärtigen Probleme (Deutsche Forschungsgemeinschaft, Boppard 1974).

CMS Beiheft 1. Studien zur minoischen und helladischen Glyptik. Beiträge zum 2. Marburger Siegel-Symposium 26. – 30. September 1978 (Berlin 1981). Redaktion: W.-D. Niemeier.

CMS Beiheft 2. Die ›talismanischen‹ Siegel (Berlin 1985). Artemis Onassoglou.

CMS Beiheft 3. Fragen und Probleme der bronzezeitlichen ägäischen Glyptik. Beiträge zum 3. Internationalen Marburger Siegel-Symposium 5. – 7. September 1985 (Berlin 1989). Redaktion: W. Müller.

CMS Beiheft 4. A Bibliography for Aegean Glyptic in the Bronze Age (Berlin 1991). John G. Younger.

CMS Beiheft 5. Sceaux minoens et mycéniens. IVe symposium international. 10 – 12 septembre 1992 Clermond-Ferrand. (Berlin 1995) Redaktion: W. Müller.

CMS Beiheft 6. Minoisch-mykenische Glyptik. Stil, Ikonographie, Funktion. V. Internationales Siegel-Symposium Marburg, 23. – 25. September 1999 (Berlin 2000) Redaktion: W. Müller.

CMS Beiheft 7. Seals and Cultural Interconnections in the Aegean Bronze Age (in preparation). J. Aruz.

APPENDIX 2 GLOSSARY

Below are defined the principal specialist and technical terms used throughout the book. Also included are selected foreign terms, especially German, which readers will encounter in the *CMS* series and other literature pertaining to Aegean glyptic.

a. adjective; *archaic* term no longer in current usage; Fr. French; G. German; Gk. Greek; It. Italian; Lat. Latin; lit. literal(ly); *n.* noun; *non-tech.* non-technical; *obs.* obsolete; *tech.* technical (term); *q.v.* see; *v.t.* verb, transitive; \approx almost equivalent.

Abdruck *n.* G. impression

agate *n.* hard semi-precious stone (Mohs 7) belonging to the chalcedony family of cryptocrystalline quartzes (*q.v.*), translucent, cloudy, or opaque, frequently disposed in alternating veins or bands, and occurring in wide range of hues: white, grey, blue, orange, brown, black.

agrimi(a) *n.* Gk. Cretan wild goat.

amethyst *n.* hard semi-precious stone (Mohs 7) of the crystalline quartz family (*q.v.*), usually translucent (but sometimes cloudy through impurities), ranging in hue from deep violet to pale lilac or even whitish (NB heating also causes colour loss).

amygdaloid *a. & n.* **1. a.** almond-shaped. **2. n.** seal with ca two almond-shaped faces, squared off at the ends, usually biconvex in section; some examples have faceted rear. G. = *Amygdaloid*.

aniconic *a.* without features (e.g. of heads).

anthropomorphic *a.* having the shape or appearance of a human being.

'Archanes Script' (or Formula) *n.* form of writing which comprises a five sign 'formula', first attested on MM I seals, recurring in Hieroglyphic (or Linear A?) on clay documents and seals.

'architectonic' *a.* (*obs.*) see **tectonic**.

'architectural' *a.* (*obs.*) see **tectonic**.

archivio di cretule *n.* It. = 'archive' of sealings at MM II Phaistos (*vano 25*).

Atelier des sceaux *n.* Fr. = seal (engraver's) workshop at Mallia (Quartier Mu).

attribution studies *n.* attempts to identify 'hands' or stylistic 'workshops'.

baetyl *n.* sacred stone.

Bandschlingen *n.* G. loop or ribbon-like elements (e.g. on Lerna sealings).

bar *n.* Cretan Hieroglyphic clay document, rectangular in shape, usually inscribed on all four sides.

Bein *n.* G. see **bone / ivory**.

bezel *n.* **1.** face of a signet ring. **2. hollow** ~ face or front part of a signet ring, comprising two parts, i.e. the ~ **plate**, which bears the design (usually executed in mixed technique of punching and engraving), plus the concave back-plate or finger-bed (*q.v.*).

biconvex *a.* having two faces of equal convexity (often seen on hard stone lentoids during LBA).

bi-facial *a.* having two engraved faces (e.g. ~ cylinders, ~ discoids).

Bildthema *n.* G. (lit. = picture theme) subject; motif in general sense (e.g. running goat, couchant bull, Mistress of Animals).

bi-metallic *a.* of two metals; misnomer for certain LB III signet rings consisting of an inner bronze core, sheathed with gold and iron (each covering half of bezel and hoop).

Birn(e) *n.* G. = pear; see **bottle**.

bone *n.* hard skeletal (i.e. osseous) material (Mohs 2). G. = *Knochen*.

bone / ivory *n.* generic term applied to skeletal (i.e. osseous) or tooth-like (dental) materials when a clear distinction is not possible. G. = *Bein*.

bottle *n.* seal with pear-shaped profile and one flat engraved face. G. *Birn(e)* = pear.

boule *n.* F. lit. = ball; see **nodulus**.

boulette *n.* F. lit. = little ball; see **nodulus**.

bucranium *n.* Lat. bull's head or skull.

- bull** (-ae) *n.* Lat. **1.** clay sealing (in Near East). **2.** spherical clay container for 'tokens' (Near East). **3.** seal with engraved designs on two convex surfaces (Near East, esp. Hittite). Cf. **semi--** seal of hemispherical shape and single face with engraved design (Near East, esp. Hittite).
- bull-leaping** *n.* activity (ritual or sport?) where human figures (usually male) are shown vaulting or leaping over bulls' horns and backs; depictions found in glyptic and other media in the LBA.
- 'bundles'** *n.* motif employed on 'talismanic' seals, derived from fish protomes (heads).
- burin** *n.* pointed tool used for engraving etc.
- button** *n.* seal with one engraved face (circular or less commonly rectangular); the reverse may be provided an integral grip or low handle, pierced for suspension, somewhat resembling the shank of a modern button; others are ca hemispherical and are merely pierced transversely.
- cachet** *n.* Fr. = seal; ~ **à tige** = **Petschaft** (*q.v.*).
- calcestruzzo** *n.* It. concrete; hence ~ destruction level at MM IIB Phaistos.
- calcite** *n.* crystalline form of calcium carbonate; sometimes translucent with pale hues (yellow, grey, pink, brown) and used as a gemstone (Mohs 2.5-3); it is also the main constituent of limestone and found as inclusions in other rocks, e.g. lapis lazuli (*q.v.*).
- cap** *n.* **1.** decoration made of gold sheet or foil, sometimes further embellished with granulation, covering the ends and string-holes of some LB I-III hard stone seals. **2.** part of a stopper (*q.v.*) for a stirrup jar, comprising the layer of clay that covered the neck of the jar and clay plug within; sometimes seal-impressed. G. = *Tüllenummantelung* (spout-covering).
- carnelian** *n.* hard semi-precious stone (Mohs 7) belonging to the chalcedony family of crypto-crystalline quartzes (*q.v.*), usually translucent (sometimes slightly cloudy), ranging in hue from yellowish-orange, orangey-red, blood-red, brownish-red (when sometimes termed 'sard'). NB popular spelling reflects false etymology from Lat. *carnis* (= flesh); more correctly cornelian, from Lat. *cornum* (= red berry). G. *Karneol*.
- Casa del Lebete** *n.* It. = house of the cauldron (at Ayia Triada).
- casella** *n.* It. = compartment, cist.
- cast** *n.* & *v.t.* **1. n.** impression of a seal or sealing, esp. when made with fine dental compound or plaster of Paris. **2. v.t.** to reproduce an object by pouring a liquid substance (e.g. molten metal or glass) into a mould made of durable material (e.g. stone).
- 'cavalier perspective'** *n.* convention for spatial relationships, where above = further away.
- chalcedony** *n.* **1.** crypto- or micro-crystalline quartz (*q.v.*) encompassing a variety of semi-precious stones, e.g. blue ~, agate, carnelian (*q.v.*). **2. blue** ~ semi-precious stone, pale blue or bluish-grey in hue, translucent or cloudy (Mohs 7).
- chamber tomb** *n.* subterranean tomb, usually cut into slope of hill and having oval or rectangular burial chamber.
- chiastic** *a.* cross-wise arrangement, i.e. like the Greek letter X (chi).
- chimera** *n.* hybrid monster; hence, the misnomer '~' **scheme** where upper part of prey (e.g. goat, deer) is shown springing away from behind lion's back.
- chlorite** *n.* soft stone (Mohs 2-3), often blackish-green, used for Cretan seals from EM II-LM III; also ~ **schist** (where the rock has tendency to split into layers).
- cist grave** *n.* small rectangular grave cut directly into the earth, sometimes lined with stone slabs.
- clay ball** *n.* hollow sphere in which counters (*q.v.*) were placed, the outer surface impressed with cylinder seals (Near East).
- clay envelope** *n.* rectangular covering into which clay tablet was placed, the outer surface being impressed with cylinder seals (Near East).
- cloisonné** *a.* and *n.* technique of decoration where thin metal (usually gold) strips are used to create tiny cells (cloisons), which are filled with coloured glass.
- CMS** *Corpus der minoischen und mykenischen Siegel* (G. lit. = Corpus of Minoan and Mycenaean Seals).
- combination sealing** *n.* lump of clay fashioned around heavy cord and pressed against an object (e.g. basketry). G. = *Objektschnurplombe*.
- composition** *n.* the way a motif and its constituent elements are disposed on a seal face.
- concavo-convex seal** *n.* pre-palatial seal shape reflecting natural form of sectioned long-bone (i.e. with one concave surface, one convex) and a flat seal face.
- cone** *n.* variety of single-hole hanging nodule, here termed conoid (*q.v.*).

- conoid** *n.* **1.** seal shaped like a cone with one flat engraved face. **2.** type of single-hole hanging nodule with seal impression on the base (= G. *Schnurendplombe*, *Konoide*); also 'cone'.
- contour** *n.* outline; ~ **line** engraved line delineating shape of body or anatomical feature (e.g. ribs). Cf. G. *Leistenstil*.
- cornelian** *n.* see **carnelian**.
- corridor house** *n.* large rectangular building with axially arranged central rooms, flanked by corridors / staircases, attested in central and southern Greece during EB II.
- couchant** *a.* (of animal) lying with body resting on legs and head raised (\approx recumbent).
- counter** *n.* small piece of clay shaped into disc, cone, sphere etc., sometimes also marked with linear incisions or dots, apparently used as early form of accountancy in the Near East.
- counter-mark** *n.* short inscription (often a single sign or ligature) on a sealing. NB in LM I ~s are rarely placed *supra sigillum* (i.e. over the impression); this becomes normal practice in LB III.
- craquelure** *n.* Fr. network of fine cracks (e.g. on surface of seal caused by exposure to heat).
- crecent, ~shaped nodule** *n.* nodule formed around knotted string, resembling a small pastry *croissant* with three or four faces which bear seal impression(s) and / or Hieroglyphic inscriptions. F. *croissant*; G. *Hörnchenplombe*
- croissant** *n.* Fr. = crescent-shaped nodule (*q.v.*)
- croix pometée** *n.* Fr. criss-cross motif with the spokes terminating in knobs.
- cretula (-e)** *n.* It. sealing (*q.v.*).
- crypto-crystalline quartz** see **quartz**
- crystalline quartz** see **quartz**
- cube** *n.* seal resembling small 6-sided block or cube, with seal faces set within circular borders.
- cult scene** *n.* generic term applied to motifs believed to represent rituals or practices of a religious nature. G. = *Kultszene*
- cushion** *n.* seal with two rectangular faces, biconvex in section (formerly termed **flattened cylinder**). G. *Kissen*.
- Cut Style** *n.* style of engraving that relies heavily on undisguised cutting wheels, but limited use of drills, to depict animals (e.g. lions, goat), griffins, birds, during LM IB / II (-IIIA).
- cutting wheel** *n.* disc-shaped tool mounted on lapidary lathe (*q.v.*) used in hard stone engraving.
- cylinder (seal)** *n.* **1.** seal of cylindrical shape; in the Near East, but rarely in the Aegean, the design is engraved around the barrel for rolling across clay etc. **2. bi-facial** ~ seal of cylindrical shape engraved on the two flat surfaces. **3. flattened** ~ (*obs.*) see **cushion**. **4. hollow** ~ seal of cylindrical shape, made from a section of long bone, hence hollow in section; engraved on one or both ends. NB some hollow ~s were perhaps originally plugged to create a solid cylinder or hammer-headed seal (*q.v.*). **5. stamp** ~ seal of cylindrical shape with engraving on the flat face(s) for stamping on clay (in the Aegean it is very rare for the barrel to be engraved also).
- decorative** *a.* ornamental; ~ **repertoire** range of motifs current at any given time.
- disc** *n.* seal with two flat faces, oval or sub-circular in shape.
- discoïd** *n.* seal having two circular faces (during MM II-III usually biconvex in profile; LH III glass 'discoïds' are plano-convex in section). G. *Diskoïde*.
- direct object sealing** see **object sealing**
- Diskoïde** *n.* G. discoïd (*q.v.*).
- double-axe** *n.* twin-bladed axe; an item of Minoan cult equipment.
- '**dragon**' see **Minoan 'dragon'**.
- Dreipass (plu. Dreipässe)** *n.* G. motif having three elements.
- drill** *n.* **1.** cylindrical implement capable of boring or making holes. **2. solid-bit** ~ having a solid section. **3. tubular** ~ having a hollow section.
- dromos** *n.* Gk. (lit. = road) the entrance passage to tholos or chamber tomb.
- dual-stamping** *n.* impressing two seals (singly or repeatedly) on a sealing; cf. multiple stamping.
- dubitanda (-ae)** *n.* Lat. piece whose authenticity is doubted.
- Elfenbein** *n.* G. (elephant) ivory.
- emery** *n.* very hard coarse mineral (corundum) used as an abrasive; found on Naxos (Mohs 8-9).
- engrave** *v.t.* to carve or cut designs (on a surface), to create intaglios (*q.v.*); hence *n.* **engraving**. NB on metal engraving indicates the removal of material, whereas punching merely involves its displacement.

- epiphany** *n.* a coming, an appearance (i.e. of a deity); hence **ecstatic** ~ a divine presence seen or felt by worshippers; **enacted** ~ where human (e.g. priestess) plays the role of deity.
- epomion (-a)** *n.* Gk. shoulder-shaped seal (ordinarily made of bone).
- faience** *n.* vitreous material produced by heating silicate (e.g. powdered quartz or sand) and a binding agent (e.g. natron), normally glazed and coloured (cf. frit, glass).
- figural** *a.* (motifs) depicting 'human' figures (i.e. may include deities in human guise).
- figure-of-eight shield** *n.* large shield shaped like an 8.
- Fimo** *n.* modern modelling compound which can be oven-baked to provide permanent impressions.
- finger-bed** *n.* part of signet ring, shaped to fit the finger, i.e. elongated and concave. ~ **plate** piece of sheet gold, shaped to fit the finger, soldered to the front bezel plate in signet rings with hollow bezels (*q.v.*).
- finger-ring** *n.* ring which lacks engraving on bezel (thus cannot serve as a signet ring for sealing), but instead may bear decoration in form of granulation, cloisonné etc; lead examples with motifs cast in relief may have been sheathed in precious metal.
- flat-based nodule** *n.* (*tech.*) lump of clay pressed over small folded piece of parchment or leather bound with fine thread; 'packet' (sealing). G. *Päckchenplombe*.
- flattened cylinder** *n.* *obs.* see **cushion**.
- floruit** *n.* Lat. period during which something (e.g. a particular style, motif or variety of seals / sealings) was current.
- fluorite** *n.* medium-hard stone (Mohs 4), usually milky-white in colour (although purplish hues are also found), often mistaken for clear translucent rock crystal.
- flying gallop** *n.* animal pose in which legs are outstretched to convey sense of movement.
- foliate back** *n.* seal with flat oval face and convex back decorated with torsional grooving.
- frit** *n.* vitreous material consisting of a polycrystalline body, sometimes coloured but having *no* glaze (cf. faience, glass).
- gable-shaped** **1.** *a.* having a ca triangular section. **2.** ~ (**hanging**) **nodule** *n.* lump of clay formed around knotted string, with ca triangular section and three flat-faces, which may carry Linear B inscriptions. Cf. G. *Schurplombe mit giebelförmiger Rückseite*. **3.** ~ **seal** *n.* seal with ca triangular section, engraved on one or more flat face(s).
- gem** *n.* **1.** (*archaic & non-tech.*) stone, esp. semi-precious, with engraved design; cf. **Island G~s**.
- genius** see **Minoan genius**
- gesture of command** *n.* human pose where profile figure holds staff / spear in outstretched arm.
- glandular-shaped (seal)** *obs.* term once applied to seals that are now called amygdaloids.
- glass** *n.* vitreous material produced by heating silica and soda with a colouring agent (e.g. cobalt), then cooling it in such a way to as prevent crystallization, i.e. retaining characteristics of a liquid.
- glyptic** *a. & n.* **1.** *a.* of carving, esp. on stones; of seals and (by extension) sealings. **2.** *n.* the study of seals and sealings.
- granulation** *n.* technique of decoration using small granules or globules of gold.
- grave circle** *n.* circular enclosure marking out burial ground; hence at Mycenae ~ **A** with six shaft graves (excavated by Schliemann); ~ **B** with 26 cists and shaft graves (excavated 1950s).
- graver** *n.* engraving tool, esp. on metals; burin.
- griffin** *n.* hybrid creature with the head of an eagle and body of a lion (usually winged).
- haematite** *n.* opaque semi-precious stone (Mohs 5.5-6.5) consisting of a crystalline form of iron oxide; in hue ranging from darkish metallic-grey to black, often with reddish flecks; sometimes erroneously called 'meteorite' (*q.v.*).
- hammer-headed seal** *n.* seal with cylindrical body and projecting T-shaped grip, somewhat like a hammer. Usually made of bone, several components are needed to achieve the shape.
- hanging nodule** *n.* lump of clay formed around string or cord, designed to hang freely from object to which it is attached. G. ≈ *Schnurplombe*. ~ **with ridged back** large flat ~, with ridged rear. G. = *S. mit dreigratiger Rückseite*. Cf. also **gable-shaped**, **single-hole**, **two-hole** ~.
- hard stone** *n.* generic term applied to stones registering Mohs 6-7, e.g. lapis lazuli, lapis lacedaimonius, haematite, and the quartzes (*q.v.*).
- Helladic** *a.* pertaining to mainland Greece in the Bronze Age (e.g. pottery, culture etc.).
- hemi-cylinder** *n.* seal with half-cylindrical section and one flat rectangular engraved face.
- hemispheroid** *n.* seal with a ca hemispherical section and one flat engraved face.

- heraldic** *a.* of or pertaining to heraldry and coats of arm. NB ~ **composition** expression sometimes incorrectly applied to a motif which is antithetical or symmetrical.
- Hieroglyphic** *a. & n.* syllabic script used in north-central and eastern Crete in MM II-III / LM I; undeciphered but presumed to express a / the Minoan language (cf. Linear A).
- Hörnchenplombe(n)** *n.* G. = crescent-shaped nodule (*q.v.*).
- horns of consecration** *n.* object resembling stylized bull's horns, usually shown surmounting buildings or shrines.
- horror vacui** *n.* Lat. fear of empty space.
- hybrid** *n.* having characteristics of two or more animals etc. (e.g. griffin, sphinx).
- iconography** *n.* imagery.
- ideogram** *n.* sign which expresses an idea or word (e.g. cloth, sheep); used in tandem with syllabograms (rendering constituent syllables of words) in the Aegean linear scripts.
- 'impaled triangle'** *n.* triangle bisected by a protruding stroke which resembles Linear B sign for wheat GRANUM, found as a subsidiary element in LM II-III seal motifs; significance obscure.
- impression** *n.* relief imprint produced by pressing a seal with an engraved design into a soft medium, such as clay or modern substances such as plasticine or silicone. G. *Abdruck*.
- imprint** *n.* mark left on the underside of a clay sealing, produced when the clay lump was pressed against a basket, chest, parchment note etc.
- Inselsteine** *n.* (G. lit. = Island stones / gems). In 19th c. applied to *any* 'early' Greek gems, i.e. including those now known to be BA seals, as well as Island Gems (*q.v.*) of the Archaic period.
- intaglio** *a. & n.* 1. *a.* engraved (from It. = 'cut in'). 2. *n.* engraved design (i.e. on seal face).
- irregular (hanging) nodule** *n.* lump of clay fashioned around heavy cord or two pieces of cord twisted together, sometimes pyramidal or plum-shaped, often found deliberately broken along string-hole or front-to-back = G. *Schnurplombe mit offener Rückseite*.
- Island Gems** (*n. tech.*) seals produced in 7-6th c. BC Greece, perhaps made in one or more production centres in the Cyclades; usually made of soft steatite / serpentine. Cf. *Inselsteine*.
- ivory** *n.* hard smooth variety of dentine (Mohs 2-3), usually creamy-white, found in tusks of large mammals, such as the elephant and hippopotamus. G. *Elfenbein* = (elephant) ivory.
- jasper** *n.* crypto- or micro-crystalline quartz of the chert family, impregnated with impurities that give it an opaque appearance and dense coloration, e.g. red, green, yellow, black (Mohs 7).
- Jaspis** *n.* G. = jasper (*q.v.*).
- Kalotte** *n.* G. lit = skull-cap. Cap-like part of clay plug used as stopper (*q.v.*) for stirrup jars (*q.v.*).
- Kamare Ware** *n.* MM pottery characterized by light (white, red, purple) decoration on dark ground, often wheel-made; named after ~ Cave on southern slopes of Mt Ida where first found.
- Karneol** *n.* G. = carnelian (*q.v.*).
- Kerbschnitt** *n. and a.* G. (decoration) of incised, engraved or impressed notches (found on EC pottery and stone vases, also attested on seals).
- Kissen** *n.* G. = cushion (*q.v.*).
- Knochen** *n.* G. = bone (*q.v.*).
- koine** *n.* Gk. = shared traits, e.g. common culture etc.
- Kultszene** *n.* G. = cult scene (*q.v.*).
- lapidary lathe** *n.* apparatus consisting of two uprights and free-turning spindle (powered by a bow) to which cutting wheels / bits could be attached for engraving of hard stones. Modern versions of the lathe differ in design, but retain the same principles (see FIGURE 5.1).
- lapis lacedaimonius** *n.* opaque porphyritic rock with characteristic light-green to yellowish-green phenocrysts (inclusions) of feldspar in a dark-green hornblend matrix (Mohs 5-6), used as a semi-precious stone for seals; also stone vases and sword pommels; also known as Spartan Basalt, found only in quarries near Krokeai in Lakonia. NB oxidation causes discolouration, with greenish hues turning yellowish or brownish.
- lapis lazuli** *n.* opaque semi-precious stone (Mohs 6), consisting chiefly of the mineral hauynite or lazurite (a sodium aluminium silicate-sulphate); in hue deep purplish-blue, bright royal blue or duller greyish-blue depending on impurities, e.g. attractive gold-coloured flecks from pyrite (iron sulphide) or, in poorer stones, whitish inclusions of calcite (*q.v.*).
- larnax (-kes)** *n.* Gk. coffin, sarcophagus (usually of clay).
- Leistenstil** *n.* G. (lit. = ridge style) use of contour lines (*q.v.*) especially on LM soft stone seals.

- lentoid** *n.* seal having two circular faces and a lenticular (i.e. lentil or lens-shaped) section, usually engraved on a single face, although bi-facial lentoids are attested. G. = *Lentoid*.
- ligature** *n.* two or more signs (e.g. in Linear A) joined to make one symbol.
- Linear A** *n.* syllabic script attested on Crete and certain islands of the Aegean from ca MM II-LM IB; undeciphered but presumed to express a / the Minoan language.
- Linear B** *n.* syllabic script, in part derived from Linear A (*q.v.*), attested on Crete (in LM II?-III) and mainland Greece (LH III) used to write an early form of Greek (i.e. Mycenaean Greek).
- look-alike** **1.** *a.* (*non-tech.*) near-identical, similar. **2.** ‘~s’ *n.* motifs that are nearly identical or similar (NB since this expression clearly lacks precision and has also been used for motifs that are united by no more than a common theme, it is best avoided).
- ‘loom-weight’** *n.* object made of clay, cuboid, hemispherical or pyramidal in shape, of uncertain purpose, sometimes bearing a seal impression.
- lustral basin** *n.* small subterranean chamber, often associated with a ‘Minoan hall’ or *polythryon*, thought to have been used for ritual activities.
- macro-crystalline quartz** see **quartz**.
- Mainland Popular Group** *n.* large group of soft stone (usually steatite) seals produced on the Greek mainland during LB III.
- Marine Style** (pottery) produced chiefly in Minoan palatial centres during LM IB, typically decorated with marine motifs executed in dark lustrous paint on light ground.
- massive** *a.* solid (i.e. of gold signet rings).
- Master of Animals** *n.* male figure / deity who controls nature; depicted with single tethered creature (e.g. lion, griffin) or flanking pair of animals. Cf. **Mistress of Animals**.
- matrix** *n.* **1.** a mould of durable material (e.g. stone) in which objects may be cast or replicated. **2.** clay ‘~’ lump of clay bearing the impression of an impression (of a seal or signet ring). NB since such an object could not be used to replicate copies, the term ‘~’ is best avoided.
- medallion** *n.* Cretan Hieroglyphic clay document, circular in shape with ogival top, perforated.
- megaron** *n.* Gk. building unit, esp. in Mycenaean Greece, consisting of porch, forehall, and large inner chamber, usually with central hearth (generally found within palaces or major centres).
- meteorite** *n.* iron-rich rock originating in outer space; not used for seals, but the term is sometimes erroneously applied to haematite (*q.v.*).
- micro-crystalline quartz** see **quartz**.
- Minoan** *a.* (from Minos, legendary king of Crete) pertaining to Crete in the Bronze Age, and by extension to Cretan cultural features found overseas; also *n.* ~ (s).
- Minoan ‘dragon’** *n.* hybrid creature with long scaly body and tail, short stubby legs, long snout.
- Minoan genius** *n.* hybrid creature, ultimately derived from Egyptian Taweret (*q.v.*), primarily connected with libation and later with sacrifice.
- minotaur** *n.* hybrid creature comprising human legs and waist joined to forequarters and head of a bull (also, but inaccurately, extended to hybrids involving forequarters of wild goat, stag, lion).
- Mistress of Animals** *n.* female figure / deity who controls nature; usually depicted with flanking pair of birds, animals, griffins; = *Potnia theron* (*q.v.*). Cf. **Master of Animals**.
- modelling** *n.* the rendering or sculpting of forms.
- Mohs scale** *n.* scale of hardness for minerals, ranging from 1 (talc) to 10 (diamond).
- motif** *n.* **1.** design, i.e. engraved on a seal face (or part thereof). **2.** design engraved on a *specific* seal face, or the impression thereof, cf. G. *Motiv(e)* as employed by *CMS* for what is here called a seal-type (*q.v.*).
- Motiv(e)** *n.* G. see **motif**
- mould** *n.* form or matrix of durable material (e.g. stone) in which objects may be cast or replicated by pouring in a molten substance, e.g. metal or glass; hence ~-made glass seals, beads etc.
- multiple sealing system (MSS)** *n.* esp. at Zakros the use of two or more seals on a single sealing.
- multiple stamping** see **stamping**.
- Mycenaean** *a.* (from Mycenae) pertaining to Greece in the LBA, and by extension to areas displaying similar cultural traits (e.g. islands, Crete in LB II-III); also *n.* ~ (s). ~ **Greek** early form of Greek language written in the Linear B script (*q.v.*).
- naturalistic** *a.* **1.** conveying life-like impression. **2.** ‘~’ (motifs) based on the living world (e.g. humans, animals), albeit rendered in an artificial fashion (e.g. as during LB II-III).

- 'negative impression'** *n.* design which in impression appears in the negative (i.e. as if engraved), thus produced by a seal or stamp with a positive (relief) image.
- nodule** *n.* lump of clay (with seal impressions). NB the recent trend in English is to restrict the term ~ to small carefully-shaped pieces of clay, as in **flat-based** ~; **crescent-shaped** ~; **hanging** ~, and not apply it to the large lumps used for object sealings (*q.v.*).
- nodulus** (-i) *n. tech.* small specially formed lump of clay without means of attachment to another object, impressed with one or two seals. Fr. *boule, boulettes*; G. *Nodulus*. NB sub-types reflect shape / number of impressions, e.g. **disc-shaped** ~ flat circular piece of clay ordinarily with impressions on both faces ≈ G. ~, *Scheibe*; **gable-shaped** ~ domed piece of clay with single impression on underside ≈ G. ~ *mit giebförmiger Rückseite*.
- object sealing** *n.* also **direct** ~ lump of clay applied directly to surface of an object (e.g. vase rim or mouth, peg or knob, matting or basketry) usually bearing multiple impressions of one or more seals. G. *Objektplombe*.
- Objektplombe(n)** *n.* G. = lit. object sealing (*q.v.*)
- Objektschurplombe(n)** *n.* G. = lit. object string sealing; see **combination sealing**.
- ornamental** *a.* (motif) having non-pictorial character, i.e. geometric, abstract etc.
- osteotheke** *n.* Gk. funerary chamber for housing bones (i.e. after decomposition).
- Päckchenplombe(n)** *n.* G. (lit. = 'packet-sealing'). Cf. flat-based nodule; 'packet'. NB in the *CMS* typology *Päckchenplomben* are further sub-divided by shape / number of impressions (e.g. *Horizontalscheibe* ≈ single-seal recumbent nodule). See Chapter 7 notes for details.
- 'packet'** see **flat-based nodule**; *Päckchenplombe*.
- 'paisley'** *n.* design of curved abstract elements; sometimes loosely applied to petaloid loops (*q.v.*)
- peg sealing** *n.* lump of clay placed over peg or knob bound with cord, used to secure closure of wooden chest or storeroom door etc.; when peg shows a flaring profile like a modern door knob, sometimes termed 'pommel' (from It. *pommello*). G. = *Stöpselplombe*.
- petaloid loop** *n.* pictorializing (*q.v.*) motif resembling a hatched petal, based on two J-spirals.
- Petschaft** (-e) *n.* G. seal with circular face and stalk-shaped grip, usually pierced for suspension. In English sometimes formerly called loop-handled, pawn-, or stalk-signets. Fr. = *cachet à tige*.
- pictographic** *a.* (writing system) consisting of pictorial symbols.
- pictorial** **1.** *a.* (motifs) depicting figures, animals, plants, objects, singly or in combination.
2. *a. tech.* (motifs) where depictions (however schematized or stylized) are based on reality and not on an underlying abstract design (cf. **pictorializing**).
- pictorializing** *a. tech.* (motif) based on underlying abstract design, modified to convey impression of figure, animal, plant or object (cf. **pictorial**).
- pintadera** *n.* large stamp (usually made of clay or stone) with flat face and deeply cut design, hence unsuited to making impressions in clay, perhaps used to apply pigments to textiles, skin etc.
- pithos** (*plu.* pithoi) **1.** *n.* Gk. storage jar. **2.** *n.* ~ **band** strip of clay onto which roller impressions were made and which were then applied to surface of pithos.
- plasticine** *n.* malleable substance (usually consisting of talc and oil) used in modelling or for making (modern) impressions of seals. NB term is now used generically, but strictly speaking, relates to trademark product Harbutt's Plasticine.
- Plastilin** *n.* G. = plasticine (*q.v.*).
- Plättchen** *n.* G. (lit. = little plates) term sometimes applied to LB III mould-made glass seals (*q.v.*) with circular faces and flat backs (cf. **discoid**).
- Plombe(n)** *n.* G. sealing; nodule.
- polos** *n.* flat cap worn by Mycenaean terracotta figurines; also by seated figure on the Tiryns ring.
- polythyron** *n.* Gk. (lit. = many doors) a 'Minoan hall' having pier-and-door construction.
- pommello** *n.* It. lit. = pommel; see **peg sealing**.
- pose** *n.* a physical attitude or posture, e.g. standing, running etc.
- Potnia** *n.* Gk. lady, mistress; hence ~ **theron** Mistress of Animals (*q.v.*).
- pot stamp** *n.* impression of a seal or stamp on a clay vase (e.g. on handle); purpose unknown.
- pressed glass (seals)** see **mould-made glass seals**.
- prism** *n.* seal with three or four faces of ca equal size and shape; **three-sided** ~ having round or oval faces; **four-sided** ~ having rectangular faces.
- Prisma** *n.* G. = prism.

- prismatic nodule** *n.* two-hole hanging nodule (*q.v.*) with three faces of ca equal size, bearing seal impressions (peculiar to LM I Zakros). G. = *Schnurplombe*, *Prisma*.
- production centre** *n.* locale where manufacture presumably occurred in more than one workshop.
- punch** *n.* tool used to displace metal, i.e. by repeated blows; hence **~ing** a technique commonly used on signet rings in conjunction with engraving (*q.v.*) i.e. the removal of metal.
- quartz** *n.* **1.** generic term for various minerals of the silica (SiO₂) group. **2. crystalline** (or **macro-crystalline**) ~ characterized by large crystals; includes rock crystal, amethyst; also rose and smoky ~. **3. crypto-** (or **micro-crystalline**) ~ characterized by minute crystals detectable only under the microscope, includes two families: chalcedonies (e.g. agate, carnelian, blue chalcedony) and cherts (e.g. chert, flint, jasper). See also entries for individual stones.
- rapport** *n.* system of decoration where motif seems to expand beyond the edge of the seal face.
- recumbent** *a.* lying down, reclining; couchant (*q.v.*); ~ **nodule** see **single-seal** ~, **two-seal** ~.
- regardant** *a.* Fr. looking backwards, i.e. head turned back.
- rhyton (-a)** *n.* Gk. funnel-like vessel, usually conical or pear-shaped, with hole at lower end.
- ring-shaped seal** *n.* seal with flat engraved face and hoop for suspension, often made from hollow section of long-bone.
- ring-stone** *n.* oval seal with convex face and flat back for insertion into metal ring setting.
- rock crystal** *n.* hard semi-precious stone (Mohs 7) of silica group (crystalline quartz family) clear and colourless.
- roller** *n.* large cylindrical object made with engraved designs, which would yield impressions when rolled across a soft medium, e.g. hearth rim, pithos band (*q.v.*). NB in older literature sometimes confusingly termed cylinder (impressions), an expression better reserved for true cylinder seals.
- Rollsiegel** *n.* G. cylinder seal; roller (*q.v.*).
- rotary tools** *n.* implements such as lapidary lathe or tubular drill, used in hard stone engraving, powered by a bow that was attached by means of leather thong or similar.
- roundel** *n. tech.* small piece of clay, usually approx. disc-shaped (D. ca 2–7 cm), with seal impressions around the edge; often bearing Linear A inscription(s) on flat faces.
- sacral knot** *n.* item resembling a large bow (with single loop), frequently included in cult scenes (*q.v.*) and sometimes combined with a double-axe (*q.v.*). NB items that resemble Minoan flounced skirts are also sometimes termed ‘~s’ (when inverted commas should be used).
- sard** *n.* brownish-red variety of carnelian (term inexact and now avoided by *CMS*).
- sardonyx** *n.* variety of agate with brownish-red and white bands (term inexact; avoided by *CMS*).
- scarab** *n.* seal in shape of a beetle, engraved on flat face.
- scaraboid** *n.* seal in shape of beetle, but without detailed body markings, engraved on flat face.
- schematic** *a.* reducing an image to its essential elements; sketchy.
- Schiefer** *n.* G. schist (*q.v.*).
- schist** *n.* see **chlorite** ~.
- Schnurplombe(n)** *n.* G. lit. = string nodule. **1.** See **two-hole hanging nodule**. **2.** ~ *mit öffener Rückseite* *n.* G. ~ with open back.
- Schnurendplombe(n)** *n.* G. lit = string-end sealing. See **single-hole hanging nodule**, where various German and English sub-types are also defined.
- seal** *n.* & *v.t.* **1. n.** object with design engraved on one or more faces, which will produce relief images when pressed into a soft medium such as clay, wax or modern plasticine. **2. n.** ~ **face** the engraved surface of a seal. **3. v.t.** to stamp with a seal; **3. v.t.** to close, secure, stop up.
- sealing** *n.* & *a.* **1. n.** lump of clay bearing impressions of one or more seals (*q.v.*); see also **combination** ~, **object** ~, **peg** ~ **2.** ~ **imprints** marks on the underside of a sealing created by pressing the lump against an object; a modern plasticine or silicone impression taken of the imprints will give clues as to the original sealing support (*q.v.*). **5.** ~ **practices** methods of securing, guaranteeing or authenticating with clay lumps impressed with seals. **6.** ~ **support** object against which a lump of clay has been pressed.
- seal-stone (sealstone)** *n.* (*non-tech.*) term popularly, if inaccurately, used for what is here called a seal (*q.v.*). NB many Aegean seals are made of bone / ivory, metal, glass and other man-made substances, i.e. not only stones hard and soft.
- seal-type** *n.* (*tech.*) an individual seal face or its ancient impression (from ancient Gk *τύπος*, the imprint of a seal).

- semi-precious stone** *n.* generic term applied to hard stones (Mohs 6-7), e.g. agate, amethyst, carnelian, chalcedony, haematite, lapis lazuli, lapis lacedaimonius, jasper, rock crystal (*q.v.*).
- serpentine** *n.* soft to medium-hard stone (Mohs 2-4) usually of greenish hue, sometimes with variegated effects (i.e. like a serpent or lizard); used for seals in LM I-III, also stone vases.
- shaft grave** *n.* rectangular grave located at bottom of deep vertical shaft.
- Siegel** *n.* G. seal (*q.v.*).
- signet** *a. & n.* **1.** ~ **ring** seal ring, usually made of metal, sometimes of stone, with designs engraved on the bezel (*q.v.*). **2.** (*obs.*) **loop-handled** ~, **pawn--**, **stalk--** non-technical names given to what is now termed a *Petschaft* (*q.v.*).
- silicate** *n.* mineral with the chemical composition SiO₂, e.g. quartz (*q.v.*).
- silicone** *n.* synthetic compound sometimes used to make permanent seal impressions or to retrieve the imprints (*q.v.*) on the undersides of sealings.
- single-hole hanging nodule** *n.* lump of clay fashioned around piece of string, knotted at one end to prevent slippage, bearing one seal impression and frequently a Linear A sign ≈ G. *Schnurendplombe*. NB various sub-types reflect shapes of nodules, e.g. ‘conoids’ (or ‘cones’) ≈ G. *S.*, *Konoide*; ‘gable-shaped’ (or ‘domes’) ≈ G. *S. mit giebelförmiger Rückseite*; ‘pendant with rounded back’ ≈ G. *S. mit gewölbter Rückseite*; ‘pendant with pyramidal back’ ≈ G. *S. mit pyramidenförmiger Rückseite*; ‘pyramids’ ≈ G. *S.*, *Pyramide*. See Chapter 7.
- single-seal recumbent nodule** *n.* flat-based nodule (*q.v.*) with one seal impression on upper surface ≈ G. *Päckchenplombe*, *Horizontalscheibe*.
- ‘**snake-frame**’ *n.* elaborate headdress or mask, resembling bull’s horns and often surmounted by double-axe (*q.v.*), which is sometimes worn by the Mistress of Animals (*q.v.*).
- soft stone** *n.* generic term applied to stones registering ca Mohs 1-4, (e.g. talc, steatite, chlorite, schist, serpentine).
- sphinx** *n.* hybrid creature with the head of a human and body of a lion (winged or wingless).
- sphragistic** *a.* pertaining to seals and sealing, hence ~**ally** *adv.* used for sealing purposes.
- stamp** *n.* **1.** item with designs on its face that can be transferred to another object, hence **2.** **decorative** ~, here used for so-called *pintaderas* (*q.v.*) with deeply cut designs, unsuited to making impressions on clay, perhaps employed to transfer pigments to skins or textiles. **3.** ~ **seal** seal with engraved face(s) for pressing onto clay as opposed to a cylinder seal that was rolled across it.
- stamping** *n.* impressing a sealing or object of clay (e.g. pot, ‘loom-weight’) with a seal; **dual--** impressing two different seals (singly or repeatedly) on a given sealing; **multiple** ~ impressing several seals (singly or repeatedly) on a given sealing.
- standing nodule** *n.* flat-based nodule of upright form, with two-seal impressions at right-angles to axis of nodule ≈ G. *Päckchenplombe*, *Vertikalscheibe*; or with three seal impressions creating a pyramid ≈ G. *Päckchenplombe*, *Pyramide*.
- stanza dei sigilli** *n.* It. room of the seals, i.e. sealings (at Ayia Triada).
- steatite** *n.* soft stone (Mohs 2-3) found widely on Crete, islands and mainland, ranging in colour from lightish-green to dark olive-green, yellowish, brownish or black; often with a slightly ‘soapy’ feel. Widely used for seals in MM II; the ‘material of choice’ for the LH III Mainland Popular Group (*q.v.*).
- stirrup jar** *n.* ceramic container, usually piriform or globular, with cylindrical mouth set onto the shoulder; on the top is a false neck flanked by two handles, somewhat resembling stirrups; large examples were used as transport containers for liquids (e.g. oil) in the Aegean LBA.
- stone** see **hard** ~, **semi-precious** ~, **soft** ~.
- stopper** *n.* plug-like closure for the mouth of a narrow-necked jar. NB stoppers for stirrup jars (*q.v.*) are usually shaped like a champagne cork (= G. *Stopperkern*), with a layer of clay (= cap: G. *Tüllenummantelung*) covering the plug and mouth of the jar. G. = *Stopper*.
- Stopperkern** *n.* G. plug-like portion of clay stopper-sealing.
- Stöpselplombe(n)** *n.* G. = lit. stopper (or plug) sealing; see **peg sealing**.
- string-hole** *n.* circular channel(s) that pierce the seal for suspension; Δ ~ string-holes drilled from three sides (as Gk letter delta) found on large pre-palatial cylinders and conoids; channel running through centre of hanging nodules, originally occupied by string or cord.
- style** *n.* manner in which something (e.g. an image) is rendered.

stylized *a.* the rendering of an image in an artificial manner, e.g. where particular stylistic conventions are taken to an extreme. NB sometimes used as the opposite of naturalistic.

supra sigillum *n.* Lat. (inscription) over the seal (impression).

syllabic *a.* (script) in which signs represent syllables (e.g. Cretan Hieroglyphic, Linear A and B).

symmetrical *a.* (composition) consisting of two equal parts.

talc *n.* very soft mineral composed of magnesium silicate (Mohs 1).

'talismanic' **1.** *a.* style of engraving current in MM III-LM I, which relied on rapid and undisguised use of cutting wheels and drills to depict marine motifs, birds, goats, stylized plant motifs and inanimate objects (e.g. double-axes, horns of consecration, jugs, sailing ships); hence **'talismanics'** (*n. plu.*) seals displaying such features.

Ta-urt see **Taweret**

Taweret *n.* Egyptian divinity with body and head of hippopotamus (or lion), lion's mane and paws, and carapace of crocodile on the back, associated with fertility and libations; transformed into the Minoan genius (*q.v.*) during MM II.

tectonic *a.* emphasizing the shape / structure; in glyptic ~ is now applied to MM II-III linear designs with alternating broad and narrow cuts, disposed in various patterns (horizontal, vertical, diagonal) across the seal face. Cf. now *obs.* terms **'architectonic'** and **'architectural'**.

terminus ante quem Lat. date before which.

terminus post quem non Lat. lit. = point after which not, i.e. given item cannot be later than context in which it was found; in glyptic studies this expression now preferred to *terminus ante quem* (*q.v.*).

tête-bêche *a.* Fr. arrangement, e.g. of animals, back-to-back and head-to-tail.

tholos (-oi) *n.* Gk. (vaulted) circular tomb.

token *n.* **1.** item that can be exchanged for specified goods / rations / services or that can serve as proof of identity / authenticity etc. **2.** lump of clay, specially shaped, marked or impressed, perhaps intended to serve such purposes (cf. **nodulus**).

Tombe dei Nobili *n.* It. lit = tombs of the nobles; cemetery of rich LM III chamber tombs at Kalyvia near Phaistos.

trefoil *n.* and *a.* (object or design) having three lobes.

two-hole (hanging) nodule *n.* lump of clay formed around piece of string or cord, thus leaving a hole at each end ≈ G. *Schnurplombe* (lit. = string nodule). NB sub-types reflect different shapes and methods of forming nodule: see **gable-shaped nodule**, **irregular nodule**, **prismatic nodule**.

two-seal recumbent nodule *n.* flat-based nodule where second impression applied at slight angle to the first ≈ *Päckchenplombe*, *Horizontalscheibe mit zweitem Abdruck*.

tubular drill see **drill**.

vano *n.* It. room.

Vierpass (*plu. Vierpässe*) *n.* G. motif having four elements.

Villa Reale *n.* It. Royal Villa (i.e. at Ayia Triada).

wasp-waist *n.* unnaturally narrow waist, used for humans and Minoan genii; also lions in LB III.

Wellenband(-e) *n.* G. wavy band.

'white pieces' *n.* MM I seals made of enigmatic man-made substance, apparently comprising magnesium silicate (talc) and perhaps a binding agent; some pieces originally glazed.

Wickelband *n.* G. piece of cord (or two ends of same cord) twisted together, e.g. by pulling one end taut and winding the other end around it (imprints retrievable from broken irregular nodules).

workshop *n.* **1.** working area, i.e. place where items (e.g. seals) were actually made; an atelier. **2.** hypothetical place of manufacture, i.e. defined on basis of common traits, as in **stylistic** ~.

Zeüstil *n.* Ger. = style of the time.

zoomorphic *a.* having the shape of an animal.

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Sealings and impressions of their undersides are listed by inventory / excavation number; the relevant *CMS* number (pertaining to the motif or seal-type) is also given. For Lerna and Phaistos, I also provide brief references to the typologies devised by M. Heath (= M. H. Wiencke) and E. Fiandra, respectively. For Mycenae and Pylos, references are given to the recent publications by the *CMS* team (i.e. Müller et al. 1998 and *Tonplomben*), which supersede earlier coverage in *CMS* I, I Suppl. and V. For general abbreviations used below see p. xxiv.

For the most part, black and white photographs of seals and drawings of seal faces / seal-types were obtained as scans from originals held in the *CMS* Archive; all but a few have already appeared in volumes of the series. For permission to reproduce them here I am deeply indebted to the general editor of the *CMS*, Ingo Pini. For impressions I have generally used my own photographs, often taken in the *CMS* Archive, sometimes in museums or at home. All images have been edited and digitally enhanced using Photoshop 7.0. The modern impressions of seals are mostly plasticine (exceptions are specified), whereas silicone is now normally used to retrieve the imprints from the undersides of sealings (see Chapter 1). A separate list of Colour Plates appears below (pp. 403-04) and Plate Credits follow on p. 405.

Chapter 1

- 1 *CMS* XI no. 42 (Berlin: FG 15). Lentoid, carnelian; SH vertical. 'Athens' (ex-Rhousopoulos 1880). a) Seal face; b) silicone impression.
- 2 *CMS* II.2 no. 60 (HM 1719). Biconvex discoid, 'chalcedony'. Knossos: Ailias T VII. a) Seal face; b) impression; c) drawing.
- 3 *CMS* VII no. 134 (BM G&R 1923.4-1.4). Unknown provenance (entered BM pre-1835). a) Plaster cast; b) plasticine impression; c) Fimo impression.
- 4 HMs 696, 945D: *CMS* II.5 no. 297. Direct object sealing (Fiandra Types D, V). Phaistos *vano* 25. a) Silicone impression; b) plaster cast; c) drawing of seal-type.
- 5 HMs 166/2, 141/1, 166/1, 141/2: *CMS* II.8 no. 256. Irregular two-hole nodules, broken (2 further fragments not illustrated). Knossos: Central Shrine and chamber to west. a) Plaster casts; b) drawing of seal-type (metal ring).
- 6 L4.320 (Argos Museum). Direct object sealing. Lerna: Rm CA. Silicone of reverse showing pithos rim and reed packing (cf. *Hesperia* 38 [1969] 508 no. 190, pl. 125).
- 7 L4.380 (Argos Museum). Direct object sealing. Lerna: House of Tiles, Rm XI. Plasticine impression of reverse showing reed matting (cf. *Hesperia* 27 [1958] 101 no. 113, pls. 24, 28; Heath Type E).
- 8 L4.434 (Argos Museum). Direct object sealing. Lerna: House of Tiles, Rm XI. Silicone of reverse showing wooden peg (cf. *Hesperia* 27 [1958] 92 no. 45, pls. 19 [here 82] and 23; Heath Type B).
- 9 HMs 825o. Direct object sealing (Fiandra Type O). Phaistos *vano* 25. Silicone of reverse showing reed matting.
- 10 HMs 195. Flat-based nodule / packet. Knossos: Hieroglyphic 'Deposit'. Plasticine of reverse showing folded parchment / leather and fine threads.
- 11 HMs 352. Flat-based nodule / packet. Knossos: Eastern Temple Repository. Plasticine of reverse showing folded parchment / leather and fine threads. Cf. 320 for seal-type.

- 12 HMs 1/6. Flat-based nodule / packet. Zakros: House A, Rm 7. Silicone of reverse showing folded parchment / leather and fine threads.
- 13 HMs 48.1. Flat-based nodule / packet. Zakros: House A, Rm 7. Silicone of reverse showing folded parchment / leather and fine threads.
- 14 HMs 498. Flat-based nodule / packet. Ayia Triada: *Villa Reale*, find-spot unknown. Silicone of reverse showing folded parchment / leather and fine threads. Cf. **283a-b** for drawing and section; and **368** for drawing of seal-type.
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- 16 HMs 459.2. Single-hole hanging nodule. Ayia Triada: *Villa Reale*, find-spot unknown. Silicone of broken nodule, revealing imprint of knot within.
- 17 HMs 16/14. Two-hole hanging nodule (prismatic variety). Zakros: House A, Rm 7. Plasticine of broken nodule, revealing imprint of knot within.
- 18 AM 1938.947a. Combination sealing. Knossos: Wooden Staircase & Secretaries' Bureau. Plasticine impression of reverse revealing imprint of wickerwork.
- 19 ANM 8521β (*Tonplomben* no. 14B). Irregular two-hole nodule with open rear. Pylos: Wine Magazine, Rm 104 doorway. Silicone revealing imprint of cord.
- 20 Mycenae Museum 11248 / CHA 62-953. Irregular two-hole nodule with open rear. Mycenae: Citadel House Area, Rm II. Silicone revealing imprint of twisted cords (cf. AA 1998, 22, no. 7).
- 21 Thebes Museum 342 / CMS V Suppl. 1B no. 354. Direct object sealing. Thebes: 'Old Kadmeion' (excav. Keramopoulos 1911). Plasticine impression of reverse revealing imprint of leather and cord.
- 22 HMs 71/1, 2. Zakros: House A, Rm 7. Drawings of seal-type: **a)** *JHS* 22 (1902) 77-78 no. 6, fig. 5; **b)** *PM* I 435, fig. 312b; **c)** *CMS* II.7 no. 7 (soft stone ring).
- 23 HMs 343. Knossos: Eastern Temple Repository. Drawings of seal-type: **a)** *PM* I 505, fig. 363b; **b)** *CMS* II.8 no. 236 (hard stone cushion).
- 24 HMs 160, 161. Knossos: Rm of the Egyptian Beans. Drawings of seal-type: **a)** *BSA* 7 (1900-01) 18, fig. 7a; **b)** *PM* II 763, fig. 491; **c)** *CMS* II.8 no. 262 (soft stone lentoid).
- 25 *CMS* II.2 no. 275 (HM 350). Biconvex discoid, rock crystal. Avgos, stray find. **a)** Seal face; **b)** impression.
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- 27 *CMS* V no. 599 (Mycenae 18813; CHA 69-728). Unfinished lentoid, agate. Mycenae: Citadel House Area, Rm 32. Seal face.
- 28 *CMS* VII no. 162 (BM G&R 1934.1-20.2). Lentoid, rock crystal. Unknown provenance. Seal face.
- 29 *CMS* V no. 60 (Argos L3. 10). Lerna: House of Tiles, Rm VI. Drawing of seal-type.
- 30 *CMS* II.1 no. 229 (HM 1208). Stamp cylinder, ivory. Marathokephalo ThT. Drawing of seal face. Cf. **106a-b** for seal profile and impression.
- 31 *CMS* I no. 252 (ANM 1774). Lentoid, agate; SH vertical, one gold cap preserved. Vapheio Th T (floor cist). Impression.
- 32 *CMS* I no. 251 (ANM 1777). Lentoid, agate; SH horizontal. Vapheio ThT (floor cist). Impression.
- 33 *CMS* I no. 144 (ANM 6442ε). Lentoid, carnelian; SH horizontal. Mycenae: CT 515. Impression.
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- 35 *CMS* II.2 no. 232a (HM 378). Three-sided prism, steatite. Mallia: stray find. Silicone impression.
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- 37 *CMS* VII no. 42 (BM G&R 1909.4-9.7). Biconvex discoid, agate, exposed to heat (?); SH vertical. Unknown provenance (ex-Wace). Impression. Cf. **C16**.
- 38 *CMS* VIII no. 110. Three-sided prism, haematite. Formerly in private collection of Hon. Robert Erskine; present whereabouts unknown. Unknown provenance. Plaster cast face a.
- 39 *CMS* I no. 242 (ANM 1780). Lentoid, red jasper; SH vertical. Vapheio ThT (floor cist). Impression.
- 40 HM 2507. Lentoid, carnelian; SH diagonal. Knossos: Unexplored Mansion (MUM J / K 3). Impression.
- 41 *CMS* II.4 no. 122 (HM 1867). Lentoid, carnelian; SH vertical. Knossos: Sellopoulo T. 2. Silicone impression.
- 42 *CMS* I Suppl. no. 21 (ANM 10136). Lentoid, carnelian; SH vertical. Midea CT 2. Impression.
- 43 *CMS* V Suppl. 1B no. 286 (Rethymnon Ε149). Lentoid, schist-like stone; SH vertical. Armeni T. 177. Impression.
- 44 *CMS* V Suppl. 1A 348 (Dion 2892). Lentoid, steatite; SH vertical. Ayios Dimitrios (Olympos): stou Lakkou t' Ambeli Gr. 2. Impression.

Chapter 2

- 45 *CMS* II.1 no. 306 (HM 1098). Cylinder seal, haematite. Old Babylonian. Platanos ThT B. Impression.
 46 *CMS* II.1 no. 283 (HM 1075). Scarab, white 'paste'. Egyptian. Platanos ThT B. **a)** Profile; **b)** impression.
 47 *CMS* V no. 707 (Verria –; exc. no. 661). Stamp, clay. Nea Nikomedia. **a)** Profile; **b)** face.
 48 *CMS* V no. 514 (Larissa –). Stamp, soft stone. Nessonis. **a)** Reverse; **b)** face.
 49 *CMS* V Suppl. 1B no. 447 (Volos M2464). Stamp, soft stone. Provenance unknown. Drawing of face.
 50 *CMS* V Suppl. 1B no. 448 (Volos M2469). Stamp, soft stone. Serelia. Drawing of face.
 51 *CMS* V Suppl. 1B no. 464 (Volos BE4675). Stamp, soft stone. Sesklo. Drawing of face.
 52 *CMS* V no. 636 (Philippi 446). Cylinder, clay. Sitagri. **a)** Profile; **b)** impression.
 53 *CMS* V Suppl. 1B no. 127 (Nemea: exc. no. ST 661). Unpierced 'lentoid', marble-like stone. Tsoungiza, Early Neolithic cave. **a)** Profile; **b) – c)** impressions of faces.

Chapter 3

- 54 *CMS* V Suppl. 1B no. 369 (Tiryns 28143). Conoid, clay. Tiryns: Oberburg, EH II level (Rm XVI). **a)** Profile; **b)** face.
 55 *CMS* V Suppl. 1B no. 368 (Tiryns 28144). Conoid, clay. Tiryns: Unterburg. **a)** Profile; **b)** face.
 56 *CMS* V Suppl. 1B no. 367 (Tiryns 28141). Ring-shaped seal, schist-like stone. Tiryns: Mittelburg. **a)** Profile; **b)** face.
 57 *CMS* XI no. 5 (Berlin: FG 59). Low pyramid, light-green translucent stone ('serpentine' or 'steatite'). 'Kouphonisia' (1889). **a)** Reverse; **b)** face. Cf. C2.
 58 *CMS* V no. 526 (Nauplia 3354). Quadrangular stamp, with pierced handle. Asine: bothros on pre-Mycenaean terrace. **a)** Profile; **b)** face b.
 59 *CMS* V Suppl. 1B no. 128 (exc. no. BP 632; Nemea Museum). Conoid, lead. Tsoungiza. **a)** Profile; **b)** drawing of impression.
 60 *CMS* V Suppl. 1B no. 105 (Naxos 4853). Stamp with round face and elongated cylindrical handle, lead or silver (not analysed). Aplomata, Naxos: Gr. I. **a)** Profile; **b)** drawing of impression.
 61 *CMS* V no. 462 (K.3948). Rim fragment of fixed hearth. Ayia Irini, Kea: House E, Rm III. **a)** Drawing of original impression; **b)** impression; **c)** plasticine impression showing the design on the original stamp.
 62 L4. 351 (Argos Museum). Direct object sealing (Heath Type E). Lerna: House of Tiles, Rm XI. **a)** Upper surface; **b)** detail (cf. *CMS* V no. 97).
 63 *CMS* V no. 54 (L4.358, L4.360, L4.401-406). Direct object sealings (Heath Type A). Lerna: House of Tiles, Rm XI. Drawing of seal-type.
 64 *CMS* V no. 56 (L4. 408-412). Direct object sealings (Heath Types A-B). Lerna: House of Tiles, Rm XI. Drawing of seal-type.
 65 *CMS* V no. 57 (L4.350). Direct object sealing (indeterminate). Lerna: House of Tiles, Rm XI. Drawing of seal-type.
 66 *CMS* V no. 79 (L4.345, L4.347, L4.362-368). Direct object sealings (Heath Type A). Lerna: House of Tiles, Rm XI. Drawing of seal-type.
 67 *CMS* V no. 93 (L4.349, L4.352-355). Direct object sealings (Heath Types B, E). Lerna: House of Tiles, Rm XI. Drawing of seal-type.
 68 *CMS* V no. 100 (L4.346). Direct object sealing (Heath Type A). Lerna: House of Tiles, Rm XI. Drawing of seal-type.
 69 *CMS* V no. 107 (L4.379). Direct object sealing (Heath Type D). Lerna: House of Tiles, Rm XI. Drawing of seal-type.
 70 *CMS* V no. 111 (L4.348, L4.358-360). Direct object sealings (Heath Types A-B). Lerna: House of Tiles, Rm XI. Drawing of seal-type.
 71 *CMS* V no. 112 (L4.451). Direct object sealing (Heath Type C). Lerna: House of Tiles, Rm XI. Drawing of seal-type.
 72 *CMS* V Suppl. 3 no. 360 (exc. no. 76 SF1 + ca 12 other fragments). Direct object sealings. Geraki. Drawing of seal-type.
 73 *CMS* V Suppl. 3 no. 361 (exc. no. 76 SF4/2 + ca 9 other fragments). Direct object sealings. Geraki. Drawing of seal-type.
 74 *CMS* V Suppl. 1B no. 106 (Naxos 7712, 7714, 7716). Direct object sealings. Zas Cave, Naxos. Drawing of seal-type.
 75 Petri exc. no. 22A. (Argos –). Direct object sealing. Petri. Upper surface.
 76 Tiryns exc. no. LXI 41/4 XVI (*CMS* V Suppl. 1B no. 371). Direct object sealing. Tiryns: Unterburg. Upper surface.
 77 *CMS* V no. 44 (L5.721 and 14 other fragments). Direct object sealings associated with East and West Pithoi in Rm DM at Lerna. Drawing of seal-type. Cf. 78-80.
 78 *CMS* V no. 45 (L5.721 and 20 other fragments). Direct object sealings associated with East and West Pithoi in Rm DM at Lerna. Drawing of seal-type. Cf. 77, 79-80.

- 79 East Pithos from Rm DM at Lerna as displayed in Argos Museum. See 80 for one of the numerous sealing fragments associated with the pithos, dual-stamped with 77-78.
- 80 L5.721. Direct object sealing, associated with East Pithos (79) in Rm DM at Lerna. **a**) upper surface (see 77-78 for drawings of seal-types); **b**) underside, showing imprint of cords.
- 81 L4.347. Direct object sealing (Heath Type A). Lerna: House of Tiles, Rm XI. **a**) Section with pole restored; **b**) two joining fragments, from above, poles restored.
- 82 L4.434. Direct object sealing (Heath Type B). Lerna: House of Tiles, Rm XI. Restored section. Cf. here 8 for silicone of reverse.
- 83 L4.345. Direct object sealing (Heath Type A). Lerna: House of Tiles, Rm XI. **a**) Upper surface (see 66 for drawing of seal-type); **b**) silicone impression of reverse, revealing imprint of pole and cords.
- 84 L4.437. Direct object sealing (Heath Type B). Lerna: House of Tiles, Rm XI. **a**) Upper surface; **b**) reverse; **c**) plasticine impression of reverse, revealing imprint of peg and cords.
- 85 K.3897 (*CMS* V no. 451). Rim fragment of fixed hearth. Ayia Irini, Kea: cutting J under Building XI. **a**) Hearth fragment (L. 14.7 cm); **b**) detail of impressions.
- 86 ANM 5235 (*CMS* I Suppl. no. 172). Three-handled jar with impressed decoration. Kastri, Syros. **a**) Vessel; **b**) drawing of seal-type.
- 87 K.4056a (*CMS* V no. 476). Shoulder fragment of jug with pot stamp. Ayia Irini, Kea: cutting J under Building XI. **a**) Vessel fragment; **b**) detail of impression. (Not illustrated K.4056b, handle fragment of same jug, bearing another impression of same seal).
- 88 L.991 (*CMS* V no. 131). Neck and part of body of pithos, decorated with attached bands of roller impressions. Lerna: NE of House of Tiles, early Lerna IV level. **a**) Vessel; **b**) drawing of roller impression.
- 89 *CMS* V no. 120 (L. 1564a-c). Three sherds decorated with applied bands of roller impressions. Lerna: from Lerna IV levels. Drawing of roller impression. Identical decoration occurs on pithos sherds from Zygouries (Corinth – : *CMS* V no. 504) and Tiryns (Nauplia 1535: *CMS* V no. 529).
- 90 *CMS* V no. 562 (Nauplia –). Rim fragment of tub with roller decoration and sherd from pithos with applied band decorated with same roller. Tiryns: find-spot unknown. Drawing of roller impression.
- 91 L.1556 (*CMS* V no. 149). Hearth with roller impression on rim. Lerna: Building BG. **a**) Hearth as displayed in Argos Museum; **b**) rim detail.
- 92 *CMS* V Suppl. 1B no. 104 (Nauplia 5148). Roller fragment, clay. Unknown provenance (from the Argolid). **a**) Restored section; **b**) drawing of motif (based on original fragment, not impression).
- 93 AM AE 159 (1889.307). Stamp cylinder, green stone. Unknown provenance: allegedly among grave goods from Kapros (Amorgos) Grave D; ex-Rhousopoulos (bought in Athens by Rev. Greville Chester; sold by him to Ashmolean 1889). **a**) Profile; **b**) – **c**) impressions.

Chapter 4

- 94 *CMS* V no. 16 (A. Nikolaos 3236). Conoid, steatite. Myrtos-*Fournou Korifi*. **a**) Profile; **b**) face.
- 95 *CMS* V no. 17 (A. Nikolaos 3235). Irregular four-sided pyramid, steatite. Myrtos-*Fournou Korifi*. **a**) Profile; **b**) face.
- 96 *CMS* no. 18 (A. Nikolaos –). Unfinished conoid, dark red-brown basalt with calcite inclusions; face unengraved. Profile.
- 97 *CMS* II.1 no. 196 (HM 1981). Low cylinder, chlorite. Lenda-*Gerokambos*. ThT II (lower level). **a**) Face **a**; **b**) profile; **c**) face **b**.
- 98 *CMS* II.1 no. 179 (HM 1924). Ring-shaped seal, bone (cattle metatarsal). Lenda-*Papoura* ThT I. **a**) Profile; **b**) face.
- 99 *CMS* II.1 no. 210 (HM 2005). Hammer-headed seal, bone (cattle metatarsal). Lenda-*Gerokambos* ThT IIA (lower level). **a**) Profile; **b**) face. Cf. C4.
- 100 *CMS* II.1 no. 144 (HM 527). Concavo-convex seal, bone. Koumasa ThT A. **a**) Profile; **b**) face.
- 101 *CMS* II.1 no. 317 (HM 1109). Shoulder-shaped seal (*epomion*), bone. Platanos ThT B. **a**) Profile; **b**) face.
- 102 *CMS* II.1 no. 60 (HM 488). Conoid, bone. Ayia Triada ThT A. **a**) Profile; **b**) face.
- 103 *CMS* II.1 no. 79 (HM 507). Seal made from tusk of pig or wild boar; natural shape little modified, save for the removal of proximal (root) end, engraving of face and provision of string-hole.
- 104 *CMS* II.1 no. 59 (HM 487). 'Cylinder' with oval section, hippopotamus ivory (lower canine). Ayia Triada ThT A. **a**) Profile; **b**) impression.
- 105 *CMS* II.1 no. 243 (HM 1029). Cylinder, hippopotamus ivory (incisor). Platanos ThT A. **a**) Profile; **b**) impression.
- 106 *CMS* II.1 no. 229 (HM 1208). Cylinder, hippopotamus ivory. Marathokephalo ThT. **a**) Profile; **b**) impression. Cf. 30 for drawing.
- 107 *CMS* II.1 no. 37 (HM 465). Conoid, hippopotamus ivory. Ayia Triada ThA. **a**) Profile; **b**) impression.

- 108 *CMS* II.1 no. 228 (HM 1207). Conoid, hippopotamus ivory. Marathokephalo ThT. **a)** Profile; **b)** impression.
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- 110 *CMS* II.1 no. 52 (HM 480). Bi-facial cylinder, hippopotamus ivory (lower canine). Ayia Triada ThT A. **a)** Impression face a; **b)** profile; **c)** impression face b.
- 111 *CMS* II.1 no. 248 (HM 1039). Bi-facial cylinder, hippopotamus ivory. Platanos ThT A. **a)** Impression face a; **b)** profile; **c)** impression face b.
- 112 *CMS* II.1 no. 222 (HM 1201). Bi-facial cylinder, hippopotamus ivory. Marathokephalo ThT. **a)** Impression face a; **b)** profile; **c)** impression face b.
- 113 *CMS* II.1 no.17 (HM 444). Zoomorphic seal, bone. Ayia Triada ThT A. **a)** Profile; **b)** face.
- 114 *CMS* II.1 no. 213 (HM 2008). Zoomorphic seal, bone. Lenda-Gerokambos ThT IIA. **a)** Profile; **b)** face.
- 115 *CMS* II.1 no. 133 (HM 516). Zoomorphic seal: dove and young, hippopotamus ivory (incisor). Koumasa ThT B. **a)** Profile; **b)** impression.
- 116 *CMS* II.1 no. 249 (HM 1040). Zoomorphic seal: seated ape, hippopotamus ivory. Platanos ThT A. **a)** Profile; **b)** impression.
- 117 *CMS* II.1 no. 253 (HM 1044). Zoomorphic seal: recumbent calf, bone. Platanos ThT A. **a)** Profile; **b)** impression.
- 118 *CMS* II.1 no. 101 (HM –). Conoid, bone. Ayia Triada ThT A. **a)** Profile; **b)** impression.
- 119 *CMS* II.1 no. 135 (HM 518). Conoid, boar's tusk. Koumasa ThT B. **a)** Profile; **b)** impression.
- 120 *CMS* II.1 no. 450 (HM 953). Half-cylinder, bone. Gouves Pediados, stray find. **a)** Profile; **b)** impression.
- 121 *CMS* II.1 no. 268 (HM 1059). Bi-facial elliptical disc, bone. Platanos ThT B. **a)** Impression face a; **b)** profile; **c)** impression face b.
- 122 *CMS* II.1 no. 391 (HM 2260). Four-sided bar with pierced handle and 14 seal faces, bone. Archanes-Phourni: Burial Building 6. **a)** Schematic drawing; **b)** drawing of face B; **c)** profile with faces J, K, L; **d) – f)** drawings of faces J, K, L.
- 123 *CS* no. 95 (AM 1938.929). Bi-facial disc, olive-green steatite. 'Hellenika', Knossos. **a)** Face a; **b) – c)** plaster casts of faces a, b. Cf. C7.
- 124 *CMS* II.1 no. 355 (HM 652). Plano-convex button, 'white piece' material. Porti ThT. **a)** Profile; **b)** face.
- 125 *CMS* II.1 no. 357 (HM 654). Zoomorphic seal, 'white piece' material. Porti ThT. **a)** Profile; **b)** face.
- 126 *CMS* II.1 no. 403 (HM 1185). Plano-convex button, 'white piece' material. Gourmes Pediados, Grave Enclosure. **a)** Profile; **b)** face.
- 127 *CMS* II.1 no. 402 (HM 1184). Minoan 'scarab', 'white piece' material. Gourmes Pediados, Grave Enclosure. **a)** Profile; **b)** face; **c)** section of face to show angle of engraving.
- 128 *CMS* II.1 no. 180 (HM 1925). Egyptian scarab, 'white piece' material. Lenda-Papoura ThT I. **a)** Profile; **b)** face; **c)** section of face to show angle of engraving.
- 129 *CMS* II.1 no. 298 (HM 1090). Bell-shaped conoid, chlorite (?). Platanos ThT B. **a)** Profile; **b)** face.
- 130 *CMS* II.1 no. 206 (HM 2000). Conoid, chlorite. Lenda-Gerokambos ThT IIA, upper level. **a)** Profile; **b)** face.
- 131 *CMS* II.1 no. 153 (HM 536). Plano-convex button, steatite. Koumasa ThT A. **a)** Profile; **b)** face.
- 132 *CMS* II.1 no. 85 (HM 1010). Three-sided prism, steatite. Ayia Triada ThT A. **a)** Profile, showing face a; **b)** face b; **c)** face c.
- 133 Ayios Nikolaos 3237 (*CMS* V no. 20). Direct object sealing. Myrtos-Fournou Korifi. **a)** Upper surface; **b)** drawing of seal-type.
- 134 HMs 1099 (*CMS* II.8 no. 6). Direct object sealing, stopper fragment. Knossos: early houses on south edge of palace. **a)** Drawing of seal-type (ivory cylinder or conoid); **b)** schematic drawing of upper surface to show location of impressions; **c)** schematic drawing to show section.

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- 135 *CMS* II.2 no. 51 (HM 1621). Bi-facial discoid, steatite. Knossos: Ailias T. 6. **a)** Face a; **b)** silicone impression face a.
- 136 *CS* no. 109 (AM 1941.247). Three-sided prism, whitish veined agate. 'Papouda near Lyttos'. **a)** Profile; **b) – d)** impressions of faces a, b, c.
- 137 *CMS* II.2 no. 9 (HM 2159). Button, 'steatite'. Kamilari ThT. **a)** Profile; **b)** silicone impression.
- 138 *CMS* II.2 no. 10 (HM 2165). Bottle, 'steatite'. Kamilari ThT. **a)** Profile; **b)** silicone impression.
- 139 *CMS* II.2 no. 6 (HM 2156). Button, medium-hard reddish stone (not red jasper). Kamilari ThT. **a)** Profile; **b)** silicone impression.
- 140 *CMS* II.2 no. 252 (HM precious metal 378). *Petschaft*, silver. Mochlos T. 15. **a)** Profile; **b)** face.
- 141 *CMS* II.2 no. 31 (HM 210). Button, brownish jasper. Knossos, palace. **a)** Profile; **b)** silicone impression.
- 142 *CMS* II.2 no. 286 (HM 1678). Rectangular bar, lapis lazuli. Palaikastro, stray find. **a)** Face a; **b) – c)** silicone impressions of faces a-b.

- 143 CMS II.2 no. 3 (HM 619). *Petschaft*, green jasper. 'Axos'. **a**) Profile; **b**) silicone impression.
- 144 CS no. 121 (AM 1938.934). *Petschaft*, agate exposed to heat. 'Kedri near Ierapetra'. **a**) Profile; **b**) impression. Cf. C11.
- 145 CMS XI no. 16 (Berlin: FG 88). *Petschaft*, yellow jasper. 'Crete' (ex-Lambros 1882). **a**) Profile; **b**) silicone impression. Cf. C10.
- 146 CS no. 122 (AM 1938.935). *Petschaft*, green jasper. 'Archanes'. Impression.
- 147 CS no. 118 (AM 1910.282). *Petschaft*, green jasper. Unknown provenance. Impression.
- 148 CS no. 112 (AM 1938.942). Biconvex discoid, agate. 'Central Crete'. **a**) Impression; **b**) profile. Cf. C15.
- 149 CMS VII no. 35 (BM G&R 1921.7-11.2). Cushion, banded agate; SH horizontal. Unknown provenance (ex Storey-Maskelyne Coll.). **a**) – **b**) Impressions of faces a, b. Cf. CHIC #205: α 1. X042-019; α 2. 019-095-052. Cf. C17.
- 150 CMS II.2 no. 131 (HM 1803). Three-sided prism, yellowish steatite. Mallia: *Atelier des sceaux*. Face a.
- 151 CMS II.2 no. 100 (HM 1770). Three-sided prism, yellowish-brown steatite. Mallia: *Atelier des sceaux*. Face b. Cf. CHIC #231: 044-049.
- 152 CMS II.2 no. 119 (HM 1789). Three-sided prism, dark-brown steatite. Mallia: *Atelier des sceaux*. Face a.
- 153 CMS II.2 no. 224 (HM 80). Three-sided prism, blackish / olive-green steatite. Gones, stray find. **a**) Face a; **b**) – **d**) silicone impressions of faces a, b, c.
- 154 CMS II.2 no. 164 (HM 1836). Three-sided prism, greyish white stone. Mallia: *Atelier des sceaux*. **a**) – **c**) Drawings of impressions.
- 155 CMS II.2 no. 174 (HM 1846). Three-sided prism, greenish steatite. Mallia: *Atelier des sceaux*. **a**) – **c**) Drawings of impressions.
- 156 CMS II.2 no. 276 (HM 588). Three-sided prism, blackish steatite with yellow flecks. Adromyli, stray find. **a**) – **c**) Drawings of impressions.
- 157 CMS II.2 no. 219 (HM 69). Three-sided prism, olive-green steatite. Mochos, stray find. **a**) – **c**) Drawings of impressions.
- 158 CMS II.2 no. 220 (HM 1191). Three-sided prism, black steatite. Avdou, stray find. **a**) – **c**) Silicone impressions of faces a, b, c. Cf. CHIC #208: 044-049.
- 159 CMS XI no. 12 (Berlin: FG 58). Three-sided prism, dark green jasper. 'Crete' (ex-Lambros 1882). **a**)–**c**) Silicone impressions of faces a, b, c. For faces b-c, cf. CHIC #243 β : 006-057-092; γ : 057-023 ><.
- 160 CMS IV no. 156 (Metaxas Coll. 190). Three-sided prism, green jasper. 'Mallia'. **a**) – **c**) Silicone impressions of faces a, b, c. For faces b-c, cf. CHIC #247 β : 044-049; γ : X 044-005.
- 161 CS no. 174 (AM 1938.791). Three-sided prism, carnelian. 'Lasithi'. **a**) – **c**) Plaster casts of faces a, b, c. Cf. CHIC #257 α : 038-010-031; β : 036-092-031; γ : X 046-044. Cf. C13.
- 162 CMS VII no. 40 (BM G&R 1934.11-20.1). Four-sided prism, green jasper. Unknown provenance. **a**) – **d**) Plaster casts of faces a, b, c, d. Cf. CHIC #299 α : X 044-049; β : X 044-005; γ : X 036-092; δ : 038-010-031.
- 163 CMS II.6 no. 228 (KSM: MP / 73 / 240). Vase handle with seal impression. Myrtos-Pyrgos, Cistern 2. **a**) Drawing of seal-type (round flat face, hard stone); **b**) handle.
- 164 CMS II.6 no. 175 (HMP 17176). Pyramidal 'loom-weight' with seal impression. Mallia: Quartier Theta (Rm α with annexes α 1 and ζ). **a**) 'Weight'; **b**) drawing of seal-type (round flat face of bone / ivory or soft stone).
- 165 CMS II.6 no. 203 (Mallia storeroom no. M 67 / E 31 [67 M 1054]). Spherical 'loom-weight' with seal impression. Mallia: Quartier Mu III 4. **a**) Drawing of seal-type (round flat face, soft stone); **b**) 'weight'.
- 166 MGM 70 M 74a (CMS II.6 no. 206). Direct object sealing, vessel rim. Mallia: Quartier Mu III 17. Silicone of reverse.
- 167 HMs 1086 (CMS II.6 no. 183). Direct object sealing, peg. Mallia: Quartier Mu III 16, NE corner. Silicone of reverse.
- 168 HMs 1083 (CMS II.6 nos. 184 + 193). Crescent, unscrubbed, with two seal impressions. Mallia: Quartier Mu III 16, E side. **a**) Side view; **b**) longitudinal section; **c**) transverse section. Cf. 192-193 for seal-types.
- 169 HMs 172 (CMS II.8 nos. 37 + 90). Crescent, inscribed on three faces, with four seal impressions (two seals impressed twice). Knossos: Hieroglyphic 'Deposit'. **a**) – **d**) Views of all four faces of crescent. CHIC #027 KN Ha (05) 01. Cf. 197 for drawing of CMS II.6 no. 90.
- 170 HMs 1082 (CMS II.6 no. 200). *Nodus*, domed back. Mallia: Quartier Mu XI 4. **a**) Underside, with impression; **b**) drawing, from side. Cf. 190 for seal-type.
- 171 HMs 1052 (CMS II.6 no. 180). *Nodus*, pyramidal, with two impressions of same seal. Mallia: Quartier Mu V 5, SE corner. **a**) Underside, with impression 1; **b**) drawing of reverse; **c**) drawing, from side. Cf. 194 for seal-type.
- 172 HM 1487 (PH Wc 37 / CMS II. 5 no. 220). Roundel, with two impressions of same seal on edge; Linear A inscriptions on faces. **a**) Face a; **b**) drawing of face b; **c**) drawing of seal-type.
- 173 CMS II.5 no. 36 (HMs 767). Direct object sealing, 1 lump (Fiandra Type D, V?). Phaistos: *vano* 25. Drawing of seal-type (round slightly convex face, soft stone).

- 174 *CMS* II.5 no. 144 (HMs 778). Direct object sealings, 4 lumps (Fiandra Types C, D, V). Phaistos: *vano* 25. Drawing of seal-type (round flat face, soft stone).
- 175 *CMS* II.5 no. 211 (HMs 736). Direct object sealings, 4 lumps (Fiandra Type B, V). Phaistos: *vano* 25. Drawing of seal-type (oval and flat face).
- 176 *CMS* II.5 no. 216 (HMs 790, 790α'D, 790γ'D, 790δ'α). Direct object sealings, 4 lumps (Fiandra Types D, M, U, V). Phaistos: *vano* 25. Drawing of seal-type (round slightly convex face).
- 177 *CMS* II.5 no. 165 (HMs 772 with exception of 772ρiθ' and 772ρκβ'). Direct object sealings, 175 lumps (Fiandra Types A-E, M, O, U, V). Phaistos: *vano* 25. Drawing of seal-type (round flat seal face).
- 178 *CMS* II.5 no. 82 (HMs 783). Direct object sealings, 38 lumps (Fiandra Types D, V). Phaistos: *vano* 25. Drawing of seal-type (round strongly convex face, hard stone).
- 179 *CMS* II.5 no. 300 (HMs 689). Direct object sealings, 6 lumps (Fiandra Types G, P). Phaistos: *vano* 25. Drawing of seal-type (round flat face, hard stone; *Petschaft?*).
- 180 *CMS* II.5 no. 317 (HMs 715). Direct object sealings, 2 lumps (Fiandra Types B, M). Phaistos: *vano* 25. Drawing of seal-type (round flat face).
- 181 *CMS* II.5 no. 322 (HMs 697). Direct object sealing, 1 lump (Fiandra Type N). Phaistos: *vano* 25. Drawing of seal-type (oval ring bezel, metal).
- 182 *CMS* II.5 no. 259 (HMs 698). Direct object sealings, 2 lumps (Fiandra Types B, N). Phaistos: *vano* 25. Drawing of seal-type (oval ring bezel, metal).
- 183 *CMS* II.5 no. 270 (HMs 693). Direct object sealing, 1 lump (Fiandra Type V). Phaistos: *vano* 25. Drawing of seal-type (oval ring bezel, metal).
- 184 HMs 845 (*CMS* II.5 no. 21). Direct object sealing (Fiandra Type A). Phaistos: *vano* 25. Silicone of reverse.
- 185 HMs 857β' (*CMS* II.5 no. 103). Direct object sealing (Fiandra Type B). Phaistos: *vano* 25. Silicone of reverse.
- 186 HMs 784 (*CMS* II.5 no. 129). Direct object sealing (Fiandra Type D). Phaistos: *vano* 25. Silicone of reverse.
- 187 HMs 860α (*CMS* II.5 no. 89). Direct object sealing (Fiandra Type E). Phaistos: *vano* 25. Silicone of reverse.
- 188 HMs 769 (*CMS* II.5 no. 153?). Direct object sealing (Fiandra Type E). Phaistos: *vano* 25. Silicone of reverse.
- 189 *CMS* II.6 no. 186 (HMs 1081). *Nodulus*, gable-shaped. Mallia: Quartier Mu III 17. Drawing of seal-type (flat rectangular face of four-sided prism, hard stone).
- 190 *CMS* II.6 no. 200 (HMs 1082). *Nodulus*, rounded back. Mallia: Quartier Mu XI 4. Drawing of seal-type (round convex face, hard? stone). Cf. 170a-b for photograph and section drawing.
- 191 *CMS* II.6 no. 193 (HMs 1076). *Nodulus*, pyramid. Mallia: Quartier Mu III 17, SE corner (surface). Drawing of seal-type (round flat face, soft stone).
- 192 *CMS* II.6 no. 195 (HMs 1078, 1083). Crescents, unscribed: 1078 with single impression; 1083 dual-stamped with *CMS* II.6 nos. 195 + 184 (here 193). Mallia: Quartier Mu III 14, NW corner (HMs 1078); III 16, E side (HMs 1083). Drawing of seal-type (round convex face, soft stone). Cf. 168a-c for photograph and section drawings of HMs 1083.
- 193 *CMS* II.6 no. 184 (HMs 1083-1085, 1088). Crescents, unscribed: 1084-1085, 1088 with single impression; 1083 dual-stamped with *CMS* II.6 nos. 184 + 195 (here 192). Mallia: Quartier Mu III 16, E side. Drawing of seal-type (four-sided prism, hard stone). Cf. *CHIC* #172: 010-092-028 ><. Cf. 168a-c for photograph and section drawings of HMs 1083.
- 194 *CMS* II.6 no. 180 (HMs 1052). *Nodulus*, pyramid, with two impressions of same seal. Mallia: Quartier Mu V 5, SE corner. Drawing of seal-type (round flat face, hard stone). Cf. *CHIC* #126 X 036-047-009-056-062 ><. Cf. 171a-c for photograph and drawings.
- 195 *CMS* II.8 no. 40 (HMs 179). Crescent, unscribed: dual-stamped with *CMS* II.8 nos. 40 + 67 (here 198). Knossos: Hieroglyphic 'Deposit'. Drawing of seal-type (round flat face, hard stone).
- 196 *CMS* II.8 no. 44 (HMs 171). Crescent, inscribed: single impression. Knossos: Hieroglyphic 'Deposit'. Drawing of seal-type (round flat face, hard stone; *Petschaft?*). Cf. *CHIC* #004: KN Ha (02) 01.
- 197 *CMS* II.8 no. 90 (HMs 172). Crescent, inscribed on three faces, dual-stamped with two impressions each of *CMS* II.8 nos. 90 + 37. Knossos: Hieroglyphic 'Deposit'. Drawing of seal-type (round flat face, hard stone). Cf. 169a-d for photographs of crescent (*CHIC* #027 KN Ha (05) 01).
- 198 *CMS* II.8 no. 67 (HMs 179). Crescent, unscribed: dual-stamped with *CMS* II.8 nos. 67 + 40 (here 195). Knossos: Hieroglyphic 'Deposit'. Drawing of seal-type (four-sided prism, hard stone). Cf. *CHIC* #162: X 038-010-031.
- 199 *CMS* II.8 no. 75 (HMs 191). Crescent, inscribed; two impressions of same seal. Knossos: Hieroglyphic 'Deposit'. Drawing of seal-type (three-sided prism, hard stone). Cf. *CHIC* #142: 018-039-005; on crescent # 24 KN Ha (04) 04.
- 200 *CMS* II.8 no. 376 (HMs 126, AM 1938.982). Flat-based nodules / packets. Knossos: Hieroglyphic 'Deposit'. Drawing of seal-type (round convex face, hard stone; discoid?).

- 201** *CMS* II.8 no. 157 (HMs 128). Single-hole hanging nodule (pyramid). Knossos: Hieroglyphic 'Deposit'. Drawing of seal-type (hard stone cushion).
- 202** *CMS* V Suppl. 3 no. 476 (exc. no. AT 97.381.9). Bone, knob. Miletus. **a**) Profile; **b**) silicone impression of face.
- 203** *CMS* V Suppl. 1B no. 321 (exc. no. EE 742). *Nodulus*, with three more or less complete impressions of same seal. Mikro Vouni, Samothrace. **a**) Drawing of seal-type (oval ring bezel, soft stone?); **b**) upper surface. NB impressions of ring hoop are preserved.
- 204** *CMS* V Suppl. 1B no. 326 / SA Wc 1 (exc. no. EEE 7). Roundel, uninscribed with four impressions. Mikro Vouni, Samothrace. **a**) Roundel face **b**); **b**) drawing of seal-type (soft stone cushion). Cf. *CHIC* #135: 042-019.
- 205** *CMS* V no. 479 (K8.112). Direct object sealing. Ayia Irini, Kea: beneath House EJ. **a**) Drawing of seal-type (flat rectangular face, soft stone); **b**) silicone impression of underside.

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- 206** *CS* no. 202 (AM 1938.964). Cushion, banded agate. 'Priene' (ex-Tyszkiewicz Collection; acquired in Smyrna). **a**) Face; **b**) impression. Cf. **C24**.
- 207** *CMS* II.3 no. 24 (HM 839). Lentoid, lapis lazuli set in circlet of gold sheet, embellished with granulation; SH vertical. Knossos: backyard of South House. **a**) Profile; **b**) face; **c**) silicone impression.
- 208** *CS* no. 355 (AM 1938.1007). Cylinder, carnelian. 'Eastern Crete'. **a**) Profile; **b**) plaster cast.
- 209** AM 1941.100. Ring bezel, black 'serpentine'; hoop broken, damage smoothed and vertical SH provided. **a**) Plaster cast; **b**) bezel; **c**) profile.
- 210** *CMS* VII no. 88 (BM G&R 1923.4-1.1). Elongated amygdaloid with faceted back, haematite. Unknown provenance (not 'Egypt': ex-BM Egyptian Antiquities 1874.4-14.65, purchased from Rev. Greville Chester). **a**) Impression; **b**) reverse.
- 211** *CMS* II.3 no. 38 (HM precious metal 530). Signet ring, gold. Knossos: Mavrospelio T. IX E. Drawing of impression.
- 212** *CMS* V Suppl. 1A no. 46 (A. Nikolaos 11877). Ayios Charalambos (Gerodomouri Cave). Signet ring, silver (bezel only survives). Drawing of impression.
- 213** HM 1017. Signet ring, gold (massive). Archanes ThT B. Drawing of impression.
- 214** *CMS* VII no. 68 (BM G&R 1842.7-28.127). Signet ring, gold (massive). Unknown provenance (but listed in the Burgon Inventory as from 'Candia'). **a**) Face; **b**) profile; **c**) impression. Cf. **C22**.
- 215** *CMS* II.3 no. 51 (HM precious metal 424). Signet ring, gold (hollow). Knossos: Isopata T. 1. **a**) Face; **b**) profile.
- 216** *CS* no. 250 (AM 1938.1127). Signet ring, gold (hollow). 'Knossos' (acquired by Evans, Candia 1894). **a**) Face; **b**) reverse showing hoop and finger-bed. Cf. **C25**.
- 217** *CMS* II.3 no. 103 (HM precious metal 44). Signet ring, gold (hollow). Kalyvia: *Tombe dei Nobili* T. 2. **a**) Face; **b**) profile.
- 218** *CMS* II.3 no. 15 (HM bronze inv. 2490). Signet ring, bronze; bezel joined to hoop with silver rivets. Knossos: Lower Gypsades Hill (behind Hogarth's House A). **a**) Face; **b**) impression.
- 219** BM G&R 1924.11-13.1. Mould, steatite. 'Kourion', Cyprus.
- 220** *CMS* V Suppl. 1A no. 58 (A. Nikolaos 11384). Signet ring, lead (bezel only survives). Mallia: House Δα, Rm 8. Face.
- 221** *CMS* I no. 219 (HM 1801). Signet ring, gold (hollow). Vapheio ThT (chamber). **a**) Face; **b**) impression.
- 222** *CMS* II.3 no. 70 (HM 1421β). Lentoid, serpentine; SH diagonal. Knossos: vicinity of Temple Tomb. Drawing of impression.
- 223** *CMS* II.3 no. 187 (HM 605). Lentoid, dark green 'steatite'; SH horizontal. 'Knossos'. Drawing of impression.
- 224** *CMS* II.3 no. 37 (HM 1327). Lentoid, olive green serpentine; SH horizontal. Knossos: Mavrospelio T. IX D. Drawing of impression.
- 225** *CMS* VII no. 51 (BM G&R 1920.11-17.1). Amygdaloid, carnelian. 'Crete, Seager's excavations'. Impression.
- 226** *CMS* VII no. 74 (BM G&R 1934.11-20.8). Amygdaloid, agate. Unknown provenance. Impression.
- 227** *CMS* II.3 no. 206 (HM 891). Amygdaloid, carnelian. 'Aphrati'. Drawing of impression.
- 228** *CMS* XI no. 304 (Breslau Museum 15: lost). Amygdaloid, 'whitish quartz' (i.e. perhaps milky quartz or chalcedony). Unknown provenance. Drawing of impression.
- 229** *CMS* II.3 no. 12 (HM 336). Three-sided prism with amygdaloid faces (two engraved), carnelian. Knossos: Palace, find-spot unknown. Drawings of impressions, faces **a**) and **b**).
- 230** *CMS* VII no. 104 (BM G&R 1884.6-28.9). Amygdaloid, carnelian. 'Crete' (Paton). Drawing of impression.
- 231** *CMS* VII no. 76 (BM G&R 1884.6-28.2). Lentoid, carnelian. 'Crete' (Paton). Drawing of impression.
- 232** *CMS* II.3 no. 367 (HM 107). Amygdaloid, carnelian. Unknown provenance. Drawing of impression.

- 233 *CMS* IV no. 244 (Metaxas Coll. 312). Amygdaloid, carnelian. 'Siteia'. Drawing of impression.
- 234 *CMS* II.3 no. 258 (HM 750). Amygdaloid, carnelian. Mochlos (Seager, find-spot unknown). Drawing of impression.
- 235 *CMS* II.7 no. 99 (HMs 64/1-6, 95/1-6). Flat-based nodules / packets (two-seal standing variety, dual-stamped with *CMS* II.7 nos. 11, 31, 81). Zakros: House A. Drawing of seal-type (hard stone cushion).
- 236 *CMS* I no. 5 (ANM 8708). Discoid, amethyst; SH vertical. Mycenae: Circle B, Grave Γ. Impression.
- 237 *CMS* II.3 no. 13 (HM 1419). Bi-facial lentoid, black 'steatite'; SH diagonal. Knossos: Little Palace. Impression of face a.
- 238 *CS* no. 293 (AM 1938.1050). Elongated amygdaloid with grooved back, green 'jasper'. 'Knossos'. Plaster cast.
- 239 *CMS* II.3 no. 198 (HM 85). Elongated amygdaloid with grooved back, haematite. 'Vathia'. Silicone impression.
- 240 *CMS* II.6 no. 37 (HMs 546/2). Flat-based nodule / packet. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (hard stone lentoid).
- 241 *CMS* V Suppl. 1A no. 135 (KH 1559 I). Irregular flat-based nodule / packet, with 12 impressions of 10 seals (*CMS* V Suppl. 1A nos. 128-137). Khania: Ayia Aikaterini Square, House I, Rm D. Drawing of seal-type (hard stone lentoid). Cf. 343a (diagram showing placement of seal impressions) and 343b (silicone of underside).
- 242 *CMS* II.6 no. 21 (HMs 587, 1110; HMPin 68, 69; and now lost inscribed bar). One-hole hanging nodule and three roundels, impressed with same seal. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (?lentoid, material uncertain). Cf. 309.
- 243 *CMS* II.6 no. 1 (HMs 505, 506/1-2, 533, 1713, Pigorini 71979). Single-hole hanging nodules. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (metal ring).
- 244 *CMS* II.7 no. 8 (HMs 85). Flat-based nodule / packet (dual-stamped with *CMS* II.7 no. 28). Zakros: House A, Rm 7. Drawing of seal-type (bronze ring).
- 245 *CMS* II.6 no. 4 (HMs 595-596). Flat-based nodules / packets (dual-stamped with *CMS* II.6 no. 15, here 371). Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (metal ring)
- 246 *CMS* II.8 no. 193 (HMs 347). *Nodulus*, pyramid-shaped reverse. Knossos: 'Eastern Temple Repository' (attributed by *CMS* team). Drawing of seal-type (metal ring).
- 247 *CMS* V Suppl. 1A no. 142 (KH 1563). Irregular flat-based nodule / packet. Khania: Ayia Aikaterini Square. Drawing of seal-type (metal ring). Cf. 344 for plasticine impression of underside.
- 248 *CMS* II.6 no. 17 (HMs 483). *Nodulus*, rounded back. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (metal ring).
- 249 *CMS* V Suppl. 1A no. 137 (KH 1559 L). Irregular flat-based nodule / packet, with 12 impressions of 10 seals (*CMS* V Suppl. 1A nos. 128-137). Khania: Ayia Aikaterini Square, House I, Rm D. Drawing of seal-type (metal ring). Cf. 343a (diagram showing placement of seal impressions) and 343b (silicone of underside).
- 250 *CMS* XI no. 26 (Berlin: FG 2). Lentoid, carnelian; SH diagonal. 'Crete' (ex-Lambros 1882). Silicone impression.
- 251 *CMS* II.3 no. 16 (HM 1279). Cushion with flat faceted back, carnelian. Knossos: SW of South House. Silicone impression.
- 252 *CMS* II.4 no. 111 (HM 1287). Lentoid, dark-green 'limestone'; SH horizontal. Knossos: House of Frescoes (1923). Silicone impression.
- 253 *CMS* II.3 no. 8 (HM 200). Lentoid, blackish 'limestone'; SH horizontal. Knossos: Palace, Court of the Stone Spout. Silicone impression.
- 254 *CMS* II.3 no. 170 (HM 143). Lentoid, blackish 'limestone'; SH horizontal. 'Knossos'. Silicone impression.
- 255 *CS* no. 227 (AM 1938.954). Cushion, blue chalcedony. 'Archanes'. Impression. Cf. C21.
- 256 *CM* no. 172 (Giamalakis Coll. 3136). Ring-stone, blue chalcedony. 'Mallia'. Impression.
- 257 *CS* no. 203 (AM 1938.963). Cushion, black steatite, covered in gold foil. 'Palaiakastro' (1894). Impression. Cf. C23.
- 258 *CS* no. 297 (AM 1938.971). Lentoid, olive-green 'jasper'; SH vertical. 'Mirabello'. Impression.
- 259 *CS* no. 343 (AM 1938.1066). Lentoid, green jasper; SH vertical. 'Knossos'. Impression. Cf. C27.
- 260 *CMS* II.3 no. 237 (HM 197). Lentoid, dark-green jasper; SH vertical. 'Gournia Ierapetrou, Avgos, gift H. Boyd 1901' (possibly purchased at Avgos near Kavousi by Boyd, and not found at Gournia: *CMS* II.3 p. 269). Silicone impression.
- 261 *CMS* II.3 no. 91 (HM 948). Lentoid, dark-green / blackish 'steatite'; SH vertical. Knossos (1911). Silicone impression.
- 262 *CMS* V no. 690 (Thera -). Lentoid, reddish-brown jasper; SH horizontal. Akrotiri Δ16. Impression.
- 263 *CMS* VII no. 67 (BM G&R 1874.3-5.29). Cushion, green jasper. Unknown provenance (ex-Merlin). Impression.

- 264** CMS VII no. 65 (BM G&R 1901.10-16.1). Bi-facial lentoid, banded agate; SH horizontal. 'Crete' (J. H. Marshall). Impression of face a. Cf. **C19**.
- 265** CS no. 240 (AM 1938.1061). Lentoid, red jasper; SH vertical. 'Central Crete'. Impression. Cf. **C28**.
- 266** CS no. 301 (AM 1938.969). Lentoid, blue chalcedony; SH vertical. 'Knossos district'. Plaster cast.
- 267** CMS VII no. 90 (BM G&R 1923.4-1.2). Lentoid, red jasper; SH horizontal. Unknown provenance. Impression.
- 268** CMS II.3 no. 174 (HM 1653). Lentoid, greenish-black 'steatite'; SH vertical. Knossos, stray find. Silicone impression.
- 269** CMS II.3 no. 348 (HM 1271). Lentoid, blackish-green 'limestone'; SH vertical. Unknown provenance (Mitsotakis bequest ca 1920). Silicone impression.
- 270** CMS XI no. 50 (Berlin: FG 30). Lentoid, dark olive-green serpentine; SH vertical. 'Crete' (1884). Silicone impression. Cf. **C29**.
- 271** CMS II.6 no. 91 (HMs 1665-1666). Flat-based nodules / packets. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (hard stone lentoid).
- 272** CMS V Suppl. 1A no. 156 (KH 2026, 2046-2052, 2064, 2098, 2099, 2113). 12 roundels, each with 2-7 impressions of same lentoid. Khania: Katré Street 10. Drawing of seal-type (hard stone lentoid).
- 273** CMS II.7 no. 101 (HMs 20/1-4). Flat-based nodules / packets. Zakros: House A, Rm 7. Drawing of seal-type (?hard stone lentoid).
- 274** CMS II.7 no. 31 (HMs 35/1, 3; 95/1-5). Flat-based nodules / packets (dual-stamped with CMS II.7 nos. 215 and 99). Zakros: House A, Rm 7. Drawing of seal-type (hard stone lentoid).
- 275** CMS II.6 no. 102 (HMs 1662). Flat-based nodule / packet. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (hard stone amygdaloid).
- 276** CMS II.6 no. 74 (HMs 577). Flat-based nodule / packet. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (?hard stone lentoid).
- 277** CMS II.7 no. 157 (HMs 21/1 + 22 further examples; FMA 94766; AM AE.11991). Flat-based nodules / packets (standing) combined with CMS II.7 no. 104A and B. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 278** CMS II.7 no. 145B (HMs 5/1-3). Flat-based nodules / packets, combined with II.7 no. 142). Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 279** CMS II.7 no. 109A (HMs 2/1-4, 6, 8, 10, 1126; AM AE.1199h). Flat-based nodules / packets (standing) combined with II.7 nos. 115 or 116. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 280** CMS II.7 no. 129A (HMs 9/4 + 9 further examples; AM AE.1199q). Flat-based nodules / packets combined with II.7 nos. 135A (**281**) or 135B and 194A (**282**) or 194B. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid). Cf. **289** flat-based nodule; also **305** prismatic two-hole nodule.
- 281** CMS II.7 no. 135A (HMs 9/1 + 14 further examples; AM AE.1199q). Flat-based nodules / packets combined with II.7 nos. 129A (**280**) or 129B and 194A (**282**) or 194B. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid). Cf. **289** flat-based nodule; also **305** prismatic two-hole nodule.
- 282** CMS II.7 no. 194A (HMs 9/4 + 12 further examples; NY MM 26.31.409; AM 1199x). Flat-based nodules / packets combined with II.7 nos. 129A (**280**) or 128B and 135A (**281**) or 135B. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid). Cf. **289** flat-based nodule; also **305** prismatic two-hole nodule.

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- 283** HMs 498 (CMS II.6 no. 43). Flat-based nodule / packet (recumbent, single impression). Ayia Triada: *Villa Reale*, find-spot unknown. Drawings **a**) View from above; **b**) profile. Cf. **14** for silicone of reverse and **368** for seal-type.
- 284** HMs 497 (CMS II.6 no. 43). Flat-based nodule / packet (recumbent, single impression). Ayia Triada: *Villa Reale*, find-spot unknown. **a**) Upper surface; **b**) silicone of reverse. Cf. **368** for seal-type.
- 285** HMs 628 (CMS II.6 no. 259). Flat-based nodule / packet (recumbent, single impression). Sklavokambos: Villa, Rm 1. **a**) Upper surface; **b**) silicone of reverse. Cf. **368** for seal-type.
- 286** HMs 508 (CMS II.6 nos. 36 + 144). Flat-based nodule / packet (recumbent, with two impressions). Ayia Triada: *Villa Reale*, find-spot unknown. Profile drawing.
- 287** HMs 4/1 (CMS II.7 nos. 132 + 165). Flat-based nodule / packet (standing, with two impressions). Zakros: House A, Rm 7. Profile drawing. See **358** and **360** for seal-types.
- 288** AM AE.1199t (CMS II.7 nos. 132 + 165). Flat-based nodule / packet (standing, with two impressions). Zakros: House A, Rm 7. Faces **a**) and **b**); **c**) underside; **d**) plasticine impression of underside. See **358** and **360** for seal-types.
- 289** AM AE.1199q (CMS II.7 nos. 129A + 135A + 194A). Flat-based nodule / packet (standing, with three impressions). Zakros: House A, Rm 7. **a**) Face a; **b**) profile; **c**) underside; **d**) plasticine impression of underside. Cf. **280-282** for seal-types; also prismatic two-hole hanging nodule **305**.

- 290 HMs 45 (*CMS* II.7 nos. 112 + 167 + 219). Flat-based nodule / packet (standing, with three impressions). Zakros: House A, Rm 7. Drawings of **a**) profile; **b**) underside.
- 291 HMs 455/5 (*CMS* II.6 no. 70). Single-hole hanging nodule (gable-shaped / dome). Ayia Triada: *Villa Reale*, find-spot unknown. Drawings **a**) front; **b**) section. Cf. 326 for seal-type.
- 292 HMs 435/15 (*CMS* II.6 no. 110). Single-hole hanging nodule (pyramid). Ayia Triada: *Villa Reale*, find-spot unknown. Drawings **a**) front; **b**) section. Cf. 333 for seal-type.
- 293 HMs 454/3 (*CMS* II.6 no. 101). Single-hole hanging nodule (conoid). Ayia Triada: *Villa Reale*, find-spot unknown. Drawings **a**) section; **b**) base. Cf. 330 for seal-type.
- 294 HMs 441/3 (*CMS* II.6 no. 11). Single-hole hanging nodule (pendant with pyramid back). Ayia Triada: *Villa Reale*, find-spot unknown. Drawings **a**) front; **b**) section. Cf. 324 for seal-type.
- 295 HMs 490/1 (*CMS* II.6 no. 107). Single-hole hanging nodule (pendant with rounded back). Ayia Triada: *Villa Reale*, find-spot unknown. Drawings **a**) front; **b**) section. Cf. 298 for photograph of back.
- 296 HMs 456/8 (*CMS* II.6 no. 70). Single-hole hanging nodule (gable-shaped / dome). Ayia Triada: *Villa Reale*, find-spot unknown. Back. Cf. 326 for seal-type.
- 297 HMs 461/15 (*CMS* II.6 no. 117). Single-hole hanging nodule (pendant with pyramid back). Ayia Triada: *Villa Reale*, find-spot unknown. Back. Cf. 332 for seal-type.
- 298 HMs 490/1 (*CMS* II.6 no. 107). Single-hole hanging nodule (pendant with rounded back). Ayia Triada: *Villa Reale*, find-spot unknown. Back. Cf. 295a-b for drawings.
- 299 HMs 478/15 (*CMS* II.6 no. 73). Single-hole hanging nodule, broken. Ayia Triada: *Villa Reale*, find-spot unknown. Silicone of string-hole. Cf. 331 for seal-type.
- 300 HMs 451/5 (*CMS* II.6 no. 11). Single-hole hanging nodule, broken. Ayia Triada: *Villa Reale*, find-spot unknown. Silicone of string-hole (pseudo-two hole). Cf. 324 for seal-type.
- 301 HMs 19 (*CMS* II.7 no. 47). Two-hole hanging nodule, gable-shaped back. Zakros: House A, Rm 7. Drawings **a**) front; **b**) back; **c**) section.
- 302 HMs 16/1 (*CMS* II.7 nos. 149 + 153 + 228). Two-hole hanging nodule, prismatic. Zakros: House A, Rm 7. Drawings **a**) front; **b**) profile; **c**) section.
- 303 HMs 1143 (*CMS* II.7 nos. 190 + 245 + ?). Two-hole hanging nodule, prismatic, broken. Zakros: House A, Rm 7. Silicone of string-hole.
- 304 HMs 93/1 (*CMS* II.7 nos. 78 + 217 + ?). Two-hole hanging nodule, prismatic, broken. Zakros: House A, Rm 7. Silicone of string-hole.
- 305 AM AE.1802 (*CMS* II.7 nos. 129B + 135B + 194B). Two-hole hanging nodule, prismatic. Zakros: House A, Rm 7. **a**) profile; **b-d**) faces a-c. Cf. 280-282 for seal-types II.7 nos. 129A + 135A + 194A (i.e. the same seal faces, showing only minor differences, perhaps re-touched or cleaned) and flat-based nodule 289.
- 306 AM 1938.1439b (*CMS* II.8 378 + II.8 150). *Nodulus*, disc-shaped. Knossos: Eastern Temple Repository. Face a. Cf. 307 for similar *nodulus* impressed with same two seals; for the seal-types see 313 and 315.
- 307 AM 1938.1439c (*CMS* II.8 150 + 378). *Nodulus*, disc-shaped. Knossos: Eastern Temple Repository. **a**) Face b; **b**) side view; **c**) section. Cf. 306 for similar *nodulus* impressed with same two seals; for the seal-types see 313 and 315.
- 308 HMs 434/10 (*CMS* II.6 no. 20). *Nodulus*, gable-shaped (dome). Ayia Triada: *Villa Reale*, find-spot unknown. **a**) Underside; drawings of **b**) rear; **c**) side view; **d**) section.
- 309 HMs 1110 (*CMS* II.6 no. 21). Roundel, inscribed: six impressions and one erasure on edge. Ayia Triada: *Villa Reale*, find-spot unknown. **a**) Photograph face a; **b**) drawing face a; **c**) section. Cf. 242 for seal-type.
- 310 *CMS* II.8 no. 115 (HMs 388/1-9; AM 1938.1440a-b). Flat-based nodules / packets, recumbent with second impression: II.8 nos. 154 / 155 (311-312). Knossos: Eastern Temple Repository. Drawing of seal-type (?metal seal).
- 311 *CMS* II.8 no. 154 (HMs 388/1-6, 8-9; AM 1938.1440a-b). Flat-based nodules / packets, recumbent with second impression: II.8 no. 115 (310). Knossos: Eastern Temple Repository. Drawing of seal-type (metal ?ring).
- 312 *CMS* II.8 no. 155 (HMs 388/7). Flat-based nodule / packet, recumbent with second impression: II.8 no. 115 (310). Knossos: Eastern Temple Repository. Drawing of seal-type (metal ?ring).
- 313 *CMS* II.8 no. 378 (HMs 333/1-6 + 4 further examples; AM 1938.1439a-c). *Noduli*, disc-shaped; combined with II.8 no. 150 (315). Knossos: Eastern Temple Repository. Drawing of seal-type (hard stone ?cushion). Cf. 306-307 for photographs of AM 1938.1439b-c.
- 314 *CMS* II.8 no. 379 (HMs 334/1-2, 335/1-2). *Noduli*, disc-shaped; combined with II.8 no. 150 (315). Knossos: Eastern Temple Repository. Drawing of seal-type (hard stone ?cushion).
- 315 *CMS* II.8 no. 150 (HMs 333/1-6 + 8 further examples; AM 1938.1439a-c). *Noduli*, disc-shaped; combined with II.8 nos. 378 / 379 (313-314). Knossos: Eastern Temple Repository. Drawing of seal-type (metal seal). Cf. 306-307 for photographs of AM 1938.1439b-c.
- 316 *CMS* II.8 no. 163 (HMs 391). Irregular two-hole nodule with open rear. Knossos: Eastern Temple Repository. Drawing of seal-type (metal signet ring).

- 317 *CMS* II.8 no. 508 (HMs 1240). Two-hole nodule with ?gable-shaped back, fragment. Knossos: Eastern Temple Repository. Drawing of seal-type (metal signet ring).
- 318 *CMS* II.8 no. 221 (HMs 396). *Nodulus*, with ?rounded back. Knossos: Eastern Temple Repository. Drawing of seal-type (cushion, material uncertain; perhaps hard stone).
- 319 *CMS* II.8 no. 237 (HMs 383/1-9, 395; AM 1938.1199 u, z). *Noduli*: one with conical back (HM 395), remainder with pyramidal backs. Knossos: Eastern Temple Repository. Drawing of seal-type (metal ring).
- 320 *CMS* II.8 no. 234 (HMs 337-339, 350-352). Flat-based nodules / packets. Knossos: Eastern Temple Repository. Drawing of seal-type (metal ring). Cf. 11 for plasticine impression of HM 352 reverse.
- 321 *CMS* II.8 no. 280 (HMs 336). *Nodulus*, pyramidal back. Knossos: Eastern Temple Repository. Drawing of seal-type (metal ring).
- 322 Akrotiri no. A8890 (*CMS* V Suppl. 3 no. 391). Flat-based nodule / packet. Thera: Akrotiri, Rm Δ18b. Cf. 370 for seal-type (metal ring).
- 323 Akrotiri no. A8891 (*CMS* V Suppl. 3 no. 392). Flat-based nodule / packet. Thera: Akrotiri, Rm Δ18b.
- 324 *CMS* II.6 no. 11 (HMs 441/1-28 and others; total 256 pieces). Single-hole hanging nodules (pyramidal backs) + 1 roundel (Hmpin 78). Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (metal ring). Cf. 294, 300.
- 325 *CMS* II.6 no. 28 (HMs 465/1-30 and others; total 61 pieces). Single-hole hanging nodules (pyramidal backs). Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (soft stone lentoid).
- 326 *CMS* II.6 no. 70 (HMs 455/1-16 and others; total 43 pieces). Single-hole hanging nodules, gable-shaped (domes) + 2 with rounded backs. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (bronze ring). Cf. 291, 296.
- 327 *CMS* II.6 no. 85 (HMs 470/1-16 and others; total 25 pieces). Single-hole hanging nodules, pyramids; one gable-shaped (dome). Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (soft stone lentoid).
- 328 *CMS* II.6 no. 134 (HMs 474/1-27, 1710). Single-hole hanging nodules, pyramids. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (hard stone amygdaloid).
- 329 *CMS* II.6 no. 99 (HMs 464/1-22; RMP 71971-71972). Single-hole hanging nodules, pyramids. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (hard stone lentoid).
- 330 *CMS* II.6 no. 101 (HMs 452/1-41 and others; total 102 pieces). Single-hole hanging nodules, conoids and pyramidal backs. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (hard stone lentoid). Cf. 293.
- 331 *CMS* II.6 no. 73 (HMs 478/1-20). Single-hole hanging nodules, pyramidal and rounded backs. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (soft stone lentoid). Cf. 299.
- 332 *CMS* II.6 no. 117 (HMs 461/1-24 and others; total 38 pieces). Single-hole hanging nodules, pyramidal backs. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (soft stone lentoid). Cf. 297.
- 333 *CMS* II.6 no. 110 (HMs 435/1-124 and others; total 139 pieces). Single-hole hanging nodules, pyramids. Ayia Triada: *Villa Reale*, find-spot unknown. Drawing of seal-type (hard stone, flat rectangular seal face, damaged). Cf. 292.
- 334 *CMS* V Suppl. 1A no. 175 (KH 1501-1526). Flat-based nodules / packets, single seal recumbent. Khania: Katré Street 10. Drawing of seal-type (metal ring).
- 335 *CMS* V Suppl. 1A no. 177 (KH Wc 2097). Roundel fragment, with six incomplete impressions. Khania: Katré Street 10. Drawing of seal-type (metal ring).
- 336 *CMS* V Suppl. 1A no. 171 (KH 1547-1549, 1551-1556). Flat-based nodules / packets, single seal recumbent. Khania: Katré Street 10. Drawing of seal-type (metal ring).
- 337 *CMS* V Suppl. 1A no. 173 (KH 1529-1535). Flat-based nodules / packets, single seal recumbent. Khania: Katré Street 10. Drawing of seal-type (hard stone lentoid).
- 338 *CMS* V Suppl. 1A no. 154 (KH 1538-1546). Flat-based nodules / packets, single seal recumbent. Khania: Katré Street 10. Drawing of seal-type (metal ring).
- 339 *CMS* V Suppl. 1A no. 153 (KH 1001-1004). Single-hole hanging nodules. Khania: Katré Street 10. Drawing of seal-type (hard stone lentoid).
- 340 *CMS* V Suppl. 1A no. 158 (KH Wc 2006 + 29 other pieces). Roundels, most inscribed, with 2-11 impressions of same seal. Flat-based nodules / packets, single seal recumbent. Khania: Katré Street 10. Drawing of seal-type (soft stone lentoid).
- 341 *CMS* V Suppl. 1A no. 144 (KH Wc 2118). Roundel, inscribed, with 6 incomplete impressions of same seal. Khania: Ayia Aikaterini Square. Drawing of seal-type (hard stone amygdaloid). Cf. *CMS* V no. 236 for further examples from Khania: Kastelli and V Suppl. 1A no 163 (for Katré Street 10): total of ca 21 roundels with this seal-type. Cf. 345-348.
- 342 *CMS* V Suppl. 1A no. 169 (KH 1005-1012; Wc 2036-2042, 2111). 8 single-hole hanging nodules; 8 roundels (inscribed) with 1-5 impressions of same seal. Khania: Katré Street 10. Drawing of seal-type (hard stone lentoid).

- 343 KH 1559 (*CMS V Suppl.* 1A nos. 128-137). Irregular flat-based nodule, with 12 impressions of 10 different seals. Khania: Kastelli, Ayia Aikaterini Square, House I Rm D. **a)** Diagram to show placement of seal impressions. Cf. here **241 (I)**, **249 (L)**. **b)** Silicone of underside.
- 344 KH 1563 (*CMS V Suppl.* 1A no. 142). Irregular flat-based nodule, with single impression. Khania, Kastelli, Ayia Aikaterini Square. Plasticine impression of underside. Cf. **247** for seal-type.
- 345 KH Wc 2002 (*CMS V Suppl.* 1A nos. 144 / 163). Roundel, inscribed with sign AB 61 (0). Scribe 60. Khania: Kanevaro Street, Vlamakis plot. Drawing. Cf. **341** for seal-type.
- 346 KH Wc 2034 (*CMS V Suppl.* 1A nos. 144 / 163). Roundel, inscribed with sign AB 61 (0). Scribe 59. Khania: Katré Street 10. Drawing. Cf. **341** for seal-type.
- 347 KH Wc 2110 (*CMS V Suppl.* 1A nos. 144 / 163). Roundel, inscribed with sign AB 61 (0). Scribe -. Khania: Katré Street 10. Drawing. Cf. **341** for seal-type.
- 348 KH Wc 2035 (*CMS V Suppl.* 1A nos. 144 / 163). Roundel, inscribed with sign AB 61 (0). Scribe -. Khania: Katré Street 10. Drawing. Cf. **341** for seal-type.
- 349 *CMS II.7* no. 15 (HMs 44/1-8 + others; AM AE. 1199d). Flat-based nodules / packets, various. Zakros: House A, Rm 7. Drawing of seal-type (?soft stone lentoid).
- 350 *CMS II.7* no. 33 (HMs 65/1-4, 1147/1-3, 5). Flat-based nodules / packets, various. Zakros: House A, Rm 7. Drawing of seal-type (hard stone cushion).
- 351 *CMS II.7* no. 70 (HMs 79, 1133). Flat-based nodules / packets: one recumbent single seal; one standing, combined with II.7 no. 244. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 352 *CMS II.7* no. 74 (HMs 38/1-4, 40/1-2, AM AE.1199r). Flat-based nodules / packets (pyramid) combined with II.7 nos. 124 + 192; hanging nodule, combined with II.7 nos. 71 + 124. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 353 *CMS II.7* no. 218 (HMs 25/1-2). Flat-based nodules / packets (standing) combined with II.7 no. 168. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 354 *CMS II.7* no. 16 (HMs 17/1 + ca 17 further examples). Flat-based nodules / packets (standing) combined with II.7 nos. 37 / 38 (here **356** and **357**). Zakros: House A, Rm 7. Drawing of seal-type (metal ring).
- 355 *CMS II.7* no. 17 (HMs 17/2 + ca 20 further examples; AM AE.1199p, z). Flat-based nodules / packets (standing) combined with II.7 nos. 37 / 38 (here **356** and **357**). Zakros: House A. Rm 7. Drawing of seal-type (metal ring).
- 356 *CMS II.7* no. 37 (HMs 17/1 + ca 13 further examples). Flat-based nodules / packets (standing) combined with II.7 nos. 16 / 17 (here **354** and **355**). Zakros: House A, Rm 7. Drawing of seal-type (metal ring).
- 357 *CMS II.7* no. 38 (HMs 17/2 + ca 20 further examples; AM AE.1199 p, z). Flat-based nodules / packets (standing) combined with II.7 nos. 16 / 17 (here **354** and **355**). Zakros: House A, Rm 7. Drawing of seal-type (metal ring).
- 358 *CMS II.7* no. 132 (HMs 4/1, 2, 4, 6, 8, 10-13; AM AE 1199a, t). Flat-based nodules / packets (standing) combined with II.7 no. 165 (**360**). Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid). Cf. **288** for photographs.
- 359 *CMS II.7* no. 133 (HMs 4/3, 5, 7, 9). Flat-based nodules / packets (standing) combined with II.7 no. 166 (**361**). Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 360 *CMS II.7* no. 165 (HMs 4/1, 2, 4, 6, 8, 10-13; AM AE 1199a, t). Flat-based nodules / packets (standing) combined with II.7 no. 132 (**358**). Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid). Cf. **288** for photographs.
- 361 *CMS II.7* no. 166 (HMs 4/3, 5, 7, 9). Flat-based nodules / packets (standing) combined with II.7 no. 133 (**359**). Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 362 *CMS II.7* no. 169 (HMs 11/1, 3-4, 6, 8-13, 18, 22; AM AE. 1199e, v). Flat-based nodules / packets (standing) combined with II.7 no. 161A / B. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 363 *CMS II.7* no. 170 (HMs 11/7, 15, 19). Flat-based nodules / packets (standing) combined with II.7 no. 161A. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 364 *CMS II.7* no. 171 (HMs 11/2, 5, 14, 16-17, 20-21). Flat-based nodules / packets (standing) combined with II.7 no. 162; one *nodulus* with same combination. Zakros: House A, Rm 7. Drawing of seal-type (soft stone lentoid).
- 365 *CMS V Suppl.* 1B no. 341 (Siteia Mus. 8018). *Nodulus*. Palaikastro: Building 5, Rm 9. Drawing of seal-type (metal ring).
- 366 *CMS II.6* no. 262 (HMs 637). Flat-based nodule / packet. Sklavokambos: Villa, Rm 1. Drawing of seal-type (metal ring).
- 367 *CMS II.6* no. 274 (HMs 427). *Nodulus*. Tyllissos: House A, Rm 5. Drawing of seal-type (hard stone ring).
- 368 *CMS II.6* no. 43 (HMs 497-499); II.6 no. 259 (HMs 628-629); II.6 no. 161 (HMs 101); II.7 no. 39 (HMs 1051). Flat-based nodules / packets from Ayia Triada and Sklavokambos; *noduli* from Gourmia and Zakros Palace impressed by same ring (see plate caption for full details). Drawing of seal-type (metal ring). Cf. **14**, **283-285** for further illustrations of examples from Ayia Triada and Sklavokambos.

- 369** *CMS* II.6 no. 44 (RMP 71974); II.6 no. 162 (HMs 102); II.6 no. 255 (HMs 612); Flat-based nodules / packets from Ayia Triada, Gournia and Sklavokambos impressed by same ring (see plate caption for full details). Drawing of seal-type (metal ring).
- 370** *CMS* II.6 no. 19 (HMs 516, 591); II.6 no. 260 (HMs 632-635); V Suppl. 3 no. 391 (Akrotiri). Flat-based nodules / packets from Ayia Triada, Sklavokambos and Akrotiri impressed by same ring (see plate caption for full details). Drawing of seal-type (metal ring). Cf. **322** for one of the Akrotiri nodules.
- 371** *CMS* II.6 no. 15 (HMs 526/1-3, 595-596); II.8 no. 279 (HMs 369, 1275). Flat-based nodules / packets from Ayia Triada (two examples combined with II.6 no. 4, here **245**); hanging nodules from Knossos (see plate caption for full details). Drawing of seal-type (metal ring).

Chapter 8

- 372** *CMS* II.3 no. 64 (HM 1658). Three-sided prism, carnelian with gold caps. Knossos: New Hospital T. III. **a)** Face **b;** **b-c)** silicone impressions of faces **b** and **a**.
- 373** *CMS* II.3 no. 63 (HM 1657). Lentoid, agate; SH horizontal (slightly diagonal). Knossos: New Hospital T. III. Silicone impression.
- 374** *CMS* II.3 no. 62 (HM 1656). Lentoid, carnelian; SH vertical. Knossos: New Hospital T. III. Silicone impression.
- 375** *CMS* II.3 no. 52 (HM 900). Cushion, blue chalcedony with gold caps. Knossos: Isopata T. 1. **a)** Face; **b)** silicone impression.
- 376** *CMS* II.3 no. 68 (HM 1864). Cushion, banded agate. Knossos: Sellopoulo T. 1. Silicone impression.
- 377** *CMS* II.3 no. 60 (HM 1712). Lentoid, banded agate; SH horizontal. Knossos: Ayios Ioannis, Gold Cup Tomb. Silicone impression.
- 378** *CMS* II.3 no. 41 (HM 836). Lentoid, banded agate; SH vertical. Knossos: Zapher Papoura T. 36 (?). **a)** Silicone impression; **b)** reverse.
- 379** AM AE.1802 / 2237. Signet ring, gold (hollow). 'Archanes'. **a)** Face; **b)** profile.
- 380** *CMS* II.3 no. 113 (HM precious metal 48). Signet ring, bezel and hoop covered with gold and iron sheet pinned onto bronze core (the half covered with iron now badly corroded). Kalyvia: *Tombe dei Nobili* T. 10. **a)** Drawing; **b)** bezel; **c)** reverse.
- 381** CS no. 359 (AM AE. 698). Glass, lentoid (engraved); SH horizontal. Dictaeon Cave. Plaster cast. Cf. **C32**.
- 382** *CMS* II.3 no. 53 (HM 905). Amygdaloid, carnelian. Knossos: Isopata T. 1a. Silicone impression.
- 383** CS no. 223 (AM 1938.978). Amygdaloid with faceted back, banded agate. 'Kritsa'. Impression. Cf. **C33**.
- 384** *CMS* II.3 no. 65 (HM 1659). Cylinder, carnelian. Knossos: New Hospital T. III. Impression.
- 385** CS no. 364 (AM AE. 700). Glass, lentoid (engraved); SH vertical. Dictaeon Cave. **a)** Profile; **b)** plaster cast.
- 386** *CMS* II.3 no. 290 (HM 639). Amygdaloid with faceted back, carnelian. 'Tzermiadon' (bought 1906). Silicone impression.
- 387** *CMS* II.3 no. 27 (HM 1317). Amygdaloid with faceted back, carnelian. Knossos: Mavrospelio T. 3. Silicone impression.
- 388** CS no. 320 (AM 1938.1022). Lentoid, banded agate. SH horizontal. 'Mirabello'. Impression.
- 389** CS no. 306 (AM 1938.1041). Lentoid, agate; SH vertical. Bought in Athens said to have been found in Crete. Plaster cast.
- 390** *CMS* XI no. 37 (Berlin: FG 11). Lentoid, agate; SH vertical. 'Crete' (ex-Rhousopoulos 1880). Silicone impression.
- 391** *CMS* XI no. 38 (Berlin: FG 12). Lentoid, lapis lacedaimonius; SH vertical. 'Crete' (ex-Rhousopoulos 1880). Silicone impression.
- 392** *CMS* VII no. 108 (BM G&R 1877.7-28.2). Lentoid, haematite; SH diagonal; 'Crete' (Petrides). Fimo impression. Cf. **C38**.
- 393** *CMS* VII no. 109 (BM G&R 1890.5-12.2). Lentoid, haematite; SH vertical; Unknown provenance (ex-Rev. G. Chester). Impression.
- 394** CS no. 341 (AM 1938.1108). Lentoid, lapis lacedaimonius. SH slightly diagonal on vertical axis. Unknown provenance. Impression.
- 395** CS no. 322 (AM 1938.1071). Lentoid, lapis lacedaimonius; SH vertical. Dictaeon Cave. Impression.
- 396** *CMS* II.3 no. 67 (HM 1865). Lentoid, banded agate; SH slightly diagonal to horizontal axis. Knossos: Sellopoulo T. 1. Silicone impression.
- 397** *CM* no. 379 (Giamalakis Coll. 3316). Lentoid, haematite; SH vertical. 'Phaistos'. Impression.
- 398** *CMS* VII no. 123 (BM G&R 1877.7-28.3). Lentoid, lapis lacedaimonius; SH vertical. 'Crete' (Petrides). Fimo impression. Cf. **C37**.
- 399** *CMS* II.8 no. 202 (HMs 226-227). Two-hole hanging nodules with rounded backs. Knossos: Queen's Megaron. Drawing of seal-type (hard stone lentoid).

- 400 *CMS* VII no. 126 (BM G&R 1899.6-4.1). Lentoid, haematite; SH horizontal. 'Cyprus'. Fimo impression.
- 401 *CMS* II.3 no. 54 (HM 908). Lentoid, banded agate; SH slightly diagonal on horizontal axis. Knossos: Isopata T. 3 (Mace-Bearer's Tomb). Impression.
- 402 *CMS* II.3 no. 111 (HM 179). Lentoid, carnelian; SH vertical. Kalyvia: *Tombe dei Nobili* T. 9. Impression.
- 403 *CMS* II.3 no. 101 (HM 167). Lentoid, carnelian; SH vertical. Kalyvia: *Tombe dei Nobili* T. 1. Impression.
- 404 *CMS* VII no. 124 (BM G&R 1874.3-5.8). Lentoid, lapis lacedaimonius; SH horizontal. Unknown provenance (Merlin). Impression.
- 405 *CMS* II.3 no. 112 (HM 180). Three-sided prism, agate; SH vertical. Kalyvia: *Tombe dei Nobili* T. 9. Silicone impressions of faces **a**) and **b**). Face **c** unengraved.
- 406 *CMS* II.3 no. 310 (HM 131). Lentoid, lapis lacedaimonius; SH horizontal. 'Siteia'. Silicone impression.
- 407 *CMS* V Suppl. 1A no. 198 (KH Λ3206). Signet ring, breccia. Phylaki Apokoronou ThT. Impression.
- 408 *CMS* V Suppl. 1A no. 202 (KH Λ3191). Amygdaloid with grooved back, banded agate. Phylaki Apokoronou ThT. Impression.
- 409 *CMS* II.8 no. 238 (HMs 650). Gable-shaped nodule, intact (uninscribed). Knossos: Little Palace. Drawing of seal-type (hard stone lentoid).
- 410 *CMS* II.8 no. 250 (HMs 219-220, 252). Fragments of irregular two-hole nodules. Knossos: Lower East-West Corridor. Drawing of seal-type (hard stone lentoid).
- 411 *CMS* II.8 no. 326 (HMs 233-238, 256/1-12, 1346). Fragments of irregular two-hole nodules. Knossos: Wooden Staircase & Secretaries' Bureau (not Little Palace). Drawing of seal-type (hard stone lentoid).
- 412 *CMS* II.8 no. 366 (HMs 300 + 10 further examples). Fragments of irregular two-hole nodules and one fragment of combination sealing (HMs 305/2). Knossos: Landing of Grand Staircase. Drawing of seal-type (hard stone lentoid).
- 413 *CMS* II.8 no. 325 (HMs 367). Fragments of irregular two-hole nodule. Knossos: Lower East-West Corridor. Drawing of seal-type (hard stone lentoid).
- 414 *CMS* II.8 no. 208 (HMs 312). *Nodulus*, disc-shaped with single impression. Knossos: find-spot unknown. Drawing of seal-type (hard stone lentoid).
- 415 *CMS* II.8 no. 188 (HMs 259). Combination sealing. Knossos: Archives Deposit. Drawing of seal-type (hard stone lentoid).
- 416 *CMS* II.8 no. 192 (HMs 255, 1259). Fragments of irregular two-hole nodules. Knossos: find-spot unknown. Drawing of seal-type (metal ring).
- 417 *CMS* V no. 243 (ex-Khania; Rethymnon –). Lentoid, serpentine; SH vertical. Armeni T. 13. Impression.
- 418 *CMS* V no. 247 (ex-Khania; Rethymnon –). Lentoid, 'steatite'; SH vertical. Armeni T. 18. Impression.
- 419 *CMS* V no. 248 (ex-Khania; Rethymnon –). Lentoid, 'steatite'; SH vertical. Armeni T. 18. Impression.
- 420 *CMS* V Suppl. 1B no. 285 (Rethymnon Σ146). Lentoid, schist-like stone; SH vertical. Armeni T. 177. Impression.
- 421 *CMS* II.4 no. 219 (HM 1290). Lentoid, black 'steatite'; SH vertical. Unknown provenance. Silicone impression.
- 422 *CMS* V Suppl. 1B no. 261 (Rethymnon Σ116). Lentoid, serpentine; SH vertical. Armeni T. 133. Impression.
- 423 *CMS* V Suppl. 1B no. 228 (Rethymnon Σ82). Lentoid, olive-green ?schist; SH vertical. Armeni T. 101. Impression.
- 424 *CMS* V Suppl. 1B no. 287 (Rethymnon Σ135). Lentoid with flat back, bone; SH vertical. Armeni T. 177. Impression.
- 425 *CMS* V Suppl. 1B no. 224 (Rethymnon Σ78). Lentoid, fluorite; SH vertical. Armeni T. 91. Impression.
- 426 HMs 110 (*CMS* II.8 no. 497). Flat-based nodule / 'packet', variant. Knossos: Rm of the Chariot Tablets. **a**) Upper surface; **b**) plasticine impression of reverse. Cf. 443 for seal-type.
- 427 HMs 111 (*CMS* II.8 no. 460). Flat-based nodule / 'packet', variant. Knossos: Rm of the Chariot Tablets. **a**) Upper surface; **b**) plasticine impression of reverse.
- 428 AM 1938.1152 (*CMS* II.8 no. 419). Gable-shaped nodule, complete, with inscriptions *supra sigillum* (TELA³ + TE) on face a and on face b (*te-pa*): *CoMIK* IV Ws 8153. Knossos: North of Rm of the Stirrup Jars. **a**) Face a; **b**) face a, drawing of inscription; **c**) face b; **d**) face b, drawings of inscription. Cf. 442 for seal-type (and list of other examples).
- 429 AM 1938.1068 (*CMS* II.8 no. 172). Nodule with ridged back. Knossos: Arsenal. **a**) Face; **b**) reverse; **c**) profile. Cf. 440 for seal-type (and list of other examples).
- 430 AM 1938.1047 (*CMS* II.8 no. 529). Irregular hanging nodule with open back. Knossos: Rm of the Seal Impressions. **a**) Face; **b**) reverse; **c**) silicone of reverse showing imprint of two thick cords of fibrous material. Cf. 441 for seal-type (and list of other examples).
- 431 AM 1938.981 (*CMS* II.8 no. 342). Irregular hanging nodule with open back. Knossos: Rm of the Jewel Fresco (not Rm of the Seal Impressions). **a**) Face (with impression of metal ring); **b**) reverse; **c**) plasticine impression of reverse showing imprint of two twisted cords of ?leather / hide.

- 432** AM 1938.1014b (*CMS* II.8 no. 287). Irregular hanging nodule with open back Knossos: Rm of the Egyptian Beans(?). **a**) Face; **b**) reverse; **c**) silicone of reverse showing thick cord. Cf. **438** for seal-type (and list of other examples).
- 433** AM 1938.1015b (*CMS* II.8 no. 268). Combination sealing. Knossos: find-spot uncertain (possibilities include: Doorway south from the Hall of the Colonnades and beyond; Upper East-West Corridor; Lower East-West Corridor). **a**) Face; **b**) back; **c**) plasticine impression of back showing coarse wickerwork. Cf. **434** for similar sealing impressed by same ring; **435** for the clay 'matrix'; **437** for drawing of seal-type.
- 434** AM 1938.1015a (*CMS* II.8 no. 268). Combination sealing. Knossos: find-spot uncertain (see **433**). **a**) Profile; **b**) face. Cf. **433** for similar sealing impressed by same ring; **435** for the 'clay matrix'; **437** for drawing of seal-type.
- 435** HMs 283 (*CMS* II.8 no. 268). Clay 'matrix' (i.e. impression of a clay impression). Knossos: Rm of the Clay Signet. Face. Cf. **433-434** for combination sealings impressed by the same original ring; **437** for drawing (showing the original impression, i.e. as on **433-444**)
- 436** AM 1938.1082 (*CMS* II.8 no. 475). Direct object sealing. Knossos: Isopata, Royal Tomb. **a**) Face; **b**) profile; **c**) reverse. Cf. **439** for seal-type (and list of other examples).
- 437** *CMS* II.8 no. 268 (HMs 277-283, AM 1938.1015a-b, KSM Box 1376). Combination sealings, irregular two-hole nodules, and clay 'matrix'. Knossos: Rm of Clay Signet; Landing on Grand Staircase; Doorway south from the Hall of the Colonnades and beyond; Upper East-West Corridor; Lower East-West Corridor. Drawing of seal-type (bronze ring). Cf. **433-435**.
- 438** *CMS* II.8 no. 287 (HMs 214-215, 258/1-2, 299, 1296; AM 1938.1014a-d). Irregular hanging nodules with open backs; combination sealings (HMs 214-215); gable-shaped inscribed nodule (HMs 258/2, now lost). Drawing of seal-type (hard stone? ring). Cf. **432** for front, back and impression of cord.
- 439** *CMS* II.8 no. 475 (HMs 415/1-2, 1576-1579; AM 1938.1082). Direct object sealings. Knossos: Isopata, Royal Tomb. Drawing of seal-type (hard stone lentoid). Cf. **436** for front, back and profile.
- 440** *CMS* II.8 no. 172 (HMs 377/1-3; AM 1938.1068). Nodule with ridged back. Knossos: Arsenal. Drawing of seal-type (hard stone lentoid). Cf. **429** for front, back and profile.
- 441** *CMS* II.8 no. 529 (HMs 1093, 1209, 1228; AM 1938.1047). Irregular hanging nodule with open back. Knossos: Rm of the Seal Impressions. Drawing of seal-type (hard stone lentoid). Cf. **430** for front, back and impression of cords.
- 442** *CMS* II.8 no. 419 (HMs 129, 1628; AM 1938.1016, 1938.1152). Gable-shaped nodule, inscribed. Drawing of seal-type (hard stone lentoid). Cf. **428** for front, rear and inscriptions on 1938.1152.
- 443** *CMS* II.8 no. 497 (HMs 110). Flat-based nodule / 'packet', variant. Knossos: Rm of the Chariot Tablets. Drawing of seal-type (metal ring). Cf. **426** for front and plasticine impression of underside.
- 444** *CMS* II.8 no. 513 (HMs 156, 224). *Noduli* with gable-shaped rear; each inscribed *supra sigillum* (*CoMIK* IV Wn 8713, Wn 8752). Knossos: Rm of the Niche (HMs 156) and find-spot unknown (HMs 224). Drawing of seal-type (metal ring).
- 445** *CMS* II.8 no. 401 (HMs 1301 + ca 54 further examples). Irregular nodules with open backs; and fragments of irregular nodules (indeterminate). Knossos: find-spot unknown. Drawing of seal-type (soft stone lentoid).
- 446** *CMS* II.8 no. 200 (HMs 256/13 + 18 further examples; AM 1938.1046). Various nodule types: direct sealing; gable-shaped nodule (uninscribed); irregular nodules with open backs; indeterminate fragments. Knossos: Wooden Staircase. Drawing of seal-type (soft stone lentoid).
- 447** HMs 1049 (*CMS* II.6 nos. 173 + 174). Stopper: only upper portion preserved, with multiple impressions of two seals. Mallia: House Epsilon, Rm IV 2. **a**) Profile; **b**) – **c**) drawings of seal-types (both hard stone lentoids).

Chapter 9

- 448** *CMS* I no. 154 (ANM 6433). Amygdaloid with grooved back, amber. Mycenae: CT 518. **a**) Drawing of impression; **b**) back.
- 449** *CMS* I no. 271 (ANM 8327). Cushion, banded agate with gold caps. Pylos: Routsis ThT (shaft 2). **a**) Seal face; **b**) impression.
- 450** *CMS* XI no. 208 (Munich: Loeb Coll. 681). Cylinder, slightly barrel-shaped, banded agate. Kakovatos (in spoil from excavation of tholos). **a**) Profile; **b**) impression.
- 451** *CMS* I no. 290 (ANM 7983). Amygdaloid with grooved back, amethyst. Pylos: Englianos T. IV. **a**) Impression; **b**) back.
- 452** *CMS* V no. 600 (Mycenae 18813; CHA 68-1637). Lentoid with flattish face, lapis lazuli; SH vertical. Mycenae: Citadel House Area, Rm 19 deposit. **a**) Impression; **b**) profile drawing.
- 453** *CMS* V Suppl.1B no. 429 (Tiryns 28140). Tiryns: Unterburg, Rm 218. 'Cushion' with flat face and grooved back, banded agate. **a**) Impression; **b**) seal face; **c**) profile.
- 454** *CMS* V no. 672 (Thebes 174). Three-quarter 'cylinder', banded agate. Thebes: Tsortsis plot, corner of Pindar and Antigone Streets ('Treasure Room'). **a**) Impression; **b**) back.

- 455 *CMS I* no. 185 (ANM 7332). Lentoid, agate; SH vertical. Dendra ThT. Impression.
- 456 *CMS I* no. 183 (ANM 7329). Lentoid, agate; SH vertical. Dendra ThT. Impression.
- 457 *CMS I* no. 179 (ANM 6208). Signet ring, gold (hollow). Tiryns 'Treasure'. **a**) Face; **b**) profile.
- 458 *CMS I* nos. 9-11 (ANM 33-35). Gold cushions, hollow. Mycenae: Circle A, Gr. III. Reverses. Cf. 459-461.
- 459 *CMS I* no. 10 (ANM 34). Gold cushion, hollow. Mycenae: Circle A, Gr. III. Impression. Cf. 458.
- 460 *CMS I* no. 9 (ANM 33). Gold cushion, hollow. Mycenae: Circle A, Gr. III. Impression. Cf. 458.
- 461 *CMS I* no. 11 (ANM 35). Gold cushion, hollow. Mycenae: Circle A, Gr. III. **a**) Face; **b**) impression. Cf. 458.
- 462 *CMS I* no. 283 (ANM 8330). Amygdaloid with facetting and cloisonné on back, gold (hollow). Pylos: Routsis ThT (chamber). **a**) Face; **b**) back.
- 463 *CMS I* no. 293 (ANM 7986). Cushion with net pattern on back, gold (hollow). Pylos: Englianos T. IV. **a**) Face; **b**) back.
- 464 *CMS I* no. 15 (ANM 240). Signet ring, gold (hollow). Mycenae: Circle A, Gr. IV. **a**) Face; **b**) profile.
- 465 *CMS I* no. 17 (ANM 992). Signet ring, gold (massive). Mycenae: Acropolis Treasure. **a**) Face; **b**) profile.
- 466 *CMS V* Suppl. 1B no. 137 (ex-Olympia; now Kalamata –). Anthia: ThT (chamber, under wooden bier?). Signet ring, gold (hollow). Profile. Cf. 486 for impression.
- 467 *CMS I* no. 126 (ANM 3179). Signet ring, gold (hollow). Mycenae: CT 91. Profile. Cf. 494 for impression.
- 468 *CMS I* no. 218 (ANM 8455). Signet ring, gold (hollow). Prosymna T. 44. Profile. Cf. 529 for impression.
- 469 *CMS V* Suppl. 1B no. 113 (Nemea 550). Signet ring, gold (hollow) with cloisonné decoration around edge of finger-bed and hoop; blue glass survives in roughly half of the cloisons. Aidonia CT 7. View of hoop and finger-bed. Cf. 491 for impression.
- 470 *CMS V* no. 198 (Benaki 2079). Signet ring, gold-plated bezel over bronze core. 'Thebes'. **a**) Face; **b**) profile.
- 471 *CMS V* Suppl. 1B no. 435 (Tiryns 28148). Signet? ring, lead. Tiryns: Unterburg. **a**) Face; **b**) reverse.
- 472 *CMS V* no. 422 (Eleusis –). Mould, dark red 'steatite'. Eleusis: West Cemetery, Gr. Hπ 9. Upper surface with two oval matrices with engraved motifs (perhaps to produce gold foil embellishment for relief rings in lead).
- 473 *CMS V* Suppl. 1B no. 186 (Piraeus: Thorikos exc. no. TP72.14). Amygdaloid, carnelian. Thorikos, Tholos IV. Impression.
- 474 *CMS V* no. 581 (Nauplia –). Three-side prism, with amygdaloid faces (one engraved), amethyst. Kazarma ThT. Impression.
- 475 *CMS V* no. 439 (Kalamata 835). Amygdaloid, carnelian. Nichoria ThT. Impression.
- 476 *CMS V* no. 437 (Kalamata 831). Lentoid, banded agate; SH vertical. Nichoria ThT. Impression.
- 477 *CMS V* no. 655 (Rhodes: Ialysos inv. no. 3641-4). Ialysos: Makri Vounara, Gr. 20? Amygdaloid, carnelian. Impression.
- 478 *CMS I* no. 16 (ANM 241). Signet ring, gold. Mycenae: Circle A, Gr. IV. Impression.
- 479 *CMS I* no. 294 (ANM 8532). Lentoid, jasper (?) SH vertical. Pylos: Vagena Grave. Impression.
- 480 *CMS I* no. 224 (ANM 1775). Lentoid, red jasper with gold caps; SH horizontal. Vapheio ThT (floor cist). Impression.
- 481 *CMS V* no. 585 (Nauplia –). Cylinder, amethyst. Kazarma ThT. Impression.
- 482 *CMS I* no. 223 (ANM 1761). Lentoid, red jasper; SH horizontal. Vapheio ThT (floor cist). Impression.
- 483 *CMS I* no. 229 (ANM 1770). Lentoid, banded agate with gold caps; SH vertical. Vapheio ThT (chamber). Impression.
- 484 *CMS I* no. 89 (ANM 2852). Signet ring, red jasper. Mycenae: CT 58. Impression.
- 485 *CMS I* no. 119 (ANM 3148). Signet ring, gold (hollow). Mycenae: CT 84. Impression.
- 486 *CMS V* Suppl. 1B no. 137 (ex-Olympia; now Kalamata –). Signet ring, gold (hollow). Anthia: ThT (chamber, under wooden bier?). Impression. Cf. 466 for profile.
- 487 *CMS V* Suppl. 1B no. 136 (ex-Olympia; Kalamata –). Signet ring, gold (hollow). Anthia: ThT (chamber, under wooden bier?). Impression.
- 488 *CMS I* no. 221 (ANM 1765). Lentoid, carnelian; SH horizontal. Vapheio ThT (floor cist). Impression.
- 489 *CMS I* no. 167 (ANM 8718). Lentoid, banded agate; SH vertical. Mycenae: stray find near W wall of Tomb of Clytemnestra. Impression.
- 490 *CMS V* Suppl. 1B no. 114 (Nemea 549). Signet ring, gold (hollow). Aidonia CT 7. Impression.
- 491 *CMS V* Suppl. 1B no. 113 (Nemea 550). Signet ring, gold (hollow). Aidonia CT 7. Impression. Cf. 469 for view of finger-bed and hoop with cloisonné decoration.
- 492 *CMS V* Suppl. 1B no. 115 (Nemea 548). Signet ring, gold (hollow). Aidonia CT 7. Impression.
- 493 *CMS I* no. 86 (ANM 2853). Signet ring, gold (hollow). Mycenae: CT 55. Impression.
- 494 *CMS I* no. 126 (ANM 3179). Signet ring, gold (hollow). Mycenae: CT 91. Impression. Cf. 467 for profile.

- 495 *CMS V Suppl.* 1B no. 135 (ex-Olympia; now Kalamata – ; exc. no. ET 4.56). Signet ring, gold (hollow). Anthia: CT 4. Impression.
- 496 *CMS V* no. 674 (Thebes 211). Irregular half-cylinder, banded agate. Thebes: Tsortsi plot, corner of Pindar and Antigone Streets ('Treasure Room'). Impression.
- 497 *CMS XI* no. 272 (Péronne: Musée Danicourt –). Signet ring, gold (massive). Impression.
- 498 *Tonplomben* 21A (*CMS I Suppl.* no. 173; ANM 9048α). Direct object sealing. Pylos: Archives Rm 8. Drawing of seal-type. Cf. 562.
- 499 *CMS V* no. 597 (Mycenae 18789; CHA 69-813). Lentoid, banded agate; SH slightly diagonal to horizontal axis. Mycenae: Citadel House Area Passage 34. Impression. Cf. C44.
- 500 *CMS V* no. 656 (Rhodes 3653). Lentoid, banded agate; SH vertical. Ialysos: Makri Vounara Gr. 21. Impression.
- 501 *CMS V* no. 645 (Pylos 19). Amygdaloid, dark red stone with green and yellow inclusions. Gouvalari ThT 1 (Koukounara T. 4). Impression.
- 502 *CMS I* no. 234 (ANM 1767). Lentoid, green jasper; SH horizontal. Vapheio ThT (floor cist). Impression.
- 503 *CMS I* no. 20 (ANM 1376). Signet ring (hoop broken), blue chalcedony. Mycenae: Acropolis (Schliemann). Impression.
- 504 *CMS XI* no. 52 (Berlin: FG 22). Lentoid, banded agate (in modern setting). SH vertical. 'Mycenae' (purchased Paris 1887; ex-Coll. de Montigny). Silicone impression.
- 505 *CMS I* no. 46 (ANM 2316). Lentoid, carnelian; SH vertical. Mycenae: CT 8. Impression.
- 506 *CMS XIII* no. 20 (BMFA 27.655). Lentoid, agate; SH vertical. 'Mycenae' (acquired in Athens for Lewes House Collection, 1898). Impression.
- 507 *CMS I* no. 54 (ANM 2318). Lentoid, banded agate; SH vertical. Mycenae: CT 11. Impression.
- 508 *CMS I* no. 71 (ANM 2437). Lentoid, banded agate; SH vertical. Mycenae: CT 29. Impression.
- 509 *CMS I* no. 52 (ANM 2319). Lentoid, carnelian; SH vertical. Mycenae: CT 10. Impression.
- 510 *CMS I* no. 57 (ANM 2433). Lentoid, agate; SH slightly diagonal to vertical axis. Mycenae: CT 24. Impression.
- 511 *CMS V* no. 432 (Kalamata 839). Lentoid, banded agate; SH vertical. Nichoria ThT, pit 3. Impression.
- 512 *CMS V* no. 433 (Kalamata 841). Lentoid, banded agate; SH vertical. Nichoria ThT, pit 3. Impression.
- 513 *CMS V* no. 689 (Thebes 2711). Lentoid, banded agate; SH vertical. Orchomenos. Impression.
- 514 *CMS I* no. 276 (ANM 8325). Lentoid, agate; SH vertical. Pylos: Routsis ThT (chamber). Impression.
- 515 *CMS V* no. 436 (Kalamata 838). Lentoid, banded agate; SH diagonal. Nichoria ThT, pit 3. Impression.
- 516 *CMS V* no. 317 (Delphi 8523). Lentoid, banded agate; SH vertical. Krisa CT 3, burial F. Impression.
- 517 *CMS V* no. 318 (Delphi 8533). Lentoid, red jasper with yellow and brown inclusions; SH horizontal. Krisa CT 2, burial B. Impression.
- 518 *CMS V Suppl.* 1B no. 110 (Nemea –). Lentoid, haematite; SH vertical. Aidonia CT 2 (dromos). Impression.
- 519 *CMS V* no. 607 (Naxos 111). Lentoid, banded agate; SH slightly diagonal to vertical axis. Kamini T. 4. Impression.
- 520 *CMS V Suppl.* 1B no. 73 (ex-Nauplion 19367; Mycenae –). Lentoid, agate; SH vertical. Mycenae: Asprochoma CT 7. Impression.
- 521 *CMS I* no. 171 (ANM 7645). Lentoid, agate; SH vertical. Mycenae: vicinity of the Perseia. Impression.
- 522 *CMS V* no. 313 (Delos A323). Lentoid, banded agate; SH vertical. Delos: NW of Sanctuary of Artemis. Impression.
- 523 *CMS XI* no. 57 (Berlin: FG 26). Lentoid, banded agate; SH vertical. 'Corinth' (ex-Rhousopoulos). Silicone impression.
- 524 *CMS I Suppl.* no. 56 (ANM 8845). Lentoid, banded agate; SH vertical. Perati CT 142. Impression.
- 525 *CMS VII* no. 111 (BM G&R 1874.3-5.14). Lentoid, banded agate, exposed to heat; SH slightly diagonal to vertical axis. Unknown provenance (Merlin). Impression. Cf. C46.
- 526 *CMS I Suppl.* no. 58 (NM 8802). Amygdaloid with grooves on back, carnelian. Perati: earth over T. 118. Impression.
- 527 *CMS V Suppl.* 1B no. 13 (Lamia BE 949). Lentoid, light-green stone with olive-green flecks (Mohs 4-5); SH vertical. Stavros Gr. V. Impression.
- 528 *CMS I* no. 231 (ANM 1776). Lentoid, banded agate; SH vertical. Vapheio ThT (floor cist). Impression.
- 529 *CMS I* no. 218 (ANM 8455). Signet ring, gold (hollow). Prosymna T 44. Impression. Cf. 468 for profile.
- 530 *CMS I* no. 129 (ANM 3182). Signet ring, gold (hollow). Mycenae: CT 91. Impression.
- 531 *CMS V Suppl.* 1B no. 153 (Patras AE 125). Lentoid, lapis lacedaimonius (?). SH vertical. Patras: Voundeni CT 4.
- 532 *CMS XI* no. 36 (Berlin: FG 10). Lentoid, rock crystal; SH vertical. 'Phigaleia' (ex-Rhousopoulos). Silicone impression.
- 533 *CMS V Suppl.* 1B no. 168 (Patras 2440). Lentoid, glass (mould-made). SH vertical. Kallithea T. Θ. Drawing of impression. From same mould as: V Suppl. 1B no. 169 (Patras 2442: also Kallithea T. Θ).

- 534** *CMS* V no. 349 (Delphi: Medeon exc. no. D61). Lentoid, glass (mould-made). SH vertical. Medeon T. 29. Drawing of impression. From the same mould as: *CMS* V nos. 348, 350 (Me/D60, D72: Medeon T. 29); V no. 380 (Me/D79: Medeon T. 29a); V no. 392 (Me/D82: Medeon T. 99); Suppl. 1A no. 82 (Medeon?).
- 535** *CMS* V Suppl. 1B no. 134 (Olympia Δ249). Lentoid, glass (mould-made). SH vertical. Ayia Triada, Elis: T. 11. Drawing of impression.
- 536** *CMS* V Suppl. 2 no. 99 (Lamia –). Lentoid, glass (mould-made). SH vertical. Elateia T. 59. Drawing of impression. From the same mould as: *CMS* V nos. 363-364 (Me/D73, Me/D63: Medeon T. 29); V no. 385 (Me/D80: Medeon T. 29a); V Suppl. 1B no. 452 (Volos BE 5232α: Kato Mavrolophos CT).
- 537** *CMS* V Suppl. 1B no. 1 (Lamia BE 2541). Lentoid, glass (mould-made). SH vertical. Kalapodi T. 1. Drawing of impression.
- 538** *CMS* V Suppl. 1B no. 132 (Olympia Δ247). ‘Discoïd’ with flat back, glass (mould-made). SH vertical. Ayia Triada, Elis: T. 11 (burial A). Drawing of impression. From the same mould as: V Suppl. 1B no. 133 (Olympia Δ248: also T. 11 burial A); V Suppl. 1B no. 451 (Volos BE 5232β: Kato Mavrolophos CT); VII no. 137 (BM G&R 1960.10-1.1: unknown provenance, cf. C48).
- 536** *CMS* V no. 598 (Mycenae 18435; CHA 68-1545). ‘Discoïd’ with flat back, glass (mould-made; misshapen during manufacture). Mycenae: Citadel House Area, Rm 19. **a)** Impression; **b)** seal face; **c)** profile.
- 540** *CS* no. 363 (AM 1941.144). Lentoid, glass (mould-made). Unknown provenance. **a)** Profile; **b)** plaster cast; **c)** hypothetical section drawing of two-part mould for pressed glass seals.
- 541** *CMS* XII no. 262 (NY MMA 1926.31.392). Irregular block, dark-reddish steatite (?) with circular matrices carved in relief, perhaps for making pressed glass seals. ‘Harbour Town of Knossos’ (Seager). Upper surface.
- 542** *CMS* V no. 375 (Delphi: Medeon exc. no. Me/D19). Lentoid, fluorite (not rock crystal). SH vertical. Medeon T. 29. Impression.
- 543** *CMS* V no. 742 (Volos 2615α). Lentoid, fluorite (not rock crystal). SH horizontal. Pteleon, Gritsa: ThT. Impression.
- 544** *CMS* V Suppl. 1B no. 438 (Tiryns 28159). Lentoid, fluorite; SH vertical. Tiryns: Unterburg, Rm 306. Seal face.
- 545** *CMS* V Suppl. 2 no. 70 (Lamia Δ925). Lentoid, black steatite; SH vertical. Elateia T. 46. **a)** Face; **b)** profile drawing.
- 546** *CMS* V Suppl. 1B no. 439 (Tiryns 28152). Lentoid, black steatite; SH vertical. Tiryns: Unterburg, Rm 88. **a)** Face; **b)** profile drawing.
- 547** *CMS* V Suppl. 1A no. 404 (Corinth –). Lentoid, steatite; SH vertical. Kato Almyri T. 6. Impression.
- 548** *CMS* V Suppl. 1A no. 84 (Chaeroneia 481γ). Lentoid, dark-brown steatite; SH vertical. Medeon: find-spot unknown. Impression.
- 549** *CMS* V Suppl. 1A no. 13 (Aigina: Aphaia exc. no. Si30). Lentoid, black steatite; SH vertical. Aigina: vicinity of Aphaia Temple. Impression.
- 550** *CMS* I no. 42 (ANM 5409). Lentoid, steatite; SH horizontal. Mycenae: Acropolis (Tsountas). Impression.
- 551** *CMS* V Suppl. 1B no. 131 (Olympia Δ316). Lentoid, dark olive-green steatite; SH horizontal. Ayia Triada, Elis: T. 7.
- 552** *CMS* V no. 376 (Delphi: Medeon exc. no. Me/D20). Lentoid, black steatite; SH vertical. Medeon T. 29. Impression.

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- 553** *CMS* V no. 499 (K3.427). Lentoid, banded limestone; SH horizontal. Ayia Irini, Kea: Temple Rm IV. Impression.
- 554** *CMS* V no. 500 (K7.344). Lentoid, banded limestone; SH vertical. Ayia Irini, Kea: Temple Rm V. Impression.
- 555** *CMS* V Suppl. 1B no. 40 (Melos 571). Lentoid, banded limestone; SH vertical. Phylakopi, Melos: East Shrine. Impression.
- 556** ANM 8553 (*Tonplomben* no. 32; Wr 1457; *CMS* I no. 308;). Gable-shaped nodule, with inscriptions *supra sigillum* (*152) on face a and *a-pu-do-si* on face b. Pylos: Main Building, Archives Rm 8. **a)** Face a; **b)** longitudinal section; **c)** drawing of face a; **d)** drawing of face b. Cf. **569** for seal-type.
- 557** ANM 8474β (*Tonplomben* no. 38B; *CMS* I no. 304). Irregular two-hole nodule with rounded back. Pylos: Main Building, Archives Rm 8. **a)** Face; **b)** profile drawing; **c)** longitudinal section. Cf. **576** for seal-type.
- 558** ANM 8527 (*Tonplomben* no. 30; *CMS* I no. 310). Irregular two-hole nodule with pyramidal back. Pylos: Main Building, Propylon, outer porch?, SW chasm. **a)** Face; **b)** profile drawing; **c)** longitudinal section. Cf. **570** for seal-type.

- 559 ANM 8552γ (*Tonplomben* no. 12B; *CMS* I no. 379). Irregular two-hole nodule, broken along string-hole. Pylos: Southwestern Building, outside SW wall, sections 6-10 and beyond Building X. **a)** Face; **b)** longitudinal section.
- 560 ANM 8507 (*Tonplomben* no. 13; *CMS* I no. 344). Irregular two-hole nodule, with open reverse. Pylos: Wine Magazine, Rm 104, doorway. **a)** Face; **b)** section. Cf. 578 for seal-type.
- 561 ANM 8472 (*Tonplomben* no. 22; *CMS* I no. 302). Combination sealing. Pylos: Main Building, Archives Rm 8, with tablet 467. **a)** Face; **b)** longitudinal section; **c)** silicone of reverse, showing wickerwork.
- 562 ANM 9048a (*Tonplomben* no. 21A; *CMS* I Suppl. no. 173). Direct object sealing. Pylos: Main Building, Archives Rm 8, with tablet 467. **a)** Face; **b)** transverse section; **c)** silicone of underside, showing object with flat surface bound with strip of ?gut. Cf. 498 for seal-type.
- 563 ANM 7632 (Müller et al. 1998 no. 24C; Wt 503; *CMS* I no. 163). Gable-shaped nodule, inscriptions *ke-ni-qe* on face b and *-te-we* on face c. Mycenae: House of Sphinxes, Rm 1 doorway. **a)** Drawing of seal-type (soft stone lentoid); **b)** face a; **c)** drawing of face b; **d)** drawing of face c.
- 564 Mycenae Museum 29216 (Nauplia 5363; exc. no. 50-227; Müller et al. 1998 no. 16). Semi-fine ware stirrup jar (FS 167) with stopper (spout cover broken off). Mycenae: House of the Oil Merchant, N end of main gallery. Vase with stopper *in situ* (stopper bears six illegible impressions of a lentoid).
- 565 Mycenae Museum 6360 (Nauplia 5359; exc. no. 50-488; Müller et al. 1998 no. 11B; *CMS* I no. 160). Stopper (spout cover broken) from stirrup jar bearing 14 incomplete impressions of damaged hard stone amygdaloid. Mycenae: House of the Oil Merchant, N end of main gallery. **a)** Drawing of seal-type; **b)** stopper profile; **c)** stopper underside. The same seal was also used on the stopper belonging to ANM 7626 (no. 11A), a semi-fine ware jar (FS 167).
- 566 *CMS* V Suppl. 3 no. 218 (Mycenae Museum –; Müller et al. 1998 no. 14). Two fragments of a stopper bearing five incomplete impressions of a soft stone lentoid. Mycenae: House of the Oil Merchant, N end of main gallery. Drawing of seal-type.
- 567 *CMS* I no. 162 (ANM 7629; exc. no. 50-490; Müller et al. 1998 no. 13A). Stopper fragment with 11 incomplete impressions of metal ring bezel. Mycenae: House of the Oil Merchant, N end of main gallery. Drawing of seal-type. The same seal impressed a second stopper, now fragmentary (Müller et al. 1998 no. 13B; box 69, no exc. number).
- 568 Mycenae Museum 9098 (Nauplia 5337; exc. no. 50-492; Müller et al. no. 12B; *CMS* I no. 161). Light-on-dark stirrup jar with stopper *in situ* (much of spout cover survives). Stopper bears several incomplete impressions of hard stone lentoid. Mycenae: House of the Oil Merchant, N end of main gallery. **a)** Drawing of seal-type; **b)** vase. The same seal impressed four further light-on-dark stirrup jars (Müller et al. 1998 nos. 12A, 12C-E: 50-207, 50-299, 50-205, 50-203). For 12A see here FIGURE 10.1e.
- 569 *Tonplomben* no. 32 (*CMS* I no. 308; ANM 8553; Wr 1457). Gable-shaped nodule, inscribed. Pylos: Main Building, Archives Rm 8. Drawing of seal-type (hard stone amygdaloid). Cf. 556 for nodule, inscriptions and longitudinal section.
- 570 *Tonplomben* no. 30 (*CMS* I no. 310; ANM 8527). Irregular two-hole nodule with pyramidal back. Pylos: Main Building, Propylon, outer porch?, SW chasm. Drawing of seal-type (hard stone lentoid with gold caps). Cf. 558 for nodule, profile drawing and longitudinal section.
- 571 *Tonplomben* no. 64 (*CMS* I no. 380; ANM 9049). Irregular two-hole nodule. Pylos: Southwestern Building, outside SW wall sections 6-10 and beyond Building X. Drawing of seal-type (lentoid, hammered gold).
- 572 *Tonplomben* no. 2 (*CMS* I no. 313; ANM 8479). Two-hole nodule with pyramidal back. Pylos: Northeastern Building, Rm 98, doorway. Drawing of seal-type (ring bezel, perhaps 'bi-metallic': imprints of two rivets and 'relief' line dividing bezel into two registers).
- 573 *Tonplomben* no. 10 (*CMS* I no. 324; ANM 8525; Wr 1327). Two-hole nodule, inscribed. Pylos: Northeastern Building, Rm 98. Drawing of seal-type (metal ring).
- 574 *Tonplomben* no. 39 (*CMS* I no. 329; ANM 8490α-σ). One gable-shaped nodule, unscribed; six gable-shaped nodules inscribed (Wr 1331-1344, 1458-1459). Pylos: Northeastern Building, find-spots various (Corridor 95, Rm 99). Drawing of seal-type (metal ring).
- 575 *Tonplomben* no. 40 (*CMS* I no. 312; ANM 8478a-i). Two gable-shaped nodules, inscribed (Wr 1326, 1330); two gable-shaped nodules, unscribed; seven irregular two-hole nodules. Pylos: Northeastern Building, find-spots various (Rm 98, Rm 99, Rooms 98-100). Drawing of seal-type (metal ring).
- 576 *Tonplomben* no. 38 (*CMS* I no. 304; ANM 8474α-β). Two irregular two-hole nodules. Pylos: Main Building, Archives Rm 8. Drawing of seal-type (metal ring). Cf. 557 for face, profile drawing and longitudinal section of no. 38B, ANM 8474β.
- 577 *Tonplomben* no. 73 (*CMS* I no. 355; ANM 8520). *Nodus* with gable-shaped back. Pylos: Wine Magazine, Rm 105 behind pithos I,6. Drawing of seal-type (hard stone lentoid).
- 578 *Tonplomben* no. 13 (*CMS* I no. 344; ANM 8507). Irregular two-hole nodule with open back. Pylos: Wine Magazine, Rm 104 doorway. Drawing of seal-type (soft stone lentoid). Cf. 560 for nodule and longitudinal section.

- 579 *Tonplomben* no. 69 (CMS I no. 367; ANM 8508a-γ). Irregular two-hole nodules. Pylos: Northeastern Building, Corridor 95 from doorway into Rm 97. Drawing of seal-type (soft stone lentoid).
- 580 *Tonplomben* no. 71 (CMS I no. 315; ANM 8484). Irregular two-hole nodule with pyramidal back. Pylos: Northeastern Building, Rm 98. Drawing of seal-type (soft stone lentoid?).
- 581 *Tonplomben* no. 31 (CMS I no. 363; ANM 8541α-ε). Gable-shaped nodules: two uninscribed, three inscribed (see 582-584). Pylos: Wine Magazine, Rm 105 by pithos I,1. Drawing of seal-type (hard stone lentoid).
- 582 ANM 8541δ (*Tonplomben* no. 31C; Wr 1360). Gable-shaped nodule, inscribed: VIN *supra sigillum* (face a), *me-ri-ti-* (face b), *-jo* (face c). Pylos: Wine Magazine, Rm 105 by pithos I,1. Drawings of faces a) – c). Cf. 581 for seal-type.
- 583 ANM 8541γ (*Tonplomben* no. 31B; Wr 1359). Gable-shaped nodule, inscribed: VIN *supra sigillum* (face a), *e-ti-wa-i* (face b). Pylos: Wine Magazine, Rm 105 by pithos I,1. Drawings of faces a) – b). Cf. 581 for seal-type.
- 584 ANM 8541β (*Tonplomben* no. 31E; Wr 1358). Gable-shaped nodule, inscribed: VIN *supra sigillum* (face a). Pylos: Wine Magazine, Rm 105 by pithos I,1. Drawing of face a. Cf. 581 for seal-type.
- 585 CMS XI no. 27 (Berlin: FG 3). Lentoid, agate; SH horizontal. ‘Elis’ (ex-Rhousopoulos). Silicone impression.
- 586 *Tonplomben* no. 15 (CMS I Suppl. no. 180; ANM 10148). Irregular two-hole nodule. Pylos: Southwestern Building, outside SW wall, sections 6-10 beyond Building X. Drawing of seal-type (hard stone lentoid).
- 587 CMS I Suppl. no. 6 (ANM 9095). Cylinder, faience (Mitannian Common Style). Mycenae: CT 517. Impression.
- 588 CMS V Suppl. 1B no. 241 (Rethymnon Σ94). Cylinder, faience (Mitannian Common Style). Armeni T. 108 (near skeleton A). Impression.
- 589 CMS II.3 no. 199 (HM 1460). Cylinder, haematite (Cypro-Aegean). ‘Astraki’. Impression.
- 590 CS no. 358 (AM 1938.1091). Cylinder, haematite (Cypro-Aegean). ‘Crete’. Plaster cast.
- 591 CMS VII no. 173 (BM G&R 1945.10-13.133). Cylinder, haematite (Cypro-Aegean). ‘Golgoi’, Cyprus (ex-Southesk Coll.). Impression.
- 592 CMS V no. 675 (Thebes 175). Cylinder, banded agate. Thebes: Tsortsi plot, corner of Pindar and Antigone Streets (‘Treasure Room’). Impression.
- 593 CMS V Suppl. 2 no. 106 (Lamia M845). Signet ring, gold (hollow). Elateia T. 62 (found with other grave goods and secondary burials in pit E in chamber floor). Face.
- 594 CMS V Suppl. 1B no. 81 (Nauplia: Panaritis exc. no. 3α). Lentoid, olive-green schist-like stone; SH diagonal. Panaritis (nr Midea) CT 1, pit α in dromos. Impression.
- 595 CMS V no. 751 (Volos 2598). Lentoid, dark olive-green ‘steatite’; SH vertical. Pefkakia, stray find. Impression.
- 596 CMS II.3 no. 78 (HM 1900). Lentoid, material uncertain (porous, blackish; possibly glass). SH vertical. Knossos: Lower Gypsades, Sanctuary of Demeter. Impression.
- 597 CMS I Suppl. no. 53 (ANM 10297). Lentoid, haematite; SH vertical. Sounion: Sanctuary of Poseidon. Impression.
- 598 CMS V no. 216 (Brauron –). Lentoid, banded agate; SH diagonal. Brauron: Sanctuary of Artemis, NW of temple. Impression.

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- 599 CMS IX no. 129 (Paris: CdM Dépôt du Louvre AM 48 = A1167). Lentoid, ‘sardonyx’. Provenance unknown (ex Coll. Montigny 1887; Cades 54 no. 75). Impression.
- 600 CS no. 307 (AM 1938.1040). Lentoid, lapis lacedaimonius; SH diagonal. Provenance unknown (not ‘Taygetus’; ex-Mayer Coll; Cades 54 no. 76). Impression.
- 601 CMS VII no. 129 (BM G&R 1874.4-5.5). Lentoid, carnelian; SH horizontal. ‘Crete’ (Petrides). Impression.
- 602 CMS VII no. 100 (BM G&R 1873.10-22.3). Truncated amygdaloid, haematite. ‘Crete’ (Petrides). Impression.
- 603 CMS VII no. 125 (BM G&R 1877.7-28.4). Lentoid, mottled green stone (not lapis lacedaimonius); SH vertical. ‘Crete’ (Petrides). Fimo impression. Cf. C35.
- 604 CMS VII no. 87 (BM G&R 1880.4-28.1). Amygdaloid with grooves on back, carnelian. ‘Gnossus’ (Franks). Impression. Cf. FRONTISPIECE; C30.
- 605 CMS VII no. 94 (BM G&R 1880.4-28.2). Cylinder, carnelian. ‘Gnossus’ (Franks). Impression.
- 606 CMS VII no. 113 (BM G&R 1870.10-8.38). Lentoid, rock crystal; SH vertical. Ialysos (tomb unknown). Impression. Cf. C40.
- 607 CMS I no. 23 (ANM 1385). Lentoid, agate; SH vertical. Mycenae: Acropolis (Schliemann). Impression.

- 608** *CMS* I no. 26 (ANM 1388). Amygdaloid, carnelian (traces of groove on seal face). Mycenae: Acropolis (Schliemann). Impression.
- 609** *CMS* XII no. 136 (NY MMA 12.214). Discoid, 'white agate'; SH diagonal. 'Lasithi' (ex-Evans). Impression.
- 610** *CMS* XII no. 212 (NY MMA 26.31.273). Amygdaloid, with faceted back; haematite. Crete? (ex-Seager). Impression.
- 611** *CMS* XII no. 168 (NY MMA 26.31.351). Lentoid, 'steatite'. Crete? (ex-Seager). Impression.
- 612** *CMS* XIII no. 21 (BMFA 92.2693). Lentoid, banded agate; SH vertical. Provenance unknown (ex-Edward Perry Warren). Impression.
- 613** *CMS* XIII no. 26 (BMFA 27.656). Lentoid, carnelian; SH vertical. Provenance unknown (acquired from R. D. Norton in 1900 for the Lewes House Collection, i.e. Edward Perry Warren). Impression.
- 614** *CMS* I no. 263 (ex-ANM 8404, now Chora 2705). Lentoid, blue chalcedony (not amethyst). SH slightly diagonal on the horizontal axis. Pylos: Tragana Th 1. Impression
- 615** *CMS* VII no. 130 (BM G&R 1874.4-5.4). Lentoid, burnt agate; SH horizontal. 'Crete' (Petrides). Impression.
- 616** *CMS* II.3 no. 389 (HM 1264). Egg-shaped 'amygdaloid', banded agate. Acquired by HM ca 1919; modern (work of the 'Sangiorgio Master'). Impression.
- 617** AM 1938.1114. 'Cushion' with flat face, gold (hollow). 'Thisbe Treasure'; modern. Face.
- 618** AM 1938.1124. 'Amygdaloid' with grooved back, gold (hollow). 'Thisbe Treasure'; modern. **a**) Face; **b**) back.
- 619** *CMS* II.3 no. 326 (HM precious metal 216?). Signet ring, gold. Modern (ex-Mitsotakis). Face.
- 620** AM 1938.790. Plano-convex plaque, bone. Allegedly from excavations at Knossos; plaque conceivably of Bronze Age date, engraving not (modern or EIA?). **a**) Face **a**; **b**) face **b**.
- 621** AM 1938.1129. Signet ring, gold (hollow). 'Candia' (ex-Evans). Face.
- 622** AM 1919.56. Signet ring, gold (hollow). Unknown provenance (ex-E. P. Warren, 'Crete'). Face.
- 623** *CMS* XI no. 29 (Berlin misc. 11886). Signet ring, gold (hollow). Purchased 1909; ex-Halvor Bagge, who had acquired it from Turkish merchant in Khania. **a**) Face; **b**) profile.
- 624** AM 1938.1130. 'Ring of Nestor'. Signet ring, gold (hollow). Provenance unknown; allegedly from Kakovatos (acquired by Evans pre-1925). **a**) Face; **b**) impression; **c**) profile; **d**) profile hoop.
- 625** 'Ring of Minos'. Original ring allegedly found at Knossos, near Temple Tomb. **a**) Face of electrotype produced for Evans by Gilliéron = AM 1938.1110 (AM 585 not shown is a second inferior copy). **b**) Drawing of the plaster cast made from the original ring by the Herakleion Museum ca 1930, prior to its disappearance. The ring re-surfaced in 2000 and is now in the HM.

COLOUR PLATES

FRONT COVER see **C37**.

BACK COVER see **C22** (The Burgon Ring).

FRONTISPIECE see **C30** for reverse.

- C1** *CMS* V no. 35 (Argos L7.332). Rectangular button, purple steatite. Lerna IIIC. Face and profile.
- C2** *CMS* XI no. 5 (Berlin: FG 59). Low pyramid, light-green translucent stone ('serpentine' or 'steatite'). 'Kouphonisia'. Reverse. Cf. **57**.
- C3** *CMS* II.1 no. 216 (HM 2011). Zoomorphic seal, bone / boar's tusk. Lenda-Gerokambos T. IIa (lower level). Profile.
- C4** *CMS* II.1 no. 210 (HM 2005). Hammer-headed seal, bone (cattle metatarsal). Lenda-Gerokambos ThT IIa (lower level). Profile. Cf. **99**.
- C5** *CMS* II.1 no. 231 (HM 1210). Flattened conoid, made from unmodified tip of hippopotamus incisor (traces of natural outer surface preserved). Marathokephalo ThT. Profile.
- C6** *CS* no. 86 (AE 1200). Zoomorphic seal, 'white piece' material. 'Ayia Pelagia (?)'. Profile.
- C7** *CS* no. 95 (AM 1938.929). Bi-facial disc, olive-green steatite. 'Hellenika', Knossos. Face **a**. Cf. **123**.
- C8** *CMS* VII no. 17 (BM G&R 1934.11-20.3). Three-sided prism, black steatite. Unknown provenance. Face **b**.
- C9** *CMS* VII no. 45 (BM G&R 1876.5-13.3). Three-sided prism, green jasper. 'Crete' (ex-Petrides). Face **a**. Cf. **36**.
- C10** *CMS* XI no. 16 (Berlin: FG 88). *Petschaft*, yellow jasper. 'Crete' (ex-Lambros 1882). Profile. Cf. **145**.
- C11** *CS* no. 121 (AM 1938. 934). *Petschaft*, agate exposed to heat. 'Kedri near Ierapetra'. Profile. Cf. **144**.
- C12** *CS* no. 133 (AM 1938.926). Foliate back, amethyst. 'Messara'. Reverse.
- C13** *CS* no. 174 (AM 1938.791). Three-sided prism, carnelian. 'Lasithi'. Face **a**. Cf. **161**.
- C14** *CS* no. 129 (AM 1938.921). Zoomorphic seal, blue chalcedony. Unknown prov. Profile.

- C15** CS no. 112 (AM 1938.942). Bi-convex discoid, agate. 'Central Crete'. Face. Cf. **148**.
- C16** CMS VII no. 42 (BM G&R 1909.4-9.7). Biconvex discoid, agate; SH vertical. Unknown provenance. (ex-Wace). Face. Cf. **37**.
- C17** CMS VII no. 35 (BM G&R 1921.7-11.2). Cushion, banded agate; SH horizontal. Unknown provenance. (ex Storey-Maskelyne Coll.). Face a. Cf. **149**.
- C18** CS no. 222 (1938.983). Amygdaloid, carnelian exposed to heat. Unknown prov. Face.
- C19** CMS VII no. 65 (BM G&R 1901.10-16.1). Bi-facial lentoid, banded agate; SH horizontal. 'Crete' (J. H. Marshall). Face a. Cf. **264**.
- C20** CMS no. 170 (BM G&R 1884.6-28.5). 'Lentoid', with flat face and strongly convex reverse, amethyst. 'Crete' (ex-Paton). Face.
- C21** CS no. 227 (AM 1938.954). Cushion, blue chalcedony. 'Archanes'. Face. Cf. **255**.
- C22** CMS VII no. 68 (BM G&R 1842.4.7-28.127). Signet ring, gold (massive). Unknown provenance (but listed in the Burgon Inventory as from 'Candia'). Face. Cf. **214**.
- C23** CS no. 203 (AM 1938.963). Cushion, black steatite, covered in gold foil. 'Palaikastro' (1894). Face. Cf. **257**.
- C24** CS no. 202 (AM 1938.964). Cushion, banded agate. 'Priene' (ex-Tyszkiewicz Collection; acquired in Smyrna). Reverse. Cf. **206**.
- C25** CS no. 250 (AM 1938.1127). Signet ring, gold (hollow). 'Knossos' (acquired by Evans, Candia 1894). Face. Cf. **216**.
- C26** CS no. 204 (AM 1938.955). Cushion, blue chalcedony. 'Knossos district'. Face.
- C27** CS no. 343 (AM 1938.1066). Lentoid, green jasper; SH vertical. 'Knossos'. Face. Cf. **259**.
- C28** CS no. 240 (AM 1938.1061). Lentoid, red jasper; SH vertical. 'Central Crete'. Face. Cf. **265**.
- C29** CMS XI no. 50 (Berlin: FG 30). Lentoid, dark olive-green serpentine; SH vertical. 'Crete'. Face. Cf. **270**.
- C30** CMS VII no. 87 (BM G&R 1880.4-28.1). Amygdaloid with grooves on back, carnelian. 'Gnossus' (Franks). Reverse. Cf. **604**.
- C31** AM AE.1231. Amygdaloid with faceted back., orange-red carnelian. 'Ayia Pelagia Th T'. Reverse.
- C32** CS no. 359 (AM AE. 698). Glass, lentoid (engraved); SH horizontal. Dictaeon Cave. Face. Cf. **381**.
- C33** CS no. 223 (AM 1938.978). Amygdaloid with faceted back, banded agate. 'Kritsa'. Face. Cf. **383**.
- C34** CMS VII no. 102 (BM G&R 1892.7-20.2). Lentoid, mottled agate; SH vertical. 'Crete' (ex-Spratt). Face.
- C35** CMS VII no. 125 (BM G&R 1877.7-28.4). Lentoid, mottled green stone (not lapis lacedaimonius); SH vertical. 'Crete' (Petrides). Face. Cf. **603**.
- C36** CMS VIII no. 149 (BM G&R 1966.3-28.27). Lentoid, banded agate; SH vertical. Unknown provenance, possibly Crete. (ex-Spencer-Churchill Coll.). Face.
- C37** CMS VII no. 123 (BM G&R 1877.7-28.3). Lentoid, lapis lacedaimonius; SH vertical. 'Crete' (Petrides). Face. Cf. **398**.
- C38** CMS VII no. 108 (BM G&R 1877.7-28.2). Lentoid, haematite; SH diagonal. 'Crete' (Petrides). Face. Cf. **392**.
- C39** CMS VIII no. 148 (BM G&R 1966.3-28.26). Lentoid, agate; SH vertical. Unknown provenance, possibly Crete (ex-Spencer-Churchill). Reverse.
- C40** CMS VII no. 113 (BM G&R 1870.10-8.38). Lentoid, rock crystal; SH vertical. Ialysos (tomb unknown). Face. Cf. **606**.
- C41** CMS XI no. 62 (Berlin: FG 21). Lentoid, banded agate exposed to heat; SH vertical. 'Achaia'. Reverse.
- C42** CMS VII no. 168 (BM G&R 1897.4-1.1). Cushion, lapis lazuli in gold casing (cut away to expose seal face). Enkomi T.1. Face.
- C43** CMS VII no. 154 (BM G&R 1872.3-15.46). Lentoid, banded agate; SH vertical. Ialysos (tomb unknown). Reverse.
- C44** CMS V no. 597 (Mycenae 18789; CHA 69-813). Lentoid, banded agate; SH slightly diagonal to horizontal axis. Mycenae: Citadel House Area Passage 34. Reverse. Cf. **499**.
- C45** CMS VII no. 131 (BM G&R 1854.5-19.149). Lentoid, banded agate; SH vertical. Unknown provenance (acquired by C. T. Newton, probably in Dodecanese). Face.
- C46** CMS VII no. 111 (BM G&R 1874.3-5.14). Lentoid, banded agate exposed to heat; SH slightly diagonal to vertical axis. Unknown provenance (Merlin). Face. Cf. **525**.
- C47** CMS VII no. 175 (BM G&R 1908.4-10.6). Lentoid, banded agate; SH vertical. Unknown provenance. Face.
- C48** CMS VII no. 137 (BM G&R 1960.10-1.1). Plano-convex disc, pressed glass. Unknown provenance. From the same mould as two seals from CT 11 at Ayia Triada, Elis (CMS V Suppl. 1B nos 132-133), and a third from tomb at Kato Mavrolophos in Thessaly (CMS V Suppl. 1B no. 451). Cf. **538**.
- C49** CMS VII no. 194 (BM G&R 1872.6-20.48). Lentoid, fluorite; SH vertical. Ialysos (tomb unknown). Face.
- C50** CMS VII no. 205 (BM G&R 1905.6-10.3). Lentoid, olive-green steatite; SH slightly diagonal to the vertical axis. 'From Mycenaean tomb at Sphikia' [= Phychtia near Mycenae]. Mainland Popular Group. Face.

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139, 141-42, 149, 150-53, 156, 158,
161-62, 164, 171, 174, 176, 178-85,
187-89, 191-92, 208, 212, 222, 252,
319-20, 324, 327
- Zas Cave 38, 45, 56n
- Zeitstil* 325, 327-28
- zig-zags 26, 33, 39, 52
- zoomorph(ic) 29, 32, 63-64, 67, 72,
76, 83
- Zygouries 44, 55

COLOUR PLATES

A full list of colour plates appears on pp. 403-04.

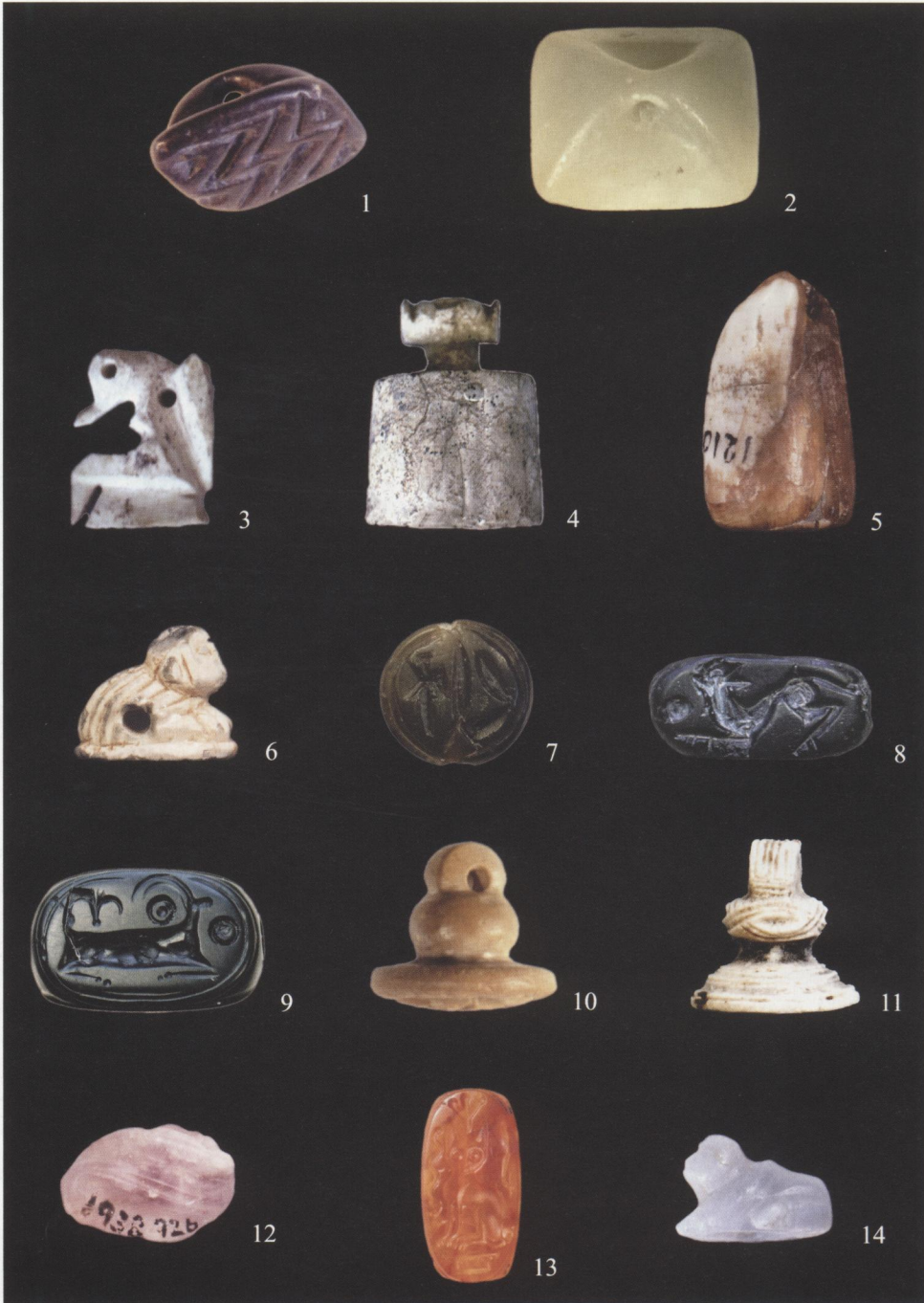
The bright glare of the Mediterranean sun, the dappled shade of an olive grove, the cool darkness of an inner chamber, the flicker of torch-light – all these and many more had an impact on how seals and signet rings appeared in the Aegean Bronze Age. Hue and opacity might also change when the seals were worn against skin or clothing, light or dark. Today we generally view seals in museum galleries: sometimes in artificial lighting, sometimes with none at all. They are set against different kinds of backgrounds, some less suitable than others. Each and every variable will affect our impression of colour.

To offer a representative selection of Aegean seals in colour would be impossible, since almost every kind of stone – agate, amethyst, blue chalcedony, carnelian, chlorite, haematite, jasper, lapis lacedaimonius, lapis lazuli, serpentine, steatite – occurs in a range of hues. Impurities or inclusions introduce more variables. Even gold comes in different shades. Bone and ivory may have been creamy-white originally, but these organic materials are prone to depositional changes in colour. The same applies to blue glass.

Faced with such imponderables – not to mention difficulties in photography and printing – it might have been wiser to avoid colour altogether in this book. And yet to give an *impression* of colour, especially to those readers who have limited opportunities to see Aegean seals, seems worthwhile. Thus in the following pages I present a small selection of 50 images, illustrating most of the materials from which seals and signet rings were made (excluded are clay, bronze, lead and silver). It seemed preferable to rely on my own photographs throughout, rather than purchasing images from museums or photographic archives, in order to retain some control over film and lighting conditions. Unfortunately, during the later stages of preparing this book, both the National Museum in Athens and the Herakleion Museum have been closed to study. As a result, most of the photographs reproduced here were taken in Berlin, London and Oxford, supplemented by a few transparencies of bone and ivory seals, made in Herakleion many years ago.

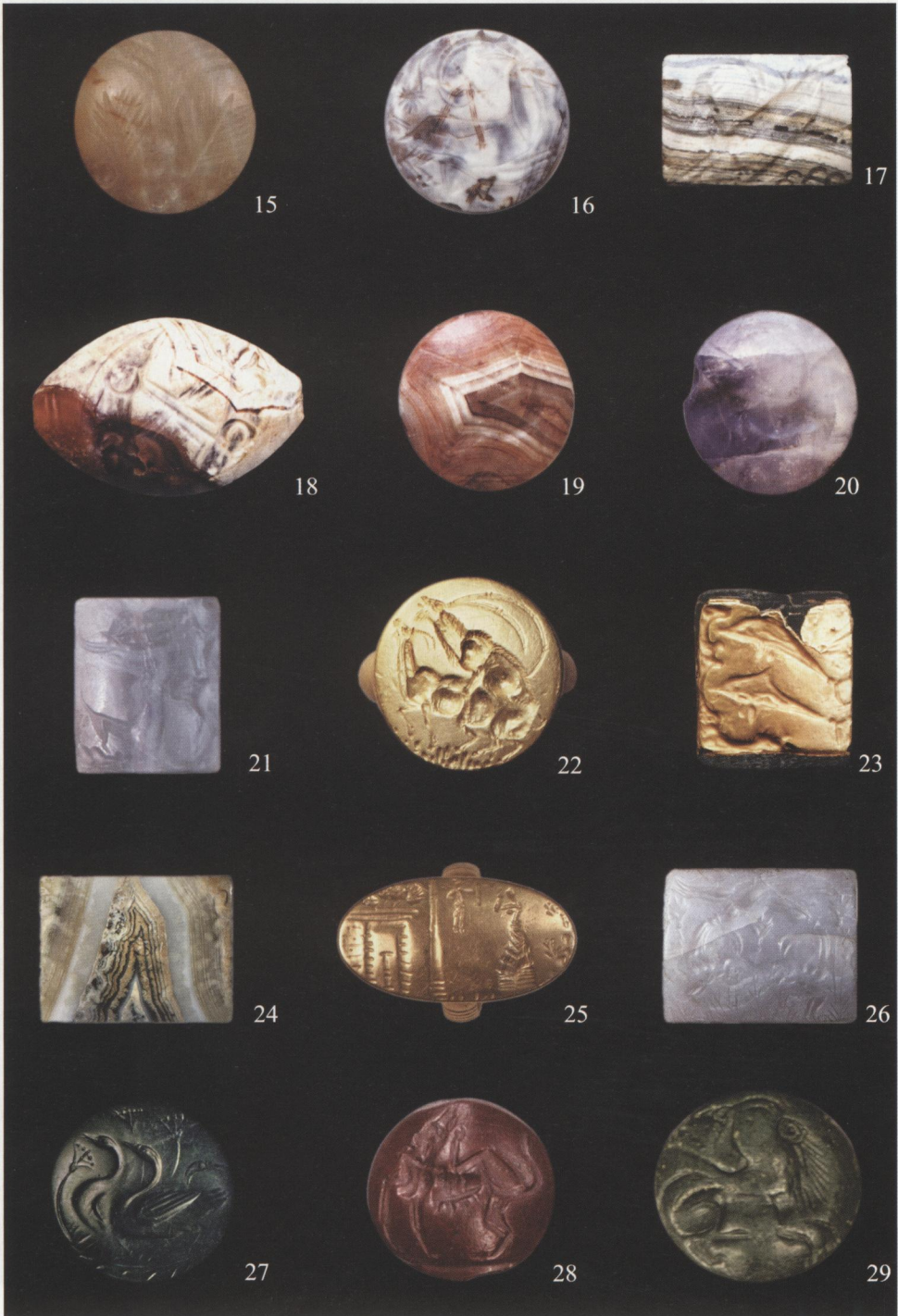
For the most part the originals used for the colour plates were transparencies, though in a few cases prints have been used. Whenever possible, photographs and seals were compared, to select the best image. I then scanned the photographs at high resolution to produce digital images for editing and enhancement in Photoshop 7.0. Since colour distortion often occurs in scanning I normally included a colour card in the original frame to facilitate correction. Even so, I am painfully aware that I have not managed to achieve complete accuracy in every case. And further opportunities for distortion – some beyond my control – will arise in printing, notably in conversion from RGB (red–green–blue colour) to CMYK (cyan–magenta–yellow–black, the four colour separation process used by printers) and, finally, in the actual printing of the plates onto paper. Notwithstanding these many pitfalls, I sincerely hope that these colour images will indeed help the reader to appreciate the attraction of Aegean seals, which drawings, impressions, or black-and-white photographs cannot wholly convey.

COLOUR PLATES 1 - 14



1-2 EB II rectangular buttons: soft stone. 3-4 EM II bone seals. 5 EM III-MM IA conoid: hippopotamus ivory. 6 MM IA zoomorph: 'white piece' material. 7 MM IA disc: olive-green steatite. 8 MM II prism: black steatite. 9 MM II-III prism: green jasper. 10-11 MM II-III *Petschafte*: yellow jasper and agate. 12 MM II-III foliate back: amethyst. 13 MM II-III prism: carnelian. 14 MM II-III zoomorph: blue chalcedony. Scale 3:2, with the exception of 4-5, which are shown at 1:1.

COLOUR PLATES 15 - 29



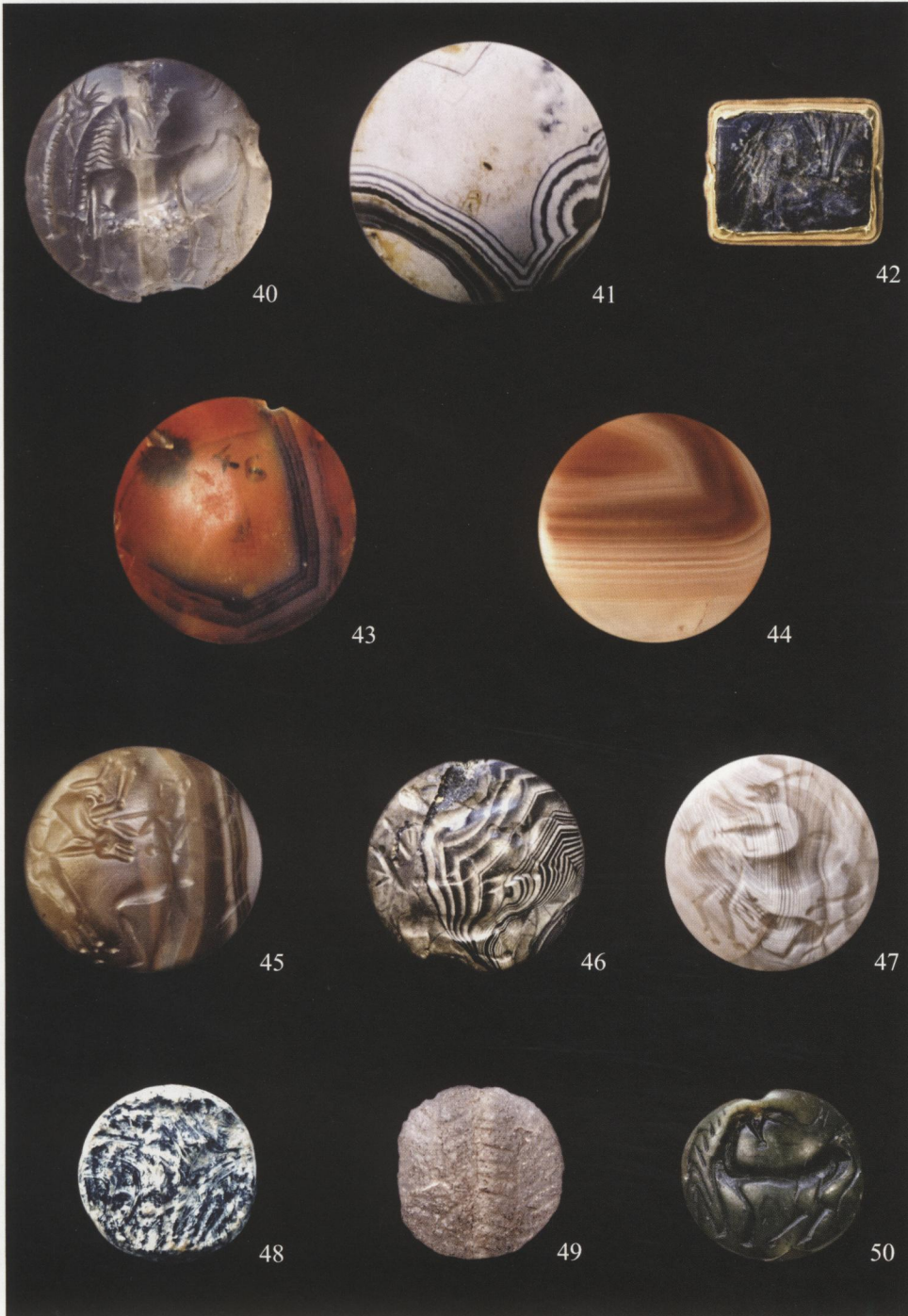
15-16 agate discoids. **17** agate cushion. **18** amygdaloid: burnt carnelian. **19-20** lentoids of agate and amethyst. **21** blue chalcedony cushion. **22** gold signet ring. **23** gold covered steatite cushion. **24** agate cushion. **25** gold signet ring. **26** blue chalcedony cushion. **27-29** lentoids of green and red jasper and green serpentine. **15-17** MM II-III; **18-23** MM III-LM I; **24-28** LM I; **28** LM I-II. Scale 3:2.

COLOUR PLATES 30 - 39



30-31 carnelian amygdaloids (reverses). 32 engraved glass lentoid. 33 agate amygdaloid. 34 agate lentoid. 35 lentoid of hard green stone. 36 lentoid of veined agate. 37 lentoid of lapis lacedaimonius. 38 haematite lentoid. 39 lentoid of agate (reverse). 30-34 LM I-II; 34-39 LM II-III. Scale 3:2.

COLOUR PLATES 40 - 50



40 lentoid of rock crystal. 41 lentoid of banded agate with fine cracks (*craquelure*) on reverse from exposure to heat. 42 cushion of lapis lazuli encased in gold. 43-44 lentoids of banded agate (reverses) 45-47 lentoids of banded and veined agate. 48 mould-made glass 'discoid' with flat back. 49-50 lentoids of fluorite and olive-green steatite. 40-42 LB I-II; 43-50 LB III. Scale 3:2.