CHAPTER 3

The Neopalatial Period

There is no firm agreement on the causes of the fall of the first palaces. Many of the important MMII centres, such as Knossos, Mallia and Phaistos, were destroyed often with evidence of fire. It is possible that this was the result of natural phenomena such as earthquakes. It is equally conceivable that this devastation was the consequence of internal strife. Civil war could have been the result of a new powerful elite and centralised administration. Or perhaps the elite established themselves in a secure position because of the upheaval caused by natural disasters. There does however appear to be no serious break in Minoan culture and the palaces were quickly rebuilt, often with extensions and greater opulence. There can be no doubt that the foundations of Neopalatial prosperity are firmly rooted in the Protopalatial period. The industries and trade contacts which were developed in the Protopalatial period continued in the Neopalatial but on a wider scale. Large amounts of Minoan pottery have been found throughout the Levant as well as in Egypt indicating that these areas had significant contact. However it would be incorrect to state that the Neopalatial period was merely an opulent extension of the previous era. There are changes in the field of metallurgy and agriculture, which had a significant impact on Minoan imports and exports. Most significantly, it was the changes in society and government, which were to have an influence on Minoan trade.

The Neopalatial period began in MMIII (ca 1700 BC) after the destruction of the first palaces. The period runs until LMIb (ca 1490 BC) where it is superseded by the Mycenaean administration. The chronology of the Minoan Late Bronze has been amended recently to take into account the revised dating of the Thera eruption, previously thought to have transpired in about 1500 BC. Recent theory, based on dendrochronology and studies of ice-cores from Greenland has the event taking place in 1628 BC, which has shifted the beginning of the Late Bronze Age to 1700 BC instead of 1600 BC

(table 1).[1] LMIa pottery has been found in eruption contexts whereas LMIb has not, indicating that the change to LMIb pottery happened after the eruption, perhaps ca 1600 BC. Rehak and Younger believe the end of LMIb occurred shortly before the beginning of the reign of Thutmose III in 1479 BC, which is supported by radiocarbon dates.

Date	Minoan Sequence	Egyptian Equivalent
1750-1700 BC	MMIII	13th Dynasty – 1759-1606
1700-1580 BC	LMIa	15th (Hyksos) Dynasty – 1637-1529
		17th Dynasty (Thebes) – 1606-1539
1580-1490 BC	LMIb	18th Dynasty – 1539-1295
		Ahmose I – 1539-1514
		Amenhotep I – 1514-1493
1490-1430 BC	LMII	Thutmose I – 1493-1481
		Thutmose II – 1481-1479
		Hatshepsut (Queen) – 1479-1457
		Thutmose III – 1479-1425
1430-1370 BC	LMIIIa1	Amenhotep II – 1427-1392
		Thutmose IV – 1392-1382
		Amenhotep III – 1382-1344

Table 1 – Comparative Chronologies of the Late Bronze Age (*after Rehak & Younger: 1998, 99*.)

[1] Rehak, P. & Younger, J.G., "Review of Aegean Prehistory VII: Neopalatial, Final Palatial and Postpalatial Crete" in *AJA*, 102, No 1, 1998, 98.

Date	Minoan Sequence	Egyptian Equivalent
1370-1320 BC	LMIIIa2	Akhenaten – 1352-1336 Smenkhare – 1338-1336 Tutenkamen – 1336-1327 Ay – 1327-1323 Horemheb – 1323-1295

(Table 1 Continued)

Knowledge on painted ceramic production in Neopalatial Crete is disproportionate, with very little information existing from the western side of the island. Therefore discussion on pottery development must necessarily be limited to Central and Eastern Crete. East Crete continued with the light-on-dark styles begun in the Protopalatial period until LMI. In Central Crete the Kamares ware was replaced by a less complex style. The best examples of this type have polychrome motifs on a dark background. It is possible that this ware was restricted to a few workshops, but produced in sufficient quantities to enable export into the Cyclades.[2]

LMI signals the introduction of a dark-on-light style, which has come to symbolise Neopalatial pottery. In Knossos a floral style and tortoise-shell ripples appeared during LMIa, which was imitated by other workshops around the island by the end of the period. In LMIb Neopalatial pottery reached its peak and can be subdivided into two distinct groups, a "Standard Tradition" and a "Special Palatial Tradition". The former was a continuation of LMIa types and has both a polychrome and a plain style. The palace style is perhaps the most best known of all Minoan pottery and can be divided into a

[2] Rehak & Younger: 1998, 121.

Floral Style, Marine Style and Alternating Style which arose at the end of LMIb incorporating both styles (Plate 23). These were sophisticated products and in all likelihood came from a small number of artists in a few workshops. The regular distribution of the pottery would imply a centralised distributor, possibly Knossos, although a local variation occurred in the south, possibly from the Hagia Triada workshop.[3] Palatial Tradition pottery, particularly the Marine Style, appears to have been highly specialised and distribution is limited. Examples of Marine Style pottery discovered in the Cyclades and the Greek mainland have been found to be local imitations, although the artists may have been Minoan.

The Administration of the Palaces and Villas

An understanding of the palace economy and administration is vital if one is to comprehend the roles of the palace and the elite within the trade sphere. It is not a simple matter of assigning the control of trade to the palaces as the status of the elite and the role of the Minoan villas must also be ascertained. These parties all had a hand in the administration of the state, the redistribution of wealth and probably international trade.

There are four different architectural categories of dwelling in Neopalatial Crete, namely the palaces (assuming they were residences and not just religious and administrative centres) and three types of houses.[4] Type I houses, or villas, tend to be larger with external storage space and appear to be modelled on the residential section of the palaces, with lustral basins, lightwells, stairways and private rooms. Some contain toilets and pillar crypts. Type 2 houses are similar in size to type 1, but have storage space within the confines of the house and do not have such a close association to the palaces. The rooms of type 3 houses are similar to those of type 2, but are significantly smaller and seldom

[3] Rehak & Younger: 1998, 122.
[4] McEnroe, J., "A Typology of Neopalatial Minoan Houses", *AJA*, 86, 1982, 3-19.

have dressed stone, which is regular in type 1 and occurs less frequently in type 2. They are the standard dwellings of the urban populace and are therefore the most common dwelling of the Neopalatial period (as much as 70% of all Neopalatial houses excavated are of the type 3 variety).[5]

In the reconstruction of the new palaces in MMIII there seems to be indications of dissociation between the palaces with the general populace. The *koulouras*, the grain silos of the Protopalatial period, were paved over at both Knossos and Phaistos between MMII – MMIII. As mentioned previously their location on the west wing of the palace suggests that they were intended for public use.[6] Their abolition in the Neopalatial period would imply a declining association between palace and public. At the same time the central courts of the Neopalatial period were enclosed during reconstruction, making them far less accessible than those in the preceding period (fig. 1).[7] There are also signs of religious segregation. The central courts, now inaccessible to general society, were probably used for religious ceremonies. The Peak Sanctuaries, which were an important part of Protopalatial religious practice show signs of centralisation. With the exception of those sanctuaries associated directly with palaces, such as Mt Juktas and Knossos, the peak sanctuaries fall into disuse during the Neopalatial period.[8]

In Chapter 2 there was some discussion on the storage facilities of the first palaces.[9] These were vast and presumably for the redistribution of food supplies, with the surpluses being used for export. In the Neopalatial period one would expect to find increased food storage facilities to accommodate the greater degree of palatial control. On the contrary the New Palaces actually have less storage space than their predecessors did. Moody calculates that storage facilities were reduced by a third at

[5] McEnroe: 1982, 10.
[6] Chapter 2, 41.
[7] Moody, J., "The Minoan Palace as a Prestige Artifact" in *Function*, 1987, 239.
[8] Peatfield, A., "Palace and Peak: The Political and Religious Relationship" in *Function*, 1987, 93.
[9] Chapter 2, 41-42.

Knossos and Phaistos.[10] At Knossos most of the storage space in the Early Palace was converted into workshops in the Neopalatial period. As already mentioned above the *koulouras* were discontinued.[11] The focus of the palaces appears to have shifted from the redistribution of agricultural goods to the production of finished goods, mainly stoneware, ceramics and metalwork.[12] However, there can be little doubt that the source of Minoan wealth stems from agriculture and if the palaces were not presiding over the redistribution and administration of agricultural products an explanation must be found for this apparent change.

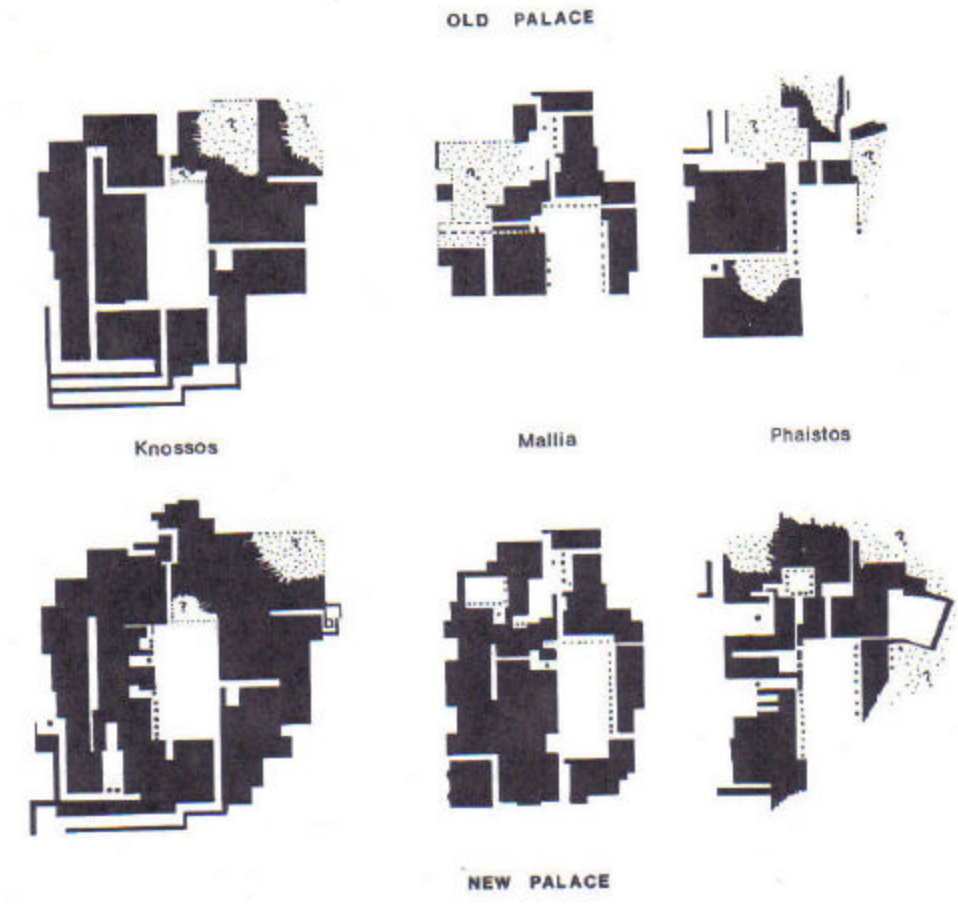

Figure 1 – Centre courts of old and new palaces.

(From: Moody, J., "The Minoan Palaces as a Prestige Artefact", Function, 1987, 239.)

[10] Moody: 1987, 237.
[11] Chapter 3. 97.
[12] Moody: 1987, 237-238.

A solution appears to present itself in the construction of the Minoan villa (McEnroe's type 1 house), which occurred in the Neopalatial period.[13] These villas such as Hagia Triada, Amnisos, Nirou Khani and Tylissos are dotted strategically throughout Crete (Plate 24). Architecturally they are not as large as the palaces and generally do not have central courts[14], but, as mentioned above, they do share many other architectural features and their construction was of the highest quality. The artefacts that have been excavated within their confines indicate not only wealth, but also show a close affiliation to the palaces with finds of administrative documents in the form of Linear A and sealings. The villas also display a remarkable capacity to store produce. Moody shows that Hagia Triada had 33% of its ground floor volume, some 638m^2 and the three houses at Tylissos (A, B and C) had 28% converted into storage facilities.[15] It is quite possible that these villas supported the palaces in their control over the island, functioning as regional offices with limited authority. The redistribution function of the palaces for the benefit of the public, an aspect of society, at least to a certain extent, in Protopalatial times may have been replaced by a sort of feudalism, where goods are collected from one section of society for utilisation by another.[16]

It is not entirely certain what the function of the villas were. Hagia Triada was called the summer residence of the occupants of Phaistos as early as 1903, a view which was often blindly accepted.[17] However, more recently the role of the villa has been reconsidered. It would seem that these structures were an integral part of the palace administration and domination. It might be argued, but

[13] Moody: 1987, 238.
[14] This is not always so as the principal buildings at Petras and Gournia both have central courts and could be considered small palaces. See Tsipopoulou, M., "A New Minoan Palatial Building at Petras, Siteia (East Crete)", 97th Annual Meeting of the Archaeological Institute of America, *AJA*, 1996, 387 and Cadogan: 1976, 132.
[15] Moody: 1987, 240.
[16] Moody: 1987, 240.
[17] Watrous, L.V., "Ayia Triada: A New Perspective on the Minoan Villa", *AJA*, 88, 1984, 123.

difficult to prove, that Knossos, due to its vast size and wealth, had a hegemonial position and the other palaces were either owned by the rulers at Knossos or were in some way subordinate to that palace. Whether or not this is true it cannot be doubted that the palaces were the economic centres of Minoan society. In the Neopalatial period they became the demesne of the local elite. It is likely that the villas, with their close association to the palaces belonged to this class.

Typically they are found either on the tops of hills overlooking fertile plains or on the coast, where they appear to have possibly served as harbours for the palaces. Both Amnisos and Poros appear to have functioned as ports for Knossos and Phaistos had Kommos and possibly Hagia Triada. Hagia Triada currently lies about 4km inland from the coast but it is possible that the alluvial plain on which the villa lies was only formed after the second millennium BC, thereby increasing the distance between the villa and the sea during modern times.[18] Others such as Tylissos and Ano Zakros were situated away from the sea and would appear to be predominantly concerned with agricultural output. The villas had workshops and dedicated land to supply staples. Some of the vast storage space must have been for local consumption. The harvester's vase (Plate 25) which depicts a procession of farmers, was found at Hagia Triada probably indicating the importance of agriculture not only at the villa, but also throughout Crete. The number of loom weights discovered at Hagia Triada suggests that textiles formed part of its economy. There is also evidence of a possible lapidary and bronze smithy.[19] Nineteen copper oxhide ingots were excavated at Hagia Triada probably for local consumption, but perhaps also for re-export. A number of bronze implements have been found at the villa including chisels and saws for stoneworking and large saws for timber. It would therefore appear that the villas were largely self-sufficient and the redistributive function, which had originally

[18] Watrous: 1984, 131
[19] Watrous: 1984, 129

belonged to the palaces now became the province of the villas. Local craftsmen and farmers were therefore tied to the villas and were probably paid with rations from the storehouses.

While it is fairly straightforward to ascertain a close relationship between the palace and the villas it is not as simple to understand the nature of the association. Most particularly whether the villas were owned by the elite, who paid taxes to the palaces or if the villas were under the complete control of the palace and acted as agents in the collection of revenue and civic administration. This is a fundamental question as it will contribute to the understanding of the status of Minoan traders during the Neopalatial period. If it is conceivable that the elite who resided at the villas were independent of the rulers at the palaces then it also follows that the traders were independent merchants or at least could have served more than one master, i.e. the palaces and the villas.

Both the palaces and the villas were managed through the use of documents written in Linear A, with the Cretan Hieroglyphic script having fallen into disuse. It has been established that the Mycenaean Linear B script was developed from the earlier Minoan Linear A, however this does not mean that the administration of these two civilisations were the same. The Linear A tablets are much smaller and clearly not designed to record the same volume of information as their Linear B counterparts. The Minoans also appear to have had a far wider range of administrative documents and relied heavily on sealed documents written on perishable materials. It was probably on these that the bulk was recorded, including craft goods which do not appear to be mentioned in the Linear A tablets.[20] Unlike Linear B, whose distribution is limited to a few palaces (Pylos, Knossos, Mycenae and Thebes), Linear A has been found at a number of palatial and non-palatial sites such as Hagia Triada, Khania, Knossos, Mallia, Phaistos, Pyrgos, Tylissos, Arkhanes and Zakros. The most representative deposits come from Hagia Triada, Khania and Zakros. While the total number of Linear A signs has been

[20] Schoep, I, "The Administration of Neopalatial Crete", *Suplementos a Minos*, 17, Salamanca, 2002, 191.

estimated between 7,362 and 7,396, only 1,370 were used for administrative documents. Of that number only 328 can be found in tablets, the rest were used for roundels, nodules, flat-based nodules and single and two-holed hanging nodules.[21] There are on average about 16 signs per tablet. Those from Hagia Triada are well preserved and average about 22 signs per tablet. The other administrative documents have less value. Roundels have limited inscriptions, but they vary from site to site, suggesting that they were of a different nature. They were stored in a separate place from the Linear A tablets and also do not seem to contain overlapping information with the tablets.[22] The others consist mainly of single signs and lack any form of context. The single-hole and flat-based nodules were quite possibly attached to written documents that have long since perished.[23] These lost documents would have been of great value and the understanding of the Minoan bureaucracy has been severely hampered in their absence. As mentioned in the previous chapter the interpretation of Linear A has for the most part been unsuccessful.[24] Still there have been some inroads. Some signs, which have been left unchanged in the adaptation from Linear A to Linear B, have been fairly confidently identified and recorded by philologists as "AB" signs. The "A" signs are exclusive to Linear A and their interpretation is far less certain.[25] Plate 26 shows a number of conventional Linear A signs and figure 2 shows the basic types of documents.

[21] Schoep: 2002 (A), 38-39.
[22] Schoep: 2002 (A), 195-196.
[23] Schoep: 2002 (A), 40-42.
[24] Chapter 2, 44-45.
[25] Schoep: 2002 (A), 28.

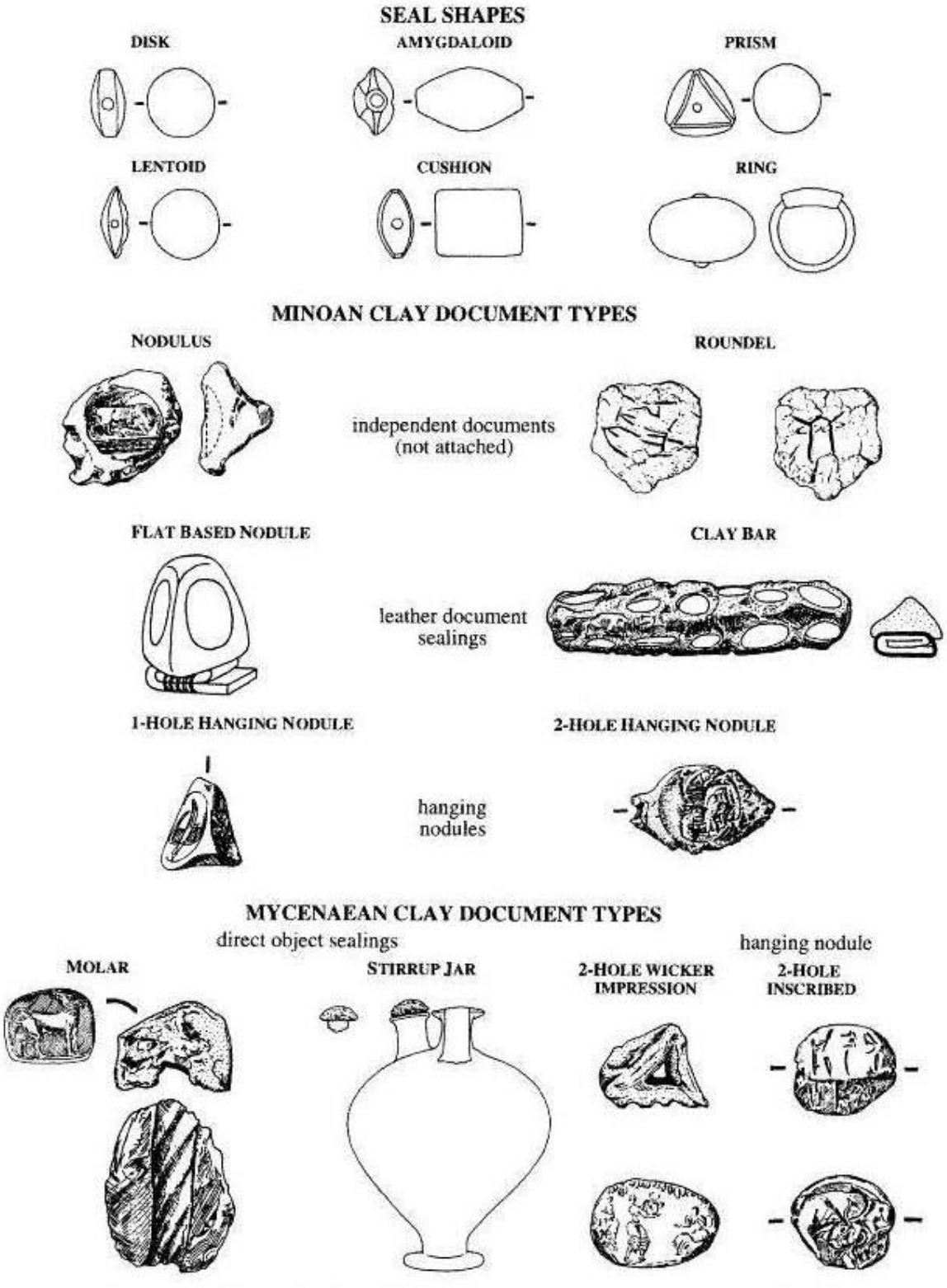

Figure 2. Minoan and Mycenaean Document Types. *(From Rehak & Younger: 1998, 113.)*

There is no perceptible difference in palace and villa administration. There are a limited number of tablets from the palaces, which are not consistent between sites, for example at Knossos only six have been found while at Zakros there are thirty-six. There are greater numbers at both Hagia Triada and Khania, which, while these were not palaces, cannot be shown to be subordinate to the major centres through their administration as both used the same range of documents. The commodities that feature in the tablets also show similarities in both villas and palaces. Some show greater numbers of specific products than others, but this probably means that this area was a more prolific producer than another and may be an indication of specialisation. For example commodity A303 (wheat?) is more common in Khania than Hagia Triada, whereas AB120 (barley)[26] is more frequent at Hagia Triada. The complete absence of some signs at some sites is more likely to be the result of a gap in the records than a lack at that particular area. An example is the absence of signs A 303 and A 100/102 (people?) at Zakros.[27]

As already mentioned these villas were self-sufficient, producing enough staples such as wool, linen, barley, oil and wine to enable them to be independent of the palaces. Both Schoep and Watrous believe they probably were, but functioned within a centralised administrative network.[28] The owners of the villas collected produce from their designated areas, with which they paid the wages of the craftsmen living on the premises and probably also reimbursed the farmers to some degree. The nodules which were found at Hagia Triada have as many as 147 seals, of which only 17 can be recognised as belonging to the scribes of the villa. The others were possibly private seals used by locals when delivering goods to the villa.[29] Seals have been found in tombs, perhaps indicating that

[26] The identification of Linear B signs *120 and *121 as wheat or barley has implications in the identification of their Linear A counterparts, namely AB120 and A303. Schoep: 2002 (A), 91.
[27] Schoep: 2002 (A), 176.
[28] Watrous: 1984, 130-131 & 133; Schoep: 2002 (A), 198.
[29] Watrous: 1984, 130.

they were also owned by private citizens and used for a mark of ownership or recognition of a contract.

There are signs of a possible taxation system, with a number of agricultural products such as AB120 (barley), AB122 (olives), A308 and possibly figs and wine being viewed as possible income.[30] It is however not clear if this is taxation on villas by the palaces or income received by the villas as a centralised administrative centre from outlying areas. While mention has been made of the fluctuating number of documents from place to place it must be noted that no documents have been found at Phaistos during LMI. This absence might suggest that the villa at Hagia Triada, with its numerous documents was not under the control of Phaistos. There also appear to be differences in bureaucratic procedures which might suggest that the administrations of each centre, whether palatial or manorial, were locally organised.

The Linear A documents would, therefore, seem to document the movement of agricultural products. However palaeobotanical evidence from Hagia Triada and other sites suggests that a wider variety of crops were cultivated than recorded such as lentils, chickpeas, bitter vetch and Celtic beans.[31] This may indicate that only those products which the villas and palaces were directly concerned with were recorded, rather than private, low yield products. There is also no mention of craft products in the tablets, although these must have been important. The copper ingots and stone-working tools found at Hagia Triada are evidence of this. This gap in the documents also makes it impossible to know whether the self-sufficiency observed in the villas was limited to agriculture. It is probable that the villas were dependent on the palaces for imported raw materials such as copper and stone.

[30] Schoep: 2002 (A), 190.
[31] Schoep: 2002 (A), 189.

The Linear A documents are also silent on the structure of Minoan society. The architecture of the new palaces and the development of the villas in the Neopalatial period reveal the undoubted presence of an elite, but there is no evidence on how this group relates to the ruler or rulers, although it would seem that they were at least semi-independent and probably paid taxes to the palaces. It is possible that they relied on the palaces for luxury goods and imported materials. A lack of storage at the palaces indicates that the villas assumed the role of redistribution to the wider population. If the villas relied on the palaces for the raw materials then it is possible that the palaces had a monopoly on trade. It is likely those villas which functioned as ports may have served as warehouses for trade as well, but this was probably conducted under the watchful eye of the palaces.[32] The few agricultural products which the Minoans had to trade: oil, wine, probably wood and possibly grain would in all likelihood have come from the villas. The craft production that occurred at the villas was probably for local consumption, with the export quality wares coming from the palace workshops. The finest pottery found at Hagia Triada seems to have been imported from Knossos.[33] However, it is not unlikely that products such as textiles and leatherwork could have been manufactured at the villas.

Linear A and Foreign Trade

One of the main assertions of this thesis has been that Crete had few raw materials and therefore limited scope in the international trading arena. The most desirable raw material that Crete had at her disposal during the Bronze Age was timber. It is also possible that stone was exported. A sandstone quarry at Mochlos appears to have been worked during the Neopalatial period. Some of this stone was used for local buildings in surrounding areas and further afield in Eastern Crete. However almost two thirds of calculated quantities that were quarried have not been accounted for, opening the debate for

[32] Watrous: 1984, 131-132.
[33] Watrous: 1984, 130.

possible trade.[34] This must be approached with caution. In Egypt, where most building projects consisted of sandstone, there were ample supplies of the material and importation would have been negligible, if at all. In Mesopotamia there was a shortage and therefore a possible market, but the logistics of moving large blocks of stone from Crete to the Levant for further trade in the east seem daunting. There also appear to be fairly extensive soft-stone (such as chlorite, serpentine and steatite) sources in Crete. Many of these appear to be of low quality, with both chlorite and serpentine outcrops being friable and therefore difficult to work and almost impossible to quarry. Steatite must be found in broad deposits in order to quarry workable blocks, and this is rare on Crete.[35] It is possible that blocks of unworked soft-stone was exported along with finished goods of the same stone, but it cannot be said that this would have been a significant segment of Cretan exports.

Explanations for her great wealth during both palatial periods can therefore rationally be attributed to agricultural produce, manufactured products and perhaps her geographic position in relation to Greece and the islands. Agriculture would encompass cereals, olives and oil, wine and livestock. Craft goods would naturally be textiles, wool, leather goods, pottery and metalwork. To substantiate these allegations there needs to be some form of evidence. Archaeology is insufficient in this respect due to the perishable nature of most of these goods and instead one has to turn to contemporary literary sources. These fall into two categories, namely those compiled by Crete's eastern neighbours and the Linear A and B documents themselves. Foreign documentary sources concern those records which mention Keftiu (Egyptian) or Kaptar (Semitic), which is probably the name for the inhabitants of Crete.[36] Not all the documents referring the Keftiu are contemporary, with the last dated to the Third Century AD, and they are not all trade related. In fact there are very few contemporary texts

[34] Soles, J.S., "A Bronze Age Quarry in Eastern Crete", *JFA*, 10, 1983, 46.
[35] Marshall, J.B., "Soft-Stone Sources on Crete", *JFA*, 3, 1976, 373-374.
[36] The identification of the Keftiu with the Minoans as well as the Near Eastern texts will be discussed in Chapter 4, 152-165.

which discuss the movement of Cretan goods. This chapter will focus on Minoan literature, specifically Linear A.

As already mentioned, the Linear A documents do not seem to incorporate manufactured items and the little that has been interpreted with the aid of Linear B appears to concentrate only on agriculture. However, the scope of this agriculture and the products listed would indicate to some degree the extent of crop specialisation and by implication the surplus products which could be exported. The AB120 logogram is the most common of all Linear A signs and has been found in documents from Khania, Hagia Triada, Arkhanes and Zakros. It was therefore probably the staple commodity in Crete. It also appears to have occurred in two species (AB120 and AB120b). Its numbers are not great at Khania in comparison to the other towns, but they still outnumber the other cereal sign of A303, suggesting that it was the main crop in west Crete as well.[37]

As mentioned above the logogram itself has been interpreted to symbolise wheat or barley. The identification of its Linear B counterpart is somewhat controversial, leading to doubts about this interpretation. Barley was probably more common than wheat due to the fact that it is a less demanding crop.[38] Wheat was a more desirable crop and its cultivation would have been aimed at the export or palatial markets. The quantities recorded in the tablets are large and often seem to be documented in both mixed commodity tablets conjunction with fractional signs, possibly indicating precise measurements.[39] The records for commodity A303 seems to only show distributions, however those for AB120 would appear to involve collection or assessment. This has led Schoep to conclude that this product could possibly be involved in some sort of taxation. At Hagia Triada, where AB120 was a specialist crop the tablets appear to show quantities of 1 018 units, about 97,720 litres which

[37] Schoep: 2002 (A), 179.
[38] See Chapter 1, 10-11.
[39] Schoep: 2002 (A), 105-106 & 180.

would fill approximately 636 pithoi.[40] This quantity discounts those values which appear ambiguous.[41] The villa of Hagia Triada could not have stored all this and some would probably have been housed in the town itself. It is also true that some crops may not have been collected, but only assessed in the fields.

After AB120 the most important product at Hagia Triada was oil (A302) where the tablets record 425 units, about 40 899 litres. At Tylissos a single tablet showing the oil logogram records 220 units (21,120 litres) indicating that oil was important elsewhere as well. The oil is believed to have been derived from the olive due to the logogram's close association with that of the olive (AB122)[42]. While the tablets do not give any indication whether the oil was incoming or outgoing, the evidence of burning may suggest that magazines 18, 17 and 66 at Hagia Triada were storehouses for this flammable substance.[43] Olives themselves are not frequently attested in the Linear A tablets. They have been recorded in documents from Hagia Triada, Tylissos, Arkhanes and Zakros, but their numbers are much smaller than other agricultural products and were possibly for consumption by the villas or palaces.[44] This anomaly is perhaps explained by a general absence of oil (and wine) presses from the villas and palaces. In Zakros the presses are to be found within the town itself, but this was probably only for small scale production. On the whole the production of oil appears to have been conducted outside administrative control. It is recorded instead as a finished product that arrives at the palace or villa. This is not the same as the manufactured products that are unrecorded by the tablets as these were made in the workshops within palatial or manorial precincts and therefore under the jurisdiction of the administration. It is also likely that some of this oil was scented. Evidence of

[40] Schoep: 2002 (A), 181.
[41] Tablet HT102 records approximately 101 760 litres, but the SA-RA suffix attached to the end of the tablet is of unknown meaning and its value cannot be included. Scheop: 2002 (A), 181.
[42] Schoep: 2002 (A), 97.
[43] Schoep: 2002 (A), 182.
[44] Schoep: 2002 (A), 183.

perfume production was found at Zakros. It is possible that some of the unidentified Linear A signs such as A304 symbolised spices for this purpose. The Linear B tablets record large numbers of both coriander and cyperus and remains of coriander were found in the West House at Akrotiri. Cyperus has also been located at the *Casa dei Ficchi*, part of the Hagia Triada complex.[45]

The third commodity in Renfrew's famous "Mediterranean triad" was the vine or more particularly wine (AB131).[46] This can be attested through large quantities in the Linear A tablets. Unfortunately the movement of wine is particularly vague. Wine quantities recorded at Zakros range between 104 to 131 units, which is approximately 9 984 to 12 576 litres (65 to 80 pithoi). Storage space in the palaces were generally limited and this is also true of Zakros. It is therefore quite possible that, as in the storage of barley, not all the wine mentioned in the tablets was stored on site. Other agricultural products mentioned in the tablets include figs (AB30) and wheat (A303). Both these products appear to have been important commodities. A303 is less frequent than AB120, which makes sense as wheat is a fastidious crop and not ideally suited to Crete's climate and infertile soils. Figs seem to have been quite common, with the largest single entry at Hagia Triada being 40 units (approximately 3 840 litres).

In addition to the agricultural products livestock must also have played a major role in the economy and production of goods. Unfortunately animals are not well attested in the tablets, but rather more frequently on inscribed roundels, which mention bulls, sheep and goats. On the tablets themselves the main commodity is sheep, but their numbers are limited. This shortfall might be attributed to the lack of survival of the tablets. At Hagia Triada there is a total of 77 sheep recorded in all the tablets, whereas at Zakros a single tablet (ZA22) records 100 sheep suggesting perhaps if more tablets

[45] Schoep: 2002 (A), 124 & 183-185.
[46] Renfrew: 1972, 280.

survived there would be greater records of these animals. Still there is nothing near the quantities recorded in the Linear B tablets, which amount to 80 000 – 100 000 sheep.[47] Oxen were generally used for transport and agriculture, such as ploughing. A tablet from Hagia Triada mentions 100 oxen. This is a large number, even in relation to the Linear B tablets, but given the focus of Hagia Triada on the production of barley it should probably not be surprising.

The question of textile manufacture in Minoan times is somewhat ambiguous. The low frequency of animals as well as a lack of mention in the Linear A tablets implies an extremely small textile industry. This is at odds with the archaeological evidence. A good number of loom weights have been found not only at Hagia Triada but generally throughout the palaces. It has already been stated that the Linear A tablets and other inscriptions are only part of the Neopalatial administration, and scribes probably made use of a vast number of written documents on perishable materials. At the same time there is also possibly a gap in the existing records that tabulate the numbers of livestock. Tablet ZA22 from Zakros may be an indication of this. On the other hand while it is possible to state with a good deal of confidence that a textile industry did exist it is not that easy to estimate the extent of this enterprise. The textile industry may have been small and localised, although this probably varied from place to place. Barber has suggested that the undoubted Minoan scroll and spiral designs on the ceilings of the Egyptian Theban tombs could possibly have been copied from patterns on textiles imported from Crete.[48]

While the Linear A tablets are limited in the information they impart they are particularly important in the understanding of Minoan agriculture. The administrative centres appear to have supervised a wide area and may have concentrated on particular crops, for example wheat in Khania and barley at

[47] Schoep: 2002 (A), 186-187.
[48] Barber: 1991, 311.

Hagia Triada. The main crops appear to be barley, olive oil, figs and wheat. Barley was the most common and would appear to be the staple throughout Crete. The storage of large quantities would have occurred as a preventative measure against drought and famine. It is not certain how much would have been exported, but in the event of a request from a neighbour or trading partner surpluses probably would have been traded. Olive oil, both in its natural state and in scented varieties, would probably have been an important trading item. The tablets do not make mention of textiles and hence it is difficult to state with any degree of certainty that they formed a large proportion of Minoan exports, although it seems likely that the textile industry was of some importance. Trade items which the tablets do not seem to mention, but are attested by archaeological finds are craft goods, including pottery and metalwork.[49] Pottery does appear to be referred to in tablets HT31 and HT69, but it is not clear whether the tablets are referring to the vessel or its contents.[50]

Organic Trade

Organic trade encompasses a wide range of goods which includes both food products and crafts, such as leatherwork and textiles. It is a fact that when assessing this segment of commerce the limitations of archaeology are exposed. While it can give a good indication of the non-perishable items traded such as pottery or metals, the organic products exchanged are for the most part lost. The few seeds and pollen grains discovered might give an indication of what goods were traded, but it cannot realistically hope to establish the full variety or quantities in question. From a Minoan perspective, it seems likely that a large percentage of trade was made up of organic goods, particularly on the export side. Minoan society and therefore also its wealth was based in agriculture. This is verified by the Linear A tablets which focus on this occupation. The information on organic trade goods must therefore come from the written documents of Crete's eastern neighbours. While there is often no

[49] While there is naturally no archaeological evidence for the trade of Minoan timber, the existence of large bronze saws and the international demand for wood make it an undoubted export.
[50] Schoep: 2002 (A), 188.

direct mention of the Kaptar / Keftiu in these records they enable us to understand the demands of the market and possibly surmise Minoan involvement within it.

Egypt had three main shortages despite her determined self-reliance. Foremost among these was timber. Wood was imported into Egypt from Punt (which has not been positively identified, but is probably Ethiopia or Somalia), Assyria, Anatolia and the Levant, where the cedars of Lebanon were legendary. There is also mention in the Amarna Letters about wood from Cyprus. In one letter the king of Cyprus requests payment for a shipment of wood sent to Egypt and another where the governor of Cyprus reminds the governor of Egypt that a beam of wood was sent to him.[51] Wood such as ebony, for luxury goods, would have been imported from the south of the empire, such as Punt, whereas conifers were brought in from the Levant. Therefore the request from the king of Cyprus for partial payment for copper sent to Egypt for 14 beams of ebony should not be surprising.[52] However it was the tall, straight beams of coniferous wood from the Levant that were most in demand. These were used for the manufacture of ships as well as architecture.

The other two shortages were olive oil and wine respectively. Olives were grown in Egypt, but this plant is not ideally suited for the Egyptian climate and their quantities were limited. Wine was produced in the South of Egypt, where vines flourished. However Knapp does not believe that the quantities produced would have satiated the royal family, the Egyptian nobility and other wealthy members of society. Therefore oil and wine were probably imported from the Levant, possibly from as early as the third millennium. From EBII there is a large increase in the exchange of ceramic jugs and storage containers between these two areas, indicating an increase in distribution of liquid

[51] Knapp: 1991, 34. The letters in question are Amarna Letters 35:27 and 40:8 respectively. From Moran, William with Hass, V. & Wilhelm, G., *Les Lettres d'El Amarna. Litteratures Anciennes du Proche-Orient*, Editions du CERF, Paris, 1987.
[52] Knapp: 1991, 34 – Amarna Letter 34: 20, 24.

goods.[53] There is also evidence of other imports including honey, resins, spices and the Keftiu bean, which may indicate *Vigna Sinensis* or *Vicia Faba* (horsebean).[54] The same commodity may also be referred to in an inscription on an alabaster jar of Keftiu paste. It is not clear from either of these references what the uses of this product were or how significant the imports were. Other miscellaneous imports could have included minerals and dyes for use in cosmetics, an important part of Egyptian culture.

The Levant was the trading hub of the Bronze Age Mediterranean. Not only did they supply goods to Egypt, with Byblos functioning as one of the major gateways into the Egyptian world, but they also had a thriving trade with Mesopotamia. Despite the size and influence of the two great civilisations, Egypt and Mesopotamia seldom had direct contact. Exchange was conducted via the cities on the Levant. Records show that Mesopotamia required the same essential products as Egypt, namely wood, wine and oil. The Mesopotamian civilisations were not concerned with naval exploits. Their rivers were not as benign as the Nile and more difficult to navigate making their path to the Persian Gulf difficult. Consequently most of their imported timber was used for construction rather than boat building. Unlike the Egyptians, Mesopotamia's inhabitants did not have the advantage of nearby stone quarries, therefore timber and mud-brick formed the basis of their architecture. Both wine and olive oil had to be sent to Mesopotamia from the Mediterranean. Oil was obtained locally from sesame, but all olive oil had to be imported from the north. From Syria came wine, where the vine probably thrived. Mesopotamia was not as insular as Egypt and their list of imports, especially luxury items, are vast. They include textiles, flax, garments, rugs, hides, resins, spices, salt, ivory and honey from trading partners in both the east and west.[55]

[53] Knapp: 1991, 34.
[54] Knapp: 1991, 32. Payrus Ebers, Lines 16-19, dated to approximately 1550BC. Strange: 1980, 93.
[55] Knapp: 1991, 36-37.

In all honesty Crete would have been a small player in this field of international trade networks. However it is clear that the products carefully listed in the Linear A tablets reflect the demand of these markets and it is therefore likely that the Minoans participated in these trading spheres providing as much timber, oil and wine as the island could spare as well as other luxury goods and crafts. There are a few notable exceptions to this. Firstly timber is not mentioned on the Linear A tablets, but as already discussed the indications are there that it was indeed a part of the Minoan economy and ought to be considered an important trade item. Secondly, grain, particularly barley, is frequently mentioned in the Linear A tablets, but there is little evidence of trade in the foreign documents. It is possible that grain was not a widely traded commodity. It is the one staple that ensured survival and surpluses would have been limited. Yet there is a document which may alter this view. A text from Ugarit indicates that Sinaranu, a well-known merchant, was granted duty free status on all oil, grain and a fermented drink, not wine but maybe beer, which was possibly imported from Crete.[56] This suggests that grain from Crete was a traded commodity either in bulk or as a fermented substance. It is difficult to ascertain the volume and demand of Minoan grain from this one text, yet provided that the identification of Kaptar with Crete is correct it does establish that grain was indeed exported by Crete.

A final product deserving some mention is honey. This commodity was prized in both Egypt and Mesopotamia, where as a rare luxury product it was considered more valuable than oil or wine.[57] Crete is a land well known for its honey production, even in modern times. It would therefore be a sensible product to export. There is unfortunately no evidence that this was a trade item. Honey has not yet been identified in Linear A. A number of unidentified signs show vases and it is likely that some, although probably not all, indicate the contents of the jars rather than the vessels themselves.

[56] Knapp: 1991, 21 & 37. RS 16238, Lines 1-11, dated to the middle of the 13th Century. Strange: 1980, 101-102.
[57] Knapp: 1991, 37.

One of these might just indicate honey. There is also the wasp / bee pendant from Protopalatial Mallia to consider (Plate 22). It is been described as an portrayal of two bees with a honeycomb between them. Unfortunately there is no conclusive identification of the insect, which could be either a wasp or a bee and should not be used as evidence of hives or a honey trade. More compelling would be the work of Evershed *et al* on the lipid residues on LMI lamps and conical cups from Mochlos, East Crete.[58] The conclusion reached in this study was that beeswax, probably in the form of a primitive candle, not olive oil was used as fuel. Naturally this does not mean that all lamps in Crete used beeswax, but it does show the presence of bees in East Crete. Remnants of clay beehives can be found throughout Crete, but these date mainly from the Archaic and Classical periods providing little indication of a thriving bee-keeping industry in Bronze Age Crete. It should however be borne in mind as a possible Minoan export.

The evidence of textile manufacture and trade in Crete is contradictory. It does not appear in the Linear A tablets and there is also little mention of livestock such as sheep which would produce wool for the industry. However the presence of spindle whorls at most major sites indicates that weaving was a common craft. Woven materials probably fall under the same craft heading as pottery and therefore appears fall under a different administrative category, one that was recorded on more perishable materials, such as papyrus and subsequently lost. The remains of murex shells (*Murex Trunculus, Murex Brandaris* or *Thais Haemastoma*) have been found at several Minoan sites, namely Knossos, Zakros, Palaikastro, Myrtos, Pyrgos, Mallia, Tylissos, Kommos and Khania.[59] While these could possibly have had a decorative or cosmetic function it is believed that the shells were used for the production of purple dye. It may be that Crete was producing purple by MMII/MMIII, before this colour became a feature of Levantine fabrics and this may have created a demand for Minoan textiles.

[58] Evershed *et al*: 1997, 980.
[59] Knapp: 1991, 44.

The primary organic Minoan export was probably olive oil. The olive is a crop that demanded long-term attention with little yield for at least the first decade and a half and as such it is not a suitable crop for subsistence farming.[60] The evidence suggests that the olive was at least known during the Early Minoan phase and there may even have been the beginnings of cultivation, although this is far from certain. In the Protopalatial period, with the huge storage facilities within the palaces, olive farming became a more viable option. Yet it is only in the Neopalatial period that there is enough evidence to support a theory of increased olive cultivation and probable trade in the surplus. The Linear A tablets record large volumes of oil, which given the incomplete nature of the documents, is impressive. By the time of the Knossos Linear B tablets (ca 1400BC), olive oil appears to ubiquitous with the disbursement records possibly reflecting as much as 22 000 litres at the palace.[61] Olive production probably began in force during the Protopalatial Period and was a thriving industry by the Neopalatial Period. Unfortunately archaeological finds do not necessarily support these documents. The Oleic lipid breaks down quickly, and it is therefore virtually impossible to identify residues remaining in pottery vessels, short of differentiating between animal and vegetable fats. There is also a lack of olive remains. This can be understood when one considers the processes involved in making olive oil. Olives are first crushed in presses, this often shatters the pits, making them less noticeable to archaeologists. It is also possible that any waste from oil production was fed to livestock as fodder. Those stones that are found whole are more likely to be evidence of olives used for food purposes than olive oil production.[62] It would appear that oil was brought to the administrative centres as a finished product. Artefacts related to oil production such as lekanes, oil separators and presses have been found in a number of areas in Neopalatial contexts, notably Zou, Zakros, Mochlos, Vathypetro,

[60] Chapter 1, 13.
[61] Godart, L., "La série Fh de Cnossos, vingt ans après", *Studies in Mycenaean and Classical Greek presented to John Chadwick,* J. T. Killen et al. (ed.), Salamanca 1987, 201-210.
[62] Hamilakis, Y., "Wine, Oil and the Dialectics of Power in Bronze Age Crete: A Review of the Evidence" in *OJA,* Vol 15, No 1, 1996, 3.

Palaikastro, Gournia and Kommos.[63] Perhaps the greatest testament to the wide trade in oil in the Aegean during the Neopalatial period is the arrival of the stirrup jar in MMIII.

This vessel is so called due to the stirrup-like handles attached to a false neck (Plate 27). The false neck is securely sealed with a clay disc, which is sometimes pierced to allow for seals or perhaps the stopper to be attached. In many early examples a third handle is attached to the neck. This handle, which sometimes only consists of a vertical ring on which may also have been used for attaching seals or tags for identification. The actual spout is mounted off-centre to facilitate ease of pouring. There are often horns or spikes attached to the spout, probably to secure the stopper in place. The jars are generally course, utilitarian ware, but by LMIb a fine version, often decorated in the Minoan marine style and referred to as the FS169 type, is introduced. This type of jar may have been prized for itself rather than its contents. It is possible there was a subtle content change as well that coincided with the development of the FS169 type. It is worth noting that all those found on the mainland are the FS169 version, many of which were found in tombs, which might indicate a change in the use of the stirrup jar.

The shape seems to have originated in Crete, but was soon copied in the Cyclades and, much later, in the mainland. The Cycladic imitations preserved much the same features of the Cretan originals, with false neck and handles. There are some deviations in the stopper securing methods, but on the whole the shape has been carefully reproduced. This might suggest that the shape itself was synonymous with its contents, just as a bottle of wine is instantly recognisable to the modern consumer.[64] Exactly what the contents of these jars were is not entirely certain. It is clear that it was some type of liquid

[63] Hamilakis: 1996, 16-17.
[64] Haskell, H.W., The Origin of the Aegean Stirrup Jar and its Earliest Evolution and Distribution (MBIII-LBI), *AJA*, Vol 89, No. 2, 1985, 224.

and it is generally believed to be oil. The facilities to fasten the stopper and attach seals imply that the contents were valuable enough to have them carefully identified.

The shape began to be used in Greece in LHIIA and under the Mycenaean banner was actively traded throughout the Eastern Mediterranean. In the Linear B tablets a large number of stirrup jars are enumerated at Knossos. However the Minoan stirrup jars do not seem to have been widely traded outside Crete. An MMIII stirrup jar, the earliest and only known stirrup jar export from this period has been found at Ayia Irini on Keos. In LMIa they are slightly more numerous with examples having been found again at Ayia Irini as well as Akrotiri. By LMIb they had been distributed to Melos, Aegina, Kythera, Rhodes, Athens, Chalkis, Thebes, Pylos and Miletos.[65] Most of these finds are in small quantities, even in Crete itself the vessels are not common finds. This lack of foreign distribution may have nothing to do with their contents, but rather their size. The jars themselves have a range of sizes that can accommodate 1.5 litres to as much as 13 litres, but are in general fairly small and average about 45cm.[66] It could be said that this vessel was for domestic use and trade was limited to the towns within Crete. The jars were not really suited for maritime trade and if olive oil was traded it was probably shipped in larger pithoi. The Cycladic copies appear not to have been exported and those made were also for local distribution.

It is tempting to believe that the fine ware jars held a more expensive product than that of the courseware, perhaps scented oils. The ingredients for manufacturing perfumed oils are extensively listed in the Pylos archives, indicating that this was perhaps a vital industry for that Mycenaean city. The trade in stirrup jars could be considered in this light. Perhaps the larger courseware version was used domestically and the finer FS169 stirrup jars were more exclusive and became prized for both

[65] Haskell: 1985, 226-229.
[66] Haskell: 1985, 223.

the contents and the jar itself. Only fine ware stirrup jars have been found in the tombs, suggesting that these vessels had a high value and possibly even a sacred purpose. By Mycenaean times these vessels were widely traded throughout the Aegean and into east, perhaps casting doubt on the theory that stirrup jars were not suitable for trade. It is possible that the Mycenaean stirrup jars which were exported to the Eastern Mediterranean contained scented oils and the larger pithoi contained natural oil. This seems likely as olive oil, in addition to being a food product, was a raw material in the manufacture of textiles, soap, unguents and of course scented oils.[67]

Organic goods, especially olive oil and wine, were in great demand in the east and it is likely that the Minoans played a part in this market. However it is less simple to deduce the organic imports into Crete. The bulk products such as olive oil and barley appear to have been catered for by local farmers and imports probably did not occur in large quantities unless in time of famine, although exotic scented oils are a distinct possibility. Wheat is a potential import, although if this cereal has been correctly identified as A303 then it was grown in Crete. It was a far more desirable crop than barley and could be seen as a luxury, possibly only consumed by the palaces or elite. Perhaps the most likely organic imports are spices and resins for both culinary use and the perfume industry. If the manufacture of scented oils was a primary enterprise in the Neopalatial period these products would have been vital. Another vegetable substance that is worthy of some discussion is opium. Merrillees, as early as 1962, suggested that the Cypriot courseware (Plate 28), which has been found throughout the Levant and in Crete as well, resembled an opium capsule (*Papaver Somniferum*) and this was possibly indicative of a thriving opium trade during the Bronze Age.[68] At the time there was no palaeobotanical evidence to support this hypothesis, despite the fact that this plant is ideally suited to the Mediterranean climate and was produced in later times in Turkey, the Levant and Egypt. There is

[67] Haldane, C., "Direct Evidence for Organic Cargoes in the Late Bronze Age", *World Arcaheology*, Vol 24, no 3, 1993, 354.
[68] Merrillees, R.S., "Opium Trade in the Bronze Age Levant" in *Antiquity*, 36, 1962, 287-292.

also a lack of documentary evidence for this narcotic. However recent tests on examples of this pottery has revealed an isoquinoline derivative which is part of the papaverine molecule, a component of opium.[69] This could constitute a tentative affirmation of Merrillees' theory.

Textiles are perhaps another organic commodity which could have been imported into Crete. While it is clear that the Minoans had their own textile industry and probably exported fabric the desire for the exotic may have prompted such imports. Unusual dyes and patterns would have had a vital role to play. The same impulses which enabled the Minoans to export their textiles possibly dyed purple and elaborately patterned with spirals could have created a demand for foreign fabrics within Crete.

The Metals Trade in the Neopalatial Period

The metals trade was covered fairly extensively in Chapter 2 and much of that discussion incorporated Late Minoan trade.[70] The most significant change in the Minoan metallurgy during the Neopalatial period however was the widespread use of tin in the manufacture of bronze. This shift from arsenic to tin bronzes may have been result of necessity, with bronze now being used in the majority of tools. Arsenic bronzes tended to be more brittle than tin, limiting their uses. Metals seem to have been transported in unalloyed ingots, whether they were oxhide, plano-convex or smooth ingot shapes. The copper ingots found at the palace of Zakros and Hagia Triada were probably part of such imports. The forging of bronze was conducted by the local smiths. Despite their relative inexperience in using tin the samples analysed have shown that the Minoan smiths had become skilled in their craft and the amount of tin added to the copper was not simply random. A bronze chisel found at Knossos contained 14% tin, a higher ratio than usual, but one necessary to achieve the hardness required in a cast tool. [71]

[69] Knapp: 1991, 26.
[70] Chapter 2, 74-85.
[71] Mangou & Ioannou: 1998, 95

The change to tin bronze may also have come about as a result of availability. Since the Early Bronze Age tin has been used in Crete in small quantities, but Arsenic was preferred. Other areas in the Early Bronze Age Aegean had a wider distribution of tin bronzes. The source of this tin is unknown, but may have come via the Troad, which had a steady flow of tin until the destruction of Troy II in about 2300 BC. The East however did not actively participate in this movement of metals. It would appear that the bulk metals trade, of which the cargo on the Uluburun wreck is an example, only developed in the Levant and Egypt during the Late Bronze Age.[72] By this time the Crete and the rest of the Aegean had a thriving metal industry. The growth in the metals trade in the East must have supplemented the existing sources, especially tin.

The majority of Minoan copper, as noted above, was not from Cyprus.[73] Instead much of the Early Minoan copper came from Kythnos, while Middle and Late Minoan copper was imported from Laurion.[74] The earliest, intact oxhide ingots have been found at Hagia Triada, and have been dated to LMIb or possibly LMIa. They fall under the "type 1" category, which do not have legs to facilitate carrying (Plate 21). They also appear not to have had an Anatolian or Mediterranean source, which as previously mentioned, this has led Gale to suggest that they may have come as far afield as Afghanistan, Iran or Southern Russia.[75] While this seems too far away to be likely it must be remembered that Lapis Lazuli, presumably from Afghanistan, has been found in an LMI context. The Minoans appear to have obtained their tin from Mari, who were acting as middlemen. It is possible that in addition to semi-precious stones and tin, copper was also brought into Crete via Mari or perhaps, more accurately, from Mari to Ugarit and then on to Crete. The Uluburun wreck has

[72] Gale: 1991, 204
[73] Chapter 2, 76.
[74] Stos-Gale & Macdonald: 1991, 267.
[75] Gale: 1991, 226; Chapter 2, 75-76.

suggested that trade was anything other than disorganised and haphazard.[76] Yet it is still likely that it was opportunistic, especially for semi-private merchants such as the owner of the Cape Gelidonya. This vessel's cargo was mainly copper, some of which was in oxhide ingot form, but a great deal was scrap and probably intended to for re-smelting. The demand for copper in the Aegean would probably have encouraged merchants to take advantage of any availability. Perhaps it is also possible that preconditions existed in trade and tin may only be provided if the copper was taken as well. It is difficult to imagine that the terrestrial transport of large volumes of copper would have been viable, especially from as far afield as Afghanistan, unless there were radical metal shortages in the Mediterranean. Still it should be noted that the Karum Kanesh tablets, of which only 5% have been published, reveal 110 donkey loads carrying 13.5 tons of tin into Anatolia.[77] Large caravans of goods moving through Asia, where in most instances they did not have the luxury of marine travel, into Anatolia and the Levant, were a common sight and a great number of products including metal and precious stones were brought into circulation via these means.

The tin which found its way into the Aegean as well as the Levant and Egypt has no traceable or known source, although it seems that cities such as Mari acted as gateways into the Levant and beyond. One important fact to remember is that he who controlled the flow of tin had a significant hold over the Bronze Age economy in that area. Since in the beginning of the Late Bronze Age Crete appears to be the only island in the Aegean that had contact with the East there is a distinct possibility that she also controlled the influx of tin into the Aegean. The flow of metals into the Greek mainland is an inadequately understood subject. There have been very few analyses done on MHIII-LHII copper to determine the origins of this metal during that period (ca 1650-1350 BC). Despite the ingots

[76] See Chapter 4, 145-152 for a detailed description of the Uluburun wreck and its implications in understanding Bronze Age trade.
[77] Wiener: 1991, 328

found at Mycenae and Kyme on the mainland, which appear to originate from Cyprus[78], the studies done on LHIII (ca 1350-1250) artefacts has shown that most of the copper used was in fact local, from the mines of Laurion.[79] If this is true also of the earlier sources, which seems likely, then perhaps the Mycenaeans did not embark on voyages to obtain metal, but exploited local supplies as much as possible. While copper was available to them, tin was not and had to be imported. One of those sources, if not the only source before the collapse of the Minoan civilisation, was probably Crete. And, if Crete did control the movement of tin into Greece and the islands this would have made her very wealthy and perhaps equally unpopular.[80] As the Mycenaean states began to emerge their reliance on Crete for such an important commodity could have led to conflict and possibly even contributed to the destruction of the Minoan palaces.

There is a distinct lack of terrestrial metal finds, not only bronze but silver and gold as well, which has led to the mistaken belief that there was a shortage of metals in the Aegean. The lack of discoveries probably has more to do with the nature of metals and their ability to be melted down and recast, meaning that metal artefacts could be circulated in a good many forms over a long period of time. The documentary evidence also suggests that copper was abundant. The Pylos tablets record 400 bronze smiths in that city alone. The ten tons of copper found on the Uluburun wreck also appear to endorse the documentary evidence.

The Status of the Minoan Trader and the Influence of the East

It is even more difficult to determine the role of traders or merchants within Minoan society during this time. The palaces were in a financial position to provide ships with which to conduct international trade, but, with the exception of Zakros, they were not located on the coast. The

[78] Gale: 1991, 227.
[79] Stos-Gale & Macdonald: 1991, 266.
[80] Rehak & Younger: 1998, 137.

harbours such as Amnisos and Kommos were possibly under the supervision of the villas located in those towns. The crews manning the vessels were possibly also in their employ, although it is probable that the ships themselves belonged to the palaces. The status of the traders commanding the overseas expeditions therefore remains controversial. Currently there are two schools of thought concerning these traders. Firstly that the Minoan palaces controlled all segments of foreign trade, based on the Egyptian system, while the second is a more moderate and perhaps modern theory of semi-independent merchants. One of the chief dangers to the understanding of any ancient economy is the evaluation of that economy through a modern perspective. At the same time, while it is easy to dismiss the entire trade initiative of the pre-monetary societies as being oriented exclusively for required imports, it is important to remember that anthropological considerations such as emotions, desires and greed must have played a part in the establishment of early economies. Even if these economies are controlled by the palace, the desire for luxuries played a large part of international trade, especially with the growth of a wealthy elite. The cargo of the Uluburun wreck suggests that trade, whether through palatial or independent merchants or royal gifts or tribute, was very much a reality in the Bronze Age.

Warren notes that one can come to at least six conclusions concerning the arrival of Egyptian stone vases into Crete, but most of these theories can be applied to all imported goods.[81]

1) They were acquired by Minoan merchants under the control of the palace, possibly as part of a gift exchange system.
2) The Minoan merchants were semi-independent, which Warren calls the *tamkar* or Ugaritic model.
3) They were acquired by completely independent Minoan merchants.

[81] Warren, P.M., "A Merchant Class in Bronze Age Crete?", *BA Trade*, 295-296.

4) The goods were sent by foreigners as part of a gift exchange system.

5) The goods were brought into Crete by foreign traders.

6) Lastly the goods were purchased in the east by Minoan traders or travellers and brought back to Crete for personal use.

None of these possibilities can be dismissed outright, but for large-scale trade some do seem unlikely. Point 6 is mainly concerned with the Egyptian stone vases and should not really be considered for the bulk of Minoan trade. Suffice it to say it is virtually impossible that all Minoan imports were for private use. Perhaps also to be ruled out is that all imported goods came from foreign merchants (point 5). There can be little doubt the Minoans were a seafaring nation. While it is not unlikely that foreigners called at Minoan ports, there are a number of signs that the Minoans took to the seas themselves. The ship representations in the seals and possibly the Akrotiri fresco (although this cannot truly be considered Minoan) as well as the representations of the Keftiu in the Egyptian Theban Tomb frescoes are such indicators. There is also literature in the east to conclude that the Kaptar, generally identified as Minoans, were sea travellers. The Minoans were short of vital raw materials such as copper and tin, and it is therefore unlikely that they would have relied solely on the chance of overseas travellers from the east for such important items. Consequently it must be concluded that they undertook trade voyages themselves. Therefore, the main and largely interactive modes in which the majority of Minoan imports probably arrived were through gift exchange between rulers (point 1 and 4) and Minoan merchants, whether they were acting on behalf of the palace (point 1), semi-independent (point 2) or independent (point 3).

The modern concept of the gift is quite different to that in antiquity. Our notion is that given in goodwill without thought of reciprocity. In ancient times the gift exchange made up a large proportion of foreign income and reference to these gifts litter ancient texts, such as those in Egypt,

Mari and Ugarit texts and Biblical references. For example the letter from the King of Alashiya to Amenhotep III[82]; the first Book of Kings in the Old Testament where Solomon is brought gifts by the queen of Sheba; Hiram, king of Tyre, as well as from Egypt. In all of these exchanges there is an expectancy of repayment, which is honoured. The queen of Sheba is given whatever she requested from Solomon's bounty to reciprocate her gift of gold and spices, Hiram received oil and wheat in exchange for wood and Egypt is sent silver for their horses and chariots.[83] There is also frequent mention of gift exchange in Homer, for example where gifts are offered to Achilles to entice him to return to battle.[84] One thing is apparent that these gifts were given with the thought of reciprocity, whether it was a service rendered in the case of Achilles or a return gift such as that given to the queen of Sheba.

It is this exchange of gifts that formed a large proportion of foreign trade in many eastern societies. Egypt under the Pharaohs appears to have had a redistributive economy, with goods being sent out to the people in accordance with their social status. The only evidence of individual or local prosperity comes during the two intermediate periods when the centralised control of the rulers appears to have diminished.[85] For the most part the Egyptians did not indulge in free trade at all and there appears to have been no concept of profit in exchange. Trade was conducted for the purpose of obtaining specific items such as wood or stone for a particular temple on the request of the Pharaoh, additional wood was not brought back to Egypt for the ship's captain to turn a profit.[86] While the merchant was probably remunerated financially by the Pharaoh, the greatest reward was the king's favour. The transfer of goods was therefore often as a reciprocated gift. This consisted of two categories, *inw* and *b3kw(t).* The main difference between these two is that *inw* was between the king and another

[82] Quoted in Chapter 4, 152.
[83] 1. Kings 10, 2-10. Also Psalms 72, 10; 1 Kings 5, 10-11; 1 Kings 10, 28-29
[84] *IL*, 9, 320-362.
[85] Bleiberg, E., *The Official Gift in Ancient Egypt*, Norman, 1996, 12-21.
[86] Bleiberg: 1996, 25.

individual, such as the ruler of another country and *b3kw(t)* was the exchange of gifts between organisations, such as a temple and country.[87] The *inw* was then distributed to the people. Although the *inw* was made to the Pharaoh it was for the most part received by his representative. The tomb of Rekhmire shows the vizier accepting the gifts of the nations from the four corners of the known world, including the Keftiu, (Plate 34). There is no evidence that this is tribute, despite the supplicant postures of the gift bearers. There would naturally have been some form of ritualistic behaviour when coming before the king, customs which the foreigners would have followed. It was also the Egyptian belief that the Pharaoh was greater than all mortals and all gifts brought to him were some form of tribute, but there is no sign of Egyptian dominance over the Keftiu. In exchange for these goods Egypt would have bestowed mainly luxury items upon the Minoan ruler such as gold, ivory, semi-precious stones, Egyptian pottery and stone vessels and ostrich eggs.

While the *inw* was conducted between the Pharaoh and an individual, the latter was usually the ruler of another country. It is difficult to imagine that foreign private merchants would have prospered in this environment. For Minoan traders to be successful in Egypt they must have had close connections with their ruler, which may have been a king at Knossos. They must therefore either have been semi-independent (Warren's point 2) who took part in private trade as well as conducted palace business, or were paid for their services with a percentage of procured goods, or were completely in the service of the palaces (Warren's point 3).[88] Warren favours the idea of semi-independent merchants, at least in the town of Knossos, citing conclusions drawn from the distribution of Egyptian stone vases around the town.[89] While many of these imported vessels have been found in the palace a large quantity have also been unearthed in the town precincts, a number which seems to grow considerably

[87] Bleiberg: 1996, 5.
[88] Chapter 3, 126.
[89] Warren: 1991, 295-296.

with ongoing investigation. Warren believes they are inappropriate as payment for services rendered to the palace and therefore possibly arrived through semi-independent agents.

The idea seems to fit better with the inclusion of trade along the Levant. Free merchants were more common and vast trade networks existed among these cities, which were not necessarily controlled by royalty. While prestige gifts between members of the ruling elite were prevalent, there also existed a prosperous merchant class, which conducted trade from Mesopotamia to the Mediterranean. The Minoans had been in contact with these peoples for a number of centuries and their influence can be seen in a number of facets of society, such as the monumental palaces and some of the deities in the Minoan pantheon. The Mari tablets of the 17th Century record dealings with the Kaptar and there was even a translator in Byblos for this reason. Since it seems there were close ties between Crete and the Levant it is also probable that the Levant trading arrangements would have influenced the Minoans.

Finally we are left with two contrasting systems, namely the insular Egyptian one with its tight control over trade and that of the Levant with free merchants, both of which would have influenced the political structure of Minoan trade. It is difficult to be sure which system would have had a greater sway. The independent nature of the villas may indicate the latter, but it is quite probable that the palaces maintained absolute control over strategic items, particularly metals. In this way the palaces could monitor and prevent the production of weapons, which must have been an important consideration.

Areas of Trade in the Neopalatial Period

Trade appears to have continued with little interruption from the Protopalatial period. In the Cyclades, which has always had close contacts with Crete, there is a marked increase in Minoan influence at Phylakopi on Melos. Ayia Irini on Keos and Akrotiri on Thera. The possibility of these three towns

being Minoan colonies will be discussed in Chapter 4.[90] Based on current knowledge it would appear that they were not, but they were heavily influenced by Minoan culture in art and architecture. Neopalatial evidence of imports from Melos have been found at Knossos in the form of bird jugs, although it must be noted that Knossos has been importing pottery from Melos since the beginning of the Protopalatial period.[91] Other islands which also appear to have had a fair amount of contact are Paros and Naxos.

Crete evidently did not further her interests in Anatolia in the Neopalatial period. During the Protopalatial period there is evidence of contact with Iasos and Miletus on Anatolia which seems to have intensified during the Neopalatial period. The Minoans also appear to have traded with the town of Knidos in Anatolia. In the Dodecanese there are indications that the Minoans traded with Trianda, a possible colony, and Ialysos on Rhodes, as well as Karpathos and Serraglio on Kos. As in the Protopalatial period there is very little evidence of Minoan contact with the Troad. The few Minoan artefacts which have been found in that area could well have arrived from third party merchants or even pirates.

We are already aware of the intensification of relations further east. Cyprus, the Levant and Egypt all appear to have had extensive trade with Crete. The Levant, perhaps Ugarit in particular, was possibly the most important area for Minoan trade. This harbour town provided the gateway into Mesopotamia providing both a ready market for Minoan luxury and organic goods and was also the source of tin and probably copper. Most of the luxury goods desired by the new palace elite came from either Egypt or the Levant.

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[90] Chapter 4, 136-139.

[91] Rutter, J., "Lesson 18: The Nature and Extent of Neopalatial Minoan Influence in the Aegean and Eastern Mediterranean Worlds" in *Prehistoric Archaeology of the Aegean*, 1997, 2.

Mainland Greece saw a large increase in trade during the Neopalatial period. Trade was no longer centred on Attica and the silver mines of Laurion, but also the Peloponnese. In Messenia Minoan pottery or at least Minoan imitation pottery has been found at towns such as Nichoria and Koryphasion. The earliest Mycenaean tholos tomb has been excavated at Koryphasion. It is possible that these tombs were inspired by the tholos tombs of the Mesara. The southern tip of Laconia is the only source for the green-flecked *Lapis Lacedaemonius*, which has been found in Crete and this area must have been visited by Minoan traders seeking this type of stone. Minoan pottery has already been found at Agios Stephanos in the Middle Minoan period and this contact continues in the Neopalatial period. It is possible that Minoan potters, either from Kythera or Crete itself, settled at Agios Stephanos from as early as MMIIIb.[92] It is also possible that some Linear A signs have been found as mason marks at the same site.

The unplundered shaft graves of Mycenae have provided a wealth of evidence of Minoan imports and influence in the Argolid. Many of the silver, bronze and stone vessels, seals and signet rings are probably Minoan imports. The inlaid daggers have always been thought to be of Minoan origin (Plate 29), but the inlay technique is as foreign to Crete as it is to the Mycenaeans. A bronze vessel from shaft grave IV bears an inscription of two Linear A signs. Many of the craft goods do not appear to have been entirely Minoan, but rather have a Mycenaean subject matter. It would appear that alien craftsmen were at work in the mainland centres. The artisans were possibly independent individuals who travelled to areas where their skills were in demand. Just as likely they were slaves or bondsmen who were owned by the palaces and traded at the whim of their owners. It is also not impossible that the craftsmen were captured by pirates and sold to or claimed by the Mycenaean princes of the Argolid and elsewhere.

[92] Rutter, 1997, Lesson 18, 4.

There are three anomalies which relate to Minoan and Mycenaean trade, namely (1) amber, (2) the niello metalworking technique and (3) amethyst. Amber (1) was imported into the Greek mainland from the Baltic and large quantities have been found from LHI – LHIII. Yet it only appears in small quantities on Crete from LMII. The finds occur in the warrior graves at Knossos at a time when control over the city may already have been handed over to the Mainland Greeks. It does not seem that there was a widespread trade in amber during this time, despite its prevalence in Greece. Rutter believes that the first amber might have arrived in a very limited number of large consignments and from then was confined to only twelve sites.[93] At the same time it does not appear to have been exported to the east during this time and it is possible that for some reason the Mycenaeans chose not to use it as a commodity for trade.

More perplexing is the appearance of niello technique (2) and amethysts (3) on the mainland but not on Crete. Niello is the technique wherein powdered copper and silver sulphides are combined and heated to form the blue-black finish used to decorate metalwork.[94] An example of this technique is the inlaid daggers found in the Mycenaean shaft graves (Plate 29). It is unlikely that the Mycenaeans had the skill to produce such high quality work, yet this technique seems to be unknown or at least unused on Crete, who had the most advanced metallurgical knowledge in the Aegean. The nearest relation on Crete would be Protopalatial daggers found at Mallia, but gold plating is used instead of inlay.[95] The skill seems to have originated in Syria, but the daggers found in the shaft graves are of a Mycenaean style not Syrian, which poses a problem. Laffineur has suggested that roaming artisans from the Levant travelled to Mycenae and produced the weapons there. If this were true it would certainly suggest that the mainland was not as cut off from the east as has been supposed. Similarly amethysts,

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[93] Rutter, J., "Lesson 22: Aspects of Mycenaean Trade" in *Prehistoric Archaeology of the Aegean*, Dartmouth, 1997, 8-9.
[94] Bahn, P. (ed), *The Penguin Archaeology Guide*, London, 2001, 321.
[95] Laffineur, R., "From East to West: The Aegean and Egypt in the Early Late Bronze Age", *Aegeum 18*, 1997, 61.

which probably came from Egypt, have been found on the mainland, but are not found in large quantities on Crete. This is unusual to say the least. With their penchant for carved seals one would assume that amethysts would have been a popular import, yet only a few amethyst seals have been found.

Conclusion

Much of the trade that began in the Protopalatial period was continued in the Neopalatial era, although on a much greater scale. The vast metals trade in the east, which only appears to have begun in earnest during the Neopalatial period, enabled the Minoans to obtain a steady supply of both copper and tin. Tin at least appears to have been in short supply during the previous periods. There was also a vast trade in luxury items with glass, faience, semi-precious stones, gold, silver, ostrich eggs and ivory coming into Crete during the period. Most of the Minoan exports appear to have travelled to the Cyclades, especially Melos and Thera, the Greek mainland, Cyprus, the Levant and Egypt. The indicators are mainly non-perishable substances such as stone and metals, but there was also a substantial organic trade that leaves virtually no trace. The discovery of elephant tusks at Zakros as well as imported stone show that there was a demand for the unusual as well as opulent. This desire was probably echoed in organic goods such as exotic textiles and spices. A majority of these imported goods have been found in palace contexts, indicating palatial dominance in international trade.

Whether the palaces had an absolute monopoly over trade is debatable. The consensus is that the palace rulers exercised considerable control. While some believe this marks a change over the Protopalatial period,[96] others argue that this control has existed since the establishment of the

[96] Branigan: 1987, 248.

palaces.[97] It cannot be conclusively proved that Knossos was the Minoan "capital" despite its large size and wealth. Cretan society appears to have been more complex during the Neopalatial period than any of the preceding periods. The establishment of the villas as administrative and storage centres implies an outsourcing of the acquisitive and redistributive functions of the palaces, such as at Hagia Triada. Unfortunately the administrative documents do not indicate whether these villas were independent or completely under the control of the palaces, but it would appear that they were at least partially independent and may have paid taxes to the palaces. They also had their own workshops in which imported raw materials, such oxhide ingots, have been found. It seems likely that these were supplied by the palaces. It is equally difficult to determine the status of the early traders, although it does seem possible that they were not under the complete control of the palace and were in fact semi-independent in the same fashion as traders from Ugarit.

In the early part of the Late Bronze Age Crete was in a powerful position to act as a gateway for all Eastern Mediterranean goods coming into the Aegean. These goods were possibly traded with the Cycladic islands of Thera, Kythera and Kastri, and Crete may well have had little contact with the mainland itself. In return the Minoans required raw materials. Silver and copper from Laurion as well as semi-precious stones such as *Lapis Lacadaemonius* and Actis Rosso. This same monopoly was possibly resented by the growing power of the Mycenaeans and was possibly one of the reasons for the downfall of the Minoan Civilisation in ca 1450.

[97] Wiener: 1987, 261-266; 1991, 327-340.