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PANT'AGATHA
COMMODITIES IN LEVANTINE-AEGEAN TRADE
DURING THE PERSIAN PERIOD, 6-4th c. B.C.

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Dedication

Parentibus optimis

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PANT'AGATHA

**COMMODITIES IN LEVANTINE-AEGEAN TRADE
DURING THE PERSIAN PERIOD, 6-4th c. B.C.**

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The primary focus of this study is to ascertain the identification and origins of the commodities in trade between the Levant and Aegean during the Persian period, ca. 540-330 B.C. Using Semitic and Greek textual sources, as well as numismatic, epigraphic and archaeological evidence nearly 200 commodities are identified and discussed, including spices, pigments, dyes, chemicals, and manufactured items such as coinage and ceramics. In the final chapter, a synthesis of the material is presented along with the historic and economic conclusions for Persian period trade that can be drawn from the assembled evidence.

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INTRODUCTION

When the Greek comic playwright Aristophanes presented *Acharnians* at the Lenaean festival in 425 B.C., Athens' war against Sparta and her Peloponnesian allies was half a decade old, with more than two decades yet to come before it would be completely ended. The protagonist of the play, Dicaeopolis, already sick and tired of the privation the war has brought, concludes his own peace treaties with the enemy and so is free to trade again with them. Goods long since declared to be contraband flow into his private market, whetting the appetite of his Athenian neighbors, both on stage and off. Nodding in his direction, the chorus leader declares (ln. 978), "all good things (*pant'agatha*) come to this man spontaneously." Like English "goods," *agatha* in Greek also meant commodities in trade, especially those that had an exquisite air about them.¹ Dicaeopolis, like other residents of Athens, had grown accustomed to these worldly delights, spoiled in an unprecedented manner by burgeoning pan-Mediterranean trade. To be deprived of *agatha* made life nearly unbearable.

These *agatha*, as the title indicates, are the focus of this dissertation, but more specifically those commodities that flowed from the Levant to the Aegean and vice versa. Despite the rather large number of studies devoted to Levantine-Aegean economic and cultural interaction during the Late Bronze Age and the centuries leading up to the 6th c., which include the "Orientalizing period" of the 8-7th c., and despite the equally large numbers of studies devoted to this interaction during the Hellenistic period (post -330), comparatively little has been

¹ Cf. Hermippus, *apud* Athen. I.27e, where the *agatha* Dionysius brings to Athens, e.g., dainties, desserts, embroidered pillows, etc., would not seem to be staples; Thucydides, II.38.2, where Pericles speaks of Athens enjoying the *agatha* that the world has to offer, etc.

written on Persian period Levantine-Aegean exchange.² The reasons for this lack of interest can be explained partly by scholarly bias. In the Near East, archaeological and philological research has generally been based on the Bible, and since the Persian period plays a very minor role in Biblical events, it has until recently been regarded as little more than a minor transitory stage between periods more worthy of attention.³ In Aegean studies, on the other hand, the bias stems from an assumption that following the defeat of the Persians at Plataea in 480/79 the flourishing economic and cultural contacts between the Semitic east and the Greek west came to an abrupt halt, and were not reestablished until Alexander marched through the Levant and on to India.⁴ Since the early 1980s, a reassessment of these biases has begun, but to date there still has not been a comprehensive study of Levantine-Aegean exchange to fill the lacuna.⁵ This project is an attempt to begin to fill that void.

Trade is an enormously complex topic; given this complexity it seems best to approach the study of trade by focusing on individual elements before attempting to form a general synthesis. This dissertation focuses on one element of the larger picture: commodities. In any study of trade, i.e., the exchange of things between two or more parties, the starting point should be the things

² Raptou's recent work (1999) is really the first study to look at economic exchange between the Levant and Aegean during the Persian period, but focuses exclusively on Athenian and Cypriot contacts.

³ See the introduction to Stern, 1982.

⁴ See Elayi and Sapin (1998), chp. I; M. Miller, 1997, 65.

⁵ The drive towards reassessment has been strongest in France, lead by J. Elayi, A. Lemaire, P. Briant and others who played a role in the foundation of the journal *Transeuphratène* in the mid-1980s, and have published extensively on the Persian (Achaemenid) Empire in recent years. Also instrumental was the series of *Achaemenid History* workshops held in the 1980s and 1990s, the proceedings of which were published in Leiden, and, in the Near East, E. Stern's 1973 dissertation (translated and published in English in 1982) on the material culture of the Persian period in the Levant. Economies and trade have received a fair amount of attention in all of these studies, but no single study yet has been devoted exclusively to the modes and mechanisms of Aegean-Levantine trade.

exchanged, since without these items, there would be no trade, or any reason for it. Surprisingly, however, in many studies, these things—commodities—are virtually overlooked because of the preoccupation with classifying the systems of production, consumption, and exchange through which the commodities circulated. The “commodities” or “goods” in these studies are largely an undifferentiated mass. More specificity might be attempted with terms like “grain,” or “timber” as an item being shipped from one point to another, but these too are general terms, and so are mostly uninformative and sometimes misleading.

To understand the systems of exchange, production and consumption, even to classify the systems, we first must identify as fully as we are able the component parts, especially such critical elements as the commodities. In other words, for example, with what type of grain or what type of timber *specifically* are we dealing? The reasons for greater specificity are simple: unless we can locate and define what it was that was being exchanged, our assumptions about (abstracted) systems of production, circulation, consumption, or even the trade routes and traders, might be completely wrong. To say that “timber” was a Levantine commodity shipped to the Aegean tells us nothing, as would any conclusion built upon such a statement. But, to say, for example, that on only a few occasion baulks of *Cedrus libani* first selected by the Persian official having control over the forests of the Lebanon were then shipped by Phoenician contractors to Aegean temple construction sites where the wood was paid for by temple accounts to be used conspicuously in the edifice, is obviously a more informative statement and would provide a firmer footing for conclusive discussions of Levantine-Aegean trade. Rather than start at the top, as it were, many steps removed physically and conceptually from the actual items in trade, this study starts near the bottom, with the basics of identifying the commodities in trade. And, while there are many studies of individual types of commodities,

mostly the manufactured goods that are recovered from archaeological sites, no study has yet attempted, using an inter-disciplinary approach as this one does, to find and identify a broader range of the commodities that were in circulation during the Persian period, whether raw, semi-processed, or manufactured, and bring them together in one volume.

This study is presented in six chapters. Chapters one to five form the core of this study in which the roughly 200 commodities that I have located are discussed in a series of mini-essays concerned mostly with the identification, vocabulary, and origin of the items. Tabulated summaries of the essays can be found in Appendix One. Chapter six, the last chapter, addresses the implications of the conclusions found in Appendix One, as well as some of the trade- and social-oriented issues concerning the findings.

THEORETICAL CONSIDERATIONS

In this study, I try to avoid actively taking a position vis-à-vis the current debates on ancient trade and economics; there are a number of reasons for this which we will turn to momentarily. I say “try” because consciously or not, I write from a perspective, to be explained below, that has been influenced by many of the economic/trade theories in circulation. Hence, it would be simplistic to claim that I have no theoretical stance. However, what I hope ultimately to achieve with this examination is a restructuring of approaches to ancient trade and economics—not necessarily a revamped or new theory or framework—but rather an approach that is something more eclectic and fluid than those generally employed now, one that can make use of particular theoretical models without being locked into any of them (e.g., Polanyism), and one that can be more generous in accepting the vagaries of real-life economic behavior as it is today and likely was in antiquity. One fatal flaw of many (universalizing) theories is their abhorrence of exceptions and their rigidity that crumbles in the face of an

ever-changing and chaotic reality. How accommodating an approach or theory is to the vagaries and variables of real-life, the more successful it will be as a descriptive (and proscriptive) tool.

Unfortunately, none of the major approaches or theories yet offered in the study of ancient trade or economics has been able to accommodate comfortably all of the evidence for economic behavior even within the limited geographical and temporal scope of the Persian period eastern Mediterranean. Economic behavior, like many other human activities, can exhibit simultaneous rationality, irrationality, explicit and implicit motivations. Thus, economic behavior can be highly complex, chaotic, and difficult to define monolithically, all tendencies which elegant, compact and succinct theories ignore or mask. Whatever their other strengths and shortcomings, the theories and models of the formalist vs. substantivist, or the primitivist vs. modernizer debates, two of the most visible, longest running and far from resolved disputes in ancient economics, fall into this category by setting (descriptive) limits on economic behavior that are often incongruous with the evidence. Because they seem rather confining (and confined), these debates are the ones that I wish to avoid. Nor am I alone; as will be seen shortly, more scholars currently are searching for ways out of the muddled inheritance that previous generations of economic thinkers, e.g., Polanyi and Finley, have bequeathed to us. Since Davies has recently (1998, 2001) provided two (historical) survey articles on the theoretical approaches to ancient trade, there is no need here for a recapitulation of the great debates. However, among those theoretical approaches which are now starting to take shape, which Davies does not dwell on, are those focusing on commodities rather than exchange systems per se. Since these theories show particular promise for leading the way out of the earlier stalemates, and since I also use them as a basis

for elaborating on approaches to commodities and trade in chapter six, we will briefly look at what they have to offer.

Most of the previous theoretical approaches have relied on exchange systems for providing the defining characteristics of both ancient economies and trade, and the objects passing through these systems. For example, two exchange systems, gift and commodity, are generally offered as opposites in a bi-polar schema of economic possibilities.⁶ Gift economies are seen as highly personal, taking place between related persons, while commodity exchange is presented in much colder tones, as a type of impersonal market exchange between strangers, e.g., capitalism. Hence, the objects passing through the systems are either “gifts” or “commodities,” which then may or may not be differentiated further. Ultimately, the focus resides not on the gifts or commodities per se, but the way in which they are produced (i.e., with what type of labor) and the moment they change hands. Soon after that moment, when they are consumed, the objects are effectively lost from view.

A few years ago Foxhall (1998) made a plea for abandoning the tried and frustrated approaches to ancient exchange and suggested a focus on consumption as a new avenue.⁷ Here she shows kinship with earlier commodity-oriented studies such as those by Appadurai and Kopytoff.⁸ These studies are an important departure from earlier approaches because they downplay the origin, e.g., production, and the moment of the exchange of a commodity and focus rather on

⁶ For a detailed, and influential overview of these systems, see Gregory, 1985, chp I.

⁷ In her brief “theoretical sketch” Foxhall does not dwell on finding a definition for “consumption,” which as Carrier (1995, 1-2) notes, is a handy term covering a broad range of activities and relations with objects. Carrier believes that consumption generally occurs in a private, individualized sphere rather than the more public sphere of production. Counter to this claim, however, Appadurai (1986b, 31) argues that consumption is eminently a social activity, meant to send messages about status, wealth, etc.

the latter portion of its trajectory, its post-exchange cultural reception. Individual commodities are unpacked, so to speak, and examined in relative isolation from exchange systems in order to determine what it is that makes a commodity a commodity, i.e., something worth being desired and acquired. As commodities are unpacked by these authors, refreshing new approaches have been found.⁹

Kopytoff, for example, speaks of a “biography of things,” a processual model of commoditization in which an item can oscillate between becoming a commodity,¹⁰ becoming “decommoditized” and possibly later “recommoditized.” Some commodities are created to be exchanged, some come to be exchanged by circumstance, and some are exchanged once and never exchanged again. This process is cultural as well as cognitive which reveals, as the status of an object shifts, a social moral economy operating behind the economy of transactions. Appadurai details at greater length this process of commoditization and the general “idiosyncracies of things;” a commodity, he argues, is not one kind of thing, but a phase in the life of some things.¹¹ Once an item becomes a commodity, social discourse inevitably envelops items of exchange on the consumption end of the trajectory. Luxury goods, for example, attract the most vocal discourse because these goods serve principally a rhetorical purpose: as

⁸ Although Foxhall does not mention Appadurai (1986b) and Kopytoff’s (1986) highly influential articles, her approach appears to be indirectly influenced by their work. It should also be noted that Appadurai and Kopytoff are modern historians and do not discuss ancient trade.

⁹ This dissertation is concerned primarily with the earlier portion of commodity trajectories, namely their places of origin and composition. Nevertheless, an awareness of the entire trajectory is useful to bear in mind since a preoccupation with only one portion of the trajectory can misrepresent commodities in trade.

¹⁰ Kopytoff (1986, 68) defines a commodity as “a thing that has use value and that can be exchanged in a discrete transaction for a counterpart, the very fact of exchange indicating that the counterpart has, in the immediate context, an equivalent value.”

¹¹ Appadurai (1986b, 17). All things have the potential to achieve commodity candidacy, i.e., the standards and criteria (symbolic, classificatory, moral) that define its exchangeability in a particular social or historical context (13, 15).

signs of status. Luxury item or not,¹² other goods also inspire symbolic use, fashions and desires within a community. Knowledge about a commodity, as Appadurai illustrates, can also affect the discourse and thus the trade and consumption of an item. Ignorance about an object's origins, for example, leads to mythological biographies of things, which in turn can lead to high profits and deception in markets; generally the farther an object travels from its point of origin, the less is known about its production and its social and monetary value in the place of origin. These "mythologies" are useful to bear in mind when dealing with ancient exchange; Herodotus's (III.107) tale of South Arabians burning storax to drive off the winged serpents that guard the frankincense trees is a case in point.

Appadurai, and to a lesser extent, Kopytoff and Foxhall, sidestep the issues concerning production, exchange system classification, embeddedness, etc., that have plagued the primitivist vs. modernist debate by focusing on the process of commoditization and commodity discourse. This approach also effectively embraces the complexities and chaos of real exchange. By de-categorizing and de-classifying objects, e.g., as "goods" in an exchange system, and rather focusing on each item's unique trajectory from production through exchange to consumption, we can see, once we gather all of the relevant individual trajectories together, that not all objects follow the same path from one point (real or conceptual) to another. Hence the picture of trade becomes more fractured and differentiated, and less easily clarified by all-encompassing terminology, definitions, or theories. As noted, my sense is that the realities of trade, in any period, are far more conceptually complex and chaotic than is often admitted. For

¹² Appadurai (1986b, 38) makes the astute observation that luxury is not so much a special class of things, but rather a special "register" of consumption, which can be denoted by restriction of certain items (by law or price) to elites, complexity of acquisition, specialized knowledge of appropriate consumption, and so forth. This idea will be discussed at greater length in chapter six.

this reason, discussions like Appadurai's are valuable in their willingness to accommodate complexity and irrationality and because they shy away from the rigidity of Polanyi and his followers.

Whatever my predispositions, however, no theory or model seems adequate to use as a starting point for approaching Persian period trade, until we have a clearer idea of what is being discussed. Hence, a fairly broad range of basic, even mundane topics need to be addressed before we can continue to higher levels of discussion. These include, for example, the identification and origin of the goods exchanged (the theme of this study), the structure and imposition of custom duties, the organization of trading companies, communication, the use of money, and so on. At the outset of this project, I am less concerned with presenting a study bound within an existing overall theoretical framework than I am with laying the foundations for a framework that will develop as the project continues.¹³

SCOPE OF STUDY

My primary concern here is to locate and identify as many of the objects as possible which appeared in Levantine-Aegean sea-borne trade during the Persian period. This means that this study is concerned mostly with the geographic and cultural origins of the commodities, i.e., the production end of the commodity trajectory.¹⁴ However, where the starting point of the trajectory is better known, other portions of the trajectory are examined, especially those

¹³ In the chapters that follow, the use of economic terms, e.g., "supply and demand," which are closely associated with one or another theoretical approach, e.g., Neo-Classical Economics, does not necessarily indicate a general endorsement of that theory per se, but rather the use of a term or concept which seems best to describe the subject at hand.

¹⁴ I use "commodity" and "goods" in this study as general terms for any object that was exchanged, but do not commit myself at this point to a wider definition of the terms or of the exchange type.

portions that are most problematic or highly contested.¹⁵ Locating a commodity is easiest when there is a textual reference or an archaeological find that fits within the temporal and geographic limits set for the study. For some of the commodities, however, the evidence does not necessarily fit within these limits; for example, there may be evidence for a commodity from sources dating to before or after the Persian period, but not during. I have been reluctant to exclude these out-of-bounds commodities for many reasons. First, despite the perils of arguing *ex silentio*, the commodities in circulation for most of the history of the Mediterranean did not vary a great deal. Within this *longue durée* of commodity production and consumption, a new commodity might occasionally be introduced, e.g., cotton around the 6th c. B.C., or a commodity might gradually disappear, e.g., marine purple in the early Middle Ages, but if one compares the evidence offered by texts, shipwrecks, and the like from the Bronze Age to as late as the 18th c. A.D., there is a high degree of correlation between the types and quantities of goods in circulation, especially raw materials. More specific examples are presented under the individual commodity headings below, but as a general guide to goods in circulation for one time period, we should not categorically dismiss the evidence from the periods before and after.¹⁶ Therefore, in the mini-essays that follow in chapters one to five, I strive to include pre- and post-Persian period evidence for the east-west trade of a commodity. At times this evidence

¹⁵ Addressing the social issues of production, e.g., the status of artisans, farm-workers, slaves, etc., would take me far afield of my primary concern, therefore these issues are not discussed. Likewise, social issues on the other portions of the trajectory, e.g., circulation and consumption, are minimized except where they are necessary to forward an argument. The topics of circulation and consumption can quickly become large and specialized studies themselves, e.g., M. Miller's (1997) work on the reception of Persian material culture in 5th c. Athens, and so are best left alone for the moment.

¹⁶ This point becomes readily apparent when comparing, for example, the commodities found in this study with those found in Jardine's (1996) study of the trade and material culture of the European Renaissance; commodities shipped to and from the Ottoman east and Christian west include pigments, alum, salt, wine, etc., etc.

complements what there is from the two centuries under consideration; at other times it stands alone when there is (virtually) no other evidence for trade in a commodity from the 6-4th c. B.C. When the evidence from other eras implies a continuity of trade, although the Persian period evidence is missing, I have included the item in the discussion. The point of this, as explained below, is inclusion rather than exclusion.

One objective of this dissertation is to open the eyes of students of ancient trade to the vast array of objects in circulation at any given time. Most studies, when individual commodities are discussed, limit themselves to the well-known staples, e.g., oil, wine, timber, etc., and rarely present these commodities in anything but general terms. More specificity in commodity discussions is needed, but so is more expansion. But, even when we expand these discussions to the reasonable limits that our evidence allows, the numbers of commodities thus located can only be a fraction (of an unknown size) of all the objects that were actually in circulation. Hence, I feel that it is best to err on the side of presenting a larger number of possibilities than a smaller number. To aid future discussions, I organize the commodities and material presented in chapters one to five in the various tables found in Appendix One.

The identification of the individual commodities fills most of the pages that follow. For raw and semi-processed materials, i.e., plant and mineral, the process of identification is primarily a correlation of the available evidence from antiquity with modern evidence in the hopes of presenting the most likely modern identification for the item under consideration, and the most likely geographic region from which the item reached the Levant or Aegean. Often, however, a decisive or even “best-guess” modern identification of the item or its origin is not possible; in such cases, my goal has sometimes been to show that the identification commonly and complacently granted an item needs reconsideration.

With manufactured items, scientific identification is obviously less important than determining the geographic or cultural origin of the object. At first glance, such a task might seem rather simple: Athenian pottery by definition came from Athens. This is not always the case, however. Artisans migrated, which in itself creates difficulties for determining the geographic origin of a commodity since what appears to be Attic pottery, for example, might have been made by an Athenian craftsman residing in the Levant. How, then, do we consider such an object: Athenian? Levantine?

Further difficulties are created by the phenomenon of imitation and related concepts like counterfeiting and derivation. Imitation was remarkably widespread in antiquity and when detected did not necessarily carry the same stigma as it does today. Also, without protective legal measures, such as today's copyright laws, there was less regulation over the act of imitation, which means that imitations of particular items, like *alabastra* (perfume vials), could have been so widespread that it is impossible for us (or them!) to state precisely what is imitative and what is original, or where any particular example might have been produced. Ultimately, our ability to identify an object as genuine or imitative can affect our interpretation of the larger picture of trade; therefore the phenomenon is worth exploring. This also is a topic that I return to in the final chapter and Appendix Two.

TEMPORAL AND GEOGRAPHIC LIMITS

As mentioned earlier, the temporal focus of this study is the Persian period, a title given to the era that saw the rise and fall of the Achaemenid Persian empire in the 6th-4th c. B.C.¹⁷ The dates traditionally delineating this period correspond to Cyrus II (Cyrus the Great) taking the Persian throne in 559 and the

¹⁷ From this point on, all dates are B.C. unless otherwise noted.

final defeat of Darius III by Alexander the Great in 330. While the title “Persian period” is often used by Near Eastern archaeologists as a general term to describe these two centuries, for the purpose of dating archaeological strata and objects recovered from them, other systems are used (e.g., Iron Age III). Scholars with an Aegean focus know these two centuries primarily as the “Classical period,” the age of Athens’ rise and fall as a cultural, economic and military leader in the Aegean. The Classical period, according to philological tradition, did not begin until 480/79, the year that the Persian invasion forces in the Aegean were turned back; the period immediately before is known as the Archaic Period, roughly the later 7th through early 5th c. Since most of the commodities listed here were already being traded by the mid-6th c., the term “Persian period” more accurately describes the temporal range of this study since it includes most of the 6th c. whereas the term “Classical period” does not. Therefore, “Persian period” is the preferred term used here.

Even so, by whatever name, the imposition of a ca. 559-330 temporal limit is somewhat arbitrary; each of the centuries under consideration here, in fact every year and decade within them, saw changes in economics and trade that made it stand apart from the preceding eras. Two centuries plus is a very long period of time, spanning nearly a dozen generations, any one of which would be a suitable focus of study if the evidence allowed. But it does not; archaeological evidence of this period often cannot be dated by year, let alone decade, so it is labeled simply “Persian period.” And although texts (and some classes of artifacts) can sometimes be more accurately dated, they do not exist in a vacuum and must be related in some fashion to other types of more loosely dated evidence to create a more complete and balanced picture. Scholarly convention too recognizes these two centuries as a discrete field of study, and so there is a long

tradition of scholarship devoted to most every imaginable subfield within them—except, it seems, Levantine-Aegean economic interaction.

I use “Aegean” mostly as shorthand for the Greek-inhabited lands surrounding the Aegean Sea, and hesitate to delineate the region too specifically (i.e., west of the Halys river in Asia Minor, etc.). My use of “the Levant,” on the other hand, does refer to a more specified region, namely the Persian 5th Satrapy. The Persians inherited this administrative district from their Babylonian predecessors, who likewise adopted it from the neo-Assyrian system. Seen from a perspective east of the Euphrates, the district was known, in Akkadian, as *eber nāri*, “Beyond the River.” By the Persian period, the 5th Satrapy, *‘eber ha-nahar*, in Biblical Hebrew, included most of the coastal territory west of the Euphrates from the Amanus range near the Bay of Iskenderum to someplace near Gaza in the south; offshore, it also included Cyprus.¹⁸ Thus “the Levant” for the sake of this study is defined primarily as Cyprus, and the territories that included the Phoenician homeland on the coast towards the north, and Judea, Samaria, and Philistia towards the south.

Like the temporal limits, the geographic limits also are somewhat arbitrary—Greek-Semitic relations interest me more than Semitic-Etruscan, for example—but these limits appear even more artificial when considered from the perspective of trade. Although the concept of interrelated, or at least highly interactive markets spread across the Mediterranean during the Persian period would not please many primitivists, nevertheless it has become increasingly difficult, as studies like Horden and Purcell’s *Corrupting Sea* (2000; especially chp. V) demonstrate, to entertain notions of sea-oriented communities having trade and economies isolated from pan-Mediterranean networks, especially in an

¹⁸ The exact borders of the 5th Satrapy are not known. See Elayi and Sapin (1998, 14ff.) for discussion.

age as active and cosmopolitan as the Persian period. Smaller local networks tied into regional networks which then were connected to intra-regional networks; the whole system was so entangled that it is also difficult to imagine any one region or regions considered together, e.g., the Levant and Aegean, as being isolated from contact with others regions, like North Africa or Spain. To focus only on the lines running between the Levant and Aegean may be presumptuous; direct lines of contact likely existed, but we can be certain that indirect lines did as well. There is no rule which states that commodities must follow the path of least resistance between point A and B; commodities go how and where they will through the networks. Even so, there is justification for seeing Levantine-Aegean trade as something special and somehow elevated above the networks, whether direct or indirect. The trade began well before the end of the Bronze Age (ca. 1200) and was important enough, at least to the Greek imagination, that it appears in some of the earliest Greek literature, Homer's *Odyssey* (see below).

Obviously, to include all the pan-Mediterranean networks in a study which is primarily concerned with Semitic-Greek interaction would become too unwieldy. Thus many of the networks beyond the Levant and Aegean are ignored in the course of this study with one exception: Egypt. The pull of Egypt on Levantine and Aegean networks was heavy, so heavy in fact that Egypt might at times have acted as a, or *the* primary transshipment point for goods traveling east from the Aegean or west from the Levant.¹⁹ Furthermore, in one form or another—texts, archaeological finds, etc.—Egypt offers a host of important evidence for the location and identification of the commodities presented in this volume. Egypt, in other words, is as central to the study of Levantine-Aegean trade as are the Levant and Aegean, and so appears frequently in the discussions that follow. But central only in its role as a major node in the networks;

¹⁹ See Oren, 2000.

expanding the discussion to include Egypt in its cultural or economic entirety would steer this study too far off course.

SOURCES

Any study of Aegean-Levantine contact and economic exchange requires that the approach be multi-cultural, but it should also be multi-disciplinary. Literary texts, inscriptions, papyrus fragments, numismatics, archaeology—nautical and land--all can offer evidence for the identification and origin of commodities as well as for trade generally. For this reason, I have endeavored to use the widest range of source material possible including a number of specialized sub-fields and studies. Since this study is meant to be accessible to students of the ancient Near East and the Aegean who may or may not be familiar with the primary sources or the secondary literature of other disciplines, I offer here a short overview of the major sources and associated problems.

A: Greek Sources

Persian period Greek source material is exceptionally rich, especially in respect to (literary) texts. Athenian culture flourished during the 6-4th c. and out of this milieu came a long train of playwrights, philosophers, historians, and orators, many of whose works have been preserved. Grateful as we may be for the preservation of some of Sophocles' tragedies or dialogues of Plato, we must also bear in mind that almost all of the preserved literature is from the perspective of Athens, only one of many communities in the Aegean. This Atheno-centric view of the Aegean texts is often difficult to deal with; the Athenians did not speak for all Greeks, but it is their voice that we hear most clearly. What few voices we have from other communities, like those from the island of Lesbos (e.g. Sappho), are often fragmentary and date to other periods. Indispensable as the Greek literary material is, it also possesses idiosyncracies specific to one author or

genre that must be considered when using this material as a source for trade studies. We will consider a few of these issues here.²⁰

Although not a genre, Homer could effectively stand for one in light of the massive amount of scholarship devoted to the blind bard (or whoever he/they was/were). The “Homeric Question”²¹ aside, the elevated, quasi-Biblical status that the *Iliad* and *Odyssey* held among Greeks reflected the great age of the works. Already by the Persian period, both epics were ancient, but just how old we do not know. As a result of the long development of the texts, numerous inconsistencies and anachronisms crept in, which has confounded our ability to pinpoint the Age of Homer.²² As a source, therefore, Homer can only really be used to illustrate a generalized Greek (fantasy) world sometime before the Persian period began; in this world, however, Phoenician traders and Greek voyages to the Levant and Egypt figure prominently, as do certain commodities, e.g., silver plate.

Greek Tragedy was not overly preoccupied with things, or issues related to things, so little use is made of the tragedians here.²³ The same pertains to the surviving fragments, and in a few cases entire works, of the Lyric, Elegaic and Epinician poets; where I’ve cited one of these works, a discussion of context and referential value generally follows. Greek Comedy, however, is an entirely different matter. Whether as actual props or as part of the verbal fireworks,

²⁰ Since it would be a rather lengthy undertaking to discuss each ca. 5-4th c. Greek author individually, I provide this short survey mostly by genre rather than author. I should also note that I mention only those genres, authors and works that I use in this study.

²¹ The "Question" refers primarily to the identity or the individual(s) and the poetic traditions they worked within. For a recent overview of the question and other related matters, see Cook, 1996.

²² Or rather, *The Ages of Homer*, the title of a volume edited by J.B. Carter and S.P. Morris (Austin, 1995) dealing with various aspects of Homeric poetry and its *Nachleben*, the Homeric world and its dating, etc.

²³ Notable exceptions to this generalization is the attention paid to tapestries in Euripides’ *Ion* (see Stieber, 1998), and the famed purple carpet scene in Aeschylus’ *Agamemnon* (ln. 944ff.).

commodities, foods especially,²⁴ were central to the comic mission. Of the hundreds of Comic playwrights and likely thousands of plays from the Persian period, all that remains mostly intact are the eleven Old Comedy plays of Aristophanes (ca. 460-386), and a few longer fragments of New Comedy's Menander (344-292), including the nearly complete play, *Dyskolos*. Preserved in other works (see Athenaeus below) or as scraps on papyrus, are fragments of the works of many of the other "lost" playwrights, e.g., Alexis (4th c.). One difficulty, of course, with using comedy as a source for the serious business of trade, is that we can be never sure of the vocabulary (e.g., is this word slang?), the usage (e.g., is this made up?), or the context (e.g., is this a joke?). Thus it is best, when using a long list of commodities found in comedy, like the Hermippus fragment (*apud* Athen. I.27e-28a), to verify the claims of origin and vocabulary with other sources. Often, with the shorter fragments, we do not have the context of the speech; often too the very reason the short fragment is preserved is because it contained some odd grammatical usage or vocabulary that caught the eye of later lexicographers. Comedy, then is not straightforward, but it is exceedingly useful since it can provide information on commodities not found elsewhere, and can give insight into their cultural reception.²⁵

Persian period Greek historians, like Herodotus, Thucydides, and the fragmentary authors like Ctesias, *vel sim.*, were not concerned with trade or commodities *per se*, but they do include many incidental details and information directly relevant to this study. At the same time, the treatment by Greek historians of non-Greek peoples, places, and things, especially by Herodotus, is highly problematic: the farther their tales take them from the Greek Aegean, the

²⁴ See Wilkins, 2000.

²⁵ See, for example, Davidson's 1997 study which deals with commodity reception using comedy sources as one main body of evidence.

more bizarre, surreal, and circus-like the people, places and things become.²⁶ This is unfortunate since many of the commodities under consideration here came from these lands; often very little useful evidence concerning origins can be salvaged from these accounts. Nevertheless, their attitudes towards these exotica are valuable since they reveal both the limits of knowledge in the Aegean about eastern commodities and their origins, as well as a general lack of concern for accurately portraying them. These are topics which I return to in the final chapter.

With the 4th c. Orators, like Demosthenes and Lysias, hard(er) evidence begins to appear in their law court and other speeches, including some dealing specifically with contracts, loans, and certain commodities, e.g., grain. The problem here though is that much of the information presented serves a rhetorical function with the result that one must be open to the possibility of distortion in the accounts or invention. Thus, like the *Histories* of Herodotus, the speeches of the orators need to be approached with great caution, but still provide a considerable amount of valuable information and details on trade procedures, legalities, types of commodities and so forth.

We turn next to an overview of a number of lesser known texts, mostly post-dating the Persian period, which I make extensive use of and which deserve our attention. Although in some cases better or more recent editions of some of these texts might exist, I indicate those editions that are more widely available and more accessible to scholars of different academic backgrounds.

To aid identification and to demonstrate the long-lived nature of east-west trade in various commodities, I note Mycenaean Greek (Linear B) comparanda where applicable. Dating to the Late Bronze Age (ca. 14-13th c.), the Linear B texts consist primarily of inventories on clay tablets from the palace centers of Knossos, Pylos, Thebes and Mycenae. For the uninitiated, there are several

²⁶ For a book-length treatment of this issue, see Romm, 1992.

secondary sources which provide useful access to this material. Most indispensable is the two volume Spanish-Linear B dictionary, *Diccionario micenico* (abbreviated *Dmic*), which also provides bibliography on the vocabulary. More recent bibliographical information can be found in the annually published *Studies in Mycenaean Inscriptions and Dialect (SMID)*. The classic introduction to Linear B studies is Ventris and Chadwick's (2nd ed., 1973); also useful is Hooker's shorter volume (1980).

Theophrastus (ca. 372-287), Aristotle's successor as head of the Lyceum in Athens, is responsible for three works frequently cited in this study. The first, a botanical work, *Enquiry into Plants*, was probably written after the death of Alexander the Great (323) and appears to make use of botanical observations on Near Eastern and Indian flora made by the scientists in Alexander's train. The most readily available text, with English translation and commentary is Hort's Loeb edition. Hort's botanical notes are generally unreliable and have been made obsolete by the commentary found in Amigues' as yet incomplete Budé edition. The second of Theophrastus' text is *On Odors*, a treatise on perfume manufacture and ingredients which shares some affinity, in terms of botanical discussions, with *Enquiry into Plants*. Hort's Loeb edition of this text has recently been superseded by the German translation and commentary by Eigler and Wöhrle (1993), which also includes an appendix on botanical identifications. Finally, *On Stones*, as the title indicates, is a short treatise on minerals, gems, and stones, which is most readily available in Caley and Richard's (1956) edition with text, translation and commentary. Although Theophrastus is generally not concerned with the trade in the plants and minerals he discusses, his studies are unparalleled sources because they alone of existing texts from the Persian period (or very near to it) are concerned with the scientific investigation of commodity-worthy raw materials.

Like Theophrastus, medical writers are also important for their discussions of the uses and properties of specific plants and minerals. The Hippocratic corpus, which I cite a few times, is a compilation of texts portions of which possibly date to the time of Hippocrates himself (469-399); the entire corpus is not readily accessible to the non-Greek reader. Some volumes of the corpus are published in the Loeb collection, but to find all of the works one must turn to Littré's 10 volume 19th c. A.D. edition with no translation. Dioscorides, a 1st c. A.D. Cilician physician, left a voluminous treatise on medicines and drugs (*de Materia Medica*) which draws mostly on his own observations and notes. The text is useful for providing insight on earlier uses of various commodities, as well as suggesting origins for others. Wellmann's early 20th c. edition in three volumes provides the text; no (modern) translation of the entire work is available.

A text contemporary with Dioscorides, which I note frequently, is the *Periplus Maris Erythraei*, a 1st c. A.D. sailor and merchant's guide to Red Sea and Indian Ocean trade routes, ports, and commodities. This fairly short Greek text, which follows a long tradition of sailor's manuals (*peripli*) for different regions, is a key piece of evidence for studies of Roman period Indian Ocean-Mediterranean trade; but the text also is useful for indicating what earlier trade might have been like, because of the likelihood of continuity in the trade over the centuries. A text, translation, and commentary of the *Periplus Maris Erythraei* (abbreviated *PME*) can be found in the edition by Casson (1991).

Later antiquity—the Hellenistic, Roman, Late Roman and Byzantine periods—saw the completion of a number of compendia, encyclopaedias, dictionaries, books of quotations and the like which preserved fragments of authors and titles from centuries earlier. For this study, one of the most important of these works is the *Deipnosophistai* ("The Learned Banqueters") of Athenaeus, a 2nd c. A.D. resident of Naucratis in Egypt. A unique, entertaining, and

cumbersome work, the tale of the *Deipnosophistai* is set around a group of banqueting literati, who as the meal progresses find opportunities to impress one another with obscure trivia and quotations on most everything associated with banqueting: food, drink, cups, furniture, dancing girls, etc. The work, which consists of little more than strings of quotes tied together by a minimal narrative, is a veritable gold mine for fragments of long-lost writers from the Persian and other periods, and has been repeatedly mined by scholars to produce dedicated studies of the fragments of individual, lost authors. For this study, Athenaeus is also mined for Persian period references, but also for later comparanda for the trade or use of particular commodities; the fact that the work is basically arranged by topic (e.g., perfumes) makes such commodity searches easier. Because these specialized studies are not always available, and are sometimes difficult to navigate, I cite Athenaeus alone if a fragment is preserved in his banquet tale, unless textual emendations or useful commentary elsewhere requires notice. Gulick's seven volume text and translation appears in the Loeb collection.

A Latin rather than Greek writer, Pliny the Elder (1st c. A.D.) composed a monumental 37 book encyclopaedia, *Naturalis Historia*, on all that could be known about animal, vegetable and mineral subjects. Primarily an armchair naturalist, Pliny claims to have made use of over 2,000 books in the composition of his opus. Unlike many of his contemporaries, Pliny generally cites his sources, such as Theophrastus, and so can be useful for locating earlier textual evidence. However, he is at times less than careful in his use of these earlier works and so must be approached critically. Of great benefit for this study, Pliny frequently discusses the trade, contemporary and earlier, of the items he catalogues; he also shows great concern with the manner in which many of these items were imitated. Rackham and Jones' multi-volume Loeb edition contains useful—although dated—notes as well as indices, and Bailey's (1929, 1932) work on the

chapters dealing with mineral topics is one of the few, good commentaries on Pliny, although it is not readily available.

Other late compilations that I have made use of include the 2nd c. A.D. *Onomasticon* by Pollux, Hesychius' 3rd c. lexicon of rare words, Photius' 9th c. lexicon and a late 10th c. historical encyclopaedia known as the *Suda*. Each of these works is valuable for their definitions and notices of rare commodity terms from preceding centuries. It is, however, difficult to assess the accuracy of these definitions since all too often it is only these works where such information is found. Also useful for terms and definitions are the collected *scholia* from various classical works. These marginalia written by the copyists and scholars of antiquity—rarely are they dated or datable—are sometimes as extensive and detailed as the lexicon entries, and so likewise provide an important collection of source material.

The sands of Egypt have preserved innumerable collections of texts in dozens of languages from antiquity written on papyrus, sometimes on skins and ceramic sherds (ostraca). Of the Greek material, I have made use mostly of a large mid-3rd c. B.C. corpus detailing economic transactions directed by Zenon, the slave-manager of the estate of one of Ptolemy's officials. Zenon frequently discusses in detail commodities, prices, measures, and trade routes and so opens a rare window onto (post-Persian period) trade. Finally, Persian period Greek inscriptions on stone offer an unparalleled glimpse of day to day life, death and legalities. Of particular value for commodity studies are the inventories of the dedicatory objects from various sanctuaries, especially those in Attica and on the island of Delos. These lists catalogue sometimes odd collections of objects, e.g., ear-shaped glass trinkets, but tend to do so in a highly descriptive manner.²⁷

²⁷ The inventory lists have been the subject of a number of recent studies which include text, translation and detailed commentary: Linders (1972) on the lists from the sanctuary of Artemis

B: Semitic Sources

The written Semitic sources for the Persian period are much poorer in number and variety when compared to the Greek sources; and these few texts are often much more problematic. The cultural and linguistic map in the Levant was not as homogenized as it was in the Aegean; the written sources appear not in one language, e.g., Greek, but primarily in three closely related, discrete languages: Biblical Hebrew, dialects of Aramaic, and Phoenician. Since it is the smallest corpus, we'll consider the Phoenician material first.

From the Phoenician homeland, Cyprus, Asia Minor, Egypt, and surprisingly the Aegean, several dozen Phoenician inscriptions from the Persian period remain. Most of these are very short—one or two lines--and are primarily dedicatory or funerary in nature, carved on steles or sarcophagi. In addition to this corpus, there are scattered notes and inventories written in ink on ostraca. Since the topical range of these inscriptions is rather limited, only a few are of use for this study, the bibliography for which is noted. Otherwise, Krahmalkov's recently published Phoenician/Punic dictionary (2000) and grammar (2001) provide updated readings for many of the Phoenician texts, and also serve as a general guide to the corpus.

As might be expected from the use of (Imperial) Aramaic as the language of Persian officialdom, Aramaic writings form a significantly larger body of

Brauronia (Attica); Aleshire (1989) on the lists from the Asclepion sanctuary (Athens); Harris (1995) on the Athenian Parthenon and Erechtheion lists; and Hamilton (2000) on those from Delos. Not all epigraphic evidence is so well presented: of great frustration even to the initiated, the general corpora of Greek inscriptions follow a system of organization and reference that is difficult to penetrate. Rather than attempt an explanation, I refer concerned readers to the clear and useful survey of epigraphic publications provided by Woodhead (1959, chp. IX), although one needs to be aware that this survey is sorely in need of an update due to the several new volumes and series of publications which have appeared since. For these newer publications, my bibliography and footnotes can provide guidance.

material.²⁸ These include not only dedicatory and funerary inscriptions and ostraca, but also collections of personal letters, contracts and other legal documents, inventories, tax records, and the like. Many of these latter texts, written on papyrus or skins, are dated (month, day, year) and most are associated with specific Jewish communities residing in Egypt. Although the Aramaic texts from elsewhere in the Near East are still scattered in various publications, nearly all those from Egypt have been collected by Porten and Yardeni in their four volume *Textbook of Aramaic Documents from Ancient Egypt (TADAE)*. This immensely useful set presents lifesize facsimiles of the documents, transcriptions into Hebrew characters, translations into modern Hebrew and English, and in some of the volumes, an English-Aramaic dictionary. No commentary is provided in *TADAE*, since the authors plan to produce a larger more definitive study which will include commentary, but their notes guide readers to earlier scholarship on the various texts.

One of the longest and, for this study, most important of these Aramaic documents is a customs account from an unnamed port in Egypt, likely dating to 475, which records a year's worth of tax intake in silver, gold, and kind from incoming Greek and Phoenician vessels (*TADAE* III.C3.7). The document was discovered by Porten and Yardeni in the early 1990s as a palimpsest in their study of the Ahiqar tale written over it. No single title for the customs account has yet been adopted by scholars; here I follow the growing trend in calling the text the "Ahiqar customs account," *vel sim*. Commentaries on the document are slowly beginning to appear, the most important of which are Yardeni's (1994) and Briant and Descat's (1998).

²⁸ The Biblical and Talmudic Aramaic texts will be discussed in conjunctions with Biblical Hebrew.

In using the Hebrew Bible as an historical source, one faces many of the same problems encountered in using Homer. The dates of the texts are mostly unknown and contested, the mythological/religious context can skew historical accuracy, and interpolations and redactions through the centuries have introduced anachronisms and inconsistencies. Perilous as it may be, however, the Old Testament, which forms the largest and most complete body of Semitic textual material for this period, is a critical source and provides at times the lone piece of evidence for a commodity. For this reason, I have relied on the Old Testament as source quite heavily, but in doing so I have availed myself of as many opinions, old and new, on a citation as possible in the hopes of solidifying its use here. Many of the more frequently cited texts in this study likely were composed during the 6-4th c., e.g., Ezra-Nehemiah, Jonah, Job, and Isaiah.²⁹ Other important texts, like the Song of Songs (Canticles), some Psalms and Proverbs, may have been composed during the Persian period but this is far from certain, and still other texts--those of the Pentateuch and the historical books (e.g., Chronicles and Kings)—have been so heavily worked and reworked that determining dates for all but a few sections of the texts is impossible. Without going into detail on these matters, I suggest readers turn to Ackroyd (1988, 1990) and Rouillard-Bonraisin (1994) who offer useful surveys on the dating and use of the Biblical texts with an eye specifically towards Persian period historical studies.

The most frequently cited Biblical text in this study is Ezekiel 27, which includes a catalog of the goods shipped in and out of Tyre. *Communis opinio* dates the text to ca. 600-580, to the period immediately before the Babylonian conquest of the Levant; aside from the date, however, there is little else that scholars agree about concerning this text. Its importance as a record of trade and

²⁹ For the dates of the Biblical texts I have generally relied on the *Anchor Bible Dictionary* (ABD, s.v., the individual books) and the specialized studies on the individual books in the Anchor Bible

commodities cannot be overstated, but what the text actually says is often unclear. The vocabulary used to describe the system of exchange appears nowhere else in the Bible; much of the commodity vocabulary is similarly rare. Any study making use of this text therefore must do so with extreme caution, must avoid general translations, and must compare assiduously the many opinions on most every word and line within the Hebrew text.³⁰ Because opinions on the text can be so diverse, one often is forced to choose sides, and generally—though not always—I have sided with Greenberg (1997) as the most sensible of the major commentators. Other secondary material is cited in the discussions that follow.

Other texts related to the Hebrew Bible that I have made occasional use of include the Septuagint (abbreviated LXX) and the Talmud. Commentators rarely find the LXX, a ca. 3rd-1st c. B.C. translation of the Hebrew Bible into Greek, accurate in regard to the translation of specific commodity-related terms, e.g., gems, textiles, etc. This may have been due to the lack of a suitable or exactly corresponding word for the item in Greek, or, perhaps more frequently, there was uncertainty about what the Hebrew or Aramaic terms actually meant. For this reason I limit my use of the LXX to mostly (adversative) comparanda. The Talmud, a title which refers to a large body of commentary on the Mishnah (post-biblical Jewish oral law), was compiled in Palestine and Babylonia (thus the discrete Palestinian and Babylonian Talmud) starting in the 3rd c. A.D. Much like the later Greek encyclopaedias mentioned above, the Talmud, for this study, is useful for providing context and definitions for rare terms, as well as cultural information for earlier periods. Steinsaltz's *The Talmud: A Reference Guide* (1989) is useful for navigating the corpus. Although not yet completed in its

series.

³⁰ I say this mostly as a warning to Classical scholars, who, e.g., Foxhall, 1998, tend to use Ezekiel 27 without caution, and in poor general translation.

entirety, the English version of Steinsaltz's edition of the Talmud is also the most accessible and lucid for non-specialists.

The sources for material evidence, e.g., archaeological reports and specialized artifact studies, are generally more accessible than the textual sources. Nevertheless, two lesser known subfields of material studies employed here, Nautical Archaeology and Numismatics, deserve some comment. The science of recovering ancient shipwrecks in a controlled archaeological excavation is still young, and is best practiced today by the various national and foreign archaeological teams working in the Mediterranean where the science was first developed 40 years ago. Shipwrecks can offer a rare snapshot of what was being traded and how it was being transported at the moment of the ship's demise. What is far more difficult to determine, however, is the nationality or ethnicity of the ship and its crew, and the starting point and intended end points of the final voyage. Athenian ceramics found on a wreck of the coast of Cyprus, for example, are not sure proof that the ship and crew was Athenian, sailing from Athens to the Levant. In antiquity, as is often the case today, crews, vessels and cargoes were multi-national, and without a manifest or ship's log to tell us, determining the ports of call and the routes followed is mostly guess work. Therefore, the claims made by archaeologists concerning the nationality of the ship and crew and the routes of the final voyage should be carefully scrutinized, as should the artifacts and methods used to date the wreck. Not all wrecks, excavations, and reports are of equal quality.³¹

Furthermore, most of the shipwrecks excavated to date were first located underwater by visual survey. As shipwrecks disintegrate over the course of time, it is mostly the inorganic portions of the cargo which remain visible on the surface of the seafloor. The evidence of shipwrecks therefore is mostly skewed towards

³¹ See Gibbins, 2001, on the perils of shipwrecks as evidence for ancient trade.

those that were carrying predominantly inorganic cargoes, such as stone, metals, ceramic containers, etc. No survey has yet to locate an ancient grain-ship or timber-ship, or any other ship carrying perishable wares; these must have been as numerous as those carrying inorganic cargoes. As bountiful as shipwreck evidence can be, it does have its specific limitations. Parker's (1992) catalog of all ancient Mediterranean shipwrecks known up to the date of publication is an indispensable storehouse of bibliography, wreck descriptions, and artifacts. Updated information and bibliography can be found at the Institute of Nautical Archaeology website (www.ina.tamu.edu), and in the *Encyclopaedia of Underwater and Maritime Archaeology (EUMA)*.

Most numismatic evidence, on the other hand, comes not from controlled excavations, but from the chance discovery of hoards buried in antiquity for any number of reasons.³² Since most of these finds reach scholars by following shadowy paths, little is ever known about the exact find spots or even region where the coins were found. The hoards therefore bear titles like "Iraq, 1973," which indicate what is known about its origins and the date when it first appeared on the international market. The authors of *The Inventory of Greek Coin Hoards (IGCH)*, another indispensable publication which appeared in 1973, attempted to catalog all the hoards and their contents known at that time. Since then, the ongoing publication *Coin Hoards (CH)*, the ninth volume of which is due out soon, has provided continuing updates. For a catalog of Persian period hoards from the Levant and Egypt but focusing mostly on Phoenician issues, J. Elayi and A. Elayi's (1993) study offers extensive commentary and bibliography on previously known hoards, as well as newer material.

³² A good essay on the limits of what can be known about and from coin hoards can be found in Howgego (1995), a volume which is also a very good introduction to numismatics generally.

One other collection of secondary literature has proven immensely valuable for my study: the French journal *Transeuphratène* and its many supplements. As a publication devoted solely to multidisciplinary studies focused on the Persian period 5th Satrapy, the journal provides, in addition to its regular contributions, frequent bibliographic review articles on specific topics, such as Cypriot archaeology, Phoenician coinage, and Aramaic inscriptions. For any Persian period Levantine topic, *Transeuphratène* should be consulted, as should Briant's annotated bibliography project, *Bulletin d'histoire achéménide (BHACH)* now in two volumes and also available on the internet (www.achemenet.com).

CHAPTER ONE

Raw and Semi-processed Commodities: Vegetable (Spices, Foodstuffs, Wood)

INTRODUCTION

As will shortly be seen, the range of commodities presented here is not easily broken into cohesive groups or even sub-groups. I have followed more traditional major groupings of commodities, such as raw or semi-processed materials vs. manufactured, and even some traditional sub-groupings, such as dividing raw materials into (mostly) vegetable, animal, and mineral sub-groups. One difficulty with divisions of this sort, however, is that they can impose unnatural collocations of commodities. It seems better, for example, to include the purple dye extracted from marine molluscs (i.e., animals) with other (vegetable) dyestuffs than under a purely animal rubric. Grouping foodstuffs, animal or vegetable, under one heading likewise seems more natural, as does grouping live animals and slaves under their own title rather than trying to fit them into some other category. Hence, the categories that follow and the materials found therein are based not only on composition but also partly on use.

As noted in the Introduction, the commodities are presented not so much as an annotated catalog, but as a series of mini-essays. The reasons for this are that many of the commodities have been the subject of extensive discussion, e.g., scholarly disputes as to an item's botanical identification, geographic origin, and

so forth. I have found the essay-form the best way to engage in this discussion, to present the previous scholarship and my own views. Also, not every possible commodity receives its own title. For example, the spices balm, bdellium, myrrh and *staktê* are all discussed in one section rather than separately since they all appear to be derived from one genus of plant species. Where it seems that there has been confusion, both in modern scholarship and in ancient use, between one or more commodities, even if they are not necessarily related by composition or use, I have discussed them together rather than risk losing focus due to arbitrary divisions.

Finally, as noted before, there is not always Persian period evidence for the trade in a commodity presented here, nor, for some of the commodities, can we be certain that they were in fact traded east to west, or vice versa. Again continuity must be kept in mind; evidence from eras before and after might indicate the unabated trade of an item during the Persian period. By throwing the net wide, I hope to expand our (limited) view of commodities in trade.

The tables found in Appendix One summarize in condensed form the origins, dates, and types of evidence for each commodity; table 1 also includes page numbers so can be used as a map for navigating through the essays that follow. Also, since there is a fair amount of cross-referencing in the footnotes between the chapters, I have maintained continuous footnote numbering in chapters one through five in order to make locating particular footnotes easier.

I.1: SPICES

These are not spices in our sense of table condiments only, but rather the traditional sense, which includes salt and pepper, as well as perfume ingredients and incense;¹ manufactured perfumes will be dealt with separately below. The trade in raw spices, throughout the history of the Mediterranean and the lands immediately adjoining it, often appear to be at the core of trade writ large. It is probable that (Arabian) spices passing through the Levant were among the most important commodities in Levantine-Aegean trade,² and so are among the most frequently mentioned commodities in our sources. The spices are arranged, as the evidence allows, according to origin. The first group consists of those spices from the Arabian trade, the second are those likely reaching the Mediterranean overland from Persia/Babylonia, and the third group are those with a general Levantine origin.

Group One: Arabian Trade

Frankincense

There is little question that frank-incense, i.e., "true"-incense (Grk: *libanos*; Heb. *lebonah*; Phn. *lbn*)³, was the keystone commodity of the ancient

¹ Miller (1969, 1) provides an informative discussion of the etymology and various meanings of "spice."

² In reference to the Roman trade with the east, Raschke (1978, 650) states: "There can be little doubt that the most important commodity imported from the East was spices." The same might have been true for the Persian period.

³ Where there is evidence, I provide the known words for the commodities transliterated from Linear B, Greek (Grk.), Hebrew (Heb.), Aramaic (Aram.), Phoenician (Phn.), and South Arabian dialects (SA). In order to make the vocabulary as widely accessible as possible, I transliterate all words; the systems of transliteration used, while they may not make some specialists happy, are

Arabian spice trade, the most important spice reaching the Mediterranean in terms of quantity, and commercial and social value.⁴ There is, it is safe to say, universal acceptance that the frankincense of antiquity was produced by one or more species of *Boswellia* Roxb., a smallish tree found today in South Arabia, East Africa, and even India.⁵ Because of the importance of this commodity, it has received a great deal of scholarly attention, elucidating much of the frankincense trade. The production and initial trade of the tears of resin was likely, in the Persian period, a monopoly of the South Arabian kingdom of Hadramawt.⁶ Once in transit, many of the (sealed) sacks of gum reached the Mediterranean by stages, either entirely overland through Arabia, or partially over water to various Red Sea ports, like Ezion Geber (modern Aqaba/Eilat).⁷ From northern Arabia and

meant to make the vocabulary more readily accessible. I should also note that for the spelling of Greek authors, works and even localities, I use the traditional, and familiar, Latinized forms despite the growing fashion for rendering them in a more “correct” transliterated way. “Aiskhylos,” for example, might not be recognized as “Aeschylus” by all readers.

⁴ Groom’s (1981, 160-161) figures for the scale of the Roman frankincense trade are impressive (up to 1,700 tons of frankincense and 600 tons of myrrh per year), and show that at most times the quantity of frankincense shipped north was around five times that for myrrh. Other sources also indicate a similarly large scale of trade for the Persian period. Herodotus reports that the Arabians paid 1000 talents (ca. 30 tons) of frankincense per year to the Persian king (of which 300 talents was burned by Datis on Delos in 490; Hdt. VI.97); when Alexander took Gaza in 332, he found there 500 talents (ca. 15 tons) of frankincense and 100 talents (ca. 3 tons) of myrrh (Plutarch, *Alex.*, 25); Vickers (1994, 231, n.5) calculates that at least 129 tons of frankincense and myrrh were taken from the Nabateans in 312 B.C. For the social and religious value of frankincense in the Levant and Aegean, see Detienne (1977) and Nielsen (1986).

⁵ *B. carterii* Birdw. and *B. frereana* Bridw. are the two primary South Arabian species, while *B. Bhau-Dajiana* Birdw. is found in east Africa.

⁶ Van Beek, 1960, 73.

⁷ Zenon (*P. Cair. Zen.* 59069) mentions sealed sacks of frankincense. Van Beek (1960, 75) is quite right to note that “at no time was there one single incense route, as most explorers of Arabia have assumed.” Jer. 6:20 and Isaiah 60:6-7 speak of camel caravans bringing incense from the land of Sheba, i.e., (southern?) Arabia; also see Kitchen, 2001. Crone (1987, 22ff.) is of the opinion that most of the northward trade was not overland, but maritime, a theory which de Romanis (1996, chp. I) vehemently disputes. Excavations at Tel el-Kheleifeh, situated today on the border between Israel’s Eilat and Jordan’s Aqaba, uncovered numerous vessels with Aramaic, Phoenician

Aqaba/Eilat, two primary roads led to the Mediterranean, one towards Gaza, the other likely following the King's Highway towards Damascus.⁸ From the outset of the journey, the trade north seems to have been largely in the hands of (South) Arabians, but once the sacks reached the coastal cities of the Mediterranean, a change of hands took place.⁹ Largely independent of Persian and Phoenician hegemony, Gaza, and the other southern Levantine cities, like Ashkelon, grew enormously wealthy, no doubt in part because they served as outlets to the Mediterranean for Arabian and Far Eastern spices.¹⁰ There seem to have been other outlets as well: even after Herodotus' digression on the strange method of frankincense's procurement in Arabia (III.107), Greek tradition knew of frankincense (and myrrh) as "Syrian."¹¹ This suggests that large quantities of incense reached the Phoenician cities overland by way of Damascus, or that it was mostly Phoenician ships that delivered it to the Aegean, which might have conveyed certain styles of incense burners as well.¹²

Some Mediterranean-region frankincense and myrrh trade likely began as early as ca. 1500, when Hatshepsut returned from Punt (Somalia?) with quantities

and South Arabian inscriptions dating from the 8-4th c., indicating some seaborne trade with Arabia (Practico, 1993).

⁸ On the northern roads, Ashtour, 1995, and Müller, *RE*, Suppl. XV, s.v. Weihrauch, cols. 723-724.

⁹ The presence of South Arabians in the Levant during the Persian period, presumably there as traders in spices, is attested by numerous inscriptions, ostraca, and the like (Lemaire, 1997; Van Beek, 1972). The problematic clay stamp with South Arabian characters found at Bethel in the 1960s and thought to date to the 9th c. is best left out of the discussion; Crone (1987, 16, n.16 and 17) offers a sober discussion on the stamp and has done a great service by collecting all of the relevant bibliography up through 1987.

¹⁰ Katzenstein, 1994; Humbert, *et al.*, 2000.

¹¹ E.g., Hermippus, *apud* Athen. I.27f; see also Müller, *loc cit.*, col. 709 for further references.

¹² Zaccagnino (1998, 69) suggests that one of the earliest forms of Aegean incense burners was transmitted by the Phoenicians.

of incense resin, and possibly seedlings of myrrh trees.¹³ References to myrrh continue throughout the (Late) Bronze Age (see below), frankincense, however, is more rarely attested. In the early Iron Age, the use of frankincense is often noted in the Old Testament and is attested by incense altars found in the Levant and on Cyprus.¹⁴ However, to borrow a phrase from Dumbrell, there seems to have been at the beginning of the Persian period, a "great awakening of South Arabian incense traffic."¹⁵ The first Aegean notice of frankincense is found in a lyric fragment of Sappho (frg. 44, L.-P.), the early 6th c. East Greek poetess.¹⁶ By the 5th c., references to the use of frankincense in Semitic and Greek texts are as abundant as the altars and *thymiateria* on which the incense was burned, known from archaeological contexts and from artistic representations (e.g., in vase paintings).¹⁷ The consumption of frankincense grew to such proportions throughout the eastern Mediterranean that it seems to have become a staple of

¹³ Van Beek, 1960, 72; Raschke, 1978, 652.

¹⁴ On earlier Iron Age incense burners in the Levant and Cyprus, see Gitin, 1989.

¹⁵ 1971, 43.

¹⁶ Fr. 44 is one of the longer extant fragments of Sappho that we have, which tells of Hector bringing Andromache home to Ilium (Troy) to be his wife. On Hector's arrival at Ilium with Andromache, amid the celebrations, *myrra kai kasia libanos t' onemeikhnyto* (ln. 30, "myrrh and cassia and frankincense were mingled"). The context is noteworthy, both for the use of the exotic spices in an elite celebration, and for their use at Ilium, the epitome of the "eastern" kingdom in early Greek thought. To Sappho and her audience, these spices no doubt represented a particular eastern flair, luxury, and sophistication which East Greek society was aspiring to obtain, especially by the use of imported exotica. Also see Masson (1967, 53-54) on the early Greek evidence for *libanos*.

¹⁷ Müller, *loc cit.*, has collected and discusses a great many of the Greek references, Nielsen (1986) the Old Testament references. Phoenician *lbn* may also be attested this early, cf. *KAI* 76. For Persian period incense burners in the Aegean, the most comprehensive study is Zaccagnino, 1998, who collects and discusses the archaeological, artistic and literary references. Also note Harris's comment (1995, 114) that incense burners are one of the largest numbers of vessels inventoried in the Parthenon and Erechtheion accounts of the late 5th c. For Levantine incense burners, see Stern, 1982, 182ff.; Singer-Avitz, 1989; Khalil, 1986; and Hachlili, 1985.

everyday private and religious life.¹⁸ One suggestion, in fact, for the purpose of Necho's (610-595) canal to link the Red Sea and the Nile was to facilitate the transport of incense to Egypt for use in state ritual.¹⁹ Although frankincense also found use in medical treatments,²⁰ and to a limited degree in cosmetic applications, it was not a primary ingredient, as myrrh was, in perfumery and perhaps not one in mummification (cf. Hdt. II.86). It was also a commodity that was frequently adulterated and imitated.²¹

Myrrh, Balm, Balsam, Bdellium, Staktê

Twenty-nine species of scraggy, thorny trees of the genus *Commiphora* (formerly *Balsamodendron*), native to East Africa, Arabia and India produce oleo-gum-resins known in antiquity (and today) by the names balm, balsam, bdellium, myrrh and *staktê*.²² While the correlation of these ancient spice names with the genus *Commiphora* is generally accepted, the determination of the specific species has been and still is a matter of dispute.

Myrrh (Grk *smyrna*, *myrra*; Linear B *MU(?)*; Heb. *mor/mōr*; Aram. *mōr*; Phn. *mr*), is one of the better-known *Commiphora* products and also one of the oldest known. As noted above, Hatshepsut's voyage to Punt ca.1500 returned with a cargo of the gums and saplings. Semitic *mr* is also attested for the first

¹⁸ See Müller (*loc cit.*, 752-57) for a discussion of its uses in the Aegean and Nielsen (1986) for its uses in the Levant.

¹⁹ Lloyd, 1977, 144.

²⁰ Müller (*loc. cit.* col. 768) discusses the evidence from the Hippocratic corpus.

²¹ Müller (*loc cit.* col. 736) notes that Juniper resins were sometimes used as imitations.

²² Serpico (2000, tables 18.3 and 18.4) lists 21 of the species and their distribution.

time in the second millennium in documents from Ras Shamra.²³ Closer in time to the Persian period, however, the first appearance in Greek of what is clearly a loan word (from a Semitic root meaning “bitter”), occurs in the early 6th c. East Greek poets Archilochus (frg. 30, 31 Bergk) and Sappho (frg. 44 L.-P.). In addition to the many medical-use references in the Hippocratic corpus, 5th c. citations of *smyrna/myrra* by Greek authors (e.g., Hecataeus, Euripides, Sophocles, Herodotus, Aristophanes), while not as abundant as those from the 4th c., are frequent enough to show that, like frankincense, myrrh was also a commodity of daily life in the Aegean.²⁴ Its use as an incense in ritual,²⁵ an incense for symposia,²⁶ as an ingredient in perfumed ointments,²⁷ drugs (Hippocratic corpus, *passim*), and spiced wine,²⁸ is generally parallel to its use in the Levant.²⁹ Unlike the Egyptians and peoples of the Levant, however, the Greeks did not use myrrh in the preparation of their dead.³⁰

Herodotus (II.106ff.) explicitly states that the myrrh he knows is a South Arabian product. Scholars therefore have been keen to identify Classical myrrh with *C. myrrha* Engl. (= *C. molmol* Engl.), a common South Arabian

²³ Zohary, *IDB*, s.v. Myrrh.

²⁴ Knowledge and use of myrrh (Linear B *MU*) in the Aegean may go back to the Mycenaean period, cf. Shelmerdine 1985, 23. But see Palaima (1991, 293-94) for arguments that *MU* may in fact be a unit of measure.

²⁵ Soph. frg. 340N; Eur. *Ion*, 89, 110.

²⁶ Arcestr. *apud* Athen. III.101c.

²⁷ Ar. *Eq.* 1332; Hyper. III.6; cf. Athen. XV 687a.

²⁸ Arist. *apud* Athen. XI 464c-d.

²⁹ Ritual, Exod. 30:23; perfume, Cant. 5:5; Ps. 45:8, etc.; in wine, Cant. 8.2? See Pope 1977, 505 on myrrh and other spices mixed with wine in the Levant. Aristotle (*apud* Athen. XI 464 c-d) claimed his “Rhodian Cups,” i.e., spiced wine, would mitigate the effects of drunkenness. In Mark 15:23, the myrrh-mixed wine offered to Jesus on the cross would presumably act as an anodyne. On myrrh’s pain killing properties, also see Freese, 1996.

³⁰ For Egypt, see Hdt. II.86. A recently found Phoenician inscription of a 5th c. Byblian king, lists myrrh as one of the two spices used for his embalming, see Cross, 1979.

Commiphora species, also found in Somalia and Ethiopia, which produces a mildly scented, hard translucent yellowish resin. But such exactitude is impossible: three other *Commiphora* species are found in South Arabia (*C. habessinica* = *C. abyssinica* Engl.; *C. kataf* Forsk.) which also exude scented resins. Moreover, the provenance of myrrh may have shifted at various times in antiquity, which would no doubt have determined which species of *Commiphora* was in primary use as “myrrh.” By the time of the *PME* (ca. 1st c. A.D., cf. §7), East Africa (over 12 species of *Commiphora* known), not South Arabia, was the major myrrh exporting region, which also may have been the case much earlier when Hatshepsut visited Punt. For the Persian period, southwestern Arabia was probably the provenance, but of this we cannot be sure.³¹ Myrrh therefore is best taken as a general term for any number of the South Arabia/East African *Commiphora* species.³²

One definition offered for Greek *staktê* is “oil of myrrh,” meaning that this too would be a *Commiphora* spp. product.³³ While the association of the word *staktê* with perfume in Classical period authors is amply attested, rarely is it made explicit that myrrh oil specifically is the item of reference (e.g., Plato, *Criti*, 155a; Ar. *Pl.*, 529). As the form *staktê* is derived from *stazein*, “to drip,” the word could well be associated with any liquid perfume, not necessarily myrrh oil. The LXX translates the Hebrew *naṭaf* (a *hapax legomenon*, Exodus 30:34; from a root

³¹ cf. Van Beek, 1960, 73.

³² For the identification of myrrh, see Amigues, 1996b, 674; Eigler and Wöhrle 1993, 92; Groom 1992, 153-54; Crone 1987, 13; Hill 1952, 173; Miller 1969, 104; Serpico 2000; the identification of myrrh with *Cistus incanus* (*ABD* II.812) on the grounds that myrrh is Hebrew *lot* is totally unfounded; see below.

³³ Thphr., *Od.* 29, where *staktê* is both a natural product of the myrrh tree as well as a manufactured perfume using myrrh resin as a primary ingredient.

also meaning “to drip”) as *staktê* as it does a more commonly attested perfume, *lot*.³⁴ In Hebrew there may not have been a specific word for “oil of myrrh.”³⁵ In Greek, *staktê*, may have come to mean such by long association.³⁶ Nevertheless, trade in myrrh oil began at least by the Late Bronze Age and continued at a considerable volume well beyond the Persian period.³⁷

As “myrrh” may have been a general term for a number of *Commiphora* spp. resins, the same is unquestionably the case for bdellium (Grk *bdellion*; Heb. *bedolah*; Aram. *bedolah*; Phn. *bdlh*); here though the range of *Commiphora* spp. includes those found further afield in India in addition to those of East Africa and Arabia. Even so, for today’s bdellium *C. mukul* Hook. (= *C. wightii* = *C. roxburghii*) is generally favored; the same species is often said to be ancient bdellium as well.³⁸ Although the word appears in Greek as an obvious loan word,

³⁴ While both *lot* and *naṭaf* have been identified as *C. myrrh*, other suggestions for *lot* include *Cistus creticus*, “lotus” or “ladanum” (*IDB*, s.v., Flora, 7j, “Myrrh”; Jastrow, *Dictionary*, s.v.; *HAL*, s.v.; *DCH*, s.v.). Zohary (1982, 192; Jacob and Jacob; cf. also *ABD* II.806, s.v. Flora, s.v. Storax) also suggests that *naṭaf* could be storax, another perfume/spice often found in liquid form. Serpico (2000, 437), claims storax for Greek *staktê*, arguing that for myrrh it is impossible to separate the volatile compound by pressing. But, as Theophrastus explicitly states (*Od.* 29), one (of two) forms of myrrh-*staktê* is a distillate made by boiling with oil of balanos. This manufactured *staktê* may have been produced close to the trees themselves, as was later the case (*PME* §24).

³⁵ Esther 2:12 spells out *shemen hamor*, “oil of myrrh,” rather than using a word such as *naṭaf*. See also Müller, 1997, 198. Cf. Arabic, *duhn al-balasân*, “oil of balsam.”

³⁶ The scholia *ad Ar.*, *Plut.* 529 (Da and Db) note that there are three and four forms of myrrh respectively: *staktê*, *pastê*, and *ranta*; Db has *khyta*, *staktê*, *rhantika* and *hygra* (“poured, dripping, flowing, liquid”). Theophrastus (*HP* IX.4.10) states that myrrh is found in two forms, fluid (*staktê*) and solid (*plastê*).

³⁷ “Myrrh-scented” oil and myrrh oil are both listed in the catalogue of goods sent by Tushratta, Hurrian King of the Mitanni, to Amenhotep III. See Cochavi-Rainey, 1999, 81. In 205, the east Arabian Gerrheans effectively purchased their liberty from Antiochus III with, among other goods, 100 talents of *staktê* (Polyb. XIII.9).

³⁸ Serpico 2000, Table 18.4; Miller 1969, 69.

the loan likely did not take place until well past the Persian period.³⁹ No 5th or 4th c. Greek author uses the word *bdellion*, although the word, in its Semitic forms, was to some degree current in the Levant at the time. The word is found twice in the Hebrew Bible, Gen. 2:12 and Num. 11:7, in contexts that make the nature of the material, let alone the species of *Commiphora* uncertain. Some modern biblical commentators, following the LXX translators (*anthrax* at Gen 2:12 and *krystallos* at Num 11:7), have argued for bdellium as a mineral or even pearly substance.⁴⁰ The LXX tradition is difficult to explain, but may simply have arisen from complete ignorance of the material in question, as is often the case with the LXX translators, especially if the Hebrew word was not well known. Less likely is the idea that the translators “refused” to render Greek *bdellion* for the Hebrew because of a question over the bdellium in context being medicinal or perfume.⁴¹

Bdellium during the Persian period was, as later, undoubtedly a spicy substance, likely a *Commiphora* spp. gum. Despite the confusion with the LXX translations of the Hebrew word, the Phoenician version appears in a context that is clearer, on a 5th c. sarcophagus from Byblos.⁴² The unnamed king placed in the sarcophagus on which the inscription was written declares that he lies *bmr wbdl[h* (“in myrrh and bdellium”), the second obviously a spice of some sort.⁴³

³⁹ The first mention in Greek may be Dsc., 1, 67/80, written at about the same time as the *PME*, which also frequently mentions *bdellion*.

⁴⁰ *IDB*, s.v. Bdellium and s.v. Flora, 7c. Jastrow, *Dictionary*, s.v. *bedolah*, hedges with the translation, “name of a jewel, also of a gum.”

⁴¹ So Crone (1987, 68) argues.

⁴² Cross 1979, 41

⁴³ Note John 19:39-40, where the body of Jesus is prepared for burial with myrrh and aloes.

If in fact the bdellium here was like myrrh also a *Commiphora* spp. gum, the distinction noted between the two in this inscription is of considerable interest. Groom has suggested that bdellium was the name given to any number of gum resins of *Commiphora* more strongly scented than myrrh;⁴⁴ therefore the distinction may only be qualitative between two relatively identical substances.

In modern parlance, besides *C. mukul*, types of bdellium are said to come from at least four other East Africa/South Arabia *Commiphora* species, some of which also produce a gum erroneously called opopanax.⁴⁵ *C. mukul*, however, is not an East African/South Arabian *Commiphora* species, but one limited to certain parts of northwest India.⁴⁶ The connection between *C. mukul* and bdellium is made somewhat explicit in medieval Arabic and Aramaic botanical works, where *mukl*, a resinous gum, is said to be identical to Indian bdellium and not Arabian myrrh;⁴⁷ this connection inspired the modern designation *C. mukul*. While the distinction between bdellium and myrrh was perhaps mostly qualitative, there might also have been, as Groom suggests, a long standing recognition that bdellium (or a type of bdellium) came from India or nearby regions.⁴⁸ Pliny claims that the best bdellium hails from Bactria (XII.19.35f.),

⁴⁴ 1981, 123.

⁴⁵ Serpico 2000, Table 18.4; Groom 1992. For opopanax see below.

⁴⁶ See Karttunen 1997, 153, who argues for bdellium as an Indian spice.

⁴⁷ The material is collected and discussed by Crone 1987, 67ff. It should be noted that there is equally a great confusion concerning the Arabic term *mukl*, which can mean both the fruit of a particular type of palm tree, as well as the gum. Note too that Bar Bahlul speaks of a *mukl al-luhūd* (quoted in Löw, *Pflanzennamen*, 359), which may be a reference to Judean balm. If so, *mukl*, would seem to be as much a general term as is bdellium for *C. spp.* gums.

⁴⁸ Potts (1990, I, 344), for example, discusses a 7th c. Assyrian text (*ABL* 791) that records among other things 126 talents (nearly 5 tons) of bdellium as tribute from Dilmun in the Persian Gulf; this bdellium may have been shipped to Dilmun from India.

which Miller has identified as *C. mukul*.⁴⁹ Hort sought to identify Theophrastus' *akantha hê Indikê* (*HP* IX.1.2), said to have a gum resembling myrrh, with *C. mukul* as well.⁵⁰ Further connections with *C. mukul* have been noted in commentaries on a passage in Arrian (*Anab.* VI.22.4, quoting Aristobolus) that recounts Phoenician traders in Alexander's train collecting an abundant local "myrrh" (*smyrna*) in Gedrosia.⁵¹ These suggestions by Hort and Steier do raise the possibility that while the word "bdellium" may not have been widespread in the Aegean before the 1st c. (B.C.), the substance could have been. As Pliny's account of bdellium indicates (XII.19), there were many kinds of bdellium known (in some cases perhaps not products of *Commiphora* spp.⁵²), by different names, from different eastern regions (e.g., Arabia, India, Media). One of these may have seen use in the Aegean during the Persian period, but how it might have been called is unknown. Indeed, it would not be surprising if one of these kinds of bdellium was known to the Greeks simply as myrrh, as might have been the case with balm and/or balsam.⁵³

⁴⁹ Miller 1969, 70

⁵⁰ 1949, II, s.v. *akantha* (4), Index of Plants; see also Miller, 1969, 3.

⁵¹ Steier, *RE*, s.v. Myrrha, col. 1141; Amigues, *Thphr.* III, 227.

⁵² Theophrastus (*HP* VII. 6.3) notes a case where some people call a gum of *hipposelinus* (*Smyrnum olusatrum?*), which looks like myrrh, but is not actual myrrh.

⁵³ I should also note another unknown "bdellium," *kankamon*, found in Dioscurides (I.24) and the *PME*. On South Arabia incense altars roughly dating to the Persian period, listed among the other spices are *kmkm* and *ḍrw*. Traditionally, *kmkm* was identified as Far Eastern copal, an amber-like hard resin produced by a number of species (Hill, 1952, 154-55). Casson (1989, 124-125), however, equates *kmkm* with *kankamon* and bdellium and suggests all are *C. erythraea*, or perhaps, *C. kataf*. Crone (1987, 54-55; see also Müller, 1997, 202) following an older suggestion of Conti Rossini, argues *kmkm* is the resin of *ḍrw*, identified as *Pistacia lentiscus* L., which in fact does not grow in Arabia or farther east. North of Arabia, attestations for both Semitic words and their loan words are late. Stol (1979, 52-53) offers a good discussion of this problem. Also see Nielsen (1986, 18) who follows yet another old line suggesting *ḍrw* is storax.

The balm or balsam of Gilead was a well-known export of Judea during the Iron Age; Judean balsam continued to be an important commodity well into the 18th c. A.D.⁵⁴ What the species of tree that produced the spice, or what the product was exactly is highly contested.⁵⁵ In the Old Testament, *tsori* appears six times, twice in Genesis (37:25, 43:11), and once in Jeremiah (46:11; here the connection with Gilead is made explicit) in contexts that make it certain that *tsori* had significant commercial value, especially in the export trade to Egypt.⁵⁶ Theophrastus' description of the "balsam growing in the valley of Syria," further elaborated upon by Josephus, tells of a product from two exclusive gardens in Judea near the Dead Sea.⁵⁷ Across the Dead Sea from Gilead, in modern En Gedi (Tel Goren) where Josephus notes one of the gardens was located, remains of a 6th c. perfume factory have been found, perhaps the royal factory which had access to the gardens.⁵⁸ Many have taken this "balsam of Syria" to be *C. gileadensis* (= *C. opobalsamum* = *Balsamea meccanensis*),⁵⁹ a transplanted native from Somalia and Ethiopia. The person responsible for introducing this non-native species to Judea, so the story runs, was none other than the Queen of Sheba when she visited

⁵⁴ See Milwright, 2001, for an account of the trade in the oil during the medieval period, when the spice was produced in Egypt from transplanted trees.

⁵⁵ Patrich and Arubas' (1989) analysis of the red liquid found in a 1st c. A.D. bottle near Qumran, and thought to be possibly the remnants of balsam, have proven inconclusive.

⁵⁶ It would seem that this trade continued well into the later Roman period, cf. Sperber, 1976, 143-44.

⁵⁷ Thphr., *HP*, IX.6.1ff; Pliny, XII.111; Str., XVI.2:41; Josph., *AJ*, IX.7; XIV.54; XV.96; *id.*, *BJ*, I.138; IV.469; Diod. Sic., II.48.9

⁵⁸ Mazar *et al.*, 1966. The earliest stratum, stratum V, is dated 630-585; seal impressions on jars and pithoi in Aramaic and Hebrew suggest a royal connection.

⁵⁹ Groom 1992, 23; Eigler and Wöhrle 1993, 82; Miller, 1969, 101.

Solomon bearing him gifts including incense and saplings.⁶⁰ From Theophrastus on, the Greek and Roman world knew of this Judean/Syrian balsam as an exceedingly fine and expensive product, rarely reaching the Greek world, so Theophrastus says, in an unadulterated state (*HP IX.6.4*).⁶¹ In fact the balsam was so desirable, he goes on to say, that prunings from the trees also could command a substantial price.⁶²

A connection between Theophrastus' royal balsam and the *tsori* mentioned in Genesis and elsewhere would be logical, but has won only moderate support.⁶³ Rather, some scholars have sought a connection between *C. gileadensis*, Hebrew *boshem*, and the etymologically related Greek word, *balsamos*.⁶⁴ In modern Hebrew, however, *boshem* means nothing more than perfume generally, and would seem to have the same connotation in Biblical Hebrew as well.⁶⁵ Others, brushing aside the tradition of the balm species being a

⁶⁰ I Kings, 10:1-13; II Chron. 9:1-28; Joseph., *AJ*, VIII.174. Thphr, *HP IX.6.1* also states that "balsam is said not to grow wild anywhere," i.e., the plant known to him was solely as a cultivar. Despite Stol's objections to this legend (1979, 51), transplanted spice trees, especially for the sake of royal gardens, was not such an oddity. See, for example, the claims of Ashurnasirpal II who had "myrrh producing trees" from the countries through which he marched planted in his gardens in Assyria (*ANET*, 558-560). The balsam that grew near medieval Cairo was said to have been produced from trees transplanted from Gilead; see Milwright, 2001, 7. Also note that later Greek, e.g., Agatharchides §97, Str. XVI.4.19, and Arabic writers mentioned a "balsam" (Arabic *balasân*) which grew along the Yemeni coast. It is unlikely, as Crone (1987, 63-64) argues, that the Arabic *balasân* and Judean balsam were the same species, if in fact they were of the same genus.

⁶¹ In later ages too pure balsam was a rarity; see Milwright, 2001, 9.

⁶² See Milwright (2001, 5) for the various ways of rendering spice products from the branches, berries and ashes of the plant.

⁶³ See Stol (1979, 50-57) for a concise and thorough discussion of the problems.

⁶⁴ Note, however, that Masson (1967, 77-78) is uncertain about the relationship between the two words.

⁶⁵ Brave attempts have been made to link *boshem* to one specific plant, e.g., Zohary 1982, 198. But the word, in the plural especially, clearly denotes generality. For example, I Kings 10:2, where *boshem* is a general term for spices brought by Sheba to Solomon. More telling is Ezekiel 27:22. Here the Sheban traders bring *rosh kol-boshem*, "the best of all *boshem*," again denoting

Commiphora transplant, have diligently searched for a native Judean species for *tsori*, suggestions include *Pistacia lentiscus* (actually not a native either) *Balanites aegyptica*, and even storax (*Styrax officinalnis*).⁶⁶ In sum, balm/balsam was likely another eastern *Commiphora* spp. traded in the Aegean, as Theophrastus explicitly tells us, and Ezekiel also implies.⁶⁷

Under whatever name it may have been, *Commiphora* spp. resins, perfumes, and powders were shipped from the Levant to the Aegean in quantity from the 6th c. on. Because of the expense and rarity of the products, there were no doubt hosts of adulterations and imitations found in Aegean and even Levantine markets, as there are today.⁶⁸ The scale of the westward trade is suggested by anecdotes (e.g., Athen. I.3e on Empedocles' sacrificial ox made of myrrh and frankincense) and historical accounts: in the aftermath of Alexander's conquest of Gaza, over 100 talents of myrrh awaiting distribution were found in storerooms.⁶⁹

generality. Also see Stol, 1979, 53 and Jastrow, *Dictionary*, s.v., *boshem*, where in Talmudic Aramaic the word means "spices, perfumes" generally. Also see *DCH*, s.v.; *HAL*, s.v.

⁶⁶ See, for example, Jones, *ABD*, s.v. Balm; Crone 1987, 63, n.74. By basing his arguments on Greek *rhêtinê* = *tsori*, Jones goes a bit too far in his equation of *tsori* with a *Juniper* spp. or *Pinus* spp. *tsori* as storax is tempting since Greek *styrax* may be a loan word based on *tsori* (Nielsen 1986, 52). Zohary (1982, 192), however, while he does equate *tsori* with storax, also notes that this storax in post-Biblical sources was also known as *ḳataf*. The root *ḳṭf* (s.v. Jastrow, *Dictionary*) has the sense of plucking or tapping, the noun, *ḳataf*, of a substance tapped, i.e., resin. Jastrow provides "balsam" as one definition. Also, the Arabic noun *ḳataf*, of the related root, was equated with a specific resin producing tree, *C. kataf* (cf. Löw, *Pflanzennamen*, 338). *Tsorias* storax as *kataf* as *C. kataf* brings us back to *Commiphora* spp.

⁶⁷ Ezekiel 27:17 lists commodities shipped from Judea to Tyre among which is the product *pannag*, a *hapax legomenon*, which commentators have traditionally translated as "balm." Stol (1979, 68ff.), however, suggests opopanax.

⁶⁸ Pliny XII.35.71, comments on the easy adulteration of "Indian" myrrh; Theophrastus as noted above also states that Syrian balsam never reaches the Hellenic world in a pure state. In my own experiences in the suqs of Yemen and Syria in particular, I have run across numerous substances sold as "myrrh" which were clearly not.

⁶⁹ Plut., *Alex.* 25; other references to outlandish displays of myrrh can be found in Steier's article, *RE*, s.v. Myrrha, col. 1145.

Cinnamon, Cassia, Malabathrum

The cinnamon (Grk: *kinnamômon*, etc.; Heb: *ķinamon*) and cassia (Grk: *kassia*, *kitto*; Heb: *ķiddah*, *ķesi'ah*) that we know today is the bark of the South Asian trees *Cinnamomum zeylanicum* Nees. and *C. cassia* Blume respectively. Malabathrum (Grk. *malabathron*), on the other hand, refers to the leaves of certain related trees native to India, *C. tamala* Nees. and *C. obtusifolium* Nees. Were it not for the comments of Herodotus and the Greek and Roman writers who followed him, who believed that these products originated in Arabia rather than the Far East, there likely would be little difficulty today in stating that ancient cinnamon and cassia are no different than ours.⁷⁰ As it stands, however, scholars who have dealt with this issue are irreconcilably divided between those who see cinnamon/cassia as Far Eastern imports and those who have searched for an Arabian/East African plant the ancients called “cinnamon” different from the cinnamon we know. The most recent and detailed treatments of the debate are found in de Romanis (1996) and the contributors to a 1995 conference held to discuss de Romanis’ then forthcoming book which focuses exclusively on the topic (see *Topoi*, 6.2 1996, pp. 649ff.); the symposiasts, especially Amigues (1996a, 1996b) and Goyon (1996), were largely not sympathetic to de Romanis’ conclusions that ancient cinnamon/cassia originated in Africa/Arabia. Briefly summarized, the arguments center on three major issues: (1) the etymology of the

⁷⁰ For the collected references see Fischer, *RE*, s.v., *Kinnamôphoros khôra*. Fischer (col. 482) concludes: “In Wahrheit aber ist der Zimt weder im Äthiopienlande noch in Arabien bodenständig; an beiden Küste wurde er aus dem indischen Ursprungslande, das als solche nur selten erwähnt wird (Strab. XV 695), importiert und hier nur umgesetzt, besonders in den Häfen der afrikanischen Küste.”

Hebrew (and Greek) words, (2) the botany of ancient cinnamon and cassia, and (3) ancient Indian Ocean and Red Sea trade and technology.⁷¹

There is no doubt that the Greeks borrowed the words *kinnamōmon* and *kassia/kitto* from one of the Semitic languages.⁷² Herodotus, the first Greek author to mention the product, knew of cinnamon as a Phoenician import, and claims the Greeks borrowed the word from the importers (III.111).⁷³ Cassia, on the other hand, was known in the Aegean several generations before that; Sappho (frg. 44, L.-P.) lists it among the other eastern spices frankincense and myrrh. In Old Testament books roughly contemporaneous with Sappho, cassia is mentioned numerous times primarily as a perfume ingredient (e.g., *ḵiddah*: Exod. 30:24; *ḵesi'oth*: Ps. 45:9).⁷⁴ Ezekiel (27:19) list *ḵiddah* along with *ḵaneh* (= calamus, see below) as imports to Tyre from Damascus, which lay along one branch of the road coming from Arabia.⁷⁵ Cinnamon (*ḵinamon*) is also found in the Old

⁷¹ Many of the arguments found in de Romanis and his detractors were treated already by Crone (1987, Appendix I, “The Provenance of Classical Cinnamon,” African/Arabian origins) and Casson (1984, Chap. 11, “Cinnamon and Cassia in the Ancient World,” Far Eastern origins). Still earlier Miller’s (1969, chp. 8, “The Cinnamon Route”) arguments for Indonesian cinnamon reaching the Mediterranean were categorically dismissed by Raschke (1978, 652ff.). Note: in most of the following section I use “cinnamon” to refer to all products from *Cinnamomum* spp.

⁷² Masson, 1967, 48-50.

⁷³ A fragment of 4th c. comic playwright, Mnesimachus (frg. 4, Kock), calls cassia “Syrian,” which might also imply Phoenician control over the westward cassia trade.

⁷⁴ The singular form of *ḵesi'oth*, *ḵesi'ah*, appears only once in the Old Testament as the name of one of Job’s daughters (Job 42:14).

⁷⁵ Ezekiel 27:18-19 is ripe with problematic readings; *ḵiddah* and *ḵaneh* are clear, but the source of the products is not. The two (or one?) words at the beginning of Hebrew line 19, *wdan wyawan*, have been taken by some as references to the Ionian Greeks (*dan* = Danaoi; *yawan* = Ionian). Alternatively, they have been read as one word in reference to the wine of Hebron, thus erasing the Ionians and making all products in lines 18-19 reach Tyre by way of Damascus. In light of the unlikelihood of Ionia being a transshipment point for cassia and calamus reaching Tyre, I prefer this later suggestion. But the idea cannot be entirely ignored; commodities sometimes followed rather odd and circuitous routes. See de Romanis, 1996, 56ff.; Elat, 1983; Millard, 1962; Lipinski, 1985; Greenberg, 1997, 557; Diokonoff, 1992, 186.

Testament as a perfume (Prov. 7:17, Cant. 4:14), and alongside cassia, myrrh and frankincense as ingredients in the Holy Oil (Exod. 30:23).⁷⁶ The word *kinamon* does not appear earlier than these biblical references; its etymology is obscure.⁷⁷ The etymology of Hebrew *kesi'ah*, on the other hand, is a point of contention in the debates.

One factor which could potentially strengthen or weaken arguments for Arabian/African origins centers on the progression of Egyptian *šs3t* (> *hs3yt*) > Hebrew *kesi'ah*. Appearing once in the 30th dynasty, in the hieroglyphic text recording Hatshepsut's Punt expedition, and again during the Ptolemaic period, *šs3t/hs3yt* clearly refers to a spice, likely resinous.⁷⁸ Opinions of what this spice might have been differ; most agree, however, that it was not a *Cinnamon* spp. commodity. Serpico and White, for example, suggest that during the Pharaonic period "cinnamon"-based products may have been derived from the East-African camphor tree (*Ocotea usamarensis*).⁷⁹ Since it is etymologically possible that Egyptain *šs3t/hs3yt* gives Hebrew *kesi'ah*, the equation *šs3t/hs3yt* = *kesi'ah* = (Grk.) *kassia* must then mean that ancient cassia came from Africa.⁸⁰ Goyon,

⁷⁶ An inscription (*OGIS* 214) dating to 288/7 notes the gifts send to the temple of Apollo at Didyma by Seleucus I which, in terms of spices, includes ten talents of frankincense, one talent of myrrh, two minai of cassia, two minai of cinnamon and two minai of *kostos*. It is interesting to note that these particular spices, all of which are connected with the Arabian trade, frequently appear together in lists from both the Levant and Aegean.

⁷⁷ Scholars have suggested (inconclusively) that the word is a compound containing the initial element *knh* ("reed") plus some unknown second element. See de Romanis, 1996, 52ff., 103ff.; Masson, 1967, 50; Crone, 1987, 263; Goyon, 1996, 655.

⁷⁸ See Goyon, 1996, for discussion of the Egyptian texts and etymologies.

⁷⁹ Serpico and White, 2000, 405; see also Germer (1985, 14) who states: "Es bleibt also kein Anhaltspunkt für das Vorhandensein von *Cinnamomum zeylanicum* im Alten Ägypten, und man muß davon ausgehen, daß diese Pflanze und ihre Produkte zu jener Zeit unbekannt gewesen waren."

⁸⁰ Crone, 1987, 257; Goyon, 1996, 652; de Romanis, 1996, 42ff.

however, is quick to point out that even if the etymological equation holds true, the botany underlying the words could have shifted; the Hebrew might refer to a *Cinnamon* spp. product while the Egyptian does not. Amigues dispenses with the Egyptian/Hebrew equation entirely and looks instead to Chinese *kei-schi* as the progenitor of the Hebrew, an etymology as equally possible, and likely, as the Egyptian.⁸¹

The botanical evidence stands firmly in favor of those who look to the Far East for the origins of ancient cinnamon and cassia. It is generally admitted that species of the *Laural* family, to which our cinnamon belongs, would have had an exceedingly hard time growing in the hot and dusty Arabian and African climes. While some have suggested that species of cinnamon may have been transplanted and/or could have since disappeared, botanists have yet to find conclusive evidence for *Laural* family species in Africa or Arabia.⁸² This fact leaves those arguing for non-Far Eastern origins with the unenviable position of first trying to find an African or Arabian species to label “cinnamon” and “cassia,” and then to explain the shift in meaning to the Far Eastern species later on. Crone avoids the problem entirely;⁸³ de Romanis likewise skirts the issue.⁸⁴ In this regard too, as

⁸¹ 1996a, 658-59. She, like Miller (1969, 154), follows Olck.’s suggestion (*RE* s.v. Casia, col. 1637), which curiously is entirely ignored by de Romanis.

⁸² Crone, 1987, 260-61; cf. Amigues, 1996a, 658.

⁸³ 1987, 262-63. Focusing on Aramaic and medieval Arabic sources, she posits that Talmudic *darsīnī*, a Persian borrowing (and one of today’s Arabic word for cinnamon), meaning “wood of China,” can be equated with an unknown Arabian aromatic substance, *qirfa* (“bark” generally, but specifically aromatic). She concludes, “there can be little doubt that *qirfa* was the cinnamon and/or cassia of the classical world.” Just what species *qirfa* may be she leaves to the botanists to decide.

⁸⁴ See, for example, p. 54, where he suggests that *kinamōmon* = *kalamos euôdês*, the botanical identification of which is not given. Generally, de Romanis is more concerned with etymological and philological issues than with botanical identification.

Amigues has noted, no region in Africa according to Theophrastus produced aromatics; the philosopher also seems to imply (but not state) that cinnamon came from the Far East rather than Arabia.⁸⁵

However, the fact that most of the ancient (Greco-Roman) literary sources clearly point to Arabia as the *Ursprungslande* for cinnamon presents those arguing for Far East origins with the task of explaining why there is no mention of the Indian Ocean maritime trade, which would have conveyed the spices to the west, before the Roman era. Few today would go so far to claim, as scholars have in the past, that the trade did not exist before the Greek pilot Hippalus “discovered” the monsoons that make this trade possible sometime in the 2nd c.⁸⁶ For earlier generations of scholars who believed the Indian Ocean trade existed before Hippalus, theories were offered of a “Sabean thalassocracy” which kept the monsoons and the true source of cinnamon a “trade secret” in order to protect a monopoly over a lucrative route.⁸⁷ There is no need to go to such extremes to explain the the silence concerning the trade. Casson, for example, does not hold it to be a deliberate effort at deception, but rather the apathy or ignorance of the spice buyer and even seller in the transshipment bazaars.⁸⁸ Arguing that South Arabia and East Africa could have long been transshipment points for cinnamon

⁸⁵ Amigues, 1996a, 662; 663, n.22.

⁸⁶ See Hourani (1995, 24ff.) and Raschke (1978, 654ff.) for discussions of Hippalus and what he did or did not “discover.” Hourani rightly notes that if anything, Hippalus merely brought the monsoons to the attention of the Greeks, but certainly not to the indigenous sailors who had been using the seasonal winds for centuries before hand.

⁸⁷ For discussions of the “Sabean thalassocracy” and trade secret theories see Rashke, 1978, 654ff.; Hourani, 1995, 24ff.; Salles, 1998; Young, 2001, 20.

⁸⁸ Casson (1984, 237) portrays this scenario: “We can imagine (the buyer) stopping in front of a heap of cassia, asking—very possibly through an interpreter—“where does it come from?” and getting a vague sweep of the hand towards the hinterland.”

on its journey north and west from Ceylon and India, Casson suggests that it was simply a matter of Greco-Roman error in confusing the transshipment point for source that led to the silence. This, in fact, seems the most elegant and economical solution to the entire problem. Despite the efforts of those like de Romanis, Crone,⁸⁹ and Raschke to argue otherwise, even going so far as to suggest that native watercraft were not technically capable of making the Indian Ocean crossing,⁹⁰ there is sufficient evidence that other Far Eastern goods (see Appendix One, Table 2) were reaching the Mediterranean long before the Roman period, many of which no doubt came first by sea to Arabia.⁹¹ If these Arabian-South Asian connections existed at an early date, perhaps as early as the Bronze Age,⁹² there is no reason to doubt that *Cinnamon* spp. products were included in the cargoes being forwarded westward.⁹³ Furthermore, as will be discussed at length in chapter six, the farther a commodity traveled, the more likely it was for

⁸⁹ In fact, the premise of Crone's study--that trade (in spices) did not play such a large role in the rise of early (Arabian) Islam--requires her to reduce the evidence for trade not only in the Islamic period, but in all periods before, to not much more than hearsay and misunderstood tradition (E.g., p. 50: "I shall begin by demonstrating, item by item, that the Qurashi trade in incense, spices, and related luxury goods is a fiction."). She is very much against any evidence for Far Eastern spices and/or trade reaching Arabia at most any time in history since such evidence would point to the actual importance of Arabia as an entrepot and transshipment point for spices.

⁹⁰ E.g., Raschke, 1978, 663: "The smaller sewn Arab craft with their lateen sails were incapable of regularly using this route, but the large square-rigged Mediterranean vessels, larger, faster, and more solidly built than the former, could utilize, with some risk, the stormy Southwest Monsoon." Raschke here is guilty of the same cultural bias as was Marco Polo when, upon seeing the sewn Arab vessels for the first time, could hardly believe that a ship built without iron nails was capable of remaining afloat, let alone sailing in heavy seas. See Hourani, 1995, chp. III, for Marco Polo's comments and a discussion of these sewn vessels. In fact, the flexibility the sewn fastening imparted to the structure (on analogy with modern aircraft wings which also are designed to flex) made these native vessels far more Monsoon-worthy than the overly rigid Mediterranean ships.

⁹¹ See Salles, 1998; Lemaire 1987; Potts, 1995.

⁹² Ashtour, 1995; Potts, 1995.

⁹³ It should also be noted that Potts and Sidebotham, who have devoted their careers to working in the Red Sea/Indian Ocean region, conclude that Far Eastern cinnamon made its way to either the Persian Gulf (cf. Arrian, *Anab.* VIII. 32.7 who states as much) or the Red Sea side of Arabia and thence onto the Mediterranean at an early date. See Potts, 1990, II, 301; Sidebotham, 1986, 35.

the information about its origins to become lost, garbled or deliberately altered. Cinnamon traveled perhaps farther than any other commodity in this study; that Herodotus and others knew so little about its true origins should not surprise us.

If the later sources reflect the nature of the 5th and 4th c. cinnamon/cassia trade, these spices likely reached the Mediterranean region in a variety of grades (five or more for cinnamon; three or more for cassia), as a manufactured oil, and possibly also as complete bushes and/or branches.⁹⁴ Like the Israelites, the Greeks knew cinnamon and cassia primarily as an ingredient in perfumes (e.g., Thphr., *Od.* 30; Antiph., frg. 4, Kock). The Hippocratic corpus includes cassia and cinnamon in a number of recipes; Aristotle (*apud* Athen. XI.464c-d) includes cinnamon in his “Rhodian Cups” hangover preventative. Malabathron, the compressed leaves of the (Indian) cinnamon tree, however, is not mentioned in our sources until after the Persian period.⁹⁵

Calamus, Aromatic Grasses and Reeds

Theophrastus (*HP* IX.7.1, cf. IV.8.3) mentions two aromatic plants, *kalamos* (*arômatikos*) and *skhoinos* (*euodês*) growing in a region of Syria, behind the Lebanon near a lake (Galilee? Huleh?).⁹⁶ These two plants in turn are commonly linked to two aromatics that appear in the Old Testament, *ḳaneh-boshem* and *ḳaneh haṭov*. In Exod. 30:23, Jer. 6:20, and Ezek. 27:19, the cane is mentioned along with imports from Arabia, e.g., frankincense, myrrh, and

⁹⁴ Casson, 1984, 228, 231ff.

⁹⁵ Karttunen, 1997, 157.

⁹⁶ The parallel text in Strabo (XVI.2.16) suggests Lake Kinneret/Galilee. Brown (1969, 30) and Amigues (*Thphr.* III, 265), however, think it is Lake Huleh near Khatzor.

presumably cassia and cinnamon.⁹⁷ Pliny (XII.248) knew of aromatic reeds from Arabia, but goes on to say that best are from Syria. Ezekiel also makes clear that the Phoenicians, i.e., Tyrians, were the ones accustomed to dealing in the spice.⁹⁸

In both context and semantics, the Hebrew offers no help for identifying the plants in question: *ḵaneh haṭov* is simply, “good cane;” *ḵaneh-boshem*, the equivalent of *calamus odoratus*. Thus, either of the words in Hebrew could be identified with either of those in Greek, *kalamos* or *skhoinos*, which for Theophrastus are two distinct items.⁹⁹ Hort renders *kalamos* as “sweet flag” (*Acorus calamus* L.) and *skhoinos* as “ginger grass” (*Cymbopogon schoenanthus* L.).¹⁰⁰ One or the other (*Acorus calamus* or *Cymbopogon* spp.) is commonly claimed for the *ḵaneh* of the Old Testament.¹⁰¹

Typical of her program to excise Far Eastern spices from ancient trade,¹⁰² Crone argues that the *kalamos* of antiquity could not have been *A. calamus*, but rather another species of *Cymbopogon*, varieties of which are found throughout

⁹⁷ In Jeremiah the cane is “from a distant land;” the frankincense from the “land of Sheba,” i.e., Arabia.

⁹⁸ For the problems associated with Ezek. 27:19 see n.75.

⁹⁹ The word *skhoinos* in Greek meaning an aromatic cane may be present in the Linear B “spice” tablets from Mycenae (the MY Ge series). Tablet MY Ge 602, for example, includes *ko-no* in a list of spices; MY Ge 606 includes what is likely a variant spelling, *ko-i-no*. *Ko-no/ko-i-no* is identified as either *C. schoenanthus* or *Acorus calamus*. See *DMic*, s.v. *ko-no*; Wylock, 1972, 125ff.

¹⁰⁰ Index of Plants, s.v. Note: there is in the literature a great deal of confusion over the botanical renderings of *Cymbopogon* spp. (formerly *Andropogon* spp.) and the English equivalents. Crone (1987, 58), for example, claims *C. martini* = ginger grass, *C. schoenanthus* = camel grass. Groom (1992, 132), on the other hand, equates *C. schoenanthus* (= *C. citratus*), not only with camel grass but also with lemon grass as well. “Ginger grass” for Groom (1992, 94) is not only Crone’s *C. martinii* but also *Andropogon* (= *C.*) *odoratus* = *A. aromaticus*. Zohary (1982, 196) has *C. schoenanthus* = ginger grass, *C. citratus* = lemon grass, *C. martinii* = “palmerosa oil grass.” Etc., etc.

¹⁰¹ E.g., Miller (1969, 93), *ḵaneh* = *A. calamus*; Zohary (1982, 196), *ḵaneh* = *Cymbopogon* spp.; Jacob and Jacob (*ADB* II.813, s.v. Flora, s.v. Sweet Flag and Lemon Grass) are non-committal.

¹⁰² See n.89 above.

the Middle East and Arabia.¹⁰³ Be that as it may, a calamus of some sort was found in Arabian trade from at least the 3rd c. on if not earlier. Zenon mentions it among imports from Arabia, a South Arabian trader of about the same date as Zenon imported calamus and myrrh to Egypt, and there are also examples of incense altars from South Arabia which have the word *klm* (= calamus?) inscribed upon them.¹⁰⁴

Aside from Theophrastus, not many Greeks of the Classical period mention either *skhoinos* (*euodês*) or *kalamos* (*euodês*), and like Theophrastus they tend to be of the late 4th c. Mnesimachus (*apud* Athen. IX.403d) lists *kalamos* among a host of other eastern spices; Aristotle's "Rhodian Cups" (*apud* Athen. XI.464c-d) includes *skhoinos* with the other exotic ingredients.

Aloe, Aloes

Various types of exotic wood, when burned were also considered spices. Neither lign-aloe (= eaglewood) nor sandalwood appears in Greek before the Roman period; they may appear in the Old Testament, but the identification is very problematic. We will discuss sandalwood first.

¹⁰³ Crone, 1987, Appendix 2, "Calamus." Today *Acorus calamus*, "sweet flag" is found in Europe, but was introduced there from Asia Minor in the 16th c. A.D. In all likelihood it was introduced to Asia Minor from India at some unknown date (Groom 1992, 36).

¹⁰⁴ See Raschke (1978, 939, nos. 1153, 1154) for comments on the Minean inscription; Nielsen (1986, 52), Crone (1987, 266), Stern (1982, 182ff), and Müller (1997, 206) for the incense altar inscriptions. As Crone notes, *klm* does seem to be a Greek loan word, which is, as she rightly comments, a curiosity (see also Müller, 1997, 206-07, who notes it is an Indo-Germanic, not Semitic word). Why would South Arabians adopt a Greek word for a local product? Perhaps, because it was not?

A prized and expensive oil in today's perfumery is distilled from the Sandalwood tree of India and Indonesia (*Santalum album* L.); the dried wood also is burned as an incense. As Casson has argued, philologists for centuries have perpetuated a 16th c. A.D. emendation to the *PME* (reading *santalion* for *sagalino* at §36) making sandalwood an import to the Mediterranean at least by the early Principate; with the original reading the import is more correctly identified as teak.¹⁰⁵ Sandalwood in Greek therefore does not appear until the time of Cosmas Indicopleustes (as *tzandana*, XI.445D), in the 6th c. A.D. But, readings in I Kings (10:11) and II Chronicles (9:10) might indicate that sandalwood reached the Mediterranean several centuries before in the Iron Age.

In I Kings, the Phoenician Hiram's fleet of ships brings cargo of precious stones from Ophir to Solomon; it also brings "*almug*" wood (*'tse ha'lmuggim*) for furniture and instrument making in the palace. The parallel passage in II Chronicles adds gold to the manifest, but also alters the spelling of the special wood to "*algum*" (*'tse ha'lgummim*); the morphological differences are generally downplayed and are thought to be an insignificant scribal error. As an import from the still unknown Ophir,¹⁰⁶ *algum/almug* wood has traditionally been identified as sandalwood, although the species is not well regarded as a cabinet wood. Josephus (*AJ*, VIII.7.1) calls *algum* a special pine wood, following perhaps the LXX translation of the II Chronicle passage (*algum = peukina*). A

¹⁰⁵ Casson, 1982.

¹⁰⁶ The location of this far-off land is much disputed; India, Arabia, and East Africa have been suggested; see Potts, 1995. Ophir is mentioned several times in the Old Testament as a source of, besides almug-wood, silver, gold, ivory and monkeys; the only extra-Biblical mention of Ophir is on an 8th c. Hebrew ostracum from Tel Qasile, which reads: "Gold of Ophir belonging to Beth-horon, 30 shekels." See Van Beek, *IDB*, s.v. Ophir; *NEAEHL*, s.v., Qasile, Tell.

text from Ugarit, dated centuries before Hiram and Solomon, mentions an *'lmg*-wood as tribute, a wood thought to be identical to our *almug/algum*.¹⁰⁷ Although not a native Levantine species, as Brown would have it, the traditional identification of the wood also does not seem to fit the bill.¹⁰⁸ Until further work on the location of Ophir progresses, the question for the moment is best left unresolved.

In English, as well as in Greek and Talmudic Aramaic, confusion over the word "aloe" reigns. Most today are perhaps more familiar with the herbal, medicinal aloe (more correctly, "aloes" = *Aloe vera*) than with the incense and perfume-oil wood aloe (= eaglewood = *Aquilara agallocha* Roxb.). Neither species is found in the Mediterranean: aloes are native to the island of Socotra and the Far East, eaglewood to Southeast Asia.¹⁰⁹ Ancient, Talmudic, and modern confusion over the wood and the herb seems to stem from four passages in the Old Testament and the LXX and later English translations of Hebrew *'haloth* (Ps. 45:8; Prov. 7:17, Cant. 4:14) and the alternative plural form *'halim* (Num. 24:6). These issues won't detain us.¹¹⁰ In Psalms, Proverbs and the Song of Songs, the association of *'haloth* with other exotic, Arabian and Far Eastern spices (e.g., myrrh, cinnamon, cassia, and nard) make the traditional identification with

¹⁰⁷ Knapp, 1991, 40

¹⁰⁸ Brown, 1969, 188.

¹⁰⁹ On the ancient and modern trade of Far Eastern scented woods, see Hansen, 2000.

¹¹⁰ Crone (1987, Appendix 3) discusses the etymology of Greek and English aloe/aloes at length. She concludes that the word *aloe* must have entered Greek initially with the sense of bitter medicine derived from Syriac and Aramaic *'lwai* (= aloes), not Hebrew *'haloth*, eaglewood, which entered Greek as *agallokhon* first in Dioscurides. The LXX erred in translating the unknown word in Hebrew as *aloe*, based perhaps on the similarity of sound, which perpetuated the confusion in English.

eaglewood probable.¹¹¹ The word *'halim* in Numbers, however, is more difficult, as the LXX translators also seem to have thought; their translation as *skennai*, i.e., "tents," besides being wrong, is obviously a guess. Its context and association with the cedars in the next line, make it certain that this is a tree of some sort, perhaps a local Levantine species.¹¹²

Kostos

First attested in Greek in Theophrastus' list of eastern aromata (*HP* IX.7.3), *kostos* was to become a staple of Roman-Indian trade and a major ingredient in various medicines. A native to Kashmir, *Saussurea lappa* G.B. Clarke was likely the plant in question, although Dioscurides (II.49.3) notes a *kostos* growing in Arabia, along with cinnamon and cassia, which should raise suspicions concerning his information (see cinnamon, cassia, above). The inscription, *ks̄t*, found on some of the South Arabian incense altars may refer to *kostos*, likely imported.¹¹³ *Kostos* was certainly known in the Mediterranean world by the end of the 4th c., how much earlier, however, we are unable to tell.¹¹⁴

¹¹¹ See Löw, *Pflanzennamen*, 295.

¹¹² Pope (1977, 494) suggests, following Moffatt, that the word in Numbers is an error for a similar word that means "oaks" a tree that, like cedar, would have been familiar to Balaam's audience at sight.

¹¹³ Müller, 1997, 204.

¹¹⁴ Miller, 1969, 84; Casson, 1989, 191-92; Crone, 1987, 73-74. Also see the comments on the inscription *OGIS* 214, n.76 above.

Nutmeg

Another spice which is more frequently attested after the end of the 4th c. than before is *komakon* said by Theophrastus (*HP IX.7.2*) to have been shipped to the Mediterranean from Arabia along with other (Far Eastern) spices, including cinnamon and cassia. Following the attribution given *kamkam* in Classical Arabic, Müller suggests the spice might have been a native Arabian species, perhaps *Pistacia terebinthus*; unfortunately no *Pistacia* spp. is known from Arabia so early.¹¹⁵ Hort suggested the spice was the Indian *Ailanthus malabarica* said in earlier editions of *LSJ* to be the *makeir* found in the *PME*. Miller's suggestion for *makeir* and *komakon*, *Myristica malabarica* Houtt. or *M. fragrans* (= nutmeg, now *makeir* in the *LSJ* supplement), has met with disapproval,¹¹⁶ as has his identification of *komakon*: "If so, everything can be anything," Crone harps.¹¹⁷ While *Myristica* spp. is perhaps not correct for *makeir*, it still is possible for *komakon*. Pliny (XII.50), as Crone notes objecting to Far Eastern origins, states the spice comes from Syria. Trade in nutmeg, particularly through the Omani port of Muscat, flourished in later centuries, as the German word for the spice, *Muskatnuß*, indicates. Arrian (*Anab.* VIII. 32.7) could be alluding to the spice when he notes that the Assyrians (i.e., Phoenicians in Syria?) imported cinnamon and "other spices" (*alla toioutoropa*) from Muscat.¹¹⁸ Nothing in Theophrastus' (or Pliny's) brief description of the *komakon* stands in the way of

¹¹⁵ Müller, 1997, 202.

¹¹⁶ Miller, 1969, 58-60; Casson (1989, 126) favors *Holarrhena antidysenterica* Wall for *makeir*.

¹¹⁷ 1987, 71. She leaves the question of identification open.

¹¹⁸ See Potts, 1990, II, 301, for the suggestion that Arrian here is alluding to nutmeg.

its identification with nutmeg; that it is described as being reminiscent of cinnamon seems, in fact, to aid the identification.

Ladanum

Another of the famed spices of Arabia that Herodotus (III.112) mentions is *lêdanon*, as the Greeks called it, but, as he tells us, the Arabians vocalized *ladanon*. Among the many names for various types of spice inscribed on South Arabian incense altars of roughly this period, is a word *ldn*, obviously Herodotus' spice.¹¹⁹ The historian goes on to tell us that as incense the Arabians burn this gum perhaps more than any other, and that it is most useful in perfumery.

Twice in Genesis the spice *loṭ* is mentioned, once (37:25) in the context of Ishmaelite caravaners from Gilead taking *nekoth* (tragacanth?),¹²⁰ *tsori* (balm?), and *loṭ* to Egypt; the second (43:11) when Israel sends his sons to Egypt with "some of the produce for which this country is famous" (*mizzimrath ha'retz*). Included again are the spices *nekoth*, *tsori* and *loṭ*. Löw suggested the plant *Cistus creticus* L. or simply *Cistus* spp. for *loṭ* (and *ladanum*), attributions still generally followed.¹²¹ Also known as the "rock rose," the shrub is common throughout the Mediterranean and Arabia, the species *C. creticus* mostly throughout Syria and Palestine, where today it is used as an incense in the eastern churches. In ancient Greece, a native rockrose was known as *kisthos*, two species

¹¹⁹ Müller, 1997, 205.

¹²⁰ *nekoth*, which appears only in these two passages, is thought to be "tragacanth", *Astragalus gummifer*, a native to the Gilead region. See Zohary, 1982, 196; Stol, 1979, 7.

¹²¹ *Pflanzennamen*, 127; *Flora* I, 361ff. Zohary (1982, 194 and *IBD* s.v. *Flora*, 291, s.v. *Myrrh*) opposes the identification of *C. creticus* because the species is not native to Gilead, and proposes either *C. incanus*, *C. villosus*, or *C. folius* instead.

of which Theophrastus discusses (*HP* VI.2.1) without mention of the gum. Herodotus aside, there is no other mention of "ledanon" in the Aegean literature of our period; *kisthos*, however, is more widely noted. Nevertheless, Herodotus' inclusion of the spice in his discussion of other commonly known, albeit rare "Arabian" spices without a descriptive digression would suggest *ladanum* was more widely known than the silence indicates.

Group Two: Persian/Babylonian Trade

Pepper

Supplying a newfound taste for pepper (*Piper* spp.) was one of the driving forces behind Rome's trade with India;¹²² pepper, however, did not play much of a role in Persian period trade. Nowhere is it mentioned in the Old Testament. In Aegean texts, it appears only in the Hippocratic corpus, where pepper is the *indikón pharmakon* (*Mul.* I.81); elsewhere we are told that the Persians call this Indian drug *peperi* (*Mul.* II.205). The etymology of Greek *peperi*, derived from Sanskrit *pippala*, through Persian *piper*, suggests that pepper may have reached the Aegean by overland routes through Media, but this is far from certain.¹²³ Peppercorns found in the mummy of Ramses II suggest that very early Indian Ocean trade may have also brought the spice to the Mediterranean region, as was the case in later centuries.¹²⁴ Not until the Roman period was pepper used as a

¹²² Pepper was known in antiquity only as an import from the Far East, and thus was known as an "Indian" spice. On the Indian and Southeast Asian provenance of *Piper* spp. see Miller (1969, 80ff.) and Dalby (1996, 137).

¹²³ On the etymology and transport, see Löw, *Pflanzennamen*, 368.

¹²⁴ Germer, 1985, 22; Casson, 1989, 16-17.

condiment; beforehand its uses appear strictly medical, primarily for eye problems.¹²⁵

Nard, Spikenard

Although Roman writers could speak of at least seven different types of nard from as many places, and Pliny (XIII.16) could name nine species of herbs that could imitate the scent, true Indian nard (*Nardostachys jatamansi* D.C.) was likely the only nard known in the Persian period.¹²⁶ The first mention of the spice in the Mediterranean region is in the Old Testament (Cant. 1.12; 4.13-14), where *nard* (= Grk. *nardos*) is clearly a loan word from Sanskrit *nalad*. Because this word underwent the same morphological changes, due to Persian intermediaries, as the word for pepper, some supplies may have come overland through Media along with pepper from the east.¹²⁷ By the Roman period, if not much earlier, the trade was (mostly?) seaborne across the Indian Ocean.¹²⁸ Like storax, the gum was often transported in organic tubes, *stakhys* in Greek, *spicum* in Latin, a practice which gave rise to our “spikenard” (= *spica nardi/nardou stakhys*).¹²⁹

¹²⁵ Steier, *RE*, s.v. Pfeffer, cols. 1424-25; Dalby, 1996, 138.

¹²⁶ Steier, *RE*, s.v. Nardus, col. 1709. Aside from Indian nard, Steier discusses six other ancient “nards.” Note too that around the time of Alexander there may have been a “nard” said to come from Arabia (Arr., *Anab.*, VII.20.2; cf. Strabo, XV.1.22). Theophrastus makes no mention of this Arabian nard, nor did anyone else before him. Crone suggests this, and a later plant known to the Arabs as *sunbul ‘arabī* may have been a species of *Cymbopogon* (1987, 73).

¹²⁷ Löw, *Pflanzennamen*, 368.

¹²⁸ Casson, 1999 and 1989, 16-17.

¹²⁹ Frequently (as Crone 1987, 72) the name “spikenard” is said to come from the hairy rhizomes or other “spiky” parts of the plant. But as Steier (*RE*, s.v. Nardus, col. 1706) does well to point out, there is no way the early writers who coined the term *spica nardi* would have seen the plant in its natural state. Using such naturally occurring tubes for transport was rather common: as late as the 1950s, “Dragon’s Blood,” a Southeast Asian resin, was shipped in hollowed bamboo (see Garoche, 1952, 144).

As in its Indian homeland, so in the Levant nard was used in perfumes concocted for erotic effects (Cant. 4:13-14).¹³⁰ Fourth-century Greeks also knew nard mostly as an ingredient in its eponymous perfume, *nardinon* (e.g., Alexis, frg. 308; Antiph. frg. 35; Men. frg. 240); in the Hippocratic corpus it also serves a medical purpose.

Galbanum, Silphium

Three species of the *Umbelliferae* family native to Iran and Afghanistan furnish the milky gums resins known today as ammoniacum (*Dorema ammoniacum*), asafoetida (*Ferula asafoetida* L.), and galbanum (*F. galbaniflua* Boiss. et Buhse).¹³¹ A fourth species, possibly *F. tingitana* L. or *Margotia gummifera* Lange, once native to North Africa, particularly the region around Cyrenaica, produced in antiquity an exceedingly popular condiment known as *silphion*.¹³² Knowledge and trade of the gums of the eastern *Ferula* species during the Roman period was widespread, especially after the African supply of *silphion* was exhausted around the time of Nero, by which point “Medic” silphium became accepted as a suitable substitute for Cyrenaican.¹³³ Roman writers—poets to scientists—also commonly took note of the other eastern gums,

¹³⁰ See Pope (1977, 348) for Sanskrit references to nard-based love charms.

¹³¹ Cf. Hill, 1952, 172-173. Ancient ammoniacum was also known as a North African species, as the name indicates, i.e., the oasis of Ammon. Müller (*RE*, Suppl. XV, s.v. Weihrauch, col. 709) claims ancient ammoniacum was *F. tingitana*.

¹³² A number of different species—*F. assafoedita*, *F. tingitana*, *Thapsia garganica* L., and *Margotia gummifera*—have been suggested for the botanical identification of *silphion*. Until recently, *F. tingitana* was generally favored. Amigues (*Thphr.* II, 157-165) offers a review of the arguments for each species and seems to support *Margotia gummifer* (p.163).

¹³³ Cf. Strabo, XI.13.7 and Steier, *RE*, s.v. Silphion, col. 104.

e.g., asafoetida, galbanum, ammoniacum, and another, *sagapenum* (from *F. persica* Willd.). Galbanum (Grk: *khalbanê*; Heb. *helbbanah*), however, to judge on the basis of literary sources, seems to be the only one of the eastern group mentioned during the Persian period. In Exod. 30:34, our sole Old Testament reference, galbanum is an ingredient in the Holy Incense along with a number of other exotic, imported spices.¹³⁴ In the Aegean, galbanum shows up in the Hippocratic corpus and nowhere else. However, it is entirely possible that other eastern *Ferula* spp. gums may have reached the Levant and the Aegean, but under an alias.

Asafoetida, for example, the “Medic silphion,” was long a popular spice in its Iranian homeland where it was known to the Persians as the “food of the gods.”¹³⁵ A late account of the commodities required for the Persian king’s table includes in the list silphium juice and silphium (= asafoetida?), indicating the spice’s status.¹³⁶ Certain parts of the plant were also used as a dye which very early on (2nd millennium) became an important article of trade in the ancient Near East.¹³⁷ While there is little question that galbanum reached the Levant, it is difficult to believe that Iranian-Levantine trade in other *Ferula* spp. products, like asafoetida, ceased during the Persian period.

¹³⁴ Galbanum also appears in the Apocryphal Ecclesiastics Bar Sirach, 24:15. Zohary (1982, 201) sees little reason to doubt that galbanum was imported to Judea as well, in this case from Iran.

¹³⁵ Miller, 1969, 100.

¹³⁶ The account is that of a 1st c. A.D. rhetor, Polyaeus. Who his source may have been, e.g., Ctesias?, is unknown. That Polyaeus mentions “silphium” raises a number of questions: was North African silphium imported to the Levant/Persia? Or is this silphium to be understood as the local variety, possibly already exported to the west?

¹³⁷ See van Soldt (1990, 349) for asafoetida dye in use at Ugarit; for later references to the dye, see Steier, *loc cit.*, cols. 109-110.

Cited in Theophrastus' list of eastern aromatics (*HP IX.7.3*) is a *panakês* (meaning "all-heal"), a frustratingly general term for a range of indigenous Aegean species. Theophrastus, however, states in the preceding section that this particular *panakês*, the one that grows in Syria, produces galbanum; thus Hort suggests *F. galbanifera* (= *F. gummosa*). Although not mentioned by Theophrastus, Pliny and Dioscurides knew of a "juice of *panax*," i.e., *opopanax*, which also was native to "Syria." Most commentators have taken this to be from *Opopanax* spp., another eastern member of the *Umbellifera* family. Stol's arguments, however, look beyond *Opopanax* spp. and open the door to the Iranian *Ferula* spp. In doing so he also suggests that terms like "galbanum," and "panakes" may not have referred to the products of one species only.¹³⁸ If so, is it possible that the word "*silphion*" may have been used for the gums of the eastern *Ferula* spp. as well?

Despite the sulfuric "stink" of some of the eastern gums, e.g. *asa-foetida* (with emphasis on the component "foetida" = fetid),¹³⁹ which some claim was not the case for the Cyrenaican silphium, ancient commentators report only minor qualitative differences between the two.¹⁴⁰ It must also be kept in mind that before the gums could be eaten or transported, a certain amount of processing, which in some cases required boiling with other ingredients (cf. Pliny, XIX.15), had to take place. Such preparation would have removed much of the acidity, if

¹³⁸ This paragraph is mostly based on Stol, 1979, 58-68.

¹³⁹ Garoche (1952, 145) warns shippers to stow these gums "away from delicate goods."

¹⁴⁰ Cf. Strabo, IX.13.7 who reports that the Medic juice is "not much inferior" to the Cyrenaic juice. Also see Steier, *loc cit.* cols. 105-106.

this was not in fact a desired trait.¹⁴¹ Admittedly, however, in all the many references to silphium by Aegean authors during our period, silphium is mentioned only as a Cyrenaican import, in the form of stems, leaves or “juice,” i.e. gum.¹⁴² There is precious little hint of an imported “Medic” silphium so early (see n.136, 143), and only slightly more evidence for Iranian *Ferula* spp. gums having much place in Levantine-Aegean trade in the 5-4th c. Conversely, an eastward movement of the fashionable African silphium is entirely possible, though as yet unrecorded.¹⁴³

Amomon, Cardamon

On the provenance of *amômon* and *kardamômon*, Theophrastus is not certain (*HP* IX.7.3); some, he says, claim they come from Media, some from India.¹⁴⁴ Like *kostos*, these two spices were later to become important items in Roman-Far Eastern trade; they appear in the Mediterranean by the late 4th c.,¹⁴⁵

¹⁴¹ Galbanum and opopanax were also said to have a penetrating, offensive smell—galbanum more so than opopanax—which only heightened their reputed powers to purify. Cf. Lucan, *Phar.* IX.913-918.

¹⁴² See Ar. *Eq.* 890 on the expense; Steier, *loc. cit.* for the various terms used to denote the portions of the plant that were traded.

¹⁴³ Strabo (XVII.3.20) reports that at some earlier time, because of official trade sanctions between the Carthaginians and Cyrenaicans, silphium smuggling between the nearby communities was rampant. Whether this was for Carthaginian home consumption or further profit making is not stated, but does hint that the Punic and perhaps other Semitic peoples had also developed a taste for the spice at an early date.

¹⁴⁴ Pliny (XII.29.50) notes four varieties of cardamon which he believed came from Arabia, not India.

¹⁴⁵ Not found in Semitic sources, in Greek *amômon* is first noted as an ingredient in Aristotle’s “Rhodian Cups” (*apud* Athen. XI.464c-d). Note that the spice *kardamon*, widely attested in early Greek literature is native *Lepidium sativum* or “cress,” not the eastern *kardamômon*. Raschke (1978, 907) seems to be confusing the species when he offers evidence that cardamon (here *kardamon*) came not from India but Egypt.

but possibly even earlier due to their popularity among the Persian elite.¹⁴⁶ Although at times the ancient commentators seem to make little distinction between the two spices, modern commentators have usually identified *amômon* as *Amomum subulatum* Roxb. and *kardamômon* as *Elettaria cardamomum* White & Maton, which produces the cardamom found in today's spice racks, both species are natives to the Far East.¹⁴⁷ There is ample reason to despair of these identifications; some classifiers have left the attributions open.¹⁴⁸ There is nothing in the Semitic sources from the Persian period to suggest that these two spices passed through the Levant. However, if they came from Media or India, as Theophrastus claims, many shipments likely would have come to the Aegean by way of Levantine ports, as did the other spices discussed here.

Group Three: Levantine trade

Cyperus, Cypeiron, Henna

At least two very different plants go by the confusingly similar names of *kypeiron* (also *kypeiros*) and *kyperos* in ancient Greek.¹⁴⁹ The editors of *LSJ* were obviously at a loss when they compiled their work: all forms are said to be variations of the name of one plant, *Cyperus longus* L. (“galingale”) or its cousin

¹⁴⁶ See Sancisi-Weerdenberg, 1995, 289-91.

¹⁴⁷ Miller, 1969, 37ff and 67ff.; Eigler and Wöhrle, 1993, 79, 84.

¹⁴⁸ E.g. Crone, 1987, 70-71; Wagler, *RE*, s.v. Amomon. Amigues (1996a, 663), however, is comfortable with the attributions.

¹⁴⁹ This confusing similarity may have its origins in the Late Bronze Age. Linear B *ku-pa-ro*, a variant *ku-pa-ro₂*, and the ideograms *CYP/PYC + O* and *PYC + QA* are thought to refer to various *Cyperus* spp. Note also *ku-pa-ro-we*, a perfume, using *Cyperus* as an ingredient. See *DMic*, s.v. *ku-pa-ro*. Wylock, 1970, 129ff.; Shelmerdine, 1985, 37, 99.

Cyperus rotundus L.. Both species are ubiquitous weeds in the Mediterranean and Greece, are of the same genus as the papyrus plant (*C. papyrus*), and have some fragrant properties.¹⁵⁰ Theophrastus notes a *kypeiros*, said by Hort to be *C. longus*, which grows in the marshes around Lake Copais in Boeotia; perhaps the same kind of marshy *kypeiros* the frogs sing about in Aristophanes's play of the same name (*Frogs* 243). However, Theophrastus also notes a *kypeiron* (NB the "n") in his list of eastern aromatics (*HP* IX.7.3), which Hort labels *C. rotundus*, a plant also found in India.¹⁵¹ Here is where trouble begins.

Although not mentioned by Theophrastus in *HP*, another word, *kyperos*, may have, as the *LSJ* editors suggest, come to stand for *Cyperus* spp. as well, or as a dialectical variation.¹⁵² In later authors, e.g., Pliny (XXI.117) and Dioscurides (I.4), *kyperos* /*cyperus* sometimes seems to mean *Cyperus* spp., but, in fact, often represents *Lawsonia inermis* L., the identification favored today for *kyperos* generally.¹⁵³ This species of *Lawsonia* is best known for its crushed leaves which produce the color-fast dye henna widely used in the Near East today on hair, skin and textiles; the white flowers of the plant also are used in perfumes, as in antiquity.¹⁵⁴ Through the similarity of sound, spelling and transliteration of

¹⁵⁰ Negbi, 1992; in Homer, e.g., *Il.* XXI.351 and *Od.* IV.600, *kypeiros* is noted as growing around Troy and in Greece, where it also serves as horse fodder. Cf. the Linear B ideogram *190 thought to represent this fodder.

¹⁵¹ Löw (*Pflanzennamen*, 277) notes *C. rotundus* growing in Egypt which went by the local name, *sari*.

¹⁵² *LSJ*, s.v., where *kyperos* is said to be Ionic and late Greek for *kypeiros*. Miller (1969, 78) suggests that Herodotus introduced the variation of *kypeiron/kyperos* in order to denote *kyperos* (= India *C. rotundus*) as a foreign product, in contrast to *kypeiron* the Mediterranean form. This is a bit far-fetched, and lacks any support in Herodotus or elsewhere. Also note, that Theophrastus does mention *kyperos* in *Od.* (25f, 31, 42, 50, 55), but as a type of perfume and not necessarily as a specific plant.

¹⁵³ Cf. Eigler and Wöhrle, 1993, 87.

¹⁵⁴ See *Encyclopaedia Islam*, s.v., *hinna*.

the ancient names, it is easy to understand how confusion over the two genera, *Cyperus* spp. and *Lawsonia* spp., came to be and has unfortunately been perpetuated. In terms of ancient trade, there is little beyond Theophrastus' cryptic inclusion of a *kypeiron* at IX.7.3 to suggest a westwards movement in eastern (Indian?) *Cyperus* spp. aromatics. Pherecrates (*apud* Athen. XV.685a) lists a *kypeiron* as among the aromatics growing in the Elysian Fields, but there is no way to determine the (real) provenance of his reed. Conversely, there is evidence for trade in henna.

A native to North Africa, Arabia, the Levant, and northwest India, trade in *Lawsonia*, to the Aegean and beyond, likely had an early start and has continued uninterrupted to the present day. Shelmerdine has effectively argued that Linear B **e-ti*, corresponding to a gloss in Hesychius (s.v., *ertis*), is to be understood as henna, used as both scent and as a dye in perfumed oils.¹⁵⁵ Only as an import from the east could henna have reached Bronze Age Pylos. Late Roman/early Islamic and more modern shipping accounts record the continued trade in the dye and flowers within the Mediterranean and to the Far East.¹⁵⁶ The etymology of Greek *kyperos*, thought to be a derivation from Hebrew *kofer*, may imply Iron Age trade, as does Theophrastus' mention of a *kypros* perfume.¹⁵⁷ In the Old

¹⁵⁵ Shelmerdine, 1985, 27-29. The word appears in Linear B texts from Pylos, e.g., PY Fr 1224, as *e-ti-we*, that is, "with *e-ti*." Another form of the word (as on PY Fr 1200) is *a-e-ti-to*, "without *e-ti*."

¹⁵⁶ Guo (2001, 90, n.39) notes henna as a luxury item in receipts from 7th c. A.D. Quseir, a Red Sea port. Crecelius and Hamza (1994), in their study of 18th c. A.D. eastern Mediterranean ship manifests, note henna transported loose, in bound bundles, in weighed sacks, and with various grades marked.

¹⁵⁷ On the etymology see Zohary, 1982, 190, and *DMic*, s.v., *ku-pa-ro*. Thphr., *Od.* 25ff. Merillees (1986) suggested an etymological connection between *kyperos*/henna and the island of Cyprus, using as evidence Linear B *ku-pi-ri-jo*, "Cyprian." As Knapp (1991, 43) rightly shows, this connection in the Bronze Age or later is not likely. Herodotus (IV.71) mentions *kyperos* as

Testament, *kofer* is found only in the Song of Songs, as a perfume, native to En Gedi (Cant. 1:14; 4:13-14).

Terebinth, Mastic

Greek *terebinthos* (also *tereminthos*) and *mastikhê* denote two products from *Pistacia* spp., a tall resin producing family of trees found throughout the Mediterranean and Near East. Although it can mean any chewable resin (from *mazein* “to chew”), *mastikhê* was and still is used to refer primarily to the gum produced by *P. lentiscus* L., a tree known in ancient Greek as *skhinós*, particularly those examples of the species that grow on the island of Chios.¹⁵⁸ Today as it seems was the case in antiquity, only those trees on Chios produce *mastikhê* of commercial quantity and quality used as chewing gum, in ice cream, in paint varnish and in the liquor *Mastica*. In the Classical period, *mastikhê* served similar purposes: as a wine preservative, as gum, and as medicament.¹⁵⁹

Terebinthos (= true turpentine), on the other hand, is the resin of one of a number of native Lebanese, Syrian, and Palestinian species of *Pistacia*, generally *P. terebinthus* L. or *P. alantica* L., but not, it should be noted, *P. vera* L., the tree that is famed for Pistachio nuts.¹⁶⁰ In the Old Testament, the resin producing tree

one of the ingredient, along with frankincense, used by the Scythians to embalm their kings. It is best, perhaps, not to venture a guess on which genera he meant, although henna reaching Scythia would have interesting implications, as the use of frankincense wood does. In Egypt, the role of *Lawsonia* in mummification is not yet decided; fragments of *Cyperus* spp. have been found in burials in Egypt, but not as part of the mummification process. See Germer, 1985, 126, 246-248.

¹⁵⁸ Theophrastus (*HP* IV.4.9; IX.1.2) speaks of an oriental “mastic” produced by the *iksenê*, identified by Hort (Index of Plants, s.v.) as the “pine thistle” (*Atractylis gummifera* = *Carlina gummifera* Lees.). For Chian mastic, see Steier, *RE*, s.v. Mastix, col. 2170; Serpico 2000, 434.

¹⁵⁹ Germer, 1985, 111; Steier, *loc cit*.

¹⁶⁰ Stol (1979, 2ff and 55ff) does great service by uncovering evidence that *P. vera*, a species native to Bactria (cf. Thphr. *HP* IV.4.7), was introduced to the Levant after the conquests of Alexander the Great, thus clearing up some of the debate over which species of *Pistacia* produced the popular Levantine resin. This is not to say that trade in *P. vera* products from Bactria did not exist. Germer reports that there are signs of *P. vera* imports in New Kingdom Egypt (1985, 113). See also Amigues, *Thphr.* III, 224-225.

is known as *'elah*; Theophrastus knew of woodlands of the species near Damascus.¹⁶¹ The trade in terebinth resin and oil (of the nuts) in the Levant has a very long history. Nearly one metric ton of the resin was found as cargo on the Late Bronze Age ship that sank at Uluburun, Turkey; the ship's final voyage seems to have been westward bound from Syria.¹⁶² In Persia, during our period, terebinth oil is included among the commodities intended for the "King's Dinner;" in fact, terebinth products were apparently so popular in Persian cuisine that, according to one Greek tradition, the Persians were known as *terminthophagoi*.¹⁶³ A fair amount of the Levantine resin trade was directed towards Egypt since no *Pistacia* grew in ancient Egypt or Sinai; from 6th c. Naucratis, large chunks of the resin were found there during the excavation of the late 19th c.¹⁶⁴ Among other uses, terebinth in Egypt was one of many chemicals used in mummification.

Levantine terebinth reached the Classical period Aegean as well, where it is attested mostly as an ingredient in medicines. Elsewhere, Xenophon (*Anab.* IV.4.13) mentions an ointment, which included terebinth oil, likely imported, used in Armenia. In a list of the best resins, Theophrastus (*HP* IX.2.2) places terebinth first, before pine and fir resins, undoubtedly because the natural qualities of the resin made it ideal, as it is today, for use in fine woodworking and

¹⁶¹ Cf. Isa. 30 where the Hebrew word is translated in the LXX *terebinthos*; Zohary, 1982, 110; Thphr., *HP* III.15.3

¹⁶² For a study of the Uluburun find, the largest single deposit of terebinth resin from antiquity yet found, see Peachey, 1995. Linear B evidence, e.g., *te-mi-t/ti-mi-t* (= later Greek *terminthos*) and *ki-ta-no* (= *kritanos*, the nuts of the tree), also attests to the widespread use of the resin in the Late Bronze Age. For a discussion of the Linear B terms and related issues, see Palaima, 2000, 14ff.; also *DMic*, s.v.

¹⁶³ Nicolaos of Damascus (likely following Ctesias) *FGH* 90 F66.34; see Sancisi-Weerdenberg, 1995. There is no way to know if these terebinth products were produced from more eastern species, e.g., *P. vera*, or Levantine species; likely it was both.

¹⁶⁴ Germer, 1985, 112.

furniture-making. Of note, other later attested uses include soap making and tanning.¹⁶⁵

Styrax, Storax

The “confusion of species” over ancient storax/styrax¹⁶⁶ is limited generally to just two: *Liquidambar orientalis* Mill. and *Styrax officinalis* L.¹⁶⁷ The former, so-called “liquid storax” is a tall tree found only in southwestern Asia Minor and Rhodes; the latter, also known as “solid storax” is a much smaller tree found not only in Asia Minor, but other parts of Europe and the Levant as well.¹⁶⁸ While one tree or the other has been named as the producer of the aromatic resin in antiquity, at least one modern commentator has tried to create a further distinction by calling “storax” *Liquidambar* spp. only, and “styrax” *Styrax* spp., a division of nomenclature for which there is no need or basis.¹⁶⁹ Because of the way in which the use of storax is described by Pliny (XII.81) and Dioscurides (I.66), solid storax has been the preferred modern identification.¹⁷⁰ Unfortunately, *Styrax officinalis* today produces no resin, nor did its resin, at least in recent

¹⁶⁵ Serpico, 2000, 436.

¹⁶⁶ The form *styrax* is the earlier of the two; *storax*, denoting the same product, was coined in the Late Roman period (see Steier, *RE*, s.v. Storax, col. 65).

¹⁶⁷ Serpico, 2000, 437.

¹⁶⁸ Casson, 1989, 163-64; Germer, 1985, 147.

¹⁶⁹ E.g., Zohary, 1982, 118 and 192.

¹⁷⁰ Pliny implies (“non alia sunt ligni genera”) that it is the wood, not resin which is traded and burned in the hearths of the Sabaeans.

centuries, ever seem to have been much of an item of trade. In contrast, liquid storax to this day still plays a role in pharmacology and perfumery.¹⁷¹

Ancient storax could be one of the very few Mediterranean aromatic resins known to have been traded well beyond the region in the Persian period, providing a counterflow, at least partially, to the great influx of spice from Arabia and the Far East. Herodotus (III.107) describes the use of Mediterranean storax by the South Arabians in their frankincense harvesting process (cf. Pliny XII.81). This southeastward flow of storax was still current centuries later: the *PME* (§ 28, 39) includes the resin as one of the products shipped from Egypt to India.¹⁷² What the South Arabians or Phoenician handlers (Hdt. III.107) called the product is unknown. One word, *ḏrw*, which appears inscribed on some South Arabian incense altars has been suggested, and rejected.¹⁷³ Löw offered Hebrew *tsori* as the etymological forerunner of Greek *styrax*, and *Pistacia lentiscus* as the plant in question. Very few have followed his lead.¹⁷⁴ It may have been that the resin in the Levant was known by a more general term, one which could mean resin or gum of any sort, e.g., *naṭaf* (*hapax legomenon*, Exod. 30:34).

In the Aegean, storax is fairly well attested in the Classical period, not only as a perfume, but also as a drug, always one of its major roles (Thphr. *HP*

¹⁷¹ *Pharmaceutical Codex*, s.v; Groom, 1992, 226. Also, Richard Hakluyt, a 16th c. A.D. British shipcaptain, reports shipping “liquid storax” from Rhodes, undoubtedly *Liquidambar* (see the Perseus web site, www.perseus.tufts.edu, s.v. Storax).

¹⁷² Mediterranean storax may have made it as far east as China (see Müller, *RE*, Suppl. XV, s.v. Weihrauch, col. 728). Crone (1987, 51) notes that the importation of Mediterranean perfumes and spices, not storax specifically, to Arabia in the Islamic period was due to an Arabian preference for foreign aromatics despite the abundance of those found locally. The same may have obtained many centuries before.

¹⁷³ Nielsen (1986, 52) following Löw has suggested; Stol (1979, 50-53) rejects, suggesting that *ḏrw* might be balsam. See also Müller, 1997, 200-01.

¹⁷⁴ See Stol (1979, 50-53), who roundly and soundly rejects the identification and etymology.

IX.7.3; Arist. *HA* 534b 24-25). The wood of the tree also found use in the manufacture of javelins, the so-called “styracine javelins” (Strabo XII.7.3). It should also be mentioned that, in addition to storax from the East, Aegean supplies (or Levantine?) were likely augmented by storax from Crete, as 4th c. numismatic evidence, divine epithets, and a “Cretan” storax noted by Plutarch (*Lys.* 28) suggest.¹⁷⁵ Later evidence also indicates that storax resin was shipped in rolled-up leaves (like nard was), and that, like most other exotic spices, it was often adulterated or imitated.¹⁷⁶

Aspalathos

The identification of *aspalathos*, and its synonym *erysiskeptron* (Pliny, XII.110; XXIV.112; *Dsc.* 1.20), is entirely unknown. Miller and the editors of *LSJ* determined the aromatic was one of two species of “camel’s thorn” (*Alhagi* spp.).¹⁷⁷ Other suggestions have included *Asatragalus* spp., *Calycotome villosa* Poir., and *Genista acanthoclada* D.C.¹⁷⁸ Dioscurides (I.20) and Pliny (XII.110) tell us that *aspalathos* came from Syria/Rhodes and Egypt respectively, while Theophrastus includes it in a list of exotica used as perfume ingredients (*HP* IX.7.3; cf. *Od.* 25, 33). If the plant was used as a perfume in the East during the Persian period, the Semitic name of the commodity escapes us.¹⁷⁹ One 5th c.

¹⁷⁵ This information was kindly supplied to me by P. Perlman.

¹⁷⁶ See Steier, *RE*, s.v. Storax, col. 66.

¹⁷⁷ Miller, 1969, 112; *LSJ*, s.v.

¹⁷⁸ Eigler and Wöhrle, 1993, 81; see also Wagler, *RE*, s.v. for further older identifications.

¹⁷⁹ Later Aramaic has the word *kindul*, which does not have any related forms in the Old Testament (Löw, *Pflanzennamen*, 340).

Aegean reference, in Pherecrates's *Miners* (*apud* Athen. XV.685a), portrays *aspalathos* as a native of the Elysian Fields.

Lykion

Native to the Aegean and Levant, and especially in Lycia and Cappadocia, species of *Rhamnus* produces a gum given the name *lykion* in Greek, probably after the region in Asia Minor (Lycia) noted for its production. To date, the earliest secure attestations for this *lykion* and possibly another *lykion* shipped to the Mediterranean from India (made from the plant *Berberis lyceum* Royle) immediately post-date our period.¹⁸⁰ Numerous small medicinal or perfume bottles from the 3rd and 2nd c. have been found in excavations throughout the Near East, in the Aegean, and even in Sicily, many of which are inscribed with the word *LYKION*, presumably a reference to either the Anatolian or Indian drug/perfume.¹⁸¹ The use and trade of this drug (mostly for eyes) may have predated these bottles by centuries although no hard evidence for the Persian period exists.¹⁸²

¹⁸⁰ For the Indian *lykion* see Karttunen, 1997, 156; Dioscurides (I.100) notes “another” *lykion* from Cappadocia in his section on the Indian variety; the *PME* (§ 39, 49) notes its embarkation points in the Far East. See also Löw, *Pflanzennamen*, 256.

¹⁸¹ See Hershkovitz (1986) for bibliography and discussion.

¹⁸² See Oppenheim (1949, 176) for possible Assyrian medical references to *lykion* and for silver replicas of the pods of the Anatolian variety used as decoration on clothing. Galen (IX.3.8) comments on the manufacture of imitation *lykion* and imports of the Indian variety to Phoenicia.

Cumin

Cultivated for such a long period, cumin (primarily *Cuminum cyminum* L.) probably originated in the Mediterranean area; it is difficult to determine its native source.¹⁸³ As a condiment chiefly, but also an ingredient in perfumes, cumin is first attested in the Aegean in Mycenaean Greek (*ku-mi-no*) and is believed to be a Semitic loan word.¹⁸⁴ In Classical Greek, cumin is attested by medical and comic writers, and philosophers; in popular culture, a *kyminopristês*, “cumin-cutter,” was a skinflint (Ar. *Vesp.*, 1357; Theoc., X.55). Of equal importance in the Levant, cumin (Heb: *kammôn*; Aram. *kammôn*; Phn. *kmn*) is recorded as a banquet spice in Assyrian records,¹⁸⁵ as a possible insecticide in Pharaonic Egypt,¹⁸⁶ a medical ingredient in Saitic Egypt,¹⁸⁷ and also found its place in proverbs (e.g., Isa. 28:25). Aside from *C. cyminum*, ancient references to “cumin” likely included a number of other different species;¹⁸⁸ Levantine-Aegean trade in black cumin (*Nigella sativa* L.; Heb. *ketseh*) was underway by the end of the Bronze Age.¹⁸⁹ Persian period trade in cumin, whether *C. cyminum* or other species, no doubt occurred, as it did centuries later.¹⁹⁰

¹⁸³ Hill, 1952, 456.

¹⁸⁴ *DMic*, s.v., *ku-mi-no*. Wylock (1972, 109ff.) believes that Linear B *ku-mi-no* does not refer to *Cuminum cyminum*, but rather native *Lagoecia cuminoides* L. For Ugaritic references to cumin, see Cline, 1994, 128. On the etymology see Masson, 1967, 51-52.

¹⁸⁵ *ANET*, 558-60. Cumin also appears as a banquet spice for Persian dinners (Lewis, 1987, 83).

¹⁸⁶ Murray, 2000, 528.

¹⁸⁷ Porten *et al.*, 1996, 71-73.

¹⁸⁸ E.g., *Carum carvi* L., *Lagoecia cuminoides* L., *Pimpinella magna* L., black cumin (*Nigella sativa* L.) and ammi (*Ammi majus* L. or *A. indicum* Buch.-Ham.); see Gossen, *RE* Suppl. VIII, s.v. Kümmel; Miller, 1969, 105-106; Murray, 2000, 644-45; Hemmerdinger, 1968, 247.

¹⁸⁹ Black cumin seeds were found on the Uluburun shipwreck; see Haldane, 1993b, 352.

¹⁹⁰ E.g., the seven sacks of cumin noted in a 18th c. A.D. eastern Mediterranean ship manifest (Crececius and Hamza, 1994, 283). In later tradition, special varieties were said to come from Palestine and Cyprus; see Löw, *Pflanzennamen*, 206-207.

I.2: FOODSTUFFS

The Hermippus fragment (*apud* Athen. I.27e-28a) enumerating many Mediterranean locales and their exports to Athens contains a large number of foodstuffs in the list.¹⁹¹ One also gets the impression from the exchange, both commercial and verbal, in Aristophanes' *Acharnians* (719ff.) that international and interregional trade in foodstuffs went well beyond the usual grains, oils and wines, to include most anything that found its way to the dining table.¹⁹² The food and beverage trade was big business, as the many ancient amphora-bearing shipwrecks and textual citations show. However, not much of this business, significantly, seems to have been directed from the Aegean to the Levant, or vice versa, despite the apparent great volumes of exchanges elsewhere in the Mediterranean. There is no evidence, for example, of some widely popular commodities like salted fish crossing the Aegean-Levantine divide, despite the demand for the product in both regions.¹⁹³ The evidence suggests rather a very limited exchange of foodstuffs of mostly fruits and nuts, specialty grains, and some wine and oil.

¹⁹¹ *Apud* Athen. I.27e-28a.

¹⁹² See Dalby, 1996, *passim*.

¹⁹³ While various communities within the Aegean produced and exported salted fish, it was the fish from the Black Sea region that seems to have been most in demand (Braund, 1995); the Aegean demand seems to have been so great that little volume managed to leave the Aegean. Some supplies of western Mediterranean salted fish reached the Aegean as well (cf. Zimmerman Munn, 1982). Beyond what was locally produced, the Levant imported preserved fish mostly from Egypt (cf. Reese, *et al.*, 1986; Glucker, 1987, 95; Sperber, 1976; Curtis, 2001, 175), and possibly from the (far) western Mediterranean (*IDB*, s.v. Fish).

Oils

Not all oils were reserved for kitchen use; many also had industrial applications. Placing oils under the rubric Foodstuffs, however, is in recognition of the fact that most known shipwrecks from antiquity (not only the Persian period) were amphora carriers; these amphoras held mostly liquid foodstuffs, e.g., wine, fish sauces, preserved meats, and of course oil. For the Persian period, there is little problem finding evidence for intra-regional trade in oil, Aegean or Levantine, the problem lies in the evidence for trade east to west or vice-versa. Before discussing the evidence for trade (or lack thereof), however, we will first consider the major oil types that were traded in parts of the eastern Mediterranean, keeping in mind that these oils are distinct products from the perfumes that were often made with them.

In his work on odors, Theophrastus (*Od.* 14-20) discusses the virtues of the primary oils used in perfumery: almond, balanos, sesame, and olive. To this list of oils we can add castor, safflower, linseed, and radish, which were produced and used primarily in Egypt.¹⁹⁴ Of these last four, castor (Grk. *kiki*, *krotôn*; Heb. *kikaion*; Aram. *t̄km/tgm*¹⁹⁵) was unquestionably the most important during the Persian period, frequently mentioned in Aramaic letters of the time, and in contemporary and later Greek sources as well.¹⁹⁶ External trade in these oils, however, seems non-existent.¹⁹⁷

¹⁹⁴ Castor oil is from the plant *Ricinus communis* L.; safflower, which is discussed above, from *Carthamus tinctorius* L.; linseed from *Linum usitatissimum* L.; and radish from *Raphanus sativus* L.) On the production and use of these oils in Egypt, see Sandy, 1989; Serpico and White, 2000.

¹⁹⁵ On the identification of *t̄km/tgm* with castor oil, see Porten, 1968, 92.

¹⁹⁶ Herodotus (II.94) digresses briefly on the use and production of castor in Egypt, commenting also that, although a similar plant grows in Hellas, it does not produce oil. In the immediate post-

Balanos oil (from *Balanites aegyptica* L.), on the other hand, was an Egyptian product that likely enjoyed some distribution in the Aegean, but perhaps only in prepared cosmetics. Ideal for perfumes and unguents, balanos oil is odorless, nearly colorless, and is not too viscous.¹⁹⁸ Consumption of the oil by Egyptian perfume makers may have outstripped, at times, local production necessitating import of the oil from the Levant;¹⁹⁹ some quantity of the raw oil likely reached Aegean perfumers, but there is no mention of it.

The two types of almonds (*Amygdalus communis* L.; Grk. *amygdalê*; Heb. *loz*, *sheked*; Phn. *shkd*), bitter and sweet, have more to do with the nature of the individual tree than a difference in species.²⁰⁰ The best type for unguents, according to Theophrastus (*Od.* 15), is the bitter almond oil from Cilicia. There is little evidence elsewhere to indicate trade in Anatolian almond oil, but trade in the nuts is attested by Hermippus.²⁰¹ Syria and Palestine were also known for their almonds in antiquity;²⁰² Levantine-Aegean trade in the nuts might have begun as

Persian era, castor appears with some regularity in the Zenon archives, most notably when some caravan drivers (accidentally?) smash jars containing the oil (*P.Col.Zen.* 21; also see Sandy, 1989, chp. II). Requests for castor oil, generally measured by the "handful," frequently appear in Aramaic letters and marriage documents of the 5th and 4th c., e.g., *TADAE* I.A2.1; A4.2; B3.3; D3.16.

¹⁹⁷ Production and use of castor oil probably was not limited to just Egypt, but still was not a widely popular oil--Herodotus makes note of its foul smell (II.94.1). It appears once in the Old Testament (Jonah 4:6ff.) in a context that suggests the plant and oil were not known in Judah (cf. Zohary, 1982, 73). The *sillikypria* mentioned by Herodotus (II.94) may also be a Cypriot castor oil export (see Reyes, 1994, 27, n.26).

¹⁹⁸ Both Theophrastus (*Od.* 14ff.) and Dioscurides (IV.157) make it rather clear that balanos oil was the oil of choice for expensive perfumes, and was used extensively in the production of Egyptian perfumes.

¹⁹⁹ Besides Egyptian balanos, Theophrastus also notes a Syrian variety, and Dioscurides a variety from around Petra. Serpico and White (2000, 393) suggest Levantine imports to Egypt.

²⁰⁰ Serpico and White, 2000, 401; Dalby, 1996, 81.

²⁰¹ *Apud* Athen. I.28a. The almonds, called the "ornaments of the feast," come from Paphlagonia.

²⁰² Pritchett, 1956, 182; Gen. 43:11. Pritchett also notes that the etymology of Greek *amygdalê* appears to be Syrian.

early as the Bronze Age.²⁰³ Direct evidence for Persian period seaborne trade in the nuts comes from the late 4th c. shipwreck found near Kyrenia, Cyprus: nearly 10,000 almonds were found scattered over the ceiling timbers of the wreck. Originally loaded aboard the ship in sacks (which since disintegrated), the almonds comprised a fair portion of the ship's eastbound cargo.²⁰⁴ If the nuts were traded in volume, no doubt the oil was as well.

The importance of olive oil (*Olea* spp.; Grk. *elaion*; Semitic *shmn*) as one third of the Mediterranean triad, grain, wine, and oil,²⁰⁵ dictated that it was a major commodity, extensively produced, traded and consumed in food, cosmetics, lamp fuel, and ritual. We might expect, given the vast range of evidence for the olive oil trade, e.g., the numbers of oil-carrying amphoras found at sites on land and underwater all over the Mediterranean in addition to the many literary allusions to the trade in olive oil, that olive oil would be a staple commodity of exchange between the Aegean and Levantine during the Persian period. This does not seem to have been the case. Trade within the respective regions of the Aegean and Levant thrived, but remained basically discrete markets.²⁰⁶ In the

²⁰³ Almonds were found on the Uluburun shipwreck, although not in great numbers. Haldane (1993b, 357) notes that “[t]he small number of nuts on the wreck today may reflect either their attractiveness as food to marine creatures or their insignificance on the ship’s last voyage.”

²⁰⁴ The ship's final voyage (ca. 306) likely began in the Aegean with a cargo of millstones, most of which were off-loaded when the ship called at its home port in Rhodes. The majority of the 404 amphoras on board were then loaded, and the ship continued east to meet her fate (*EUMA*, s.v.). Where the almonds came aboard is far from certain, though Rhodes, already a major entrepot by the end of the 4th c., is highly probable.

²⁰⁵ The triad was recognized as basic both in the Levant (see *Baba Metsia* 107b) and in the Aegean. See Daivdson (1997, chp. I) for the Greek perception of a difference between these staple foods and *opsa*, non-staples.

²⁰⁶ The production and trade in olive oil in antiquity has been the subject of a number of recent, extensive studies. For the Aegean see Amouretti, 1986; Amouretti and Brun, 1993; for the Levant, see Heltzer and Eitam, 1995, and Hadjisavvas, 1992.

Levant, seaborne exchange of olive oil was primarily in the hands of the Phoenicians,²⁰⁷ who used a distinctive “basket-handled” amphora to ship the oil.²⁰⁸ Finds of these jars are mostly restricted to the Levant and Egypt, but a small number have also been recovered from the sea off the Turkish Aegean coast.²⁰⁹ These few finds do not suggest much in the way of Levantine oil making its way to the Aegean. With respect to Aegean oil in the Levant, the fineware ceramics found at sites in the Levant, like Athenian Panathenaic vases, *lekythoi*, and *aryballoi* could denote some trade in specialty oils or perfumes, but there are few Aegean oil-carrying amphoras to indicate trade in raw olive oil on a larger scale.²¹⁰

In the eastern Mediterranean, the Levantine and Aegean oil trade may have overlapped in Egypt, where the olive was scarce. Porten has suggested that the olive oil mentioned in 5th c. Aramaic letters was imported; the Ionian and Phoenician ships registered in the Ahiqar customs account brought oil, but what

²⁰⁷ Phoenician production of oil may have been somewhat limited due the amount of land available to them in the narrow coastal strip they inhabited. Oil for home consumption and export, as Ezra 3:7 and Ezekiel 27:18, indicate likely came from external sources like Judea, or in the Assyrian period, from sites like Mique-Ekron where the largest industrial oil producing complex from antiquity was found. Destroyed in 601, this complex was capable of producing up to 500 tons of oil in a season (Dothan and Gitin, *OEANE*, s.v.).

²⁰⁸ Not yet subjected to a sorely needed study, the basket handled jar’s temporal range, typology, origin and use are still mostly unknown. However, current consensus recognizes these jars as primarily a Persian period Levantine product, most likely Phoenician, used to ship oil, as inscriptions on some jars indicate, and possibly other commodities. See Zemer 1977, no.24 for an earlier overview, and Elayi and Sayegh, 2000, 293-97, for more recent thoughts; while suggesting that the Phoenicians may have shipped oil in non-specific containers (p.293), they also claim (p.297) that the basket handled jars were almost exclusively used to ship oil.

²⁰⁹ See Cowin, 1986, 90, 96ff. for finds from the southern Turkish coast.

²¹⁰ The assumption, of course, is that these closed-type containers were shipped with contents, and that the associated value was focused on the contents rather than the jar itself (cf. Elayi and Sayegh, 2000, 291, n.203). This may or may not have been the case, see Perfumes.

type is not certain.²¹¹ To discourage any dependency on outside oil and to bolster their monopoly, the Ptolemies imposed a stiff 50% duty on imported olive oil, perhaps an indication of the extent to which the trade had grown in previous generations.²¹²

Wine

Wine (Grk. *oinos*; Heb. *vin*; Aram. *ḥmr*) is one of the few commodities in ancient Mediterranean trade important and profitable enough for enormous ships to be devoted to carrying this commodity alone;²¹³ the overall scale of the seaborne ancient wine trade in the Mediterranean was impressive. Most every region and city both in the Levant and the Aegean produced wine, although some, such as the island of Thasos or parts of Syria, earned distinction for their vintages.²¹⁴

As Herodotus notes (III.6), Levantine and Aegean wine shipments converged on Egypt, a land apparently lacking in viticulture (II.77). Whether this was true or not, the Ahiqar customs account, as well as archaeological finds in the eastern Delta and along the coastal strip towards Gaza, shows that both the Greeks

²¹¹ Porten, 1996, 92-93; Briant and Descat (1998, 70) leave the question of the type of oil open, suggesting it could in fact be Ionian perfumed oil. Like the Ionian ships, the Phoenician ships also pay the 20% “portion of the oil” tax indicating that these ships too brought oil of some sort to Egypt.

²¹² *SEHWW*, 302.

²¹³ Or nearly alone. For example, the late 5th c. shipwreck found near Alonnesos in the Aegean was carrying as its primary cargo several thousand northern Aegean wine amphoras when it sank (Hadjidaki, 1996; see also Athanassopoulos, 2000).

²¹⁴ For Thasian wine see Salviat, 1986. For Syrian wine see Millard, 1962. During the Augustan period, Syria was the main source of wine for Egypt (Gibbins, 2001, 292); in the eyes of medieval Arabs, Syria was the “Land of Wine” (Crone, 1987, 105).

and Phoenicians did send large quantities of wine to Egypt.²¹⁵ However, as was the case with olive oil, the Greeks and Phoenicians do not seem to have sent great quantities of wine to each other.

Excavations at most every Persian period Levantine coastal site, and a few farther inland, have turned up what have been called “Greek Style” wine amphoras, but never in very large numbers.²¹⁶ The term “Greek Style,” rather than “Samian” or “Chian” for example, has been adopted by excavators in the Levant because of earlier suspicions that some of these jars may have been locally produced imitations of the Aegean types; this has been recently proved correct by Neutron Activation Analysis on samples from Tell el-Hesi.²¹⁷ For this reason, the numbers of actual imports found in the region may be far less than previously thought. Reduced numbers or not, however, those amphoras published to date

²¹⁵ The Ahiqar account notes import tithes on wine paid by both the Ionian and Phoenician ships; the amounts indicate that the ships were carrying anywhere from a couple hundred to over 800 jars of wine each (*TADAE* III.C3.7.131, 137, 153). The “large numbers” of East Greek (e.g., Samian and Chian) and Phoenician amphoras found in the eastern Delta, coastal strip and around Gaza have to date only been published in cursory form. See *NEAHL*, IV, s.v. Sinai; Giroud, 2000. Iron Age Aegean imports to Egypt likely began to increase after the foundation of Naucratis; the brother of the Lesbian poetess Sappho (early 6th c.) was supposed to have been a wine trader at the colony. Direct evidence for Iron Age Phoenician imports to Egypt comes from two 8th c. shipwrecks found off the coast of Ashkelon, Israel both of which were carrying cargoes of several hundred wine-filled amphoras (see Ballard, *et al.*, 2002).

²¹⁶ For an overview of the sites and bibliography up to the mid-1970’s, see Stern, 1982, 112-113. For some mid-1970’s underwater finds from along the Israeli coast, see Zemer, 1977, nos. 30-31 (4th c. Chian amphoras). More recent finds, summaries and discussions can be found in the final reports for Apollonia-Arsuf (Roll and Tal, 1999, 104), Tell el-Hesi (Bennett and Blakely, 1989, 213ff.) and Dor (Mook and Coulson, 1995, 98-99). At Apollonia-Arsuf the amphoras represent only 3.81% of the common ware assemblage from Area H, Persian stratum 2; an even lower figure was obtained in the excavations of one area in Beirut, where 109 Phoenician amphoras were found, but only two Greek style amphoras (Elayi and Sayegh, 1998, 287). For Areas A and C at Dor for the entire Persian period, ca. 30 Greek amphora fragments were found versus hundreds and hundreds of sherds for the Phoenician-type jars.

²¹⁷ Only one of the five sampled fragments could be definitively identified as Aegean, the origin of two were unknown, while the final two were shown to be from Gaza and Hesi (Bennett and Blakely, 1989, 214).

from all Persian period sites would not be sufficient to fill even a modest-sized ship, indicating a low-volume trade in Greek wine.²¹⁸ At those sites where bona fide Aegean wine jars have been found, the East Greek islands of Samos and Chios seem to have been the primary suppliers, with amphoras from other East Greek and northern Aegean *poleis*, such as Cnidus and Thasos, also occasionally reported. In lieu of any textual evidence to support or counter the archaeological finds, the overall impression of Aegean wine in the Levant is not great. In fact, it could have been that many of these Aegean amphoras were siphoned off the Egyptian-Gazan trade, and not shipped directly to the Levant from the Aegean.

Whereas there is archaeological evidence for Aegean wine in the Levant, there is only textual evidence for Levantine wine in the Aegean, and what there is, is rather contentious because of differing interpretations. The great 4th c. gourmet Arcestratus recommends Bybline wine “that hails from holy Phoenicia” to his Aegean audiences.²¹⁹ At least one other Aegean author, Hesiod (*WD* 589), also mentions a wine variously spelled as *Byblios* or *Byblinos*. The Classical philological tradition, harking back to the scholia on Hesiod, however, has generally refused to recognize this bybline/bibline wine as coming from Phoenician Byblos; the Hesiodic scholia claim there was a little known wine-producing town, named Biblos, in Thrace.²²⁰ Archaeologists working in the

²¹⁸ A very rough, and perhaps even generous estimate of all the published amphoras would total about 300. Even if this figure represents only a small fraction of the volume of Aegean wine amphoras imported during the Persian period, the real figure may not have been much more than what one or two ships the size of the Alonnesos wreck could have carried. A shipwreck reportedly carrying a cargo of 5th c. Samian, Chian and Cnidian jars has been reported off the ancient harbor of Atlit, but has not been investigated (*NEAEHL*, s.v., Atlit).

²¹⁹ 59-60, Ribbeck.

²²⁰ The most thorough discussion of the problem, including the opinion of some earlier commentators that Bibline wine meant wine made from papyrus (*Cyperus papyrus*), can be found

Levant, on the contrary, argue against this tradition, often pointing to Syria's famous wines, which could easily have been shipped to the Aegean through Byblos, just as Egyptian papyrus seems to have been.²²¹ If any Phoenician or Syrian wine actually did reach the Aegean during the Persian period, it did so in such small quantities so as to leave virtually no physical trace, i.e., amphoras.

Wheat

Aegean imports of grain,²²² primarily wheat (*Triticum* spp.) from the Black Sea, Sicily and Egypt during the Persian period are legendary. Since there is an unusual amount of evidence for the (Aegean) grain trade, the mechanisms of this particular trade have also been extensively discussed and debated.²²³ In Athens, at least by the mid-4th c., the trade in grain was heavily regulated, having

in West's commentary on Hesiod *WD* ln. 589 (1978, 306). Classicists have been most unwilling to accept Byblos as a source of the wine; Davidson (1997, 321, n.5), in fact, has gone so far as to say, in reference to the Arcestratus passage noted above, that "the connoisseur seems to have made a mistake." This despite the fact that Arcestratus twice labels the wine "Phoenician."

²²¹ See for example, Albright's comments (*AJA* 54, 1950, 165), who also notes the traditional etymology of Greek *byblos* (i.e., papyrus, Bible) as being derived from Phoenician Byblos. More recently, Elayi and Sayegh (2000, 294-95) have insisted Arcestratus and other Aegean writers meant wine from Byblos, not from Thrace.

²²² The Greek and Semitic vocabulary for the various grains, including wheat, is extensive and specialized. For an overview of the Greek vocabulary see Amouretti, 1986, table 1; for the Hebrew vocabulary, see *IDB*, s.v., grain, wheat.

²²³ Most of the evidence for the grain trade is found in (later) 4th c. Athenian orators, e.g., Demosthenes and Lysias, supplemented by a handful of inscriptions and references in 5th c. authors. Recent debate has sought to determine the extent to which Athens was dependent upon outside grain, mostly from the Black Sea, to feed its population. Since population size is a key factor in such arguments, the discussions are often loaded with statistics which may be and can be skewed to conform to an author's opinion. Garnsey (1985) stands at one extreme positing a relatively small Athenian population and thus a relatively small dependency on outside grain. Others, like Whitby, follow the more traditional line arguing that Athens (and the Aegean) was heavily dependant on outside grain to feed its populations (for a recent overview of the various arguments and bibliography, see Whitby, 1998).

its own special market, its own set of overseeing officials, and its own special laws and provisions, indicating just how important this commodity was to the community.²²⁴ In other Aegean communities, grain imports were likely just as important and just as regulated.²²⁵ Significant imports of grain to the Aegean from the north and south likely began towards the end of the 6th c., although the first textual evidence is a bit later.²²⁶ Herodotus records Xerxes' comments upon seeing a fleet of Aegean-bound grain ships passing through the Hellespont in 480 (VII.147); the early 5th c. poet Bacchylides describes how "over the gleaming sea wheat-bearing ships from Egypt bring the greatest wealth" (fr. 20B Snell 14-16 Snell). This fragment of Bacchylides may hint at how the Aegean population initially saw wheat imports: as a luxury foodstuff to be used alongside, or if possible, in place of indigenous barley.²²⁷ Only later did foreign wheat become a real necessity.

²²⁴ Upon penalty of death, no resident or citizen of Athens was to convey grain, or loan money for the conveyance of grain to anyplace but Athens (Dem. XXXIV.37; XXXV.50-1; LVIII.8-9; Lycurgus, *Leoc.* 27). Once a grain-bearing ship arrived in Piraeus, all (?) grain was to be unloaded and two-thirds of it was to be hauled up to the city. Overseeing this operation were 35 *sitophylakes* ("grain wardens"), who also ensured that unground grain was sold at a fair price, and that bread sellers sold bread of prescribed weight in accordance with the price paid for the wheat. The *sitophylakes* were also to make sure that no one grain dealer (*sitopoles*) purchased more than 50 *phormoi* of wheat wholesale and that their profits were restricted to no more than one obol on this amount (*Ath. Pol.* 51.3-4; Lysias, 22.5,8). See also the grain-tax law of 374/3 (Stroud 1998).

²²⁵ See, for example, a 5th c. inscription from the island of Teos calling for imprecations against those prohibiting the import of grain and those exporting grain (*ML* 30).

²²⁶ Significant grain imports may have begun much earlier, if one intention behind the foundation of Naucratis in the Delta, ca. 615, was to send Egyptian grain to the Aegean. See Roebuck, 1950.

²²⁷ Salleres (1991, 313ff.) has argued that the climate and ecology of Attica and other areas of the Aegean made wheat cultivation a much more risky prospect than barley cultivation; thus very little wheat was actually grown in the Aegean. Because of the perceived nutritional superiority of wheat over barley, as well as the better breads and other products that could be obtained from certain species of wheat (e.g., *T. aestivum*), wheat was a more desirable grain (see also, Braun, 1995).

It is difficult to judge the overall importance of the Black Sea, Egypt and Sicily relative to one another as grain suppliers to the Aegean during the Persian period. This has as much to do with the nature of our evidence (primarily Athens-centric) as it does with the constantly changing political landscape. Grain, like timber, became a strategic commodity, the focus of treaties, pacts, and state-sponsored piracy. There is no question, however, that the Black Sea, Egypt and Sicily were the major suppliers.²²⁸ The role of Levantine grain in the Aegean, which never achieved the same importance as grain from the other regions, is still more difficult to determine. Some amount of wheat reached the grain-hungry Aegean from the Levant from time to time. Andocides, for example, ca. 400, mentions 14-plus shiploads of grain that he personally arranged to be sent from Cyprus to Athens.²²⁹ Whether this was grain grown on Cyprus or whether Cyprus was a transshipment point for grain from elsewhere in the Levant or even Egypt is uncertain.²³⁰ Even so, we have no way of knowing how important or how

²²⁸See discussion and references in Knorringa, 1987 [1922], 98-99. Demosthenes (*Ag. Leptines*, 31-33) states that Athens' Black Sea grain imports were equal to the amount from all other places combined. Aside from the natural fertility of the region, this also was due to special trade incentives given to Athens by local rulers, so Demosthenes claims. Demosthenes may be exaggerating to some degree the importance of Black Sea grain in the late 4th c., but probably not by much. Salleres (1991, 332) suggests too that taste may have been another factor in the Black Sea grain trade. The region produced mostly a high quality, naked bread wheat (*T. aestivum*) which could be finely ground, and which also contained sufficient gluten to make a well-rising, airy loaf. Emmer (*T. dicoccum*), a hulled variety and the only type cultivated in Egypt during this period, and durum (*T. durum*), a common Near Eastern naked variety, were not of the same quality nor did they possess much gluten, which meant they were more suitable for porridges than breads.
²²⁹*On His Return* 11, 20-21. For discussion, see Raptou, 1999, 152-53.

²³⁰Scholars generally have been reluctant, for reasons that are not entirely clear, to concede that this is Cypriot grain, suggesting instead that it is Egyptian grain in transit. Andocides doesn't say, but since later sources, e.g., Demosthenes LVI.3-10, indicate that Rhodes was the common transshipment point for Egyptian grain, which in fact was one factor leading to Rhodes's commercial power in the Hellenistic period, we should not hesitate to allow Cypriot or Levantine grain to be present in these shipments (on Rhodes, see Casson, 1954; on Cypriot grain, Raptou, *ibid.*).

frequent such deliveries were; a remark in Thucydides (II.69) about protection afforded merchantmen en route to Athens from the Levant has sometimes been interpreted as a sign of a regular and important Levantine grain trade.²³¹ There are other possible interpretations (see chp. 6 below). We should also keep in mind that besides Andocides there are no other certain references to shiploads of Levantine wheat in the Aegean before Alexander.

There are, however, a number of references to a particular type of wheat or wheat product, *semidalis*, which is always said to be imported from Phoenicia.²³² In Greek, the word *semidalis* is clearly a loan word, likely Akkadian in origin, but of an uncertain meaning.²³³ Cognate with Talmudic Aramaic *semida*, the word likely corresponds to Hebrew *soleth* (e.g., Ezekiel 16:19), which according to the Mishnah, was a type of highly processed, high quality flour, ground and sifted 2-13 times.²³⁴ “Finest wheaten flour” is also the definition provided by *LSJ*.

Salleres, however, has expressed doubts that *semidalis* could represent a fine flour. The most common species of wheat found in the Levant at this time, *T. durum*, as the name implies, produced kernels too hard to be ground finely using the types of mills available; moreover, *T. durum*, even with modern mills, still is not a top quality flour producer.²³⁵ Instead, grinding the grain would produce semolina, which could not be used to make bread, but rather porridges, e.g., the

²³¹ E.g., Elayi, 1988, 74; also see my discussion of this passage in chapter six.

²³² Cf. Hermippus, *apud* Athen. I.28a; Alexis, *apud*, Athen. III.127b.

²³³ Szemerényi, 1974, 156.

²³⁴ Silver, 1983, 97; Amouretti, 1986, 126-127.

²³⁵ Salleres, 1991, 323, 369.

US product “Cream of Wheat” which is essentially nothing more than semolina. With the Semitic tradition emphasizing “fine flour” for *semidalis* and its cognates, we cannot be too certain of this conclusion. It may be, as Salleres also suggests, that *semidalis* simply denoted a particular grade of flour, not necessarily finely ground, rather than flour from any one species.²³⁶ Whatever the solution to the problem of identification may be,²³⁷ we can be certain of two things: Phoenicia supplied the Aegean with *semidalis* and this product was shipped not as whole grain, but processed. The compounded problems of shipping flour or semolina overseas (i.e., over water) and insuring that the shipment would stay dry might also indicate small trade volumes.²³⁸ While Aegean appetites for fine flours and

²³⁶ Salleres, 1991, 324.

²³⁷ If the Aegean sources are correct in identifying Phoenicia as the source of *semidalis*, this also raises the question of where the Phoenicians obtained the grain or flour/semolina. The Phoenician homeland, because of geographical restrictions, was not a major grain producing region. I Kings 5:2 and Ezekiel 27:17 indicate Judea supplied some amount of grain to Phoenicia. A Phoenician inscription (*KAI* 14, ca. 500) notes that the “good grain land of the Sharon” (*'rtst dgn h'drt 'm bshd shrn*, ln.19) was a gift from the Persian king (?) to the king of Sidon along with Dor and Jaffa. Also, al-Muqaddasi, the 10th c. A.D. geographer notes (p. 151, *editio* de Geoje) that ar-Ramla, slightly to the east the Sharon, produces *al-huwwâra*, a special type of fine flour.

²³⁸ Keeping harvested grain dry and pest-free are the two biggest problems facing farmers and shippers alike. Grain begins to spoil rapidly when wet, even when subjected to more extreme atmospheric humidity. On land, sophisticated storage facilities were developed, particularly in the Near East, to keep grain dry and pests out (cf. Stroud, 1998, 53, on keeping storage facilities in Athens dry). However, what techniques were used onboard ships to keep the shipment dry has never been discussed. Wooden boats, even when new, leak; cargo holds on the best ones still would be damp. If grain was shipped loose, i.e., poured into the hold or into special hoppers within the hold, some percentage of the cargo would necessarily be lost. The same problem would obtain if the grain was shipped in sacks; to date no classical amphoras or other ceramic containers have been found to be used to ship or store grain as a general practice. If grain (in kernel form) is susceptible to wetness, flour is many times more so. Thus, if *semidalis* was a type of flour, it must have been shipped over water in containers which were hermetically sealed to avoid ruining by dampness. Cf. Garoche (1952, 140) on modern precautions for shipping grain on ships, who also notes: “Consequence bad for other goods is penetrating odor from putrefaction due to wet or heating cargo” (*sic*). Such special precautions for a high value commodity would suggest that high volumes, i.e., shiploads, of *semidalis* were not sent to the Aegean. That said, Telemachus (*Od.* II.349-355) takes milled barley aboard ship in leather bags, and Herodotus (VII.23) notes that when the Phoenicians were cutting the canal through Mt. Athos in preparation for the Persian

grains drew Levantine wheat westward, there may have been a trickle of Aegean wheat moving to the east. Strabo (XV.3.22), remarking on the excessive luxury of the Persian king, notes that among other dainties, the king demanded grain from Assus in Aeolis. Whether the story is true or not is beside the point; the farther anything had to travel, even wheat, made it that much more valuable; such might have been the case with *semidalis*.

Sesame and Rice

These two grain-type commodities of Far Eastern origin saw some circulation in the Levant and Aegean during the Persian period, but how much is difficult to estimate. The cultivation of rice (*Oryza sativa* L.) spread from south-east Asia to Mesopotamia by the 7th c.; by the Hellenistic period, but not before, cultivation probably reached Anatolia. Some quantities of rice may have reached the Aegean as early as the Late Bronze Age, as the solitary grain of rice found at Tiryns suggests.²³⁹ Textual evidence from the Persian period is sparse. A fragment of Sophocles' *Triptolemos* contains what is likely the earliest Aegean reference to *oryza*,²⁴⁰ while Theophrastus' note on *to kaloumenon oryzon* (*HP* IV.4.10) indicates both its far eastern origin and comparative rarity in the Hellenic

assault on Hellas, "much ground grain was brought to them from Asia." In both the Homeric tradition and Herodotus, shipping ground grain was perhaps made necessary by a lack of available mills, in other words, it was not commonly done. The Athenian expeditionary force to Sicily took along with it mills (?), millers, and unprocessed grain (Thucydides VI.22).

²³⁹ Salleres, 1991, 23; see also Löw, *Flora* I², 731ff.

²⁴⁰ Sophocles' *ornidês artos* was glossed as "rice bread." Cf. Stadler, *RE*, s.v. Reis, col. 517.

world.²⁴¹ Rabin's suggestion--that *minnith* at Ezekiel 27:17 is "rice"--has not been widely accepted, it would nevertheless be a natural assumption that any rice reaching the Aegean during our period passed through Phoenician hands.²⁴²

Like rice, sesame (*Sesamum indicum* L.) gradually came to be cultivated in the Mediterranean. How early and how widespread this cultivation was, however, is unclear.²⁴³ Both the seeds and the oil extracted from them were known in the region long before the Persian period, as textual evidence, i.e., Linear B *sa-sa-ma*, and archaeological finds from Egypt demonstrate.²⁴⁴ During the Persian period, sesame was regarded, if not as a luxury product, than as one which was reserved for special occasions and needs. Theophrastus, for example, lists sesame among the fine-grade oils used in perfumes (*Od.* 20); sesame oil also appears in Aristophanes as an expensive import used as a bribe (*Vesp.* 675-9). The seeds themselves are often mentioned in the Comic writers as a delicacy eaten at feasts, especially mixed with honey to form cakes.²⁴⁵ But because of the gradually increasing spread of sesame cultivation throughout the Iron Age we cannot be too sure if the sesame which appeared in the Aegean was actually

²⁴¹ Cf. Herodotus III.100. Even if rice was cultivated in the Mediterranean during the Roman period, still it appears among imports from India in the *PME* (e.g., §§ 14, 31, 41), as may have been the case much earlier. Also see Amigues, *Thphr.* III, 226.

²⁴² Rabin, 1966.

²⁴³ Serpico and White (2000, 397) present evidence which suggests that sesame cultivation did not reach Syria-Palestine until the Iron Age; by the 3rd c., but not before, sesame appears to have cultivated in Egypt, perhaps mostly for oil (cf. *P.Mich.Zen.* 96; Sandy, 1989, 71). One should note, however, Strabo's comment (XVI.1.14) that while the sesame plant is commonly known in Babylonia, it is "rare in all other places."

²⁴⁴ *DMic*, s.v.; Wylock, 1972, 115ff.; Serpico and White, 2000, 397; for Ugaritic references to sesame see Cline, 1994, 128..

²⁴⁵ E.g., Steisichorus *apud* Athen. IV.172e; Alexis *apud* Athen. IV.170a; Aristoph. *Pax* 869, etc. Sesame also appears among the goods confiscated from wealthy Athenians in 414 (Pritchett, 1956, 189).

grown there or, perhaps more likely, was imported from Mesopotamia.²⁴⁶ Iron Age documents from Mesopotamia record the transfer of a number of commodities from Sippar to Suru (Tyre?), among which is sesame.²⁴⁷ It stands to reason that Phoenician supplies of sesame probably originated in Mesopotamia, known to Herodotus as a major sesame producer (I.192), supplies which may then have been transported to the Aegean.

Dates, Figs and Raisins

Among the (dried) fruits in trade, Levantine dates seem to have been a popular commodity, particularly those from Syria, which earned high marks with many ancient Aegean and Italian writers.²⁴⁸ The product of the *Phoenix dactylifera* L. (Grk. *phoinix*; Semitic *tmr*), a tree mostly confined to the eastern Mediterranean, dates were (and still are) a relatively expensive treat.²⁴⁹ The importance of the date and date palm in Mesopotamian and Levantine cultures is known to be quite early;²⁵⁰ the Greeks, at an unknown early date, seem to have associated the date palm with the Phoenicians.²⁵¹ Despite some attempts in the

²⁴⁶ Salleres (1991, 363) thinks that some sesame may have been grown in the Aegean during the Persian period, but does not discuss the issue further. Sandy (1989, 71) concludes that there is no evidence for sesame cultivation in Egypt before the Ptolemaic period.

²⁴⁷ Elat, 1991, 33.

²⁴⁸ Cf. Diod. Sic. II.48; Strabo XVI.2.41; Pliny XIII.26-49. Syrian dates were known as “caryoti.”

²⁴⁹ Safrai (1994, 140) notes that during the Roman period the dates sold in Palestine routinely were much more expensive than figs, in one case six times more expensive. My own experience purchasing dates in Palmyra (Tadmor), the only place in modern Syria where dates are grown, and elsewhere in the Levant shows that this roughly 6:1 fig-date price ratio is still often the case.

²⁵⁰ See, for example, an Akkadian fable concerning which is more useful, the date palm or the tamarisk (*ANET*, 410-11). Strabo (XVI.1.14) recounts a similar Persian song enumerating 360 uses for the date palm. Also see Murray, 2000, 617ff.

²⁵¹ Muhly, 1970, 32.

Persian period to plant palm trees in Greece, dates, as Hermippus, Melanippides and later writers indicate, were imported to the Aegean from the Levant.²⁵² Aegean consumers, however, do not seem to have ever developed a taste for date honey (Semitic *dbsh*), an extensively used and highly regarded product in the Levant used alongside or in place of bee honey.²⁵³ A trickle of prized types of bee honey, like Attic, may have made it to the Levant during the Persian period; in the century immediately following, Zenon records Attic honey in trade in Egypt and the Levant.²⁵⁴

The ancient world knew at least two species of figs,²⁵⁵ the sycomore fig (*Ficus sycomorus* L.; Grk. *sykamoros*, *sykaminos*; Heb. *shikmah*) and the common fig (*F. carica* L.; Grk. *sykon*; Heb. *teenah*). In antiquity, the cultivation of the sycomore fig for the sake of the fruit, which is inferior in taste and sweetness to the fruit of the common fig, was probably limited to just Egypt, where not only the fruit, but the wood (in furniture) is widely attested in tombs.²⁵⁶ A more likely candidate for appearing in international trade was the dried common fig (Grk. *iskhades* [pl.]) often packed into cakes (Aram. *dblh*; Heb. *debeleth teenim*) for shipping and storage. Long cultivated as a cheap and favorite food, the common

²⁵² On experiments planting palm trees in Greece, see Thphr. *HP* II.2.10; III.3.5; Herodotus (I.193.5) is the first Greek to mention the fruit of the palm; as Dalby notes (1996, 82), “he writes as if the fruit, but not its natural history were familiar to his audience.” Melanippides, a 5th c. lyric poet, lists dates along with frankincense and cassia, as coming from Syria (*apud* Athen. XIV.651e).

²⁵³ Hebrew and Aramaic *dbsh* can mean either date or bee honey (Jastrow, *Dictionary*, s.v.). Zohary suggests that most biblical uses of *dbsh* refer to date rather than bee honey (1982, 72).

²⁵⁴ *P.Mich. Zen.* 3; *P.Cair.Zen.* 59012, 59426. Various regions within the Levant, particularly Syria, were also major bee honey producers and exporters; the trade was mostly confined to the Near East (Safrai, 1994, 183; Ezekiel 27:17; Greenberg, 1997, 556).

²⁵⁵ Pliny (XV.68-83), in fact, lists 29 species of figs.

²⁵⁶ Murray, 2000, 622; Germer, 1985, 24, 26. The wood was also used for furniture in the Levant, see I Kings 10:27; II Chr. 1:15.

fig, as the name implies, is/was found throughout the eastern Mediterranean.²⁵⁷ As to be expected, however, certain places, like Athens, developed a reputation for the quality of their figs.²⁵⁸ According to the 4th c. historian Dinon, Attic figs were served at the Persian king's table;²⁵⁹ later writers report Attic figs appearing in Babylon.²⁶⁰ Figs coming from the east also appeared in the Aegean (in Athens),²⁶¹ as they no doubt had for centuries.²⁶²

Raisins (Grk. *astaphides* [pl.]; Heb. *tsemokim* [pl.]) were another important type of dried fruit which was likely traded between the Levant and Aegean. Famed not only for its wine, but also its raisins, Syria was an important exporter of raisins well into the Islamic period.²⁶³ Beirut's reputation for raisins no doubt encouraged exports as the Bronze and Iron Age amphoras filled with raisins found there in recent excavations would seem to indicate.²⁶⁴ More so in the Levant than the Aegean, raisins packed into cakes (Heb. *'šišoth*) were used both as an aphrodisiac and in ritual.²⁶⁵ Hermippus (*apud* Athen. I.27e) lists

²⁵⁷ For the comparative cheapness of figs, see Pritchett, 1956, 191, and n.249 above.

²⁵⁸ Cf. Antiphanes *apud* Athen. II.43c; Alexis (*apud* Athen. XIV.651e) calls figs *to parasêmon tôn Athênôn*, "the emblem of Athens." The 3rd c. historian Istros (*apud* Athen. III.74e-75a) provides two accounts for the origin of the *sykophantes*, both of which focus on the export of figs from Athens: 1) when exports were once forbidden, the *sykophantes*, or "fig-detectives" ferreted out those exporting them illegally; 2) when exports were permitted, but heavily taxed, the *sykophantes* were the honest tax collectors.

²⁵⁹ *Apud* Athen. XIV.652c. The account is probably fantasy; when Xerxes is told where his dessert figs come from, he forbids his purveyors to purchase more until he can conquer Athens and have them for free.

²⁶⁰ Pritchett, 1956, 190.

²⁶¹ From Rhodes: Hermippus, *apud* Athen. I.27e.

²⁶² Tens of thousands of fig seeds appeared on the west-bound Late Bronze Age Uluburun shipwreck (Haldane, 1993b, 357).

²⁶³ Strabo XV.735; Le Strange, 1890, 16; Crone, 1987, 104.

²⁶⁴ Brown, 1969, 120; Elayi and Sayegh, 2000, 296.

²⁶⁵ As an aphrodisiac: Pope, 1977, 378; in ritual: Andersen and Freedman, 1980, 298.

raisins (and figs) as Athenian imports from Rhodes; perhaps these were in transit from farther east?

Salt

An important commodity for human and animal health, for ritual, as a condiment and effective food preservative, for tanning, metallurgy, and a host of other industries, salt (Grk. *hals*; Semitic *mlh*), as Pliny remarked with little exaggeration (XXXIII.88), is necessary for a civilized life.²⁶⁶ Trade in salt in most regions and at most times in antiquity was a tightly controlled and highly profitable business.²⁶⁷ The scale of trade could be enormous; Plutarch notes a special type of ship (*halega ploia*) devoted to salt transport, while in North Africa and in Thrace salt was one of the primary mechanisms driving overland, cross-cultural trade.²⁶⁸ The type of salt most familiar to us today, common table salt (sodium chloride, NaCl), was only one of a number of types available in antiquity; differences depended as much on the locality of production as on the

²⁶⁶ Similar aphorisms on the importance of salt can be found in most of the world's literature. In the Old Testament, for example, Job (6:6-7) asks, "Can what is tasteless be eaten without salt?"

²⁶⁷ Most examples post-date our period: see Rostovtzeff (1959, 309) on the Ptolemaic salt tax and monopoly and its Egyptian institutional predecessors. An early Republican papyrus from Egypt lists the contractual obligations of a group of local salt merchants (Boak, 1937) and explicitly restricts the profits that any one member of the group can make without the inclusion of the others. See also Safrai (1994, 186) on the exaggerated profits and methods of protection in the later Palestinian overland salt trade. See also, Davies, 2001, 24-26.

²⁶⁸ Liverani (2000, 508) argues that the exchange of salt for gold and slaves was the fundamental mechanism of the transsaharan trade mentioned in Herodotus IV.181-185; a similar mechanism was found in Thracian trade (Blümner, *RE*, s.v., Salz, col. 2095). Trade in salt was also at the core of the caravan trade which developed at Palmyra (Tadmor); the salt pans to the east of the modern town still provide employment for most of the 75,000 inhabitants.

methods of production.²⁶⁹ Salt was mined, panned (collected from the evaporation of salty waters), and extracted by involved processes from plants and salty earths.²⁷⁰ In the Levant, Phoenician inscriptions note important salt works at Kition in Cyprus, which continued to have importance in later centuries.²⁷¹ Other notable salt factories in the Levant were located around the Dead Sea, and perhaps in Beirut.²⁷² There is no explicit mention of trade in salt between the Aegean and Levant at any period, aside from specialty salts, like those from the Dead Sea which were thought to have a special medicinal value. However, a verbal exchange between a Megarean and Athenian in Aristophanes's *Acharnians* (lms. 759-760), implies that Athens in the late 5th c. regulated the internal Aegean salt trade, cutting off supplies to her enemies at will. If such was the case, her enemies may have looked for salt from any number of extra-Aegean sources, including the Levant, if they weren't already doing so beforehand.

²⁶⁹ Most salt in trade was some variety of sodium chloride, although a number of other "salts" of different chemistry were also traded (Butz, 1984, 277ff.). The range of salts extracted from the Dead Sea, for example, include magnesium chloride ($MgCl_2$), potassium chloride (KC), and calcium chloride ($CaCl_2$). Grades of salt could include coarse and fine, as a 5th c. Aramaic letter notes (*TADAE* IV.D7.7). The famous salt from the Oasis of Ammon in Egypt (*sal Hammoniacus*, cf. Hdt. IV.181ff) was not ammonium chloride (= mod. Sal Ammoniac, NH_4Cl), but rather a sodium chloride/gypsum mix. See Bailey, I, 1929, 163.

²⁷⁰ Potts, 1984, 248ff. Potts (table 1) also includes an informative chart compiled from Ottoman records on the types, qualities, and amounts of salt produced in various regions in 19th c. A.D. Mesopotamia; quality ranges from inferior to "the finest in Iraq;" yield from a couple thousand kg, to "millions, over 150,000 camel loads yearly."

²⁷¹ Manfredi, 1992, 5.

²⁷² Elayi and Sayegh, 2000, 280.

I.3 TIMBER, PITCH

There is little that can be added here to what has been repeatedly stated about the critical need for wood and wood products in antiquity, a need that continued to escalate as time passed. As Meiggs observed, Athens' timber needs saw an estimated four fold increase in the course of the 5th c. over what they had been in the 6th c.;²⁷³ similar dramatic increases in timber needs were certainly felt in other parts of the Mediterranean. In no small way did the advent and maintenance of the large trireme navies of the Persian period contribute to new timber and pitch demands.²⁷⁴ On a similar scale, metal mining and smelting operations for the production of bronze and iron arms/implements and for the silver (coins) used to purchase them, required huge amounts of lumber to fuel the furnaces.²⁷⁵ These two realms alone, navies and metallurgy, were vital enough to

²⁷³ Meiggs, 1982, 193.

²⁷⁴ Meiggs, *ibid.*, suggests four primary reasons for the increase in timber consumption: the development of navies, the transformation of building standards, the growth of industry, and a general population increase. Except where there was virtually no timber growth, as on Delos, most of a population's needs for timber, e.g., for heating and cooking, could be supplied locally (cf. Olson, 1991). While timber for construction purposes (e.g., for wagons, carts, scaffolding, and for the structure itself) could be demanding, the demand was not self-perpetuating as it was in the case of the navies and industry. Once the building was completed, the need for timber ceased. Navies and industries, particularly metallurgy, on the other hand, generated non-stop demands for (imported) timber.

²⁷⁵ Ancient smelting operations, not to mention charcoal production and shipbuilding techniques were, by today's standards, very wasteful in terms of wood use. Moorey (1999, 93) estimated, for example, that smelting one ton of iron ore required eight tons of charcoal; for one ton of copper, nearly 20 tons of charcoal were needed. Depending on the method used and the condition and type of wood, ancient charcoal production methods had an average yield of only 15-20%, that is to say that for about every seven tons of wood used, only one ton of charcoal was produced (Olson, 1991, 412; Horned, 1982, 12; cf. Meiggs, 1982, 240ff.). Thus to smelt one ton of iron, nearly 50 tons of wood were needed; for one ton of copper, nearly 140 tons of wood. Miller (1986) suggested metallurgy as the primary culprit in the (extreme) deforestation of Syria in the first millennium; for Cypriot deforestation due to the mines and shipbuilding, see Meiggs, 1982, 373ff. The pegged mortise and tenon, shell-first construction method current in shipbuilding at this time, required that most every strake be carved to shape and dimension. This severely limited the numbers of planks that could be made from a single baulk.

the survival of most Mediterranean cities and empires to guarantee that trade in timber, as a strategic commodity, was tightly controlled and regulated by those with the power to do so (see below). Of equal strategic value, primarily as the most efficient warship undercoating available, pitch (Grk. *pissa/pitta*; Heb. *zephet*, *hemar*²⁷⁶) also earned itself considerable bureaucratic attention.²⁷⁷

There is little problem in finding evidence for trade in timber and pitch during the Persian period. The problem, significantly, is that there is very little indication of trade between the Aegean and Levant, despite the considerable amount of evidence for timber trade within the regional spheres of the Aegean and Levant respectively, and between the Levant and Egypt. Within the Aegean, the surge of fleet building and industry at the beginning of the 5th c. put considerable strain on local timber resources. Some areas which had been reasonably self-sufficient in supplying their own timber and pitch needs, now had to look (well) beyond their borders for supplies. When Athens, for example, decided suddenly to build its first major trireme fleet in the 480s, local resources fell short and assistance was sought elsewhere. The wood initially came, as Meiggs argued, from southern Italy; it was only later in the 5th c. that Athens became almost wholly dependent on Macedonian timber to keep her fleet afloat.²⁷⁸

²⁷⁶ *Zephet* and *hemar* likely refer to bituminous pitch, rather than the pitch obtained from trees. See bitumen below.

²⁷⁷ As a general waterproofing compound, pitch found use in a number of applications, including roofing of buildings, but its primary importance was in shipbuilding, especially as an effective, lightweight underside coating on triremes (Morrison and Coates, 1986, 185ff.; Meiggs, 1982, 469-71). Pitch is one of the trireme-related, trade-restricted commodities mentioned in Aristophanes, *Frogs* (362ff.).

²⁷⁸ Meiggs, 1982, 124.

The extent of the international timber and pitch trade for other communities of mainland Greece is difficult to judge. Around the Corinthian gulf and in the Peloponnesus there may not have been much need to look too far for supplies; Corinth, for example, likely drew heavily on the forests of Arcadia and Achaia, and could also rely on its Ambracian colony just beyond the mouth of the gulf to supplement its needs.²⁷⁹ Around the Aegean proper some of the larger, better-forested islands, like Crete and Samos, were well enough stocked to engage in a limited amount of export. Access to the forests of (western) Asia Minor for the Greeks of the mainland was, however, restricted by the Persian satraps; as a favor or bargaining chip access might on occasion be granted, as was the case in the final stages of the Peloponnesian War.²⁸⁰

Generally, there were sufficient supplies of timber in the forests bordering the Aegean to supply the local demand, even for such large consumers as Athens. Constant access to the forests, however, was a matter for the games of timber-diplomacy and timber-policing, i.e., currying the favor of those who controlled the forests and laying a heavy hand on the shippers to ensure timber shipments were directed to the right port, as it were, and stayed there.²⁸¹ In the Aegean,

²⁷⁹ Meiggs, 1982, 130, 356.

²⁸⁰ See Meiggs, 1982, 357.

²⁸¹ Delving too deeply into the issues of the internal Aegean timber trade would take us beyond the scope of this study. There is yet, despite Meiggs' great contribution, many questions concerning this trade that need further treatment, e.g., the extent of the power that Athens had as state over the individual traders who brought the timber and pitch to her port. Ps.-Xenophon's *Old Oligarch* (II.3), speaking when Athens was at the height of her 5th c. power, is explicit about the traders: (shipbuilding) timber suppliers must sell exclusively at Athens (the late 5th c. is the generally accepted date for this tract; Hornblower, 2000, puts forth arguments for a 4th c. date). Once timber reached Athens, its export was prohibited (*Ar. Ran.* 362ff.). In terms of timber diplomacy, permission to export and favors, such as tax-exemption, seems to have often been granted on a case by case basis to individuals, rather than to states as a whole (Thphr. *Char.* XXIII; MacDonald, 1981). An early 4th c. treaty (*SIG* 135) between the Macedonian Amyntas III

these games could have serious consequences; the life or death of a city depended on ensuring sufficient amounts of timber for navies and industry (cf. Thucyd. VIII.1-4). For this reason, Aegean politicians and generals were always scanning the horizon for other (shipbuilding) timber sources, should their diplomacy and policing fail, but they generally looked to the west, to the forests of southern Italy, not to the east.²⁸²

Southern Asia Minor and the Levant were quite well stocked with timber, especially Cilicia, Cyprus, Syria and the Phoenician homeland. But despite these riches, and Aegean awareness of them, there are no records of large shipments of timber west to the Aegean until soon after the collapse of the Persian Empire.²⁸³ Meiggs has ventured to suggest that the reasons for this were mostly economic: "the Greeks could find adequate supplies of good timber in the Aegean and it was very uneconomical to import from the Eastern Mediterranean."²⁸⁴ But this raises the question: more uneconomical than importing it from the Western

and the Chalchidians is a more rare example of a timber treaty between state, which specifies not only the type of timber (here all but fir, except in some circumstances), but also the intended use and legal manner of export.

²⁸² Thucydides notes the importance of Italian timber in Athens' struggle, e.g., the shipbuilding timber stockpiled for the Athenians in Caulonia which was burned by marauding Peloponnesians (VII.25). Alcibiades, truthfully or not, confesses Athens' intentions in the west: with Syracuse defeated, Athens could fully exploit Italy's timber to build enough new ships to bring the war to a decisive end (VI.90.3).

²⁸³ Diodorus Siculus (XIX.58) gives the first notice of shipbuilding timbers sent west (to Rhodes) from the east (from Cilicia? Phoenicia?) to assist in Antigonos's massive shipbuilding program in 315. But it was Antigonos' son Demetrius who in 306 sent timber all the way to the Aegean from the Levant. Eager to win Athens' favor he arranged for enough pine (?) to build 100 triremes be released from Cyprus (?; for a discussion of the Athenian decree authorizing payment for the shipment, see Meiggs, 1982, 145 and n.87. The reading "pine" and the source of the wood, Cyprus or Syria, is not certain).

²⁸⁴ Meiggs, 1982, 353

Mediterranean?²⁸⁵ There is evidence for a trickle of Levantine timber reaching the Aegean during the Persian period, mostly cedar (*Cedrus libani*?²⁸⁶) imported as a specialty wood for specific projects, e.g., temple doors.²⁸⁷ Where prices are recorded, the cedar is expensive, but this may have been due more to the type of wood, its size, or even an export tax targeting this particular commodity.²⁸⁸ The reason for the lack of Levantine timber in the Aegean was not necessarily economics, but rather, I would suggest, (Persian?) prohibitions. Whatever treaties and peace may or may not have existed between the Persians and Aegean Greeks

²⁸⁵ Aside from Meiggs' suggestion that Italian timber was used to build Athens' first trireme fleet (see above), temple records from Eleusis dated 408/07 record thirty large timbers from Thurii, proof that sizeable amounts of Western Mediterranean timber reached the Aegean (see Meiggs, 1982, 124). During the Peloponnesian War, when Athens' access to the Corinthian *dioklos* would have been cut off, the timber from Italy would have had to be shipped completely around the Peloponnesus, a difficult passage even in good weather, which could only have added cost (monetary, time, and hardship) to the shipment.

²⁸⁶As is frequently noted, ancient Greek usage of *kedros* referred not only to *Cedrus* spp., mostly *Cedrus libani*, but also *Juniperus* spp. This of course causes confusion, but more seriously requires that every mention of *kedros* be examined individually to determine which genus best fits the discussion (see Meiggs, 1982, Appendix 3). Similar confusion is found in the identification of Hebrew *beroš* (*Juniperus* spp.?) and to a lesser extent *'rets* (generally *Cedrus libani*). See Löw, *Flora* III, 14ff. and Brown, 1969, 141ff.

²⁸⁷ Records of Greek temple building and restoration in the 6-4th c., e.g., Delphi, Delos, Eleusis, Ephesus, often mention imported cypress (*Cypressus sempervivens*) and less frequently cedar (see discussion below) for use in roofs and doors. Both woods share the similar traits of resistance to rot and insects, fragrance, and longevity, although cypress will take a better polish. The cypress, at least in one instance, is recorded as Cretan; Hermippus further suggests Crete was the usual source for this timber. The cedar, on the other hand, could only have come from the Levant. Besides its use in temple architecture, there are only a few references to other uses in the Aegean, e.g., Cypselus' 6th c. chest at Olympia seen centuries later by Pausanias. See Meiggs, 1982, 200, 292ff., 414ff., 437ff.

²⁸⁸ In the accounts of the Eleusinian Commissioners for 329/8, the three cedar logs recorded are four times more expensive than the next most expensive (and larger) timbers (see Meiggs, 1982, 437). Quality and distance aside, the Levantine export tax on these timbers may have been sufficiently high to discourage commonplace Aegean-bound trade in cedar, or any other Levantine timber. Such discriminatory taxes are found in the Ahīqar customs account; the Ionian ships pay a number of additional taxes that the Phoenician ships do not, and the rates are considerably higher (see Briant and Descat, 1998, 73ff.). One should also note that while in the Aegean cedar was reserved for the gods (i.e., for use in sanctuaries), in Egypt, where it was also an import, the wood saw more widespread, commonplace use, especially in ship construction. This would suggest also that (at least while Egypt enjoyed Persia's favor) cedar was inexpensive enough for such use, i.e., was not subject to excessively high export or import taxes (on cedar imports and use, see below).

over the course of the 5-4th c., the Persians would have been fools to upset the balance of power by giving the Greeks full and unrestricted access to Levantine timber supplies to build their warships. Athenian military expeditions in southern Asia Minor and the Levant in first half of the 5th c. may have had, as one objective, the acquisition of timber supplies; by 440 whatever inroads the Athenians made in the area were halted and turned back.²⁸⁹ If timber had been an objective, once again supplies would have had to come solely from the Aegean or the west.

There is precedence in the Levant for (Mesopotamian) overlords dictating how timber supplies were to be used and to whom they could be given or traded, particularly in respect to the famed cedars of Lebanon.²⁹⁰ The Lebanon and these

²⁸⁹ Childs (1981, 61 ff.) observes that "Athenian interest in Lycia may have been mainly commercial--probably the acquisition of wood for ship-building." Child also suggests that at the time the Lycian and Carian cities disappear from the Athenian Tribute Lists, ca. 440, marks "a purposeful attempt by the Persians to counter Athenian aggression in the area." And possibly, one might add, to curtail any timber trade. On this note, it may be significant that while northern Asia Minor also had considerable timber reserves, which Xenophon noted on his march home, one never hears of this timber reaching the Aegean despite the considerable amount of Black Sea trade in other commodities. Again this may have been due to Persian regulations.

²⁹⁰ Nehemiah (2:8) illustrates how (some) Levantine timber resources were managed. Before leaving Susa, Nehemiah obtains from Artaxerxes a writ to give to Asaph, the *šomer hapardes*, literally, the "guard of the garden" of the province Beyond the River (*pardes*, a Persian loan word, also gives Greek *paradesios*, from which English "paradise" is derived. The word denotes a tract of land marked as royal property, as *lmelek* indicates). Asaph is to give Nehemiah enough timber (*'tsim*) to (re-)build the gates of the citadel, the city wall, and the prophet's palace in Jerusalem. *Pardes* here is generally taken to mean the cedar reserve in Lebanon, and *'tsim* cedar timber, although neither the words nor context explicitly states as much. Asaph's position may have been more encompassing, and may have included all major forests in the province and their management. This is in fact suggested by the use of the word *'tsim* (= "wood" or "timber" generally) rather than *'rets* (= "cedar"), which the Hebrew authors had no qualms about using when cedar is meant specifically (the word appears over 70 times in the Old Testament). Furthermore, in Jerusalem, cedar was also a wood type meant for the divine (i.e., in sanctuary architecture, as in the Aegean) and not for gates, city walls and other base applications where most any wood type would suffice. A greater range of wood types could indicate a greater geographical range in Asaph's oversight. At any rate, timber usage on a larger scale still required special royal permission.

cedars were considered the private domain of the Assyrian, Babylonian and Persian masters.²⁹¹ A special dispensation from the Great King was needed for one-time use of the trees, as in the case of the Jews returning to Jerusalem from exile intending to rebuild their temple, or for unqualified use and trade, which was a privilege Tyre alone enjoyed for almost three hundred years, from the 10-7th c.²⁹² An early 7th c. Assyrian letter sent to the capital of Nimrud by the official in charge of supervising Phoenician commerce, describes the regulations concerning timber use and exports. Tyre has open access to the ports and quays of the coast, and is free to bring down timber from the Lebanon and export it where desired provided the tolls are paid. Sidon, in contrast, is subject to greater restrictions; it too has access to the timber, but is not allowed to sell to the Philistines and Egyptians.²⁹³

By the first quarter of the 5th c., a number of decades after the Persians had taken control of the Levant, these restrictions on Sidon were no longer in

²⁹¹ A great deal has been written on the complex relationship between these cedars and their various owners. See, for example, Brown, 1969, 141ff; Meiggs, 1982, Chp. 3; Elayi, 1988; and most recently, Zaccagnini, 1996.

²⁹² Ezra (3:7) records that Cyrus granted the Tyrians and Sidonians permission to ferry cedar timbers for use in the temple to the port of Jaffa, where the Jews gave them grain and oil as payment. What exactly this payment was for, purchase or shipping charges, is uncertain, but it is paralleled in I Kings 5:9-11 where Hiram delivers cedar timber for Solomon's temple. The passage in Ezra may be in that case an allusion, or may denote one of two things. Either the Persian gave the timber free of charge, but still made the Jews responsible for transport charges (cf. the Athenians paying for the transport of Demetrius' gift in 306), or the King gave the Jews the rights to purchase the timber from the Phoenicians. For Tyre's special privilege, see Zaccagnini, 1996.

²⁹³ Saggs, 1955, no.12. Zaccagnini (1996, 451-52) suggests the restrictions may be due to a trade dispute between the rival cities of Sidon and Tyre which the Assyrians attempted to mitigate. Whatever the purpose may have been, the letter does show that Levantine overlords had the power to dictate who could sell what to whom; presumably they also set the tax/toll rates.

effect.²⁹⁴ In the Ahiqar customs account, most every Phoenician/Sidonian ship calling at the Egyptian port had on board large shipments of wood, often specifically named as cedar.²⁹⁵ From at least the second millennium, Egypt had sought Lebanon's cedar as the most valued wood for royal shipbuilding; procuring the timber often required timber-diplomacy, as the sad tale of Wenamun illustrates.²⁹⁶ An Egyptian official of the early Iron Age (ca. 10th c.), Wenamun was sent to the Levant to obtain cedar for a new royal barge, only to be robbed, shipwrecked, and detained for over a year until the king of Byblos, grudgingly, released the timber. With both the Levant and Egypt under the Persian yoke, the timber trade was perhaps less subject to the whim of individual local rulers, but the primary purpose of the cedar imports--shipbuilding--remained more or less the same.²⁹⁷ A 5th c. Aramaic letter from Egypt, for example, concerned with the repairs of a Persian (ceremonial?) ship, lists quantities of "new" and "old" cedar in

²⁹⁴ Liphshitz and Biger's (1995) study, based on archaeological finds of timber from ancient Palestine indicates an appreciable decline in timber imports in the Iron Age compared to those in the Bronze Age, from 19.2% of total wood found, to 3.6%. For the Persian period, 25.5% of the wood studied was imported (including only one fragment of *Cedrus libani* noted in their 1991 study). These figures are suggestive of relaxed restrictions on trade, but should also be taken with caution since not all the wood from sites in Israel has been recorded (or studied). Also, for the Persian period, the sample size was only 51 pieces of wood, compared to 3442 for the Iron Age and 2129 for the Hellenistic. Obviously, a comparable sample size for the Persian period would make the figures more credible.

²⁹⁵ The wood is often noted simply by weight, e.g., 7000 *karsh*, which may indicate some type of easily weighed wood product, e.g., charcoal, sawdust, or small firewood pieces, rather than stackable lumber, which also is specified, e.g., "550 beams and boards of cedar."

²⁹⁶ Geodicke, 1975.

²⁹⁷ This is not to suggest that all Egyptian boats and ships were made of cedar. Local woods, such as acacia, while not ideal boatbuilding timber, still served in ordinary nilotic craft, as Herodotus noted (II.96). The remains of a Persian period boat uncovered in Egypt, the Matariya boat, included sections that were of sycamore, which may have been imported from Palestine (Haldane, 1993a, 240). Cedar was, as in earlier periods, likely reserved for ceremonial and official vessels, e.g., the 42 m long Khufu I ship which was built entirely of cedar (Haldane, 1993a, Chp 5).

addition to four other undetermined types of wood.²⁹⁸ As in the Aegean, cedar was also used in Egypt in temple architecture. Another 5th c. letter, from the Elephantine Jewish community to Bagohi, the governor of Judah, mentions the destruction of the local temple's cedar roof.²⁹⁹ What all this shows, in other words, is that consistent and presumably large shipments of cedar continued to make their way to (Persian-controlled) Egypt, but not to the Aegean. Again, I propose this was because the wood would be used to build triremes, which was not something the Persians (or Phoenicians) would necessarily want to encourage in light of their former and sometimes recurring animosities with the Greeks.

The discussion to this point has focused on large shipments of (mainly) shipbuilding timber and Lebanese cedar. In the archaeological record, especially from Egypt,³⁰⁰ some evidence can be found for a more diversified trade in wood, e.g., a trade in non-strategic woods for furniture, musical instruments and the like. Unfortunately, the evidence does not indicate how extensive the trade in non-shipbuilding woods actually was; also the distribution of many of the species of furniture woods might preclude long distance trade.³⁰¹ Boxwood (*Buxus*

²⁹⁸ Lines 49-50 of the letter state that the boatbuilders are to bring the old wood removed from the boat to the treasury. Porten (1996, 119, n.50) suggests that this was to prove the need for replacement as well as for recycling; emphasis should be placed on the latter. In timber-poor Egypt, timber re-use, especially in shipbuilding was commonplace (see Haldane, 1993, Chp. 8). The other types may have included Cilician fir (*Abies cilicia*), Cypress (*Cypressus sempervivens*), *Juniperus* spp., and Aleppo pine (*Pinus halpensis*) all of which were suitable boatbuilding woods and which are known to have been shipped from the Levant to Egypt (see Germer, 1985, 7-12; Gale et al., 2000, 347, 350-52).

²⁹⁹ *TADAE* I.A4.7

³⁰⁰ See Gale et al., 2000. Most of the archaeological evidence for this trade, including ca. 12 species, pre-dates the Persian period. With the exception of ebony, all of the other species are believed to have come from Syro-Palestine. Also see der Manuelian (1995, 1628) on the imported wood species, mostly from Syria, used in Egyptian furniture making.

³⁰¹ The evidence for ebony, an imported wood wherever it is found in the Mediterranean, is more extensive; this wood will be dealt with below in conjunction with ivory. The fine-wood

sempervivens; Linear B *pu-ko-so*; Grk. *pyksos*; Heb. *te'ashur*³⁰²), for example, a light-colored, easily worked and durable wood, was much sought after in the east where it is noted in Assyrian tribute records.³⁰³ The sources for this wood were likely Syria, where Mt. Amanus was also known as the Box Mountain, and possibly Cyprus; closer to the Aegean, box was used in furniture found at Gordion.³⁰⁴ Maple (*Acer campestre*; Grk. *sphendamnos*) was also, as it is today, a prized furniture wood which may have come mostly from Asia Minor, but this is far from certain since maple is found abundantly elsewhere.³⁰⁵ Indications of some limited trade in Ionian specialty (?) woods, like maple, might be found in the Ahiqar customs accounts; one of the taxes the Ionian ships are required to pay consists simply of turning over a piece of wood to the harbor masters, but what shape or type of wood this was, we do not know.³⁰⁶

I.4 EBONY AND IVORY

Aside from their long-standing association as exotic materials used for furniture inlays, cosmetic containers, instruments and the like, ebony (Grk.

almug/algum noted in the Old Testament is discussed in the Aloe section. Among the items inventoried in the furniture factory he inherited, Demosthenes (*Ag. Aphobus* I.9-11) notes wood (*xyla*) for couches. This wood undoubtedly was some select species, possibly imported, but what and from where, we have no clue.

³⁰² See Löw, *Flora* I, 316 for the Hebrew; Ventris and Chadwick, 1973, 135, for the use of box in the Linear B tablets.

³⁰³ E.g., *ANET*, 288, 290.

³⁰⁴ Box is found in many of the forests of the Mediterranean, so we cannot be sure how far the box found at Gordion traveled. To date, the only archaeological evidence for box in Greece is from Bronze Age Pylos (Meiggs, 1982, 281; cf. Ventris and Chadwick, 1973, 135).

³⁰⁵ Germer, 1985, 106.

³⁰⁶ The word *smkt*, "prop" (?) makes little sense. The Phoenician ships also are required to pay a wood-tax, but there the due is specifically an oar, old or new.

ebenos; Heb. *hebeni*) and ivory (Grk. *elephas*; Heb. *shen*) are presented together here because they both originated in the same parts of the world and were often transported (and mentioned) together. The Levantine-Aegean trade in (raw) ebony and ivory was well established by the Late Bronze Age as archaeological and textual finds from Greece, Egyptian tomb paintings and shipwrecks show.³⁰⁷ This trade carried on into the Iron Age unabated, as finds from Samos illustrate.³⁰⁸ While there is considerable archaeological and textual evidence for the Persian period ebony and ivory trade, some questions persist, such as the identification of the “ebony” and “ivory,” and their origins.

Two hundred blocks of ebony, so Herodotus tells us (III.97), were part of the tribute sent to the Persian king annually by the Ethiopians; he also tells us that there was an abundance of ebony in Ethiopia (III.114). A Nubian/Ethiopian source for (one type of) ebony would accord well with archaeological and textual evidence. Egyptologists have long favored the identification of what the Egyptians called *hbny*, which gives us English “ebony,” with *Dalbergia melanoxylon* Guill. et Perr., known as “blackwood,” or “Egyptian ebony,” which comes from tropical Africa.³⁰⁹ This was the ebony found on the Bronze Age Uluburun shipwreck, en route from the Levant to the Aegean, and in various

³⁰⁷ Both appear in Linear B texts: ivory = *e-re-pa*; ebony = *ku-te-so*; see Ventris and Chadwick, 1973, s.v.; *DMic*, s.v.; Palaima, 1991, 279; Duhoux, 1988, 80. Ventris and Chadwick equate Linear B *ku-te-so* with later Greek *kytisos*, “false ebony,” which Hort and *LSJ* identify as *Laburnum vulgare*. However, various types of “ebony” likely existed; see below. Archaeological finds of both raw and worked ebony and ivory from Greece are summarized by Bass (1997, 159-160, 162-63), where discussion of the finds from the Uluburun shipwreck can also be found. An illustration of Nubians carrying ivory tusks and ebony blocks is found in Germer, 1985, 97.

³⁰⁸ For a summary of archaeological ivory finds in the Aegean from the Archaic and Classical periods, see Barnett, 1982, Chp. 9; for a summary of mostly textual references to the ivory trade, see Gill, 1992; for ebony finds and textual references, see Meiggs, 1982, 310ff.

³⁰⁹ Germer, 1985, 97-98.

Egyptian tombs.³¹⁰ The records dealing with the construction of the Persian palace at Susa mention an “ebony” from Egypt (the tribute mentioned by Herodotus?), they also note *yaka* from India.³¹¹ An Old Persian word equated with Akkadian *musukkanu*, *yaka* is likely *Dalbergia sisso* Rox., an “ebony” which grows from Oman to Pakistan.³¹² Today, our ebony is mostly tropical African *Diospyros* spp., especially the south Indian and Sri Lankan *Diospyros ebenum* König. However, no archaeological or other evidence has been found to equate *Diospyros* with any ancient “ebony.”³¹³ Hence, the ebony which found its way to the Aegean presumably came either directly from Africa (i.e., Egypt or Carthage), or passed first through Levantine ports, as would have been the case anyway with *sisso*.

From the 9-7th c., the Phoenicians and Israelites gave to the Assyrians considerable quantities of ebony, either as tribute or as plunder.³¹⁴ I Kings (10.21-22) provides some clue as to where some of this ebony came from; in the passage the Tarshish fleet brings home ebony and ivory, along with gold, silver, apes and baboons. The identification of Tarshish as the Phoenician colony of Tartessus in Iberia is generally accepted;³¹⁵ the ships on their return passage perhaps stopped

³¹⁰ Bass, 1997, 163.

³¹¹ See Lecoq, 1997, sec. 9 and 11.

³¹² Moorey, 1999, 352; Maxwell-Hyslop, 1983.

³¹³ Gale, *et al.*, 2000, 338; Hepper, 1977; Hill, 1952, 115; note also Theophrastus’ discussion of the two types of ebony known to him, one of which is better (*kalon*) the other inferior (*phaulon*) (IV.4.6). Amigues (*Thphr.* III, 224) identifies the former with *Diospyros ebenum*, the later with *Dalbergia sisso*.

³¹⁴ *ANET*, 276, 281, 283, 288, 290; cf. Bunnens, 1985, 126.

³¹⁵ Aubert, 1993, 177ff.

in Egypt or Carthage where the ebony (i.e., blackwood) and ivory may have been obtained.

The Old Testament offers further evidence for the transport of ebony (*sisso* or blackwood?) and ivory through Phoenician ports. The sons of *dedan* or *redan* are said by Ezekiel (27.15) to bring ebony and ivory to Tyre. The variant readings in the manuscripts, as often, is due to the similarities of the letters *resh* and *dagesh*; if it is the sons of *dedan*, they are said to be from north Arabian Dedan, recurring in verse 20, while the sons of *redan* are from Rhodes, a tradition followed by the LXX and most commentators.³¹⁶ The case for either Dedan or Rhodes is equally strong on philological grounds; both might equally have served as entrepots for ebony and ivory as well. Blackwood from Egypt could easily have reached Rhodes, a major Egyptian-Aegean transshipment point;³¹⁷ blackwood or *sisso* could likewise have easily reached Dedan through various African/Indian trade routes ending in Arabia. Perhaps, we should not try too hard to distinguish one wood from the other, or one entrepot from the other. Either "ebony" could have been considered real or false depending on one's perspective.

Turning to ivory, our determination of the sources of ancient ivory is hampered on two counts: first which animal(s) were involved and secondly, through which routes the ivory reached the ports and workshops of the Mediterranean.³¹⁸ Along with their tribute of ebony logs, the Ethiopians, so

³¹⁶ For discussion see Greenberg (1997, 554) who favors Dedan over Rhodes.

³¹⁷ Rhodes, as an Egyptian-Levantine transshipment point, may have been encouraged by its Phoenician population. See Coldstream, 1969.

³¹⁸ Ivory today is generally understood to be the tusks only of the various elephant species, which in some cases can be virtually indistinguishable from the dentine of other large mammals, such as hippopotamus, walrus, and whales. Also, the bones and horns of other species, like water buffalo, cattle, and camels, was used extensively and may have been confused for ivory, as has often been

Herodotus tells us, were also required to send 20 elephant tusks (III.97), and Ethiopia, in addition to its abundant supplies of ebony, also had plenty of elephants (III.106). Other evidence also points to Africa,³¹⁹ and thus the two African elephant species, the forest elephant (*Loxodonta africana cyclotis*) and the bush elephant (*L. africana africana*), as a major source for Persian period ivory.³²⁰ But, as was the case with ebony, the Persians also received supplies of ivory from the Far East,³²¹ from the eastern species *Elephas maximus*. Some of this far eastern ivory may have reached the Mediterranean overland from Media, or just as likely, through shipments to Arabia or Red Sea Egyptian ports.³²² A third purely hypothetical elephant species, is the so-called “Syrian elephant,” which was, according to those who believe it existed (e.g., Miller, 1986), the species which supplied the ivory to the famed Phoenician ivory carving shops of the early first millennium; by the Persian period this species was, presumably, all but extinct, exhausted by overuse and abuse of the local ecology.³²³

the case with archaeological finds (Krzyszowska and Morkot, 2000). Here, I will use “ivory” as a general term denoting all bone and ivory-like material, unless otherwise stated.

³¹⁹ Hermippus (*apud* Athen. I.27f) notes that Libya has much ivory for commerce; Ezekiel 27.15 might indicate African ivory in trade; Phoenicians in Ps.Scylax (112) obtain ivory on the Atlantic coast of Africa; an African elephant tusk was also recovered from the Persian period shipwreck at Shave Zion, near Akko (*NEAEHL*, III, 958). See also Pausanias V.12.3 and Gill, 1992, 233.

³²⁰ Aside from tusk shape and size in an unworked state, distinction between the ivory of the two African species is nearly impossible, as it is for distinguishing between the ivory of the African species and the Indian (*Elephas maximus*).

³²¹ The Susa palace foundation records note ivory coming from not only Ethiopia, but also India, Arachosia and Kush.

³²² Krzyszowska and Morkot, 2000, 322.

³²³ See Krzyszowska and Morkot, 2000, 322; Caubet and Poplin, 1992, 95; Miller, 1986; Turfa, 2001, argues most vehemently against the existence of the Syrian species.

The relative scale of ivory consumption in the Aegean region, where there was a long tradition of raw and worked elephant ivory imports,³²⁴ appears to have been fairly high.³²⁵ References to its use in furniture are common,³²⁶ other uses included chryselephantine statues,³²⁷ temple doors,³²⁸ figurines,³²⁹ shield inlays,³³⁰ and parasol handles.³³¹ Phoenician ships or merchants operating both in the eastern and western Mediterranean likely conveyed much of the raw ivory to the Aegean.³³²

³²⁴ See the summary in Barnett, 1982, Chp. 9, for early Iron Age and Archaic Aegean imports of oriental ivories, raw ivory and possible eastern craftsmen. For Archaic ivory finds from Sparta, see Carter, 1987; for finds from Corinth and Delphi, Carter, 1989; for Asia Minor and the nearby islands, see Özgen, 1994; Dusinberre, 2000; and Brize, 1992.

³²⁵ The supply seems to have been high enough (or the demand low enough) that even for a prestige commodity the price of raw ivory was not outrageous. Ivory tusks, in a sale at Delphi in the late 4th c., went for 24.5 drachmas/mina, only a quarter of the value of a similar weight of silver, thus making ivory, as Gill notes (1992, 235) only a little more expensive than some foodstuffs. Throughout the 3rd c., the price of ivory per mina, in sales at Delphi and Delos, dropped dramatically to 8 drachmas/mina, then to 3 drachmas/mina.

³²⁶ E.g., Athen. II.48b. Demosthenes inherited a workshop producing couches and swords at Athens which consumed up to two minae of ivory per month, presumably in inlays (XXXII.9-11; 30-33). Also note that the remains of ivory inlaid couches have been found in 6th c. burials in Athens (Kurtz and Boardman, 1971, 71).

³²⁷ Such as those Pheidias made for the sanctuaries in Athens and Olympia. See Laptin, 1997, for the ivory working techniques adopted by Pheidias. On chryselephantine statues also see Meiggs, 1982, 315ff.

³²⁸ The evidence is best summarized and discussed by Oliver, 1992.

³²⁹ See Barnett, 1982, Chp. 9; Özgen, 1994.

³³⁰ Such as Alcibiades' (Athen. XII.534e)

³³¹ Chamaeleon's comments on the poet Anacreon condemn his use of an ivory parasol as effeminate (*apud* Athen. XII.534e).

³³² For the Persian period, as well as for previous and later periods, no text or archaeological evidence thus far links any Greek directly to the ivory trade, while for Phoenicians the evidence abounds. This is not to say that Greeks did not act in the trade, but that the evidence available points to the Phoenicians only. In the western Mediterranean, Ps.-Scylax notes Phoenicians trading for ivory on the Atlantic coast of Africa (112); off the coast of Spain, a 5th or 4th c. shipwreck was discovered carrying 13 ivory tusks inscribed with Phoenician and Punic names (Bajo de la Campana A; see Parker, 1992, no.83). Near Akko, on the Israeli coast, an elephant tusk was discovered on a Persian period wreck at Shave Zion (*NEAEHL*, III, 958); the long tradition of Phoenician ivory working, and supply to the Assyrians should also be taken into account (see Barnett, 1982, Chp. 8). Only if we accept the reading "Sons of Rhodes" in Ezekiel 27:15, might there be evidence for Greeks acting in the ivory trade. But the reading is contested,

A curious observation concerning the ivory trade in the Levant is the “brutal rarification” of finished elephant ivory goods from eastern workshops after the 7th c., which has been tied to the extinction of the “Syrian elephant” mentioned above.³³³ Analysis of manufactured “ivories” from Persian period sites throughout the Near East, shows an increasing use of teeth, bone and horn from other species in place of elephant ivory.³³⁴ The reasons for this, apart from the proposed extinction of the “Syrian” elephant, have been ascribed mostly to indifference on the part of craftsmen and consumers.³³⁵ Indifference is rather hard to believe; some “ivory,” like that of hippopotamus dentines, may have been preferred for its whiter color and polish.³³⁶ Supply or demand may have also been a factor; the large output of (camel) bone utensils, gaming pieces and inlays from the 5th c. workshop found at Ascalon, obviously answering an equally large demand for such items, depended on a steady supply of bones presumably from the slain and eaten dromedaries from the caravans which came to the city.³³⁷ The bones and horns of some species were more readily available than elephant ivory; some carved bone types may also have had specific religious connotations.³³⁸ Long-distance trade in raw bone and horn indicates that they had more than

and these “Rhodians” could have been the Phoenician inhabitants of the island. Note also the Syrian merchant selling ivory at Delos in 269 (IG II² 1672).

³³³ The translated quote is from Elayi and Sayegh, 1998, 259.

³³⁴ These include hippopotamus, cattle, camel, goat, sheep, and donkeys.

³³⁵ Elayi and Sayegh, 1998, 333; Caubet and Poplin, 1992, 95.

³³⁶ See Krzyszkowska and Morkot, 2000, 326-27.

³³⁷ Wapnish, 1991, 60.

³³⁸ E.g., the bovine scapula found at Dor with a carved sailing departure scene and Cypro-syllabic dedicatory inscription on the reverse. For this piece and the cultic use of the bovine scapula in the Near East, see Stern, 1994.

ordinary value, perhaps because they could mimic elephant ivory well.³³⁹ In fact, this phenomenon of bone and horn use in the Levant may have been more widespread, and may be lurking behind many of the “ivory” references in Aegean sources; the presumed high levels of elephant ivory consumption in the Aegean might be partially illusory.³⁴⁰ Unless a workshop received elephant ivory in a recognizable state, i.e., as a (relatively) complete tusk, there could be no guarantee that it was real ivory. And perhaps too some workshops hoped their customers could not tell the difference between bone and ivory, as often is the case today.

³³⁹ Bones from an African hartebeest were recovered at the Ascalon workshop, as were the sawn antlers of a Persian fallow deer (Wapnish, 1991, 62, n.1). The elephant ivory tusks recovered at Al Mina (8th c. levels) in the 1930s have since proven to be water buffalo and domestic cattle horns (Francis and Vickers, 1983). Also note that along with the elephant ivory found on the Bronze Age Uluburun ship were hippopotamus incisors (Bass, 1997, 162).

³⁴⁰ One reason, in fact, that non-elephant ivory has been detected to such a great extent in Levantine excavations is because of the routine scientific test conducted on such finds. Perhaps more Aegean “ivories” would prove not to be elephant if tests were conducted on older and newer excavated material.

CHAPTER TWO

Raw and Semi-processed Commodities: Dyes, Pigments, and Chemicals

INTRODUCTION

The items in this chapter are a rather loose grouping of organic and mineral dyes, pigments, and other chemicals that do not easily fit under any other rubric. Some of these items were shipped and traded in very large volumes, perhaps not uncommonly as entire shiploads (e.g., alum, salt, *miltos*), other items, like some of the rarer pigments and dyestuffs were worth small fortunes in trade and likely were not high volume imports/exports. The sub-groups of these commodities are according to composition: vegetable, animal, or mineral.

GROUP ONE: VEGETABLE

Saffron

Saffron (*Crocus sativus* L.³⁴¹) has the unique characteristic in ancient commodity usage of blurring many genres, as it were. Best known today as a prohibitively expensive condiment, saffron also found use as a spice in antiquity, but was more commonly known as a rich perfume ingredient and dye. The high

³⁴¹ Raven (2000, 49, n.2) insists that *C. sativus* is the older name for the saffron crocus, while *C. cartwrightianus* the newer; elsewhere, *C. cartwrightianus* is noted as “wild saffron” versus the cultivated *C. sativus* (e.g., Barber, 1991, 233; Warren, 101, in Raven, 2000; Amouretti, 1999, 366).

cost of saffron, today and in antiquity, is due to the fact that the stamens of the flowers, which are used in food, perfumes, and dyes, must be collected individually; at least 60, 000 flowers are needed to produce one pound (ca. 0.5 kg) of the product.³⁴² Found in the Aegean and Asia Minor, and possibly indigenous to other areas of the eastern Mediterranean, saffron was already in use by the Bronze Age as shown by frescoes from Thera, which picture maidens picking the flowers.³⁴³ These frescoes, plus the later mythical references linking Persephone and other young goddesses (wearing *krokopeploi*) to the flower, suggest that saffron gathering and saffron-dyed garments may have played a role in a puberty ritual for Aegean girls.³⁴⁴ "Saffron-dyed" garments (*krokobaptos*, e.g., Aeschyl. *Per.* 660), however, may have referred to the color and not always the use of actual saffron (*Crocus sativus*) for dyestuffs. While saffron will readily stain the napkins of those eating Spanish paella, for example, the product's rarity and questionable color-fastness may have precluded its (widespread) use as a dye.³⁴⁵

³⁴² Groom, 1992, 214; also Hill, 1952, 132 where 4, 000 flowers are said to be needed for one ounce. Elsewhere (*RE*, s.v.) a figure of 100, 000 to 200, 000 flowers per pound is given. As might be expected given its rarity, saffron was widely imitated and adulterated. See Robert, 1960, 337, n.1.

³⁴³ The identification of the crocuses depicted is not certain. *C. sativus* is often favored, but other *Crocus* spp. may also be possible. See P. Warren's epilogue in Raven, 2000. See *DMic*, s.v., *ko-ra-ka*[for possible Linear B attestations. Cf. *ka-na-ko*, safflower?

³⁴⁴ Barber (1991, 338, n.13), in her discussion of the frescoes, suggests that saffron yellow clothes may have been reserved for a special class of (young) women. Note also that Roman wedding veils were traditionally yellow, cf. Pliny XXI.45-46. Crocus (saffron?) is one of a number of flowers that Persephone gathers in the final moments before her abduction (*Il.* XIV.348; *Hymn Dem.* 6). A parallel might also be found in Eurip. *Ion* (887) where Creusa gathers *krokea petala* before her rape. Which crocus this is, if it is in fact *Crocus* spp., is contestable; see Raven, 2000, 52ff., who suggests *Sternbergia sicula*). Athena wears the *krokopeplos* (Eurip. *Hec.* 466-74), as does Dawn (*Il.* VIII.1; XIX.1).

³⁴⁵ Barber, 1991, 233. If actual saffron was used to dye cloth, "saffron-dyed" would have elite connotations, not only because of its rarity but also because it was ephemeral. Aside from the *krokopeplos* mentioned above, Sappho (fr. 92.7, Lobel-Page) mentions something *krokoenta* ("dyed with saffron?"); see also Aeschyl. *Ag.* 239. In Aristophanes (*Lys.* 44, 47; *Thes.* 253; *Eccl.*

A yellow dye, called *krokos*, could have come from safflower, known today as “Dyer’s Saffron,” and sometimes “Spring Crocus” to distinguish it from the autumn-blooming *Crocus sativus*. The safflower yellow is also said to be an extremely fugitive dye, but its common availability, and ability to produce a (poor man’s) saffron-like yellow may have overridden such concerns (see Safflower).

Theophrastus knew of at least two types of saffron, a scented cultivated variety, the best of which grew in Cyrene (and Aegina and Cilicia), and a “scentless mountain” saffron (*oreinos aosmos*).³⁴⁶ There is little doubt that the cultivated variety, perhaps also grown in Attica,³⁴⁷ was the type most commonly used in perfumes,³⁴⁸ and the type of saffron that was also used as a condiment.³⁴⁹ What is not clear, however, is if this cultivated variety is the same saffron that may have been used as a dye, or if this was the saffron known in the Near East.

Only once in the Old Testament (Cant. 4:13) is the Hebrew word *karkom* used, enumerated along with nard, cinnamon, calamus, frankincense and myrrh as the scents found in the beloved’s “garden.” Often taken to be *Crocus sativus*, *karkom* has also been identified as Indian turmeric (*Curcuma longa* L.), which in

332) *krokota* and *krokotidia* in context seem to refer to pricey garments worn solely by women, perhaps truly saffron-dyed. Timaeus (*apud* Athen. XII.519b-c) records that the Sybarite cavalry, the Classical world’s prodigal sons, paraded about in saffron-colored coats. Use of a rare and expensive saffron dye by such a crowd would be expected.

³⁴⁶ *HP* VI.8.3. Notably, at *Od.* 27 Theophrastus makes no mention of Cyrenaic saffron, but lists Aegina and Cilicia as producing the best.

³⁴⁷ Soph. *Oed. Col.* 685. As with Creusa’s *krokea petala* (see n.344 above), Raven (2000, 53ff.) disputes the traditional identification with *Crocus sativus* here, suggesting *Sternbergia sicula* instead.

³⁴⁸ See, for example, Ar. *Nubes* 51 where the rustic Strepsiades complains of his social-climbing wife smelling of perfume and crocus (*myrous kai krokou*). Athenaeus records a Ptolemaic procession in which tens of camels were paraded each bearing 300 pounds of saffron, cassia, cinnamon and other exotic spices. Kurtz and Boardman (1971, 207) also note a Hellenistic epitaph of a dead woman rejecting food and drink but requesting saffron and frankincense.

³⁴⁹ Saffron is included in a list of spices for a Persian king’s dinner (Lewis, 1987, 83).

a list of imported exotic eastern spices might not be out of the question.³⁵⁰ Furthermore, Semitic *karkom* is a loan word, presumably from Sanskrit *kunkuma*; Greek *krokos*, also a loan word, is thought to be derived from *karkom*.³⁵¹ This causes problems with the identification of *krokos* with *Crocus* spp. Did the Greeks (at what point?) first call a yellow powder (?) imported from the Far East *krokos*, only to re-apply the name to their local saffron later? It does not seem likely. Theophrastus mentions a yellow spice called simply *chrôma* imported from Syria, which was used to dye and flavor some perfumes; this has been identified as turmeric.³⁵² A second suggested etymology for *krokos* is a derivation from the name of a Cilician mountain, Korykos, where wild saffron grew in abundance.³⁵³ This may make more sense. If Cilician *krokos* traveled both east and west from a more central point, we no longer are left positing Levantine importation of the commodity from the Aegean, while those in the Aegean imported the name (along with the commodity) from the Levant.³⁵⁴ It

³⁵⁰ Zohary, 1982, 206; Pope, 1977, 493.

³⁵¹ Muss-Arnold, 1892, 116.

³⁵² *Od.* 31; for the identification see Eigler and Wöhrle, 1993, 91.

³⁵³ *RE*, s.v. Saffran, col. 1728. Dsc. (I.39) claims, like Theophrastus, that one of the best types of saffron, called *korykios*, a name obviously derived from that of the mountain, comes from Cilicia. Later Arabic sources, perhaps derived from Dioscurides, also mention the exceptional quality of the Cilician variety (Löw, *Pflanzennamen*, 215; Robert, 1960, 334). See also Germer (1985, 199) who suggests saffron was an early import to Egypt from Asia Minor or Crete. An eastward flow of saffron-dyed garments as tribute from Phoenicia to Assyria in the centuries immediately before our period has also been suggested (Forbes, 1964, 123). Sidebotham (1986, 18) and Bautier (1992, 300) note an eastward flow of saffron in later centuries.

³⁵⁴ Zohary (1982, 206) suggests that *karkom* could be a homonym for two different plants, turmeric and saffron, in two different periods. In his opinion, however, Biblical *karkom* is turmeric. Miller (1969, 63) posits that there may have been large scale imports of saffron from the west during our period to supplement a perceived Persian demand for yellow dyes that turmeric imports from India could not fulfil. This seems to be only a fanciful guess. Perhaps also guessing is Jebb, who in his commentary on Soph. *Oed. Col.* states that the cultivated *krokos*

may have been that the scentless, mountain type, mentioned by Theophrastus, was the Cilician variety imported for use as a dye, while cultivated varieties grown elsewhere were used more for their aromatic qualities.³⁵⁵ In lieu of further evidence, we can presume that trade in saffron of some type--as raw material for perfumes, as a prepared dyestuff, etc.--took place, but we cannot be certain.

Safflower

Far more common than saffron, safflower (*Carthamus tinctorius* L.), was probably a native of India, Persia, and possibly Asia Minor, but its long history of cultivation makes any attempt to trace its origins quite difficult.³⁵⁶ A tall (30-150cm), thistle-like plant, cultivated safflower produces florets at the end of each stalk containing sunflower-like seeds from which is rendered a yellowish, slightly bitter oil used in food and in perfumes.³⁵⁷ The flowers also produce two dyes, a colorfast red to pink, used in textiles, food coloring and as a cosmetic rouge, and a highly fugitive yellow whose worth as a textile dye is said to be practically useless.³⁵⁸ And, at least in Dioscurides's day, the flowers were considered a delicacy.³⁵⁹

mentioned growing at Colonus was first introduced as a dye from the "East." See also, Harrison, 1966, 28.

³⁵⁵ This is highly speculative. For a concise and pointed discussion of the *Crocus* spp. problem in ancient Greek literature see Raven, 2000, 9, 49-54.

³⁵⁶ Groom, 1992, 213; Löw, *Pflanzennamen*, 216; Serpico and White (2000, 393) note that safflower may have been cultivated in Syria by the middle of the third millennium.

³⁵⁷ See Sandy, 1989, chp. V on safflower oil production in Egypt, which seems to have occurred more in the Roman period than earlier.

³⁵⁸ Barber, 1991, 313. Even so, Hesychius (s.v., *knêkos*) implies that the plant was known for its yellow dye (*to krokizon khrôma apo tou anthous*).

³⁵⁹ Dsc. IV.88.

In the Late Bronze Age, safflower was used in the Aegean as a dye and possibly a food. Linear B texts from Mycenae, e.g., MY Ge 603, list two types of *ka-na-ko* (= Classical Greek *knēkos*) a white (*re-u-ka*) which is measured, and a red (*e-ru-ta-ra*) which is weighed, presumably the whitish seeds and reddish dye.³⁶⁰ Remains of safflower found on the Late Bronze Age Uluburun shipwreck indicate that it was an item of early Levantine-Aegean trade.³⁶¹ By the Classical period, however, the trade and use of safflower products merits no comment from our ancient sources. The possibility of its trade, however, cannot be ignored since red and yellow dyes were highly prized, especially the cheaper varieties since these could be used to imitate the more expensive dyes. While he does not mention the places where they grow, Theophrastus knows of one cultivated and two wild species.³⁶² Worth keeping in mind too, is the fact that the cultivated plants, because of different harvest times for each product, can only be grown for the oil or for the dye but not for both.³⁶³ For some communities, cultivation may have been more for the sake of oil, elsewhere, it may have been for dye.

Pomegranate, Sumac

Pomegranate (*Punica granatum* L.; Grk. *rhoa* [plant], *sidios/side* [rind]; Heb. *rimmon*) and sumac (*Rhus coriaria* L.; Grk. *rhous*) also produced common yellow dyes frequently used to color leather; sumac leaves also contain tannins so

³⁶⁰ Ventriss and Chadwick, 1973, 226; 229-30; Wylock (1972, 121) casts some doubt on this attribution.

³⁶¹ Bass, 1997, 167; Haldane, 1993b, 352.

³⁶² *HP* VI.5.4.

³⁶³ Serpico and White, 2000, 394.

were used in leather tanning.³⁶⁴ The fruit of the pomegranate and the seeds of the sumac were also delicacies.³⁶⁵ Remains of both plants were found on the Late Bronze Age Uluburun shipwreck indicating that Levantine-Aegean trade in the food or dye products had begun long before the Persian period.³⁶⁶ Syria particularly was known in later ages as a source of sumac;³⁶⁷ Iron Age sources also note the importance of Levantine pomegranates.³⁶⁸

Alkanet

Although Dioscurides and Galen speak of three and four types of alkanet respectively, Theophrastus mentions only one, likely *Anchousa tinctoria* L., also known as “false alkanna” to distinguish it from “true alkanna,” i.e., henna.³⁶⁹ A native to the Aegean, western Asia Minor, and north Africa, the processed roots of alkanet (Grk. *ankhousa*, *enkhoussa*; Phoen. *bouinesath*;³⁷⁰ Heb. *ḥalamoth*?) produce a red dye used in textiles, cosmetics, and perfumes. As a textile dye, alkanet is fugitive and is considered of lower quality than kermes or madder. But it was not for textiles that the dye seems to have been prized in antiquity. For

³⁶⁴ Theophrastus, *HP*, III.18.5; Van Driel-Murray, 2000, 305; Barber, 1991; Amouretti, 1999, 368; Hill, 1952, 123.

³⁶⁵ The pomegranate fruit has long had mystical/religious associations which Löw (*Flora*, III,80-133) discusses at length. On sumac seeds as a delicacy see Amigues (*Thphr.* III, 193-94) who has collected and discusses the Persian period references. Also see Dalby, 1996, 80, 86.

³⁶⁶ Bass, 1997, 164; Haldane, 1993b, 351-52.

³⁶⁷ Galen (XIX.741) speaks of a *rhous syriakê*; al-Muqaddasi (p. 207, *edition de Geojje*) lists sumac (*summaq*) among the products of Palestine/Syria.

³⁶⁸ *KAI* 182, the Almanac of Gezer, dated 925, includes the pomegranate harvest; in Deut. 8.7-9, pomegranates are listed along with wheat, barley, the vine, olive, honey and figs, as one of the products of Palestine.

³⁶⁹ *Thphr.* VII.9.3; Wagler, *RE*, s.v., *anchousa*.

³⁷⁰ *Dsc.* IV.23 gives a Greek transliteration of the Phoenician.

Theophrastus its primary use is as a coloring agent in oil-based perfumes, a use that went back to the Late Bronze Age.³⁷¹ Perhaps even more common, however, was the use of the dye as a (cosmetic) rouge. Xenophon mentions the use disparagingly, but the practice was common enough to coin the verb *ankhousizesthai*.³⁷² In the Levant during the Persian period, alkanet for cosmetic purposes may have taken a backseat to other widely available red dyes, like “true alkanna.” The only closely contemporary reference in Semitic sources is the contested drug/spice *ḥalamoth* in Job (6.6).³⁷³ Possibly some specialized types of alkanet, as was the case later, were also traded during the Persian period.³⁷⁴

Madder

Long a major source of a cheap dye used for textiles and skins, the processed roots of madder (*Rubia tinctoria* L.), especially when alum is used as a mordant, produce bright and stable reds and pinks.³⁷⁵ Since it was one of the most important natural dyestuffs, madder was widely cultivated in the eastern Mediterranean, especially in Asia Minor, the Levant and even Arabia.³⁷⁶ In the

³⁷¹ Thphr. *Od.* 31; Foster (1974, 131) suggested that Linear B *po-ni-ki-jo*, a commodity listed in several sets of tablets from Knossos (not all dealing with perfumed oils), is either alkanet or madder. See also Shelmerdine, 1985, 99-100; Knapp, 1991, 27.

³⁷² Xen. *Oec.* X.2.7; Ar. *Lysistr.* 48, *Eccles.* 929; for the verb see Hesychius, s.v.

³⁷³ Löw (*Flora* II, 292ff.) argues for identifying *ḥalamoth* as alkanet.

³⁷⁴ For example, P. Holm. (424, 730) mentions a *pontikê* (Pontic) and *eksotikê* (foreign) alkanet.

³⁷⁵ See Bailey 1932, vol. II, 234 on madder with alum mordants.

³⁷⁶ In the middle ages, madder (Arabic *fuwwa*) was one of the primary cash crops of Yemen. The volume and net worth of the production was so great that one of the annual four tax-periods centered on the madder harvest (Varisco, 1994, 157, 160). In modern history, an unground madder root called *lizari* or *alizari* was used as a source of pigment imported to Europe from the eastern Mediterranean; one of the coloring agents found in the madder root, *alizarin*, earned its scientific name from these pigments. See Schweppe and Winter, 1997, 109, 116.

early second millennium, madder already was being cultivated in Syria and Anatolia, and the dyestuff along with alum was exported to Mesopotamia for leather and linen dyeing.³⁷⁷ Traces of the dye also have been found on linen from Late Bronze Age Egypt where the dye was surely an import.³⁷⁸ To the north, madder may have reached the Aegean at about this time as a cultigen from the Near East; the Linear B term *po-ni-ki-jo*, likely related to later Greek *phoinix*, may be a name for the dye, or simply the color.³⁷⁹

There are only a few direct references to madder in the Persian period. Biblical *puah* appears only once as a personal name (I Chron. 7:1);³⁸⁰ references to Greek *ereuthedanon* are scant.³⁸¹ It may well be that references to madder or madder-dyed articles lurk behind other, general terms. In later Greek the plant (and dye) was known simply as *riza* (or *rizari* as on Crete today), "root."³⁸² It could also be that the famous "Sardian red" used on the carpets, tapestries and clothes from early Lydia is madder.³⁸³ Western Asia Minor continued to produce famous reds, like the one from Colossea and another from nearby Hierapolis, where, as Pliny notes, the water was of such a special quality that "the wools dyed with the roots of madder rival those dyed with kermes or with marine purple."³⁸⁴

³⁷⁷ Van Driel-Murray, 2000, 305; Van Soldt, 1990, 347ff.

³⁷⁸ Vogelsang-Eastwood, 2000, 279.

³⁷⁹ Foster, 1974, 131 (who also suggests alkanet as a possibility); Barber, 1991, 232. On the complicated etymology of Greek *phoinix* and related words. Muhly's (1970, 24ff.) review of the question of the etymology is inconclusive. As a color, *phoinix* was purplish-red.

³⁸⁰ See Löw (*Plazennamen*, 311) for *puah* as madder.

³⁸¹ E.g., Thphr. *HP* IX.13.4 (cf. Hort, *Index of Plants*, s.v.); Hdt. IV.189 (goat skins in Libya dyed with madder).

³⁸² Barber, 1991, 232; Halleux, 1981, *Lexique*, s.v. *riza*.

³⁸³ Pliny (VII.196) says that the art of dyeing was invented at Sardis, perhaps a reference to the use of madder dyes. *Ar. Pax* 1174: *bamma sardianakon* is *phoinix* in color.

³⁸⁴ Pliny VIII.190; XXI.51.

Likewise, the famed bright red “Laconian” shoes could also have been madder-dyed.³⁸⁵ Among later alchemists, madder played a role in recipes for imitation purples.³⁸⁶ The practice may have begun long before, partially accounting for the profitable trade in madder noted by Pliny (XIX.47). Pots of madder-based pigments have also been found in 2nd c. Athens and Corinth, paralleling “Greco-Roman” paint pots from Egypt; some of these pigments likely were used to paint terracottas.³⁸⁷ Given the evidence for madder’s continued importance in the Mediterranean from the Bronze Age to recent times, we can be certain that there was an active madder trade in the Persian period, perhaps running both east to west and west to east.

Lichens

Processed lichens (*Rocella* spp.) also produced important red and blue textile dyes.³⁸⁸ Not as enduring as the marine reds and blues, the lichen dyes nevertheless were an essential ingredient for making imitation purples, and for use in conjunction with mollusk dyes to produce certain trademark shades, like Tyrian purple.³⁸⁹ An early use of lichen dyes is possibly attested in Assyrian recipes, and

³⁸⁵ Cf. Ar. *Vesp.* 1157.

³⁸⁶ P. Holm, 927, 962.

³⁸⁷ Farnsworth, 1951; Schweppe and Winter, 1997, 111.

³⁸⁸ The most common *Rocella* spp. are: *R. fuciformis* (source of Orchil and a Litmus) which produces a purple-crimson or red-yellow dye used for dyeing wools, silks, wood and marble; *R. phycopsis* (= Archil) the source of a blue dye; *R. tinctoria* (= Orseille) the source of Litmus, giving a blue when alkalis are used with it, a red when acids are used.

³⁸⁹ E.g., P. Holm. 32 lists lichens and safflower as ingredients in an imitation purple; Pliny notes the Tyrian use of lichens in conjunction with mollusk purples to produce a shade of purple for which the Tyrians were famed. Also see Steigerwald, 1986.

might account for some shades of blue/red cloth mentioned as trade items in Ezekiel.³⁹⁰ In later days, the islands of Crete and Amorgos were known for their lichens which corroborates, as least for Crete, a statement in Theophrastus (*HP* 4.6.5) concerning lichens used to dye ribbons, wool and clothes. If the dye is fresh, he continues, the color is much more beautiful than purple (i.e., marine purple). As a cosmetic, the use of red powders (rouge) made from lichens is noted by Pollux (V.102), where *phykos* is listed among other facial cosmetics. Such a use would also seem to be attested in the Old Testament. Hebrew *pok* (Jer. 4:30; II Kings 9:30) may be etymologically related to Greek *phykos*, but the borrowing is less than certain, as is the use of lichens as a cosmetic in the Levant.³⁹¹ Other uses for lichen dyes, attested later, include staining wood and marble. No trade in lichen dyes is attested for the Persian period, but its possible existence should not be discounted.

Indigo, Woad

Two sources for rich, colorfast blues in antiquity were indigo (*Indigofera tinctoria* L.), an Indian native, and the various species of indigenous woad (*Isatis* spp.), both of which produce the colorant indican.³⁹² By ca. 1500 in Egypt,

³⁹⁰ Barber, 1991, 232. Kok (1966, 248) suggests Ezekiel 27: 7 may be one of the earliest references to (trade in) lichen-dyed cloth. The words in the Ezekiel passage translated “blue and purple,” Hebrew *tekeleth* and *'rggaman*, are very problematic. Most take the terms to refer to mollusk, not vegetable dyes, although vegetable dyes cannot be entirely dismissed. This issue is more fully discussed in the “purple” section below. Also, Samuel (2000, 559) notes the import from Greece of the lichen *Evernia furfuracea* Mann. found in an Egyptian Middle Kingdom tomb that was likely used in perfumes or as a medicine.

³⁹¹ See Löw (*Flora* I¹, 20-23) who discounts the cosmetic use in the Levant.

³⁹² Germer, 1985, 47-48; 74-75. Indican, a soluble colorless glucoside, must be oxidized in water to form the insoluble dye. Thus the process for producing the dye involved mashing, soaking and

imported indican is present in textiles, but whether as Levantine woad or Indian indigo cannot be determined; woad also appears in early Sumerian accounts.³⁹³ In the Ptolemaic, Roman and Islamic periods, true indigo was imported from India; as with many other dyes, it also served in recipes for imitation purples.³⁹⁴ Because of its rich colors and colorfast properties, indican dyestuff continued to be very desirable and is frequently noted as an article in commerce in later centuries.³⁹⁵ References to Persian period trade in indican dyestuffs, however, are difficult, if not impossible to locate. A “mineral blue” dye used for textiles traded in 6th c. Mesopotamia may refer to indican dyestuff; later Greco-Roman writers, because of the compact, balled form in which the dyestuff was traded, considered it to be mineral, not vegetable.³⁹⁶ Nowhere is the use of actual mineral blues for textiles attested.³⁹⁷

fermenting the leaves of the plants, which then often were molded into balls for shipment; in 7th c. A.D. shipping manifests from Aden, indigo (*nil*) was measured using the word *qit'a*, “piece.” (Hill, 1952, 129-130; Guo, 2001, 85, n.20; *Encyclopaedia of Islam*, s.v., nil.; Bautier, 1992, 294ff.).

³⁹³ Germer, 1985, 47-48; 74-75; Volgesang-Eastwood, 2000, 278; Schweppe, 1997, 81.

³⁹⁴ Spanier, 1987, 11. In fact, there is very little chemical difference between the dyes obtained from some molluscs and the plant indigo.

³⁹⁵ Oppenheim (1967, 242-43) suggests woad for a blue dye noted in commerce between the Levant and Mesopotamia in the 6th c., perhaps the only reference to indican dyestuffs close to our period.

³⁹⁶ Cf. Weisberg, 1980, text no. 253, offers no suggestion for the composition of the mineral blue dye. Vitruvius (VII.9.8) mentions indigo as a mineral.

³⁹⁷ Barber (1991, 231) notes the use of some iron oxides and perhaps realgar as textile pigments (here, however, she seems to confuse arsenic sulphide, mercuric sulphide and a vegetable dye which went by the name *cinnabari*; see Red Pigments below), but makes no mention of the use of blue minerals. Furthermore, the major blue mineral pigments, azurite and Egyptian Blue, in their powdered forms would perhaps not even stain garments, as true dyes, but rather simply clings to the surface.

GROUP TWO: ANIMAL

Kermes

Made from a ladybug-like insect (*Kermococcus vermilio*), the dye kermes produces far richer and longer lasting reds than either madder or alkanet; for this reason it was considered a luxury dye (Pliny XXI.45ff.). English "crimson" is etymologically related to "kermes;" likewise Greek *kokkinos* ("red," ancient and modern) is derived from *kokkos*, the word for the dye. For its reds, the dye was a perennial favorite for textiles, especially in recipes imitating the yet more expensive marine purples.³⁹⁸ The dye itself is made from the dried and crushed bodies of the female insect which tends to favor a particular type of oak (*Quercus coccifer* L.) as habitation. Some early confusion about the origin of the dye, plant or animal, likely arose from the close association between the tree and the creature.³⁹⁹ As early as the time of Sargon's invasion of Armenia in 714, (eastern) Asia Minor was a recognized source of the dye; in the Islamic period, Artashat, near the modern Turkish-Armenian border, was known to Arab geographers as *Qiryat al-Qirmiz* ("City of Kermes").⁴⁰⁰ Other areas of Asia Minor were noted for kermes production, at least in the later Roman Empire: the Diocletian Price Edict (A.D. 212) includes kermes dye from Nicea (modern Iznik). One of the two

³⁹⁸ P. Holm. 908, 911; Spanier, 1987, 11; Blümner, 1875, I², 249.

³⁹⁹ Thphr. *HP* III.7.3; Forbes IV, 1964, 104-105. Note also that the related cochineal, a New World insect also yielding a red dye, should not be confused with kermes (see Barber, 1991, 231 for discussion). Likewise, another related Far Eastern insect, *Coccus lacca*, produces the red dye lac (Grk. *lakkos*, and a by-product, shellac) that is noted as an import in the *PME* (see Casson, 1989, 114). Lac may have been imported to Persia from India during the Classical period. Ctesias reports an insect-produced Indian dye much more brilliant than Persian kermes (see Forbes, 1964, 106).

⁴⁰⁰ See Kurdian (1941) for a discussion of these later sources.

varieties of kermes mentioned by *P. Holm.* is *kokkos galaticos*, from Galatia in Asia Minor. The second variety found in *P. Holm.* is *kokkos syrios*, Syrian kermes, which may be Hebrew *karmil*, a dye (?) that only a skilled Tyrian would know how to work (II Chron. 2:10-13). Elsewhere in the Old Testament the phrase *tol' shani*, rendered *vermiculum* in the Vulgate is identified as kermes.⁴⁰¹ From 5th c. Egypt, an Aramaic letter mentions two skins dyed purple/crimson.⁴⁰² The word for the dye, *tol'*, Aramaic "worm," nearly parallels the Biblical phrase (and the Arabic for kermes, *dūd as-ṣabāgin*, "Dyer's Worm") and so may refer to kermes dye.⁴⁰³ Aegean references from this period, unless buried in other terminology, e.g., "Sardian red," escape notice. As with madder, however, the importance of kermes as a dye no doubt meant it was traded in the Persian period, perhaps again both east to west and vice versa.

Marine Purple

Enchanting ancient and modern commentators alike, sea-purple, the dye obtained from a number of different species of Mediterranean mollusks, was more widely traded--and written about--than any other type of ancient dye.⁴⁰⁴ The process involved in producing the dye was intensive, as was the task of obtaining

⁴⁰¹ E.g., Lev. 14:4; Jer. 4:30. *tol'* is "worm," *shani* "scarlet," thus the phrase can be translated "worm-crimson," not "doubly dyed," misreading *shani* for "twice" or "again" (see Ziderman, 1987, n.1; Jastrow, *Dictionary*, s.v.). Phoenician *shnt*, related etymologically to *shani*, may also refer to kermes (Krahmalkov, 2000, s.v.). See also Lundbom, 1999, 368.

⁴⁰² *TADAE* I.A6.16, ln.3.

⁴⁰³ Löw, *Pflanzennamen*, 250.

⁴⁰⁴ The major species involved are: *Bolinus brandaris* (= *Murex brandaris*); *Thais haemastoma* (= *Purpura haemastoma*); *Trunculariopsis trunculus* (= *Murex trunculus* = *Hexpex trunculus*). Lesser species are: *Ocenebra eriaceus* (= *Murex eriaceus*) and *Helix ianthina*.

suitable numbers of the shellfish.⁴⁰⁵ But the efforts were rewarded with the richest, most colorfast reds and purples obtainable by any ancient means. Sea-purple was prestigious and became a mark of royalty, power and the wealthier strata of Mediterranean cultures.⁴⁰⁶ Because of the status and expense, sea-purples were also the most widely imitated and adulterated dyestuffs known.⁴⁰⁷

The use of sea-purple as a dye began in the Bronze Age in the eastern Mediterranean and had spread, by the Iron Age, throughout the entire Mediterranean basin.⁴⁰⁸ Despite widespread use and knowledge of sea-purple dyes, only certain areas or cities, both in the Levant and Aegean, produced noteworthy products. This may reflect a particular color or technique found only in that city, or in some cases might indicate more aggressive trading and/or the monopolizing of regional trade in purple dyed garments or dyestuffs.⁴⁰⁹ Phoenician Tyre and Sidon were for centuries among the most highly regarded

⁴⁰⁵ The dye is obtained from the hypobranchial gland of the species mentioned above, which when extracted, sometimes by simply crushing the shell, produces a yellowish liquid which turns shades of blues and reds when oxidized. Each animal produces between 0.1 mg to 1.2 mg of the liquid; thousands, if not tens of thousands were required for every kg of dye. For an extensive, annotated bibliography on purple dye production, chemistry, and history, see *Dyes in History and Archaeology* 12 (1994), 57-66. See also Pliny IX.62ff.; Strabo XVI.2.23 and XVII.3.18 for descriptions of the ancient manufacturing process.

⁴⁰⁶ The high cost and social significance of purple in the Levant and Aegean has been widely discussed, see the bibliography noted above. A few examples from the Aegean will suffice: Aeschylus (*Ag.* 950) and Theopompus (*apud* Athen. XXI.526d) speak of purple (clothes or dyestuff?) being worth its weight in silver (*isoagyron*); around the same time that Athens's late-5th c. bad-boy Alcibiades swaggered into the Agora with his purple cloak trailing on the ground (Plut. *Alc.* 16.1); such a cloak, according to Plutarch, cost three minae (*Mor.* 470f).

⁴⁰⁷ Many of the recipes listed in the *P. Holm* and *P. Leyd.* are for mollusk purple imitation dyes using vegetable ingredients. For commentary and discussion on purple imitations, see Reinking, 1938. Curiously, Roman *purpurarium* seems to have been the scum of purple vats sold as an indigo imitation (Bailey, II, 1929, 219).

⁴⁰⁸ On Linear B *po-pu-re-ja* see *DMic* s.v.; Palaima, 1991, 279; Duhoux, 1988, 80; Faure, 1991; for the archaeological evidence of Bronze Age Aegean and Mediterranean purple industries, see Reese, 1986 and 1987.

⁴⁰⁹ "Tyrian" purple seems, at least in the Roman period, to have been a certain reddish color, made from what may have been a secret Tyrian recipe (cf. Pliny IX.125-141);

producers in the east. Their neighbors in the Levant, many of whom produced their own purples, had high esteem for their craft as did the Greeks, who apparently imported quantities of Phoenician purple to add to their locally manufactured goods.⁴¹⁰ The trade was not, however, only westbound. Corinthian purples and garments reached western Asia Minor, and possibly continued eastward.⁴¹¹ Ezekiel and Babylonian records of the 6th c. suggest purples reached the Levant from the Aegean.⁴¹² More to the point, Plutarch states that Alexander found at Susa 5,000 talents of purple from Hermione, stored for 190 years, perhaps tribute or war booty from Asia Minor.⁴¹³

One difficulty in determining the extent of trade in ancient purples, their imitations, and dyed purple garments is the range of vocabulary for these items found in Greek and Hebrew, and just what the terms actually meant. In Greek, *porphyra*, often translated as simply “purple,” meant a color approximating our purple (the color of the sea?); it also stood for sea-purple dyestuff.⁴¹⁴ Adjectives

⁴¹⁰ Photios (s.v. *scaphas*) records “Phoenician” (= purple? or Phoenician purple?) garments carried by metics in the yearly Panathenaic procession in Athens, indicating that such imports had ritual as well as private use.

⁴¹¹ As noted by Democritus of Ephesus (3rd c.) when speaking of the Ephesians earlier luxuries and wealth (*apud* Athen. XII.525c-d).

⁴¹² Ezekiel 27:7. The *'rggaman* and *tekeleth* (see below) are said to come from the islands of “Elishah,” one of the sons of Yavan (i.e., Ionia, cf. Gen. 10:4). An alternative interpretation, Elisha = Carthage, seems less likely (see Greenberg, 1997, 550). Weisberg (1982) notes a case where 4.5 minae of high quality blue wool are recorded in Babylonian texts as coming from Ionia.

⁴¹³ Plut. *Alex.* 36. Hermione, a port in the Argolid, was later noted for its purple production as well (see Alciphron III.10.4). Plutarch’s wording in this passage makes it unclear if he refers to 130 tons of dyestuff, or more likely, purple-dyed garments. What most confuses the issue is the statement: *to tēn baphēn dia melitos ginesthai ton alourgon*, which basically states that the process of dyeing, not storing, the garments (? not mentioned) used honey. Vitruvius (VII.13.3.) notes that a liquid purple dyestuff, *ostrum*, could be preserved from drying out by mixing it with honey, but nowhere is there recorded a case where honey is used in the actual dyeing process, or, even more absurdly, to preserve garments (what moth could resist *that* temptation?). The passage remains enigmatic.

⁴¹⁴ *LSJ*, s.v.

qualifying this purple, such as *thalattia* (Phylarch. 45 J) or *alêthinas* (Xen. *Oec.* X.3) suggest that *porphyra* could also encompass any dye or color resembling true sea-purple.⁴¹⁵ To leave no doubt that true sea-purple was meant, the word *alourgê*, “work of the sea,” was used, or *haliporphyra*, “sea-purple.” The word *phoinix* is also at times used in connection with sea-purple, but perhaps referring only to a particular shade rather than the dye itself.

The shades of color obtained from the mollusks become more of an issue when we turn our attention to the Levantine vocabulary. Modern experiments with various species of the snails suggest that certain species produce only a particular shade of color. *B. brandaris*, *T. haemastoma*, and *O. eriaceus*, for example, contain as the major colorant only 6-6' dibromoindigotin which would impart more purplish colors, while *T. trunculus* has nearly equal parts of 6-6'-dibromoindigotin and indigotin, giving more bluish colors.⁴¹⁶

Some scholars have argued that a distinction in shades of blues and purplish-reds, due to different species mollusks being used for each shade, is represented by the two Old Testament words *'rggaman* and *tekeleth*, often found as a doublet.⁴¹⁷ Although the arguments are generally accepted, the identification of both *'rggaman* and *tekeleth* as sea-purples is not without serious problems.

⁴¹⁵ E.g., Theopompus *apud* Athen. XII.526d and *P.Holm*.

⁴¹⁶ Ziderman, 1987, 27. Jensen (1963, 105), basing his results on much older but perhaps still valid research, claims *B. brandaris* produces a dull red so-called “Tyrian” purple, while *T. trunculus* produces something more akin to our color purple. Other investigators have gotten a red color from *T. trunculus* perhaps the result of different methods, oxidation, or the material from which the vat was constructed (see Ziderman, 1987, 28). As these different results show, it may be that attempts to argue that certain species produced *only* a certain range of purple-blue-red shades is invalidated by ancient practice. Ancient dyemasters could easily have tampered with the variables to produce and reproduce their distinctive shades no matter what shade a particular species generally produces.

⁴¹⁷ Most recently Ziderman, 1987.

Both words have cognates in the Assyrian tribute lists of the 8-7th c., where *argamannu* (red-purple?) and *takiltu* (blue-purple?) are demanded of the Phoenicians and the people of Carchemish and Hattina.⁴¹⁸ Still earlier, in texts from Ugarit, *argammannu* and *takiltu* are also listed as types of colored wools. As van Soldt has shown, *argamannu*, originally having the sense of “tribute,” does come to mean sea-purple, but *takiltu* does not. The word refers to wool dyed deep blue, not with sea-purple, but with some other material such as indican dyestuffs or even lichens.⁴¹⁹ This may help to explain the appearance of *takiltum* in a mid-8th c. caravan coming from Arabia (not known for its purples!) that was ransacked in the Levant by the ruler of Suhu and Mari.⁴²⁰ Talmudic exegesis and the LXX translation may have clouded this issue to some degree, as has some modern scholarship.⁴²¹ While we can not be absolutely certain in the matter, we

⁴¹⁸ See Luckenbill, 1925, vol. I, § 601, 20 talents of *takiltu* from Carchemish and Hattina; vol. II, § 912, tribute from Arwad. See also *ANET*, 275, 281, 296.

⁴¹⁹ Van Soldt, 1990, 343-44. Oppenheim (1969, 242), commenting on the extensive vocabulary in later Akkadian for shades of blue, purple and red cloth, suggests that some of the terms, most likely not Akkadian, are loan words perhaps referring to indican dyes. Shades of blue/purple, in other words, should not always be considered products of the sea.

⁴²⁰ Commentators have had problems with the *takiltu* in this account, even proposing that the “purples” were traded first south and then came north again. Obviously there are no problems if *takiltu* is taken to be another, non-mollusk dyestuff, like woad, which would be available in Arabia. Weisberg (1982, *225) translates *takiltum*, which appears in Neo-Babylonian texts of the 6th c., as “wool treated with mineral blue dye.” Also see MacDonald, 1997, 338-39; *HAL*, s.v., *tekeleth*. One potential difficulty with this proposal, however, is that Ezekiel 27:16 notes *'rggaman* among the imports from *'rm/'dm* (a variant reading due to the similarities in the morphology of the characters *dagesh* and *resh*). The reading Aram, in the hinterland of Damascus, poses little difficulty; Edom, however, in the region of Wadi Araba and near trade routes coming from the south would suggest goods coming from Arabia. See Greenberg, 1997, 555 for the problems with the readings. Greenberg favors “Aram” following the received Massoretic text.

⁴²¹ Basing his arguments on Talmudic statements that *tekeleth* originated from sea-snails, Herzog (in Spanier 1987, 54ff.) constructs an elaborate argument to explain the LXX translation of *tekeleth* = *hyacinth*, which in Greek clearly refers to a dye of vegetable origin. The only remotely contemporary reference to *hyacinth* as a fabric color is found in Democritus of Ephesus’ list of the colors of luxury Corinthian garments worn by the old-time Ephesians (*apud* Athen. XII.525c-d).

should nevertheless remain open to the possibility that Biblical *'rggaman*, or more likely *tekeleth* refers not to sea-purple, but to a vegetable dye. Such an interpretation may help to further elucidate the distinction between the quality of color, if not dyestuff, when *'rggaman* and *tekeleth* appear in the same passage.⁴²²

As for the trade in *'rggaman* and *tekeleth*, in passages such as Ezekiel 27:7 the assumption is that the dyes stand for the cloth/garments dyed with them.⁴²³ We should not be so quick, however, to discount the trade in purple dyestuffs. A few decades after Ezekiel, *inzahuretu*-dye and *huratu*-dye--both purple/reddish dyestuffs of some sort--are listed among goods (including dyed wool) in two Neo-Babylonian documents as commodities being shipped from the Levant to (probably) Babylon.⁴²⁴ Pliny (XXXV.44) and Vitruvius (VII.13.3) also show that purple dyestuffs were traded during the Roman period, probably both as liquors and as dried solids, so we can assume that the practice was common throughout antiquity, including the Persian period.

Of the five colors listed, only *porphyra* is attested elsewhere as an actual dye; the other colors, rarely attested, seems to be more for rhetorical effect than a reflection of actual practice. It may be that the Talmudic commentators were misinformed, the meaning of the word had changed, or that the LXX translators, as often was the case, had no idea what the term actually meant.

⁴²² E.g. Esther 1:6; Jer. 10:9; II Chron. 2:14; Exod. 26:1. Commenting on this last passage, Josephus (*Antiq.* III.7.7) observes that the purple (= *'rggaman*) represents the sea since it was dyed with the blood of fish, while the hyacinth (= *tekeleth*) represents the air; *tekeleth* here is clearly not a product of the sea.

⁴²³ In 27:7 they must; in 27:16, where *'rggaman* appears alone, this is less certain. See Greenberg, 1997, 550. This often is the case in Greek as well with words like *porphyra* (e.g., Plut. *Alex.* 36).

⁴²⁴ See Oppenheim, 1969, 242ff. Oppenheim suggests that these dyes, generally understood to be two different shades of sea-purples, are instead vegetable dyes, e.g., woad, capable of producing similar colors.

GROUP THREE: MINERAL

Mineral Red and Yellow Pigments

Despite Bailey's encouraging opinion that some ancient authors, like Pliny, were able to distinguish between the various red mineral pigments, the general impression remains that most ancient writers, and maybe some artisans, were not always able to do so.⁴²⁵ Unfortunately, this confusion has also seeped into recent discussions of the minerals and their designations, partly due also to confusion and changes in modern terminology. The major red and their closely related yellow pigments were, first, the naturally occurring iron oxides which fall into two basic groups: 1) anhydrous oxides of iron, like hematite (Fe_2O_3), which are abundant in the Mediterranean, and 2) hydrated oxides of iron such as limonite (a mixture of hydrated iron oxides) and goethite ($\text{FeO}[\text{OH}]$), both commonly occurring, important iron ores.⁴²⁶ The modern terms "ochre" (red or yellow), "umber" (brown/black), "ruddle" and the various ferric/iron oxide designations (e.g., "red oxide") refer to some mixture, whether naturally occurring or man-made, of the three minerals above. The second red pigment is mercury

⁴²⁵ Vol. I, 1929, 217.

⁴²⁶ Lee and Quirke, 2000, 113. Note that hematite also refers to the mineral in its black metallic state which was commonly worked into beads, weights, pendants and the like. See for example, the string of beads from Persian period Tel Michal (Levy, 1996, 58). Red ochres can also be produced artificially by dehydrating (i.e., roasting) yellow ochres, a process said to have been discovered by the Athenian artist Cydias around 400 (Thphr. *de Lap.* 53). During the excavations for the Athenian Metro, a pigment kiln was uncovered probably for roasting native Attic limonite (Y. Bassiakos, lecture given at the American School of Classical Studies at Athens, Nov. 28, 2000). Noted sources of iron oxides in antiquity include Attica, the Aegean islands of Ceos, Lemnos, and Asia Minor (see Blümner, IV, 1897, 479-481).

sulfide (HgS), modern cinnabar (American designation) or vermilion (British). Some processing, essentially grinding and washing, is necessary to produce the scarlet, somewhat greasy cinnabar powder; Iberia and Colchis were the two major sources in antiquity.⁴²⁷ Third are the naturally occurring and toxic arsenic sulphides known today as orpiment (As₂S₃) and realgar (AsS, also As₂S₂); the mines for both in antiquity were mostly east of the Aegean, in Syria, Asia Minor, and even Persia.⁴²⁸ Finally, lead tetroxide (Pb₃O₄), modern red lead or minium, occurs naturally as an extreme oxidation product of other lead minerals. However, the lead tetroxide known in antiquity may have been only the artificial pigment produced by roasting either lead acetate or lead carbonate (PbCO₃, cerussite). When roasted, the compound first loses carbon dioxide forming lead monoxide (PbO, litharge); further roasting, i.e., oxidation, produces lead tetroxide. This process, according to Pliny (XXXV.20) was discovered purely by accident, when a shipment of *cerussa* in jars burned in a warehouse fire in the Piraeus.⁴²⁹ Pliny, unfortunately, does not say when this accident occurred, but he does mention that the 4th c. painter Nicias was the first to use it as a pigment, implying Persian period use. There is no mention of lead oxides in Theophrastus

⁴²⁷ Thphr. *de Lap.* 58. Apparently by Pliny's age, Iberia had become the sole source of the pigment. Around 2000 pounds per year of the raw ore was shipped to Rome for processing there in state-run workshops (Pliny XXXIII.40).

⁴²⁸ Orpiment and realgar often occur together. Our word "orpiment" is said to derive from Pliny's *auripigmentum*, "golden-paint," a very appropriate designation for the bright yellow pigment; "realgar," on the other hand is from Arabic *rhaj al-gār*, "mine dust." Syria (Pliny XXXIII.22), Asia Minor (Strabo XII.3.40; mines so deadly that the criminal miners had a drastically curtailed life-expectancy), and Persia (Pliny VI.98; Achaemenid mines).

⁴²⁹ Bailey, I, 1929, 220; Fitzhugh, 1986, 121. Bailey (II, 1932, 204) argues that Pliny's *cerussa* (= Grk. *psimithion*) refers almost always to the artificially produced lead acetate (formed by exposing mineral lead to vinegar), rather than natural lead carbonate/cerussite. The shipment that burned in Piraeus might easily have been lead acetate, widely traded and used for cosmetics. See "psimithion" below.

or other roughly contemporary sources, but reports of over 100 tons of "litharge" found on a 5th c. ship which sank near Spain could prove Pliny's account of lead oxide use in the Persian period correct--unless, of course, litharge is a misnomer, which is entirely possible.⁴³⁰

For identification in the Persian period, the consensus, for Greek, generally is as follows:⁴³¹ *miltos* (Heb. *shasher?*; Aram. *sherek?*) = red iron oxide; *okhrê* = yellow iron oxide; *arrhenikon/arsenikon* (Heb. *shasher?*; Aram. *zrnik*) = yellow arsenic sulphide/orpiment; *sandarax* = red arsenic sulphide/realgar; *kinnabari/tiggabarou* (Heb. *shasher?*) = mercury sulphide/cinnabar.

Miltos was one of the most commonly used pigments in the Aegean, serving in construction (as carpenter's lines),⁴³² as a highlighter for the letters in inscriptions,⁴³³ as paint on marble sculptures,⁴³⁴ architectural features and ceramics,⁴³⁵ as an anti-fouling paint on ships (see below), in murals and perhaps house painting,⁴³⁶ in medicines and cosmetics.⁴³⁷ In sum it was an important and widely traded commodity.⁴³⁸

⁴³⁰ See Parker, 1992, no.14.

⁴³¹ Caley and Richards, 1956, s.v. (Index).

⁴³² IG⁷ 3073.120; AP 6.103; a related use was the *skhoinos miltêliphês*, the "ruddled rope," used to chase citizens in Athens to the Pnyx for state meetings. Those tardy souls who were marked red by the rope, stretched out and herding the men in the direction of the Pnyx, would not receive their pay for the day (cf. Ar. *Achar.* 22).

⁴³³ Plu. II.108

⁴³⁴ As *shesher* is used in Ezekiel, 23:14

⁴³⁵ Thphr. *de Lap.* 51; ferric oxide was detected in a deep red pigment on a terracotta from Athens, see Caley and Richards, 1956, 172; cf. Jer. 22:14, *shesher*, as an architectural pigment.

⁴³⁶ *P. Zen. Cair.* 59847 (+59663) mentions *miltos* among the pigments used to paint the frames of house windows.

⁴³⁷ See Blümner IV, 1897, 480, for the collected references.

⁴³⁸ The Aegean trade especially was so important that one community, on the Aegean island of Amorgos, named one of the months *miltophorion* to reflect the *miltos* trade. See Sontheimer, *RE*, s.v. *miltophorion*.

Sometime before 350, as noted in an inscription, Athens set restrictions over the exports of *miltos* from the small Aegean island of Ceos.⁴³⁹ The instructions in the decree include the designation by the Athenians of what ship was to carry the cargo, presumably to Athens, and the taxes and freight charges due. It may be that the Athenians were safeguarding a strategic, military commodity; Torr has suggested that triremes were painted with *miltos*, no doubt in an underside anti-fouling compound.⁴⁴⁰ Paints called "red oxide" and/or "red lead" have long been used as both primers and anti-fouling paints on ships, and are still available in maritime stores today. Many of these modern paints, however, seem to be lead-based.⁴⁴¹ Archaeological evidence for possible *miltos* anti-fouling paints is limited solely to the Roman Imperial Lake Nemi barges, where bitumen mixed with "some substance containing iron, possibly minium, as coloring-matter" was found painted on the hulls.⁴⁴² The literary evidence is equally meager: two passages from Homer and a statement in Herodotus, all of

⁴³⁹ IG II² 1128 = Tod, II, no.162.

⁴⁴⁰ Torr, 1964, 35ff; cf., Blümner, IV, 1897, 479; others following this lead are Austin and Vidal-Naquet, 1977, 297. Lead sheathing, as an underside anti-fouling device, had by this time become more widely used. But, because any excessive weight could seriously hamper the vessel's performance, lead sheathing was probably not used on triremes. See Morrison and Coates, 1986, 187.

⁴⁴¹ Wehlte (1975, 103) states, "The term 'red lead' should only be used for lead tetroxide and not for anti-corrosive pigments based on red ferric oxide." On steel hulls, iron oxide would be ideal in anti-corrosive paints since the iron oxide, which is essentially rust, is more stable chemically than the surface it would be applied to; the same would be the case with the lead oxides. Obviously, for wooden hulls these anti-corrosion properties would not matter as much as inhibiting marine growth and teredo worms. One of the uses listed for iron oxides in the *Condensed Chemical Dictionary* (s.v., iron oxide red) is specifically marine paints, while for lead oxide (s.v.), "metal-protecting paints" is listed as a use. Perusing most any nautical catalog, however, one finds that many "red oxide" marine paints, if not specifically copper oxide, seem to be lead based; in fact Euromere currently sells a "Red Oxide of Lead" (= lead tetroxide?) anti-fouling paint.

⁴⁴² Casson, 1971, 211, n.46. "Minium," however, in modern and ancient parlance never means iron oxides, but rather anything from mercury sulphide to lead tetroxide. In the quote, therefore, iron and minium are mutually exclusive; one or the other must be a mistake.

which suggest, in fact, that the red was clearly visible well above the water line.⁴⁴³ Generally, on ships and boats today, it is too expensive and serves little purpose to use specially compounded anti-fouling paints much above the waterline. The *miltos*-paint of antiquity was perhaps more of a general-purpose paint, providing equal protection above and below, and having the added benefit of high visibility, never a bad thing at sea, when used above the waterline.⁴⁴⁴ In sum, there is evidence that *miltos* was used in marine paints, but like the "red oxides" today, we cannot be certain that *miltos* in this context meant specifically iron oxide, nor can we be certain that the Kean iron oxides were meant specifically for use in the shipyards, although this is still the likeliest explanation.⁴⁴⁵

It may have been that like Latin *minium*, Greek *miltos* was a general designation covering all sorts of mineral red pigments; without chemical testing it would have been very difficult to distinguish some of the varieties.⁴⁴⁶ That *miltos* might also refer to mercury sulphide (cinnabar) was argued most vehemently by

⁴⁴³ *miltopareês*, "*miltos*-on-the-cheeks," i.e., bows? (*Il.* 2.637; *Od.* 9.125); *miltalphiês*, "*miltos*-smeared," (*Hdt.* III.58). Herodotus qualifies his statement by saying that in ancient times "all" ships were "*miltos*-smeared," including, of course, the type of ship that the ambassadors to Siphnos traveled on, which nearly a century later was no longer the case. But what types of ships are these? Herodotus, unfortunately, does not say.

⁴⁴⁴ The second part of the compounded word in Herodotus, *-alophê*, is used in Plutarch (*Mor.* 676A) to mean specifically an underside paint, and likewise appears in another compound (*hyalophê*), again as an obvious underside paint (Morrison and Coates, 1986, 188). It should be noted that Morrison and Coates (1986, 188ff.) in their discussion of trireme paints and coatings, make no mention of *miltos*, but discuss at length wax and pitch for trireme undersides.

⁴⁴⁵ There is nothing in the inscription that indicates the volume of the *miltos* trade. The trade was, however, the focus of a number of prior agreements in the years before this one (ln. 11), which implies considerable volume over time. Theophrastus (*de Lap.* 52) says that Cean *miltos* was the best (*beltistê*), but best for what purpose? Besides use in the shipyards, where else would Athens use its *miltos* imports--for painting public buildings?

⁴⁴⁶ Difficult if not impossible especially if the pigments were mixed or adulterated, as was common practice. As Blümner observes (IV, 1897, 479, n.3): "Auf alle Fälle hat man sehr verschiedenartige Minerale unter den Name *miltos*, *rubrica*, zusammengefasst, und namentlich bei Schriftstellern welche nicht Fachmänner sind, darf man Genauigkeit in der Bezeichnung nicht voraussetzen."

Leaf almost a century ago.⁴⁴⁷ Theophrastus, like later writers, mentions a type of *miltos* mined in Cappadocia, but called "Sinopic," because Sinope served as its outlet market.⁴⁴⁸ Leaf's arguments, however, have not won much support although they still should not be entirely ignored; mercuric sulphide is indeed found in Cappadocia.⁴⁴⁹ Trade in this Sinopic earth continued for many centuries;⁴⁵⁰ trade in the famed Lemnian varieties of *miltos* likely had not developed on a large scale during the Persian period.⁴⁵¹ Eastward (or westward?⁴⁵²) trade of iron oxides is difficult to detect. Certainly some varieties gained fame for their pigmentation or medicinal qualities and so may have been sought out by traders, but because iron oxides were also widely available in the Levant, large-scale trade towards the east may not have occurred.⁴⁵³

⁴⁴⁷ Leaf, 1916; see also Blümner, IV, 1897,

⁴⁴⁸ Thphr. *de Lap.* 52. Pliny XXXV.13 notes that there were three grades of this Pontic product.

⁴⁴⁹ The arguments are based not only on the difficult elucidation of the meaning of Latin *minium*, but also on geological considerations and trade patterns. On the question of Sinopic cinnabar, Blümner (IV, 1897, 481, n.10), writing two decades before Leaf said simply, "weiss ich nicht," but does remark (488, n.2), "bei den späteren Schriftstellern mag der Zinnober bald mit *kinnabari*, bald mit *miltos* bezeichnet worden sein." Caley and Richards (1956, 172) however, have insisted that it was not cinnabar, and Bailey (II, 1932, 208) thinks the Sinopic variety was, like Caley, mostly ferric oxide.

⁴⁵⁰ The 10th c.A.D. Arab geographer, al-Muqaddasi, remarks that *al-mağra* was traded in Aleppo (*editio de Geoje*, 181). Le Strange (1890, 19) claims that this red chalk is *rubrica sinopica* which served mostly pharmaceutical purposes among the Arabs. If *mağra* is in fact Cappadocian earth, its appearance in the Aleppo suq (only?) implies overland eastern trade in the mineral which may have begun centuries before.

⁴⁵¹ Theophrastus does not mention the Lemnian variety, although among later writers it was considered one of the best (cf. Pliny XXXV.13; also see Bailey, II, 1932, 209-210 and Blümner, IV, 1897, 482). Pliny also mentions ferric oxide (ochre) varieties from the Aegean island of Scyrus (the third best variety) and says that there used to be a type, which was no longer available, from near Sardis (XXXIII.56); Egypt also produced a variety (XXXV.13).

⁴⁵² Pliny (XXXIII.120) describes a mixture of realgar and various types of iron oxides (including Sinopic earth!) which was called *Syricum*, elsewhere this is called *Phoeniceum* (see Blümner, IV, 1897, 488, n.1). Perhaps centuries earlier, the Levant began exporting this special blend.

⁴⁵³ In one of the seaside, Persian period warehouses excavated at Ascalon (grid 50), the remains of a basket was found which had contained "red ochre and brown umber from Cyprus" (*NEAEHL*, vol. I, 103). How the excavators were certain this was Cypriot ochre is not stated.

Except for a confused remark in Vitruvius,⁴⁵⁴ the names of the arsenic sulphides in Greek and transliterated Latin remained consistent, *arsenikon* for orpiment, *sandarax* for realgar. Although the use of these pigments in the Aegean may have been limited, there is little doubt that both were imported to the Aegean from Syria and possibly Asia Minor.⁴⁵⁵ This westward trade endured for millennia: orpiment was found on the Late Bronze Age shipwreck at Uluburun, and on the medieval wreck at Serçe Limani.⁴⁵⁶

Further evidence of orpiment trade and a hitherto unrecorded nautical use of the mineral is found in an Aramaic letter from 5th c. Egypt. The letter, from a Persian grandee to storehouse officials, directs that certain materials be distributed for the repair of a boat;⁴⁵⁷ listed among these materials are specified weights of *zrnik* and *kbr*, orpiment and sulphur.⁴⁵⁸ The purpose of the orpiment here is spelled out, *lhndonh*, a difficult word, which Porten suggests means "for

⁴⁵⁴ He says (VII.12.2): "cerussa vero cum in fornace coquitur, mutato colore ad ignem incendio efficitur sandaraca." He must be referring to the production of lead oxides; artificial production of arsenic sulphides from lead carbonate (*cerussa*) is simply not possible. Pliny (XXXV.39) notes that "sandaraca...fit adulterina et ex cerussa in fornace cocta;" this adulteration may have been what Vitruvius had in mind.

⁴⁵⁵ For arsenic sources, see n.428 above. Caley and Richards (1956, 172) suggest it had limited use. Pure orpiment was found in a container in a Persian period grave in Athens; from a 2nd c. "hardware store" in Corinth came vessels containing traces of realgar. In the first case, it is difficult to discern a personal use (implied by the burial context) for the pigment, since aside from forming a depilatory when mixed with lime, toxic orpiment had little cosmetic use. Orpiment, when mixed with wax, was also used to create a writing surface on writing boards, a possibility for personal use (Wiseman, 1955, 6). The material from Corinth was obviously for (architectural?) painting. For the use of elemental arsenic in alloys with copper, see Copper below.

⁴⁵⁶ Bass, 1997, 159.

⁴⁵⁷ *TADAE* I.A6.2, ln. 17 = Cowley, 1923, 26.

⁴⁵⁸ Porten (1996, 121) translates *zrnik*, "arsenic," which cannot be entirely correct. While Aramaic *zrnik* can stand for native mineral arsenic (As), here orpiment would be better, another possibility for *zrnik* (Jastrow, *Dictionary*, s.v.). Cowley, in his commentary on the letter, suggests that *zrnik* is a loan word from Greek, which if true, must then represent Greek *arsenikon* (= orpiment). If in fact it is a loan word from Greek, the implications of a Levantine commodity reaching Egypt under a Greek name are certainly interesting.

coating."⁴⁵⁹ What specifically the sulphur and orpiment, ca. 0.83 kg and 8.3 kg respectively, might have been used for in this context is very much open to discussion. Elsewhere in the letter (lns. 13-14), (lead) sheeting and linen cloth are ordered presumably for underside protection; it may be that the orpiment and sulphur also played some role in sheeting or otherwise protecting the undersides of the vessel.⁴⁶⁰

A recognized import in the Aegean, mercuric sulphate (cinnabar) saw more widespread use than the arsenic sulphides.⁴⁶¹ Documented finds of cinnabar from Athens and the Levant demonstrate the pigment's appeal and use for

⁴⁵⁹ Porten, 1996, 121.

⁴⁶⁰ As shipwreck finds show, lead sheeting was generally not applied directly to the undersides of a vessel. Applied first was some (chemical impregnated?) layer of cloth, often linen. Porten's suggestion for the sulphur, "used for soaking the linen" (121, n.63), may be correct if the sulphur was dissolved into some solution. Sulphur, however, was more frequently used as a burned fumigant. Roman fullers, in fact, were required by law to fumigate clothes by suspended them above burning sulphur (see "Sulphur" section below). Here perhaps, the sulphur was used also as a fumigant, not only for the linen, but perhaps for the wood as well. Orpiment's toxicity, well recognized in antiquity, would be an appreciated addition to the undersides of vessels, to inhibit growth of marine life. In modern times, arsenic has also been used in anti-fouling paints, but its use in such an application, because it is so toxic, has been discontinued. The orpiment rather than the sulphur, may have been what the linen and/or the undersides were coated with before the lead sheets were nailed in place. For use in a topside paint, as Grelot (1972, 292, n.q) suggests, orpiment would be less than ideal especially in the Egyptian sun; both of the arsenic sulphide pigments fade rapidly and decompose with prolonged exposure to sunlight (Fitzhugh, 1997, 51). Note, however, that Pliny (XXXV.49, 149) indicates that yellow and other pigments, mixed with wax and applied to topsides with heat (encaustic), were less prone to spoilage by sun, salt, and wind. Herodotus (I.98) mentions one of the circles of battlements at Ecbatana being *sandarakinoi*, i.e., painted with *sandarax* (?). The validity of this account is questionable; the last two battlements are said to be painted with gold and silver. But it may be, if realgar is meant here, that Herodotus mentions the pigment as yet another example of Persian conspicuous consumption; constant re-painting with realgar would be necessary to maintain the color.

⁴⁶¹ Greek *tiggabarou* and *kinnabari* are loan words, but from which language it is not certain (see *RE*, s.v., Minium, cols.1848-49). Theophrastus (*de Lap.* 58) knew of only two sources for natural cinnabar, Iberia and Colchis, both of which continued to produce the mineral well into the modern era. In the Persian period, cinnabar may have also been mined farther east in Kirkuk (Moorey, 1999, 227). Note also the appearance of cinnabar on a shipwreck (Parker, 1992, no. 689).

decorating statues and ceramics.⁴⁶² Literary sources of the Persian period may also document the first mechanochemical reaction in which cinnabar, today the major mercury producing ore, was used to produce metallic mercury (Hg), which in turn was used in gilding objects with gold or silver.⁴⁶³ Metallic mercury (*hydragyron* in later Greek, e.g. Dioscurides) may have been one by-product of the second type of cinnabar mentioned by Theophrastus, an artificial cinnabar (*kat'ergasian*) made from a sandy ore found near Ephesus.⁴⁶⁴ Mercury also appears as a commodity in trade; quantities were found stored at one of the Achaemenid palaces in Susa, but more importantly, it was also found in a late-5th, early 4th c. warehouse at Al Mina.⁴⁶⁵

Problems with the ancient terminology for mercuric sulphide mostly post-date the Classical period. As noted, Dioscurides used both *miltos* and *kinnabari*; Pliny used *cinnabari* to refer to a vegetable pigment imported from the Far East,

⁴⁶² Cinnabar has been detected on 6th c. statues from Athens (Caley and Richards, 1956, 194), and on the 5th c. Cypriot Amathus Sarcophagus (Metropolitan Museum, New York, accession number 74.51.2453); from the excavations in the Athenian Agora came a small "salt-cellar" with remains of the pigment inside (*Agora* XII, no.915), used as a paint-pot or inkwell? From Cyprus, a Classical period terracotta figurine was painted with cinnabar (Karageorghis, *et al.*, 1997; note, however, that the authors question the originality of the pigment, suggesting it could have been a modern museum touch-up).

⁴⁶³ By heating and grinding cinnabar, mercury can be extracted (see Takacs, 2000). For mercury used in ancient gilding technology, see Alexander, 1976.

⁴⁶⁴ Thphr. *de Lap.* 58. Blümner (IV, 1897, 494) remarks on the artificial type are worth noting: "Am wahrscheinlichsten dünkt mich die Ansicht Boeckhs, dass auch der bereitete Zinnober aus einem Quecksilbererz gezogen war, und dass der Unterschied zwischen dem natürlichen Zinnober und dem Sande, woraus der künstliche bereitet wurde, nur darin lag, dass in letzterem ein fremdartiger Stoff beigemischt war, welcher durch Waschen ausgesondert wurde."

⁴⁶⁵ See Moorey, 1999, 227; Porter and Vesel (1993, 147ff.) argue that the cinnabar (*shangarf*) which saw widespread use as a pigment in medieval Iran came from Spain, suggesting that this might also have been the Persian period source.

but *minium* for our cinnabar and *minium secundarium* for lead tetroxide (red lead), from which comes the modern equation, minium = red lead.⁴⁶⁶

Green Pigments

Natural green pigments, most of them copper-based, were perhaps not as widely used as the more standard reds, yellows, blues, and blacks; green, as is often the case, could be made from a mixture of yellows and blues.⁴⁶⁷ Nevertheless, some green pigments, especially *khrysokolla*, were likely traded east to west.

The mineral known today as chrysokolla is a hydrated copper silicate ($\text{CuSiO}_3 \cdot n\text{H}_2\text{O}$, *vel sim.*);⁴⁶⁸ ancient *khrysokolla*, may also have been copper silicate, although an identification with malachite (copper carbonate hydroxide, $\text{Cu}_2(\text{CO}_3)(\text{OH})_2$) is often put forward.⁴⁶⁹ In its mineral state, malachite is a banded light and dark green, semi-precious stone which for use as a pigment requires laborious grinding and washing to process (cf. Pliny, XXXIII.26). In the Near East, malachite served a number of purposes from the Bronze Age onward, both in its mineral and processed states. Worked into beads, malachite served as

⁴⁶⁶ Crone (1987, 60) provides an overview of the vegetable dye cinnabar (from *Dracaena* spp.), also known as "Dragon's Blood," which likely was not regularly imported to the Mediterranean until the Roman Period. See Bailey (I, 1929, 217) for an overview of the terms, especially for the confusion caused by *minium*.

⁴⁶⁷ Caley and Richards, 1956, 174.

⁴⁶⁸ The composition can vary a great deal; copper silicates, as noted in the *Condensed Chemical Dictionary* (s.v.) are "a complex mixture precipitated by solutions of copper salts from sodium silicate solutions."

⁴⁶⁹ See Caley and Richards, 1956, 174; Bailey, I, 1929, 205.

jewelry, as it does today.⁴⁷⁰ More commonly, however, processed malachite was a primary ingredient in eye shadow and as a major ingredient in the famed Egyptian Blue pigment.⁴⁷¹ In the Aegean, cosmetic use is implied (cf. Pliny XXXIII.27), but there it was mostly used as a pigment for painting and as a binder in reaction soldering.⁴⁷² Pliny remarks that the *khrysokolla* (the name means “gold-glue”) used by goldsmiths was a mixture of verdigris, urine and natron; from this green-colored *khrysokolla*, all other types derive the name,⁴⁷³ a remark which suggests that, as with many other color/pigment terms, *khrysokolla* may have been no more than a general designation for anything bright green. Nevertheless, identifying *khrysokolla* as copper carbonate or copper silicate could help determine the origin of ancient supplies. Three major copper/malachite-mining areas have been located in the Sinai peninsula, and one in Wadi Araba, ca. 30 km north of Eilat/Aqaba.⁴⁷⁴ Although Theophrastus does not specify where Aegean *khrysokolla* originated, other ancient writers note high quality grades

⁴⁷⁰ A hoard of over one thousand beads from Ur, dating to the Neo-Babylonian/Persian period, contained 12 malachite beads (see Moorey, 1999, 94). One suggestion for the Hebrew word *nofek*, one of the goods listed in Ezekiel 27:16 traded by Aram/Edom is malachite, or turquoise. Malachite today, in fact, often is used as imitation turquoise.

⁴⁷¹ From the 7th c. levels at Tel Sukas, a decorated tridacna shell, used as a cosmetic container, had within remains of malachite cosmetics (Buhl, 1983, 81); similar finds were made at Tel Arad. Dating much earlier, cosmetic containers with malachite within were also found at Ur (Bimson, 1980, 75).

⁴⁷² Thphr. *de Lap.* 40, 51; Jüngst, 1986. Malachite was also used for a green-pigment on a terracotta from 4th c. Athens (Caley and Richards, 1956, 174). Since the Bronze Age, eastern Mediterranean goldsmiths had practiced granulation techniques using some type of gold-solder, generally copper-based (see Jüngst, 1986). Eur. *Ph.* 2, and Fr. 587, and Soph. Fr. 378 mention chariots, swords, and cups respectively all decorated using the technique

⁴⁷³ XXXIII.29: "Chrysocollam et aurifices sibi vindicant adglutinando auro, et inde omnes appellatas similiter virentes dicunt. temperatur autem Cypria aerugine et pueri inpubis (!) urina addito nitro teriturque Cyprio aere in cypriis mortariis; santernam vocant nostri."

⁴⁷⁴ Aston, *et al.*, 2000, 43-44.

from Armenia, Macedonia, and Cyprus.⁴⁷⁵ Most of the evidence points generally to the east for Aegean supplies of the mineral.

Two other greens were possibly traded in the Persian period.⁴⁷⁶ Verdigris, known as *ios* ("rust") in Greek, is an artificially produced copper acetate; the methods of production using copper and vinegar are described by Theophrastus, but the localities of production are not (*de Lap.* 57). Pliny (XXXIV.112, 114), however, lists only Rhodes and Cyprus as major verdigris producers, which may also have been the case, especially for Cyprus, centuries earlier.⁴⁷⁷ Given the rich deposits of high quality *creta viridis* ("green chalk" = green earth = celadonite) on Cyprus and its importance in later trade, earlier trade in Cypriot green earth can be conjectured.⁴⁷⁸ Pliny (XXXV.29), in fact, notes an Italian type of green earth being used as an imitation for *khrysokolla*, which suggests the Cypriot variety could also have fallen under that rubric in earlier times. On Cyprus, celadonite was used as a pigment on ceramics and sculpture during the Persian period;⁴⁷⁹ traces of the mineral on a mural from Hellenistic Jericho also indicate an eastward

⁴⁷⁵ Dsc. V.104; Vitruv. VII.9.6. Israel today is a major source of copper silicate, indicating perhaps that some Levantine *khrysokolla* may have been copper silicate rather than copper carbonate.

⁴⁷⁶ A third, atacamite (copper chloride hydroxide) was used as a cosmetic in Arabia and Mesopotamia (Masia, 2000; Thomas and Potts, 1996), but has not (yet) been noted in reports from the Mediterranean. One other green compound, smithonite (zinc carbonate) was found on a terracotta figurine from Cyprus, but the rarity of the compound has raised suspicions that it might be a museum touch-up rather than an original pigment (see Karageorghis *et al.*, 1997).

⁴⁷⁷ A number of other copper compound minerals, e.g., *sori* and *misy*, (copper sulphides?), were known to later authors as products chiefly of copper-rich Cyprus (see Bailey, II, 1932, 175). Given the island's very long history of copper production and working, earlier Persian-period exportation of less common copper products and by-products should not be dismissed.

⁴⁷⁸ Vitruvius (VII.7.4) notes that while *creta viridis* is found in many places, the best is from Smyrna, where it was discovered accidentally on the property of a man named Theodotus, and so is called *Theodotion*. No other author mentions green earth specifically from Asia Minor.

⁴⁷⁹ Karageorghis *et al.*, 1997, for ceramics; it appears on the early 5th c. Amathus Sarcophagus in the Metropolitan Museum in New York (accession number: 74.51.2453).

trade.⁴⁸⁰ Export of Cypriot celadonite continues unabated today; in the 19th c. Dutch ships returning to Europe from the Levant transported Cypriot green earths as (profitable) ballast, a possibility we should consider as well for ancient merchantmen heading towards the Aegean from the Levant.⁴⁸¹

Blue Pigments

There are three blue pigments (*kyanos*), Theophrastus says, two natural types, Skythian and Cypriot, and a third artificial type known as Egyptian.⁴⁸² The Skythian blue generally is thought to be lapis lazuli, but this identification is problematic since there is as yet no conclusive archaeological evidence in the Aegean, Levant, Egypt, or Mesopotamia for its use as a pigment.⁴⁸³ Furthermore, the routes and even actual occurrence of lapis lazuli trade in antiquity is a contested topic (see "gems" below). For the moment, no suitable alternative has been suggested.⁴⁸⁴ The Cypriot blue, however, is probably azurite (copper carbonate hydroxide, $\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$)⁴⁸⁵, which is attested archaeologically as an architectural and mural pigment in the Aegean and at the Achaemenid Persian sites

⁴⁸⁰ Porat and Ilani (2000), 7*

⁴⁸¹ Grissom, 1997, 149.

⁴⁸² Thphr. *de Lap.* 55, 70.

⁴⁸³ For the (questioned) identification, see Bailey, II, 1932, 220; Caley and Richards, 1956, 183. For the lack of evidence of its use as a pigment, see Lee and Quirke, 2000, 111; Moorey, 1999, 327.

⁴⁸⁴ In hand and under magnification, powdered lapis lazuli and azurite are often confused. It may be that the Skythian blue was also azurite, but originating somewhere to the north of Greece.

⁴⁸⁵ Malachite is also copper carbonate hydroxide, only a difference in structure produces the green color in malachite. Both minerals are often found closely associated in the same deposits.

of Persepolis and Pasargadae.⁴⁸⁶ Azurite is not known to be an especially permanent or a consistently colored pigment, which may explain why no examples have been found in Egypt where the higher quality artificial blue was in use at a very early date.⁴⁸⁷

One of the most important pigments in antiquity and the first known synthetic color, Egyptian Blue was a calcium copper silicate formed by heating together to ca. 850° C powdered calcium (e.g., limestone), copper (e.g., malachite), and silica (generally quartz sand); the resulting frit was then powdered to create a bright blue, easily worked and lasting pigment. Lack of clarity in Theophrastus' discussion suggests that he believed that the pigment was developed outside of Egypt. What he does say clearly though is that it was brought to Egypt as tribute (along with the *apyros* blue, i.e., a natural blue) at some unspecified early date by the Phoenicians and others.⁴⁸⁸ Archaeological evidence has not yet shown conclusively where the pigment was developed, but it does appear in Egypt as early as the third millennium, long before it appears anywhere else in the archaeological record.⁴⁸⁹ By the Late Bronze Age, the use of Egyptian Blue had spread to the Aegean and the east. Persian period occurrences are numerous: Egyptian Blue has been detected on 6-4th c. Aegean architecture, wall paintings, ceramics, and terracotta figurines;⁴⁹⁰ similar occurrences are

⁴⁸⁶ For the identification, see Caley and Richards, 1956, 183. Small details of the facade of the 6th c. temple of Aphaia on the Aegean island of Aegina were painted with azurite (Riederer, 1997, 26); for the Persian sites, see Moorey, 1999, 327, and Riederer, 1997, 25. Azurite also appears on the 5th c. Amathus Sarcophagus in the Metropolitan Museum, New York.

⁴⁸⁷ Lee and Quirke, 2000, 111.

⁴⁸⁸ Thphr. *de Lap.* 55.

⁴⁸⁹ Riederer, 1997, 23; Lee and Quirke, 2000, 110.

⁴⁹⁰ See Riederer, 1997, 26 for finds and bibliography.

reported from the Levant, Mesopotamia, and Egypt.⁴⁹¹ Unfortunately, it cannot be said with any certainty where the pigment was manufactured during this period. The techniques and ingredients necessary to make Egyptian Blue are similar to those used in glass production, thus we should look for manufacturing sites where such skills and ingredients were available, which would suggest someplace in the Levant or Egypt. For Theophrastus, this blue was "Egyptian," possibly denoting where Aegean supplies originated;⁴⁹² his account of Phoenicians bringing it as tribute may be anachronistic, perhaps indicating contemporary trade patterns. As yet, no kilns have been uncovered, but fragments found recently in Beirut suggest that the pigment was manufactured on site, where there was ready access to the ingredients.⁴⁹³ Finds from 7th c. Nimrud also point to Levantine production and trade of Egyptian Blue; there one large Palestinian-type amphora was found containing lumps of the pigment ready to be powdered for use.⁴⁹⁴

White Pigments and Fuller's Earths

White pigments for murals, architectural whitewash, ceramics and the like were often powdered forms of various calcium compounds, e.g., calcium sulphate

⁴⁹¹ Moorey, 1999, 186; Lee and Quirke, 2000, 110.

⁴⁹² Of course, this name might also, as in the case of the "Egyptian" type of perfume, merely indicate the place from which the Greeks first learned of it. Despite the extended history of production and use of Egyptian Blue in Egypt, there are only sporadic finds there from the Persian period, most, in fact from the Delta trading sites of Naucratis and Tanis. Whether this means the pigment was no longer produced in Egypt, but only imported, or produced only at sites like Naucratis, has not been determined (see Moorey, 1999, 188).

⁴⁹³ Elayi and Seyagh, 2000, 281.

⁴⁹⁴ Moorey, 1999, 191.

dihydrate (gypsum), partially dehydrated calcium sulphate (Plaster of Paris), and calcium carbonate (whiting, chalk). Magnesium calcium carbonate (hunite), a bright, high quality, orpiment-like pigment has been found on items from Egypt dating as early as ca. 1900, but hunite has not been detected beyond the borders of Egypt.⁴⁹⁵ Cyprus was known in antiquity to have large deposits of calcium sulphate (Thphr. *de Lap.* 64), which today in both the hydrated and anhydrous forms are major Cypriot exports;⁴⁹⁶ high quality varieties are also found on Crete.⁴⁹⁷ As a pigment, calcium sulphates have been detected on 5th c. Attic *lekythoi*,⁴⁹⁸ in the Near East they have been noted as components in temple whitewashes,⁴⁹⁹ and from 5th c. Egypt, gypsum (*gṣ*) appears in an Aramaic list of items possibly in trade.⁵⁰⁰ Finally, as a whitener, powdered gypsum may also have been used by fullers for "cleaning" clothes.⁵⁰¹

Fuller's earths, white native compounds of various sorts (sometimes similar to white pigments), were highly prized in the Mediterranean throughout antiquity.⁵⁰² Several islands in the Aegean were famous in the Classical period

⁴⁹⁵ Lee and Quirke, 2000, 114.

⁴⁹⁶ Caley and Richards, 1956, 213.

⁴⁹⁷ Chlouveraki, 1998.

⁴⁹⁸ Caley and Richards, 1956, 218.

⁴⁹⁹ Moorey, 1999, 37; records of Nabonidus's temple building also note decorations made of gypsum and bitumen to make the face of the structure brilliant (*ANET*, 313).

⁵⁰⁰ *TADAE* IV.D7.23.

⁵⁰¹ Caley and Richards, 1956, 218. In its mineral state, fine-grained forms of gypsum, sometimes called "alabaster" were also used for making sarcophagi, perfume bottles, and so forth. This use of gypsum, the calcite that is often mistaken for it and calcium oxides (quicklime, lime) will be addressed below.

⁵⁰² White garments, particularly in ritual contexts, were of great importance (cf. Num. 31:20-24), and were necessary, in some cases, to be socially acceptable (cf. Eccl. 9:8). Garments taken to a fuller were first laundered in a sequence of cold and heated washes with some type of alkali detergent (e.g., natron, potash, soapwort, etc.), then often fumigated with sulphur, and finally scoured with a type of fuller's earth. See Forbes (1964, 82ff) for descriptions of various ancient fulling methods. Fulling was one of the staple trades in antiquity. As far back as records in the

for their fuller's earths: Cimolus (mod. Argentiera), a tiny island near Melos in the Cyclades, produced *kimolia* (mod. cimolite) a clay of both purplish and bright white types;⁵⁰³ nearby Melos produced a bright white, soft and extremely fine *kaolinês* (mod. kaolinite, china clay), a hydrated aluminum silicate;⁵⁰⁴ and Samos had *samia gê*, perhaps bentonite.⁵⁰⁵ In addition to these Aegean varieties, Theophrastus (*de Lap.* 85) also mentions another type from Cilicia, but not the Eretrian, Lemnian, Chian, Sicilian and Syrian earths known to later authors.⁵⁰⁶ Internal Aegean trade in these native earths was surely on a considerable scale. In Athens, *kimolia gê* was perhaps so common that the title became the designation for most types of fuller's earths. The same happened in the Near East at some unspecified date (Aram. *kimōlya* = *kimolia gê*), which indicates (considerable) Aegean imports in the Levant.⁵⁰⁷ Evidence for extra-Aegean trade (e.g., Aegean-Egyptian) in *samia gê* might be found in the Ahiqar Aramaic custom's account.⁵⁰⁸ In the document, Phoenician ships are taxed on *tin shmwsh*, "clay from *shmwsh* (=

Mediterranean region go, fullers are mentioned (e.g., Middle Assyrian Laws, *ANET*, 188; 195-196; in the Aegean Linear B tablets: *DMic*, s.v. *ka-na-pe-u*), and pictured (e.g., examples from Old and Middle Kingdom Egypt).

⁵⁰³ Thphr. *de Lap.* 62; cf. Pliny, XXXV.196; chemically, the white variety was likely similar to that from Melos (see Bailey, II, 1932, 243), while the purplish type may have been a native porous calcite (Y. Bassiakos, lecture given at the American School of Classical Studies at Athens, Nov. 28, 2000).

⁵⁰⁴ Bassiakos, *ibid.*

⁵⁰⁵ Bassiakos, *ibid.*; Bailey (II, 1932, 240) suggests the Samian clay was also kaolinite. Theophrastus (*de Lap.* 107) only notes one type of Samian earth, while later writers, e.g., Dioscurides (V.172), mention several with distinctive names.

⁵⁰⁶ E.g., Pliny, XXXV.191ff and commentary (with references to Dioscurides, Galen, etc.) in Bailey, II, 1929, 240ff. Raby (1995) discusses the 16th c. A.D. popular revival of these Aegean earths, used primarily as medicines, and their imitations.

⁵⁰⁷ See Ar. *Ranae*, 713; *kimōlya* (Jastrow, *Dictionary*, s.v.) appears in Talmudic Aramaic as a Greek loan word meaning fuller's earth.

⁵⁰⁸ As Briant and Descat note (1998, 72), there is 3rd c evidence for Aegean-Egyptian trade in *samia gê* as well.

Samos?);” Briant and Descat suggest this is Samian kaolinite.⁵⁰⁹ If so, this *samia gē* may have first traveled to the Levant, when some may have been off-loaded for local use, then continued south. While we do not have the full record of the annual *tin shmws* imports in this document, but one ship alone was carrying half a metric ton of the clay, suggesting that this commodity was significant enough to be passed on, port to port, from the Aegean, to Phoenicia and on to Egypt, in fairly large quantities.

Antimony, Galena, Psimithion

An important eye cosmetic in the ancient Near East, *pok* (= *kohl*) is mentioned in the Old Testament mostly in association with foreign and lewd women.⁵¹⁰ Although the widespread use of this cosmetic in the Aegean has been questioned,⁵¹¹ mention of *stimmi* (dark eye paint) is found in Classical period Greek authors, again associated with foreign women of less than ideal character.⁵¹² The minerals antimony (Sb), antimony sulphide (Sb₂S₃, stibnite) and

⁵⁰⁹ Briant and Descat, 1998, 72.

⁵¹⁰ II Kings 9:30 (*pok*); Jer. 4:30 (*pok*); Ezek. 23:40 (*kohl*); one of Job’s daughters is named *keren happok*, “horn of kohl” (Job, 42:14)

⁵¹¹ One indication of the cosmetic’s widespread use in the Near East is the long, slender kohl-tubes made of metal, bone, glass, etc., and the associated wand-like applicators frequently found in female graves (e.g., Stern, 1971, 25-30; Iliffe, 1935, 182-185, illustrates a quadripartite bronze example). These kohl-tubes are notably absent in the Aegean. However, bronze implements from the western Mediterranean looking rather like kohl-sticks are known, but have been interpreted as perfume, rather than eye-paint applicators (Hill, 1965).

⁵¹² A fragment of Ion’s satyr play, *Omphalē*, mentions *stimmi* (Pollux V.101); a second fragment (*apud* Athen. 690b) lauds the perfumes and cosmetics of Lydia compared to those of the Peloponnesus. In myth, Omphale was the barbarian seductress of Heracles; in reality, Pericles’s consort Aspasia was often called Omphale and may be the intended focus of the comments found in Ion’s play (Powell, 1995, 259). Cf. also Antiph. frg. 189 and Pliny, XXXIII.34, where he notes that the Greeks called the cosmetic *platyophthalmon*, “wide-eye.”

lead sulphide (PbS, galena) have all been suggested as the major components of the cosmetic. Antimony is usually favored, in part because second millennium Egyptian and Neo-Assyrian records mention the mineral as tribute from the Levant;⁵¹³ antimony also served sporadically as an alloy with copper and tin.⁵¹⁴ In his discussion of *stimmi*, Pliny notes that there are two types, a male variety and a female, the later perhaps native metallic antimony, the former stibnite.⁵¹⁵ Following Stohl's citation of more modern imports of galena from Iran to Syria for the manufacture of kohl, Moorey suggests that kohl products in antiquity were likely more lead- (i.e., galena) than antimony-based.⁵¹⁶ A major argentiferous ore, galena was widely mined in the Aegean for its silver content and so was available. However, no tests have yet been conducted to prove the validity of Moorey's theory. The composition of kohl/*stimmi* may have changed depending on the availability of antimony or galena and the trade of the minerals.

A very popular lead-based cosmetic in the Aegean, *psimithion*, was used in powdered form to whiten faces.⁵¹⁷ Pliny (XXXIV.175) equates Latin *cerussa* with Greek *psimithion* and describes the production of the cosmetic, likely drawing on a similar description in Theophrastus (*de Lap.* 56), using lead shaving

⁵¹³ *ANEP*, 3, fig. 3 pictures a caravan of 37 "Asiatics" bringing antimony to Egypt ca. 1890; there likely was no native source of antimony in Egypt (Ogden, 2000, 149); nevertheless, Hemmerdinger (1968, 243) notes that *stimmi*, in Greek, is an Egyptian loan word; see also *ANET*, 282 (Neo-Assyrian tribute from Gaza); 293 (booty from Egypt); Moorey, 1999, 1. Near Tel Dan and Mt. Hermon, there is a smaller mountain known in antiquity as Mt. Kohl, likely a major source of the mineral (Moorey, 1999, 242).

⁵¹⁴ Moorey, 1999, 2, 242.

⁵¹⁵ Ancient alchemists and scientists often designated "male" and "female" types for minerals, which had more to do with the natural properties of the minerals than use by different sexes. For "male" and "female" *stimmi*, see Bailey, I, 1929, 213.

⁵¹⁶ Moorey, 1999, 293.

⁵¹⁷ E.g., Ar. *Eccl.* 878, 929, 1072; Xen. *Oec.* X.2.3.

and vinegar; the best is made in Rhodes, Pliny says. *Psimithion* therefore is lead acetate, rather than native cerrusite (lead carbonate, PbCO_3), also known as “sugar of lead” because of its sweet taste.⁵¹⁸ Trade in lead acetate was likely for the Persian period as it was in Pliny’s, but who the producers and customers (aside from Athens) may have been we have no clue.

Alum

One of the most indispensable, widely traded, and longest known chemicals in antiquity, alum was used in glass making, as a medicament, in metallurgy, in tanning, but mostly as a mordant in dyeing.⁵¹⁹ The identification of alum (Grk. *stypteria*) is hampered by the range of terminology and types, e.g., white and black, found in later accounts such as Pliny’s (XXXV.183ff). There is little question that a number of different substances with an astringent nature were meant, most of them the alums proper, i.e., the hydrated salts (aluminum sulphates) formed between aluminum and some other metal.⁵²⁰ Mesopotamian accounts of the 6th c. and earlier record considerable trade in Egyptian alums probably for use in the textile industry.⁵²¹ While Egypt seems to have been a

⁵¹⁸ Bailey, II, 1932, 204.

⁵¹⁹ Van Beek (1960, 85) notes the use of alum mixed with myrrh as a mouthwash; for the use of alum in separating gold from silver, see Moorey, 1999, 69; for tanning, Driel-Murray, 2000, 304; for dyeing, Barber, 1991, 236-38. Alum appears in Linear B texts, *DMic*, s.v. *tu-ru-pe-te-ri-ja*; see also Palaima, 1991, 279. For alum in medieval Mediterranean trade, see Bautier, 1992, 294ff., where it appears as an import in western Europe from Asia Minor and the Levant.

⁵²⁰ Barber, 1991, 238; Bailey (II, 1932, 233) suggests kalinites (hydrated double sulphates of aluminum and a monovalent metal, e.g., potassium) or halotrichites (hydrated double sulphates of aluminum with a bivalent metal, e.g., iron) for the white and black varieties respectively.

⁵²¹ One Neo-Babylonian document records the importation of 233 minae of alum from Egypt; others refer to alum from Syria (Oppenheim, 1969, 243; see also Weisberg, 1982).

major source, Syro-Palestine, Cyprus, and Anatolia also are noted for (white) alums.⁵²² According to Dioscurides (V.10) and Celsus (VI.19), the Aegean island of Melos produced a high quality black alum not mentioned by earlier sources. As an indication of how important and profitable the alum trade could be, the demand for a particular type of alum from the Lipari islands so far exceeded the supply that outrageous profits were made from the high prices requested (Dsc. V.10).

Natron⁵²³

Natron (Grk. *nitron*, *litron*; Heb. *neter*; Aram. *nt*), like alum, was traded in number of different guises, none of which has been satisfactorily identified.⁵²⁴ The identity of natron is also contested, modern niter/saltpeter (potassium nitrate, KNO₃) was long favored, but has been shown to be impossible in some cases. Other suggestions have pointed to potassium carbonate (potash, K₂CO₃), or some other carbonate, especially sodium carbonate (soda, NaHCO₃, or similar).⁵²⁵ Like alum, natron served not only as a mordant in textile dyeing and as an ingredient in glass production, but also as an important cleanser and in Egypt as a desiccating

⁵²² Josph. *BJ*, VII.189 notes alum mines at Machaerus; for Cypriot alum, Bass, 1997, 164; use of Anatolian (i.e., Hittite) alum is recorded in Akkadian ritual prescriptions (*ANET*, 335); Anatolia was also an important source of alum in medieval trade (Bryer, 1982, 146).

⁵²³ In modern (English) usage, "natron" is the preferred form when referring to Greek and Latin *nitron/nitrum*, although "nitron, nitrum" is at times found in the literature. This form is not to be confused with "niter, nitre" which, in modern usage, refers specifically to potassium nitrate.

⁵²⁴ With the exception of *aphronitron* (*spuma nitri*), most of the varieties of natron are known from post-Classical sources, e.g., *halmyrax*, *flos salis*, *sal nitrum* (see Schramm, *RE*, s.v. Nitrum).

⁵²⁵ Bailey (I, 1929, 169) reviews the various arguments; see also Butz, 1984, 275ff. As Bailey correctly notes, (hydrated) sodium carbonate is found in large quantities in Egypt in the region around Wadi Natron, presumed to be the primary source for ancient Egyptian natron. Thus, at least for Egypt, sodium carbonate should be *nitron*. Potassium carbonate (potash) occurs naturally, but can also be obtained from the ashes of certain plants, like soapwort (*Saponaria officinalis*). This artificial potash is likely Heb. *borith* (cf. Jer. 2:22, and Lundbom, 1999, 278).

agent used in mummification.⁵²⁶ The Ahiqar customs account (475) records large exports of Egyptian natron on Ionian ships; no other commodity is listed in the export records, which means either it was the only item being exported, or the only item taxed, possibly indicating that the natron trade already in the 5th c. was a royal monopoly as it was in the Ptolemaic period.⁵²⁷ Briant and Descat suggest that the recipients of these natron shipments to Ionia/Greece were glass factories in Rhodes or Asia Minor.⁵²⁸ Egyptian (?) natron was also imported to Phoenicia for the same purpose from a very early date, as Pliny's story on the Phoenician invention of glass implies.⁵²⁹ Large quantities of Egyptian or possibly Judean natron also reached Mesopotamia overland from Syro-Palestine.⁵³⁰ Aristophanes (*Frogs* 712) indicates that natron was also imitated and/or adulterated.

Sulphur

Burning elemental sulphur (S) as a fumigant and for the sake of purification in ritual, households, and industry created a substantial demand for the chemical.⁵³¹ In Greek, sulphur (*theion*) is mentioned as early as Homer (e.g., *Il.* XIV.415) where its foul odor, which occurs when (atmospheric) water mixes with the mineral producing hydrogen sulphide (H₂S), is said to be *deinë*,

⁵²⁶ For use in (purple) dyeing, see Jensen, 1963, 111; in glass, Nicholson, 2000, 177 and Pliny XXXVI.65ff; as a cleanser, see Ritner, 2000, 116; also Theoc. XV.16 and Alexis (*apud* Athen. XI.502f) where *litron* is used to clean silver cups before the guests arrive for dinner; for use in mummification, Hdt. II.86-87. In a recent experiment attempting to replicate ancient mummification techniques, nearly 600 pounds (ca. 275 kg) of natron from Wadi Natron were used to cure one body (Brier, 2001, 46).

⁵²⁷ Briant and Descat, 1998, 80; *SEHWW*, 310.

⁵²⁸ Briant and Descat, 1998, 95. But see "Glass" on the existence of these factories.

⁵²⁹ Pliny XXXVI.65ff.

⁵³⁰ Oppenheim, 1969, 243; Brown (1969, 106) claims natron is found in the Judean desert.

⁵³¹ For more detailed descriptions of sulphur use in antiquity, see Blümner, *RE*, s.v. Schwefel.

“wondrous, fearful, terrible,” i.e., something divine (*theion*). Pliny (XXXV.50) knows of several types and grades of sulphur, one (*glaeba*, “clod”) which is only used by fullers, another used only for smoking woollens which makes them soft and white. Similar grades likely existed during the Classical period and Melos, as in Pliny’s day, was possibly the major Aegean supplier of the best grade.

In the Levant, sulphur was readily available as well; Josephus (*BJ* VII.189) mentions mines at Machaerus, Arrian notes the defenders of Tyre had supplies enough to rain down burning pitch and brimstone (sulphur) on Alexander’s troops (II.19.1). The use of *kbr* (Aram.) in the repair of a Persian administrator’s boat in Egypt, mentioned above, shows that stores of the mineral were collected and kept in warehouses.⁵³² Because of its many applications, sulphur probably was traded, but to what extent and where we can only guess. Silver suggests that Judah exported sulphur along with other products in the 8th and 7th c.⁵³³ Direct evidence for sulphur trade, involving Ionians and Carians, may be found in a fragmentary Aramaic papyrus from Saqqara in Egypt; unfortunately neither the reading nor the date is certain.⁵³⁴

⁵³² See n.457 above. The Aramaic letter orders nearly one kg of sulphur to be released from the royal storehouse for use in the repair.

⁵³³ Silver, 1983, 24.

⁵³⁴ The letter orders the obstruction of Carian and Ionian ships, but where and for what reason cannot be made out. In line four of the document, the Carians and Ionians are said to be bringing sacks (*zk* = Grk. *askos*?) of some commodity, read variously as *bdni* (“tanner’s work”), *nbri* (“palm fibers”), or *kbrni* (possibly “sulphur,” although the form is problematic). The date of this text and other (Aramaic) papyrus finds from Saqqara are entirely uncertain, although paleography, personal names and Iranian word borrowings indicate the Persian period for this letter. See Segal, 1983, no.26; 43, n.8.

Bitumen

An important commodity in trade within the Levant and Mesopotamia, and between the Levant and Egypt, bitumen (Grk. *naphtha*, *asphaltos*, *malthê*; Heb. *kofer*, *hemar*, *zepheth?*; Aram. *zpt?*) likely did not reach the Aegean in quantity during the Persian Period as it seems to have in later centuries.⁵³⁵ A petroleum product occurring in a number of forms ranging from liquid to solid, ancient Levantine bitumen came from sources concentrated along the Phoenician coast and around the Dead Sea.⁵³⁶ Among the more important uses for the material were in shipbuilding and embalming, but also an adhesive for inlays and solid forms were often carved into figurines and utensils.⁵³⁷

⁵³⁵ Bitumen trade within Mesopotamia is well documented, as is the trade between the Levant and Egypt, where bitumen was used primarily in mummification. See Serpico, 2000, 466. Forbes has stated that trade in Mesopotamian bitumen may have been greatly curtailed during the Persian period (I, 1964, 39), but this is challenged by Moorey (1999, 333). Post-classical authors, especially the medical writers, suggest a fair amount of westward trade in Dead Sea bitumen especially. See Strabo XVI.1.14; Pliny XXXV.178.

⁵³⁶ Serpico, 2000, fig. 18.15 illustrates the coastal deposits and those in the Dead Sea basin. For a philological survey of “Sidonian” bitumen, see Brown, 1969, 86-87.

⁵³⁷ Forbes, I, 1964, 56ff.; Moorey, 1999, 332; Serpico, 2000, 456ff.

CHAPTER THREE

Raw and Semi-processed Commodities: Stones, Minerals, and Metals

III.1 STONE

For buildings, funeral monuments, sculptures, even smaller items like cosmetic containers, quarried stone was in great demand and was widely traded. There is evidence for some Persian period trade in raw, non-gem stones, primarily marble, alabaster, and touchstones.⁵³⁸

Marble (metamorphosed limestone, CaCO_3) does not occur naturally anywhere in the Levant.⁵³⁹ For that reason, all marble found in the region, from any time period, had to have been imported, which must have greatly increased the value of an already prestigious stone. From the Persian period there is a considerable number of marble items found in the Levant, mostly from Phoenicia and Cyprus, in the form of statuary and funeral monuments. Marble's rarity and expense in the Levant no doubt made it impractical to use as extensively in architecture as it was used in the Aegean where supplies abounded.⁵⁴⁰ During the

⁵³⁸ Trade in other stone types, like basalt, which was widely used in the Levant for millstones and sculptures, seems to have been more regional than international (see Moorey, 1999, 21; Stol, 1979, 83ff.). Cyprus also may have supplied some types of (lime)stone for sculpture production in Phoenicia (Elayi and Haykal, 1996, 9). On the regional and international marble trade, see Herz and Waelkens, 1988.

⁵³⁹ Although dolomite and dolomitic limestone, which do occur, are suggestive of marble (Brown, 1969, 85). Al-Muqaddasi, the 10th c. A.D. Arab geographer, claims that as-Sham (= roughly the Persian province Beyond the River) is a source of marble (*rukām*), but this cannot be.

⁵⁴⁰ But see I Chron. 29:2 where quantities of *'ben shesh*, perhaps marble, are set aside for use in Solomon's temple. This might also be Egyptian onyx; see below.

Roman and Byzantine periods, marble was imported mostly from (Aegean) Asia Minor and passed through marble yards and receiving agencies in Tyre before being distributed elsewhere in the Levant for use in statues, buildings and so forth.⁵⁴¹ No such documentation exists for the Persian period, but we can suppose a similar system operated. From Dunand's excavations of the Temple of Eshmoun near Sidon come nearly a dozen 5-4th c. marble statues of children, many inscribed with Phoenician dedications.⁵⁴² These statues, and other carved marble thrones, protomes, and sarcophagi found in the vicinity,⁵⁴³ while they have some Greek traits, are not purely Greek in style. These works were likely carved on the spot, rather than in Aegean workshops to be shipped as finished pieces, as some items were.⁵⁴⁴ In the case of the children statues, the marble was likely shipped as (mostly) unworked blocks, perhaps from the island of Paros, which has already been identified as a source of marble for some of the sarcophagi.⁵⁴⁵ Attica, as Xenophon alludes (*Poroi* I.4), may also have been as source of marble,

⁵⁴¹ Friedland, 1997; Fischer and Grossman, 1996.

⁵⁴² These now are displayed in the National Museum in Beirut and are best illustrated in the recent catalogue *Stones and Creed* (no date), nos. 70-81. Also see Dunand, 1965 and Mullen, 1974.

⁵⁴³ E.g., the marble throne found at Byblos (*Stones and Creed*, no. 11), and the capital with double bull protomes from near Sidon (*Stones and Creed*, no. 72). See also Dunand, 1967, 28ff.

⁵⁴⁴ In Cyprus a number of marble funeral stelae have been found which more than likely came out of Aegean workshops as finished products, with only the (Phoenician) inscription left to be carved at the destination (Raptou, 1999, 73ff.).

⁵⁴⁵ "Mostly unworked" because there is evidence that marble blocks were roughly shaped at the quarries on Paros before being transported, probably to save on weight (see "Sarcophagi" below). In the case of some of these items, like the children statues, the small size of the statue would likely preclude any need to shape the block before hand. In their study of Phoenician funerary monuments, Elayi and Haykal suggested that Sidon and Arwad were major marble carving centers, using Aegean stone (1996, 120).

as well as Proconnesus in Asia Minor, which supplied the Levant in later centuries.⁵⁴⁶

Another prestige stone, alabaster, traveled east to west and was used primarily to manufacture cosmetic containers (e.g., *pyxidēs*), cosmetic palettes, and the so-called *alabastron*, a perfume or ointment container of a distinctive shape (see below). True alabaster is a compact variety of gypsum, a hydrated calcium sulfate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$); another alabaster noted by Pliny (XXXVI.59ff.) is likely the “oriental alabaster” or onyx marble of Egypt, a compact stalagmitic calcium carbonate (CaCO_3 ; also called travertine or calcite).⁵⁴⁷ Other “alabasters” are noted as well, which makes it quite likely that various types were in trade as raw material, originating in Egypt or the Levant.⁵⁴⁸ Direct evidence that alabaster was in trade as a raw material comes from excavations in Athens, where in a 5-4th c. level at the Pnyx, alabaster drill cores were found, i.e., the remains of vessel production from raw material.⁵⁴⁹

For distinguishing fine gold and silver from their alloys or imitations, a common and necessary practice when precious metals were used as exchange media, a touchstone was probably found on most every money-changer or banker’s table in the markets of the Aegean and Levant. During the Persian period, Lydia, it seems, had cornered the market on the mining and export of the

⁵⁴⁶ Raptou (1999, 139-140) presents evidence for the trade in marble between Cyprus and the Aegean, noting Athens as a major source for finished stelae. For the marble trade generally see, Pensabene, 1992.

⁵⁴⁷ Aston, *et al.* 2000, 21-22, 59-60.

⁵⁴⁸ Moorey, 1999, 35; Ajootian, 1989. Excavations at Metaponto in Italy produced vessels made of both calcite and gypsum (Carter, 1998, 761).

⁵⁴⁹ Ajootian, 1989.

Lydios lithos.⁵⁵⁰ The use of the stone in the Aegean is assured; we can assume that Lydian touchstones also found their way to the Levant.

III.2 GEMS

There is not a great deal of evidence for Aegean-Levantine trade in raw or semi-finished gemstones during the Persian period. However, the traffic in gems passing through the Levant, and on to the Aegean, before and after the Persian period was notable, and therefore continuity on some scale likely occurred. In the years immediately before the reign of Cyrus I, Ezekiel (27:16) speaks of traders of Aram/Edom dealing in various gems,⁵⁵¹ and likewise there is mention (27:22) of traders of Sheba (i.e, Arabian) bringing precious stones generally (*'ben yeqarah*) to Tyre. Elsewhere in the Old Testament (II Chron. 9:9), Arabia is again noted as a source of gems (*'ben yeqarah*), a source which Diodorus Siculus (II.52) praises specifically for its *smaragdi*, *beryllia* and *khrysolith*.⁵⁵² India, during the Roman period and later, was a supplier par excellence of gems to the Mediterranean, as Pliny (XXXVII.200) and the *PME* attest.⁵⁵³ It is tempting to see this overseas

⁵⁵⁰ The earliest reference is from Bacchylides (frag. 10, Jebb). Cf. Plato *Gorg.* 486D; Theognis 449. The Lydian stone was likely a “serpentine-chlorite-agnetite schist” (Lord, 1936, 430). On touchstones generally and the techniques for developed for their use, see Caley and Richards, 1956, 67ff, 152ff.

⁵⁵¹ Like all Hebrew words for gems, the identification of the words *kadkod* and *nofek* remains more speculative than certain (cf. Exodus 28:15-21, on the twelve stones of the High Priest’s breastplate, and the various translations and interpretations). Modern identification of ancient Hebrew gem terms relies mostly on later commentary, especially *Midrash Rabbah*. The Old Testament sources, when they speak of specific gems, should therefore be taken with great caution, as must the Greek sources, keeping in mind also that the LXX translators often were at a loss as well.

⁵⁵² For identifications and discussions, see below.

⁵⁵³ For India and the Far East as a source of rubies, emeralds, diamonds, turquoises, and peridots in the medieval period, see Porter and Vesel, 1993.

trade in gems for which India was to become so famous later on as already being (well) established by the Persian period; Ctesias, for example, knew India as a source of gems (*FGH* 688 F45b).⁵⁵⁴ Gemstones might easily have traveled west with other Indian commodities discussed in this study, like pepper or nard. Moreover, Indian evidence suggests that by the 4th c., if not earlier, strict control over the gem trade was established which implies a thriving and profitable (export) trade.⁵⁵⁵ Our primary contemporary Greek source for gems is the *Peri lithôn (de Lapidibus)* by Theophrastus, which does not offer much comment on the gem trade, save for one or two remarks.⁵⁵⁶ In what follows, we will briefly consider those gemstones and gem-like materials that very likely came to or passed from the Mediterranean through Levantine ports.⁵⁵⁷

Although it is not a gemstone per se, Baltic amber (Grk. *elektron*) was often treated as such. The Baltic amber which reached the Levant in limited quantities likely passed through Greece on its way east.⁵⁵⁸ Some amber-like

⁵⁵⁴ Also see Casevitz (1995, 25) on the possible Sanskrit etymology of some Greek gem names, e.g., *smaragdos*.

⁵⁵⁵ See Gorelick and Gwinnett, 1988, 549.

⁵⁵⁶ E.g., the great profitability of *anthrax* which was shipped from the western Mediterranean ports of Carthage and Marseille (sec. 18). This *anthrax* may be a garnet (Caley and Richards, 1956, 90). As with the Old Testament, we face much uncertainty and disagreement in the identification of the gems mentioned by Theophrastus.

⁵⁵⁷ The jewelry and seals made from these gems will not be considered here mostly because it is quite difficult to trace with any exactitude the provenance of such items. Artisans migrated and copied motifs from other regions or cultures, finer pieces were kept as heirlooms for centuries or migrated as booty from one land to another. A group of stamp seals from 4th c. Samaria, for example, shows such strong Attic-Greek influence that it difficult to say for certain where they came from or who made them (see *NEAEHL*, s.v.). Picking through the artistic nuances of jewelry and seals and their possible implications for trade is somewhat beyond the scope of this study.

⁵⁵⁸ Moorey, 1999, 80. Cf. Heltzer, 1997. The amber known during the Islamic period seems to have come also from the Baltic Sea region (*Encyclopaedia of Islam*, s.v. *kahruba*).

materials, copal for instance, which came to Arabia and Persia from India, may also have been passed on to Mediterranean markets.⁵⁵⁹

Various types of beryls ($\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}$), the most prized of which is the emerald (Grk. *smaragdos*; Heb. *bareketh*, *tarshish*?; Aram. *bareka*), were imported to the Mediterranean from mines in the eastern Egyptian desert, or India as was later the case.⁵⁶⁰ Unfortunately, Greek *smaragdos* seems to have been a term applied to a number of different green minerals--emeralds, malachite, plasma, quartz--and their imitations, so we are left guessing the nature of the material when Herodotus (e.g., II.44) and Theophrastus (23) speak of it, although actual emeralds should not be discounted.⁵⁶¹ Trade in eastern emeralds likely began as early as the Bronze Age.⁵⁶²

The various types of the cryptocrystalline quartzes (chalcedony)--agate, cornelian (= less correctly, carnelian), sard, onyx--were the most popular stones for seals during the Persian period, and the most commonly available.⁵⁶³ Later texts mention India and Persia as suppliers for specialty types of agate (Grk. *onykhion*, *myrrhinē*?; Heb. *shebo*?),⁵⁶⁴ and Babylonia, India, Arabia and Egypt as

⁵⁵⁹ See Meyer, *et al.* (1991), who in their presentation of a copal pendant shipped from India suggest the *kankamon* in the *PME* is copal rather than a *bdellion* as Casson (1989) and Müller (1997) argue.

⁵⁶⁰ Aston, *et al.*, 2001, 24; Casson, 1989, 222; Porter and Vesel, 1993, 144; Webster, 1977, 94.

⁵⁶¹ See Caley and Richards, 1956, 97ff. Caley and Richards, however, are reluctant to concede that any use of *smaragdos* by Theophrastus could mean emerald (see the comments on p.99 especially), or that the *smaragdos* pillar seen by Herodotus at Tyre (II.44) was emerald or beryl, although massive, poor quality beryl crystals, some up to 18m long are known.

⁵⁶² Linear B *pa-ra-ke-we* refers either to emeralds or an emerald paste/inlay. Cf. *DMic*, s.v.

⁵⁶³ Moorey, 1999, 96; Caley and Richards, 1956, 123.

⁵⁶⁴ *PME*, §§ 48-49; see, Casson, 1989, 206; Moorey, 1999, 99. For Hebrew *shebo* see Exod. 28:19; 39:12; agate may also be Hebrew *kadkod*, Isa. 54:12; Ezek. 27:16. See also Webster, 1977, 196.

sources for sard/cornelian (Grk. *sardos*).⁵⁶⁵ Since Neo-Babylonian texts confirm Arabia and India as sources,⁵⁶⁶ positing a continuation of this trade a few decades later, with some of it reaching a Mediterranean outlet, would not be too far off base.

The colored forms of corundum (aluminum oxide, Al_2O_3), ruby and sapphire, are after diamonds the hardest gems known.⁵⁶⁷ Because of the supposition that grinding and finishing technologies during the Persian period were not able to handle such a degree of hardness in engraving or polishing gemstones,⁵⁶⁸ Greek *anthrax*, for example, is thought to refer to the ubiquitous garnet rather than ruby.⁵⁶⁹ Such arguments also hinge on the interpretation of Greek *adamas* (= diamond?), and more generally the acceptance or denial of Persian period Indian-Mediterranean trade.⁵⁷⁰ Later ages knew India and Sri Lanka as the prime sources for both corundum and diamonds;⁵⁷¹ no physical evidence yet can show either reaching the Mediterranean before the Hellenistic period.

⁵⁶⁵ In modern usage, sard is the more translucent red variety of chalcedony, while cornelian is more opaque. Pliny (XXXVII.31) states the most important source in his day was Babylonia, which may simply have been a transshipment point for stone from India (see Moorey, 1999, 108).

⁵⁶⁶ Joannes, 1982, 254-55.

⁵⁶⁷ On the Mohs scale of hardness, diamond ranks 10, while corundum is 9.

⁵⁶⁸ The crystalline form of corundum, emery, was a popular abrasive in antiquity used in gem carving and polishing, and was also a well known export of the Aegean island of Naxos, and Miletus.

⁵⁶⁹ See Caley and Richards, 1956, 89. Hebrew *odem* and *kadkod* have both been suggested for ruby; see *IDB*, s.v. Jewels; *HAL*, s.v.; *DCH*, s.v.

⁵⁷⁰ Caley and Richards (e.g., 91, 148) tend not to be receptive to the idea of diamonds, or rubies, reaching the Mediterranean during the Persian period. More recent studies of the ancient diamond trade have not settled the question, see Gorelick and Gwinnett, 1988.

⁵⁷¹ Porter and Vesel, 1993, 142.

One gemstone for which there is physical, Persian period evidence,⁵⁷² and which could only have come to the Mediterranean from well to the east is lapis lazuli (Grk. *sappheiros*; Heb. *sappir*; Phn. 'kn '?).⁵⁷³ The only supplier of lapis lazuli to the Mediterranean, from the Bronze Age onward,⁵⁷⁴ seems to have been the famous Badakhshan mines, approximately 200 miles NE of Kabul in Afghanistan.⁵⁷⁵ The Persian rulers likely had more or less direct overland access to this source, which would account for the relative abundance of lapis lazuli jewelry and seals found in the Near East during this period. Theophrastus' discussion of *kyanos* (*de Lap.* 55), artificial and natural blue pigments, may indicate a northern, overland route for trade in lapis, handled at its Mediterranean end by the Scythians.⁵⁷⁶ Equally possible is a southerly, overseas-overland route from Barbarikon to Arabia and then north, as the *PME* suggests (§ 39).⁵⁷⁷

Theophrastus makes brief mention of pearls (*de Lap.* 36; *margaritis*) from India and the Red Sea, noting that valuable necklaces are made from them. A necklace with 400-500 pearls from a 4th c. female grave found at Susa has been

⁵⁷² Boardman, 1970, 192; Markoe, 2000, fig. 62 (a), illustrates a lapis lazuli scaraboid from Byblos.

⁵⁷³ The rock contains a number of minerals, but is prized for the rich blue of the primary mineral lazurite: $(\text{Na,Ca})_8(\text{Al,Si})_{12}\text{O}_{24}(\text{S,SO})_4$. On lapis generally, see Moorey, 1999, 92ff. On the possible mention of lapis in the Song of Songs and Exodus, see Pope, 1977, 544. For Hebrew *sappir*, see Exod. 24:10; 28:18; 39:11; Job 28:16, etc. For Phoenician 'kn' see Krahmalkov, 2000.

⁵⁷⁴ Cf. von Rosen, 1990. From the Bronze Age onwards, blue glass served as an imitation lapis lazuli to the point that the words for glass and lapis, in some languages like Akkadian, had to be marked "real" and "imitation." Linear B *ku-wa-no* could be either lapis lazuli or glass paste; see *DMic*, s.v.; Palaima, 1991, 283; Cline, 1994, 131. For medieval trade in lapis lazuli see Porter and Vesel, 1993, 143.

⁵⁷⁵ Webster, 1977, 220.

⁵⁷⁶ Caley and Richards, 1956, 183.

⁵⁷⁷ See also Casson's comments (1989, 194).

reported, as have finds from Parsagadae.⁵⁷⁸ Whether pearls were traded any farther west with any regularity at this time is possible, but not recorded.

Among the numerous types of quartzes (SiO₂) considered gem quality in antiquity, two--amethyst and rock crystal--deserve special mention here. A very popular gem for seals and beads throughout the Mediterranean, where Persian period supplies likely came from Egypt,⁵⁷⁹ amethyst was also popular in Mesopotamia where there are no native sources,⁵⁸⁰ suggesting some eastward trade. Rock crystal was used from the Bronze Age onward to produce vessels, as furniture inlays and perhaps as lenses.⁵⁸¹ Pliny claims the source of the best raw material was India (XXXVII.23), although Cypriot crystal was also fine (XXXVII.9). Workshop debris points to 7-5th c. rock crystal working at Sardis, although the source of the crystal or even what exactly was manufactured is not clear, although goods for export (east or west?) is a possibility.⁵⁸²

⁵⁷⁸ Moorey, 1999, 93.

⁵⁷⁹ Aston *et al.* 2001, 51.

⁵⁸⁰ Moorey, 1999, 94.

⁵⁸¹ See Moorey, 1999, 95. A number of rock crystal lens-like objects are known. Sines and Sakellarakis (1987) say they are just that, magnification lenses for detailed work such as engraving. Plantzon (1997), on the other hand, thinks they served merely a decorative purpose. There is no agreement on either the Greek term for rock crystal (*krystallos?*, *hyalos?*) or its comparative worth vis-a-vis recognized prestige materials like glass and silver. For opposing views of both terminology and value, see Vickers, 1996, and E.M. Stern, 1997. Note, however, that Linear B *we-a-re-ja*, corresponding to *hyalos*, is mentioned as a furniture inlay; see Ventris and Chadwick, 1973, 340.

⁵⁸² McLauchlin, 1989.

III.3 METALS

Very few materials can claim to have the social and economic power that metals do; few are as useful. Eras of history are named after metals; battles were fought for and by means of metals. And, as some argue, the catalyst for Greek and Phoenician colonization in the west (and elsewhere) was the search for metals.⁵⁸³ Metal mining, production, and trade occurred on various scales, from small independent groups to large, state-run operations. Small time metal traders may have simply dug ore out of a plot and transported it, overland and/or overseas, to refiners elsewhere, or may have performed crude refining on the spot.⁵⁸⁴ Large scale operations, like those at Laurion in Attica, could include complex leasing agreements, thousands of slaves, refining centers, and finished products delivered in (stamped) ingot form, offered to consumers with the state's guarantee of fineness and weight.⁵⁸⁵ Any number of larger and smaller operations, included metal recyclers, could be placed between these two extremes, with consumers for the metals ranging from independent traders, to states, to artists, all of whom could have transported the metal in any number of ways, e.g., coins and artwork, or in any amount. For our purposes, we will first consider the trade in ores and ingots between the Levant and Aegean for the individual metals;

⁵⁸³ Ancient colonization is a complex topic, a phenomenon which cannot be explained in all cases by a single reason or pursuit. By as Aubet notes, “[t]he origin of the first Phoenician expeditions in the west seems to be generally related to the wealth of silver in the Iberian peninsula (1993, 236).” See also Niemeyer 1989 and 1993 for models of Phoenician (and Greek) colonization in the west.

⁵⁸⁴ Cf. Diod. Sic. V.13.2 for such a practice in antiquity; Brown, 1969, 39, for more modern examples.

⁵⁸⁵ See Jones, 1982, for an overview of the Laurion operations.

the trade in manufactured metallic items, like bowls and jewelry will be considered in the manufactured items section, with one exception. Because the trade in silver and gold was often in the form of coinage, which may have been initially conceived of as mini-ingots anyway, we will consider silver, gold, and coinage under one heading.

Iron

The “Coming of Iron,” i.e., the displacement of bronze by iron as the primary metal of use for weapons and implements took place gradually over the course of the early first millennium.⁵⁸⁶ The superiority of iron (Grk. *sidēros*; Heb. *barzel*; Aram. *brzl*) over bronze in hand-weapons and armor made iron an especially important metal for arms production;⁵⁸⁷ this application may have been what initially drove the early iron trade.⁵⁸⁸

⁵⁸⁶ The quote is from the conference and proceedings of that title (Wertime and Muhly, 1980). Iron did not completely displace bronze or copper, however. For example, of the 341 Persian period metal objects catalogued at Tel Michal, including weapons, tools, and various fasteners, 253 were copper or copper based, only 57 iron (Muhly and Muhly, 1989). In shipbuilding, copper-based fasteners continued to be used predominantly until well beyond the Persian period, until their eventual replacement by iron fasteners. Nevertheless, most evidence shows a dramatic increase in iron production occurring in the 6th c., with a subsequent drop in prices (Ogden, 2000, 168; Moorey, 1999, 33).

⁵⁸⁷ The strategic importance of iron weapons has been noted many times, and has been used to argue for military supremacy in a number of contests, such as the Persian conquest of Egypt (Ogden, 2000, 168), or Greek colonization generally (Bakhuizen, 1977). Mention must be made here of steel, formed from iron by a process of carburisation, which adds carbon to the iron producing, through quench hardening and tempering, a metal of considerable hardness. Carburisation, however, requires sustained forging temperatures well above what could normally have been achieved with ancient furnaces. For this reason, it is unlikely that many, if any true steel items were produced during the Persian period. See Rostoker, 1983; Wheeler, 1976; Ogden, 2000, 168.

⁵⁸⁸ The Hittites and Assyrians were the first to make extensive use of iron in weaponry, and the first to acquire and store iron on a large scale, e.g., the 150 tons of iron excavated in a 7-6th c. storehouse at Khorsabad. See Moorey, 1999, 97; Maxwell-Hyslop, 1974; Muhly, *et al.*, 1985.

Iron ores (e.g., magnetite, hematite, limonite, etc.) are found ubiquitously in the Aegean and Levant. Nevertheless, some areas or cities, like Athens, which had its own iron deposits did not exploit them, but imported iron from elsewhere.⁵⁸⁹ As can be expected, the Phoenicians from an early date had a hand in the international movement of iron. Homer's Taphians (*Od.*I.180ff; XV.425ff., etc.), thinly disguised Iron Age Sidonians,⁵⁹⁰ carry in their ships "shining iron" to Temese (Tamassos in Cyprus?⁵⁹¹) to exchange for bronze (I.184). Their search for iron and other metals drew the Phoenicians to the Aegean as miners, if not colonists, in the era just before the Persian period began.⁵⁹² Herodotus (e.g., VI.46-47) recounts these early Phoenician mining expeditions to the Aegean; other textual sources from the Levant might also.⁵⁹³ A mid-6th c. trade record from Mesopotamia records a shipment of, among other things, two types of iron, 130 minas of iron from *Yamana* (Ionia), and 257 minas from *Labnanu* (Lebanon). Oppenheim has suggested that the considerable distinction in price between the two types has less to do with the distance than with grade; the Aegean, or western Asia Minor iron was qualitatively superior to the native Syrian.⁵⁹⁴ Ezekiel 27:19, roughly contemporaneous with this Mesopotamian account, also records

⁵⁸⁹ See Treister, 1996, 258 on Athens' iron resources and imports in antiquity.

⁵⁹⁰ Riis, 1970, 166; Brown, 1969, 92. But see Heubeck, *et al.* (1988, 88) who follow the ancient philological tradition of placing the home of the Taphians on a small island nine miles from Ithaca.

⁵⁹¹ See Heubeck *et al.*, 1988, 100; S. Morris, 1992, 119; Burkert, 1992, 159..

⁵⁹² Morris, 1992, 133ff; Elayi (1988, 72) also suggests that the Phoenicians obtained some iron from Crete and/or Cythera, i.e., Laconia.

⁵⁹³ See Morris, 1992, 133ff.

⁵⁹⁴ Oppenheim, 1969, 241; see also Moorey (1999, 106).

Ionian/Aegean iron being brought to Tyre.⁵⁹⁵ Almost a century after Ezekiel, in 475, Sidonians are mentioned in the Ahiqar customs account bringing to Egypt two types of iron in rather large quantities. One Sidonian ship carries around one metric ton of *brzl sni* (“*sni*-iron,” or, “iron of *sn*”), and around two metric tons of *brzl pkdn/pkrn* (iron of *pkdn/pkrn*); a second ship carries slightly more than two metric tons of the latter type of iron.⁵⁹⁶ We cannot be sure of the source of this iron, but as there is precedence for iron from Asia Minor or the Aegean passing through Phoenicians ports elsewhere, one of the two types of iron mentioned in this text might have been in transit from the west. Of significance too are the 30 bundled iron ingots found on the late 4th c. Kyrenia shipwreck.⁵⁹⁷ The ship’s final voyage likely began in the eastern Aegean, making a stop at Rhodes before it met its demise off the northern Cypriot coast. Could these ingots have originated in the Aegean?

⁵⁹⁵ In the verse *dan wyawan* offer “worked iron” (*barzel’shoth* = iron ingots?) from Uzal (? *m’uzal*) to Tyre. While the origin of the people named *dan* (either Tel Dan or the Greek Danaoi) is unresolved, *yawan* is generally recognized as Ionia. Elat has argued that *’uzal* is Uzal, the modern Anatolian town of Konya, where even today there are rich iron ores (Elat, 1983). While the specifics may not have a consensus, most commentators agree that the iron generally is coming from Asia Minor or the Aegean (see Greenberg, 1997, 557; Diakonoff, 1992, 193, prefers iron from Damascus). If this iron trade had any connection with that mentioned in the Mesopotamian texts then the Phoenicians would appear to be acting as middle men, if not the actual shippers. To say that *dan* and *yawan* offer (*nathannu*) the iron, does not mean necessarily that they also sent the iron in Ionian bottoms.

⁵⁹⁶ *TADAE* III.C3.7.133 and 151. Porten and Yardeni have no suggestions for the untranslated Aramaic terms *sni* and *pkdn/pkrn*, which could be toponyms or ethnics, thus denoting the place where the iron comes from, or a technical term designating iron produced by a particular process. A late 5th c. Aramaic fragment (*TADAE* IV.D4.31) reads *brzl tsrup*, “pure iron,” which no doubt denotes specially prepared iron. As for the weight of the cargo, the first ship carries 30,000 Persian *karsh* of iron, the second ship, 21,000. The weight of the *karsh* at this time is not exactly known. Porten suggests ca. 83.33 g (1996, 121, n.67), while Stern (2001, 573) presents a *karsh* weight found at Ascalon which weighs 136 g. I have calculated the tonnage of the cargo using Porten’s figure.

⁵⁹⁷ Parker, 1992, 232.

Tin

An important metal because of its use in alloys with copper to form bronze, tin (Grk. *kassiteros/kattiteros*; Heb. *bedil*; Aram. *'bts*) was rare and expensive,⁵⁹⁸ yet very much in demand.⁵⁹⁹ From where the ancient Mediterranean's traders and metallurgists procured their tin, however, has been the subject of many papers, disputes, and conferences, none of which have yet provided a definitive answer to the problem.⁶⁰⁰ What relatively little amounts of tin occur naturally in the Mediterranean region likely were not exploited in antiquity. Herodotus explicitly states (III.115) that the tin known to the Aegean world in his day came from the most distant parts of the world, from the Tin Islands (*Kassiterides*), perhaps the British Isles which sent tin through Gaul or Iberia to the Mediterranean,⁶⁰¹ or perhaps Iberia itself.⁶⁰² Ezekiel's mention (27:12) of Tarshish traders (i.e., from Tartessos) bringing tin, silver, lead, and iron to Tyre corroborates Herodotus' account the west to east flow. Much of the additional evidence for the Persian period supports a far western Mediterranean

⁵⁹⁸ Evidence for 5th c. tin prices in Athens makes it 6.5 times more expensive than copper (Treister, 1996, 248).

⁵⁹⁹ Metallurgical analysis of Aegean bronze objects from the Archaic and Classical periods shows a leap in the tin content up from an average in 8-9th c. of ca. 3-4% to an average of 8.5% in the 5-4th c. (Treister, 1996, 156). Aside from using more tin in the alloys for vessels, mirrors, tripods and the like, a significant amount of tin would be needed for arms production, particularly bronze trireme rams, which could weigh up to 200 kg each (Morrison and Coates, 1988, 168).

⁶⁰⁰ Moorey (1999, 299-300) provides a concise overview of the problems with an up-to-date bibliography, particularly with an eye towards recent claims of ancient tin mines having been found in southern Turkey, an issue which currently is very hotly contested (see Muhly, 1995, and Yener, 1995). For a slightly older overview, see Peuhalluric, 1986.

⁶⁰¹ Hawkes, 1984; Isager and Hansen, 1975, 31.

⁶⁰² Elayi and Seyegh, 2000, 302-303.

origin for the tin in trade, a trade which, according to Strabo (III.5.11) and some scholars, was a Phoenician/Carthaginian monopoly.⁶⁰³ Physical evidence includes tin ingots associated with Persian period (Phoenician) shipwrecks in both western and eastern Mediterranean waters. Off the Iberian coast a wreck was found carrying an unstated number of lenticular tin ingots;⁶⁰⁴ off the Israeli coast, a number of ingots were recovered with Iberian markings and a stamp of the head of Arethusa.⁶⁰⁵ Other textual evidence recounts Phoenicians handling tin: in the Ahiqar customs record, a Phoenician ship brings 2000 *karsh* (roughly 170 kg) of tin along with 5000 *karsh* of copper to Egypt. This tin may have originated in the west; it may also have come from farther east, e.g., Afghanistan, where other sources of Mediterranean tin were likely to be found.⁶⁰⁶ In any event, the image of Phoenicia as a major tin entrepot is clear. Tin from the west, or east, came to Sidon and Tyre for redistribution elsewhere, possibly west again to the Aegean, or

⁶⁰³ Treister, 1996, 259. But Treister merely cites Isager and Hansen (1975, 31), who cite Strabo, a late and perhaps unreliable source for an earlier monopoly. What Strabo and the evidence do indicate is that the Phoenicians and/or Carthaginians played a major role in transporting the tin east, if not actually mining it. Suggestions that Greeks, i.e., Phoenicians, transported western tin to the Aegean has not received much support (Treister, 1996, 152-53).

⁶⁰⁴ This is the Bajo de la Campana wreck, dated 5-4th c., which as noted (see Ebony and Ivory above) was also carrying 13 Phoenician/Punic inscribed ivory tusks (Parker, 1992, 66).

⁶⁰⁵ Artzy (1983) argues that the ingots originated in Iberia, but passed through Syracuse on their way east. Other Persian period underwater tin ingot finds off the Israeli coast, which cannot necessarily be linked to the west, include a scattered hoard of bar ingots associated with Phoenician coins, likely a shipwreck (Parker, 1992, 225-26), and a single rectangular tin ingot found on the Maagan Mikael wreck of ca. 400 (*NEAEHL*, 918).

⁶⁰⁶ This unknown far eastern source is thought to be the primary supplier of tin to the Mediterranean during the Bronze Age and earlier Iron Age (see Moorey, 1985, 129ff.). Also note that the tin ingots found on the Late Bronze Age shipwreck at Uluburun, a ship whose final voyage was west bound from the Levant, is thought to have come from somewhere in the east (Bass, 1997, 157).

east again to Mesopotamia.⁶⁰⁷ This is not to say that the Phoenicians had a tin monopoly during the Persian period, or that their ships alone carried tin, but that our evidence to date shows that they were major players in the tin trade. There may have been other tin redistribution centers (like Athens?), but there is yet no evidence for this.

Copper and Bronze

Only with the gradual ascendancy of iron as the multi-purpose metal in the first millennium did the importance of copper and bronze (Grk. *khalkos*; Heb. *nehash*; Aram. *nḥsh*), a mostly tin-copper alloy,⁶⁰⁸ began to wane. Still, however, during the Persian period, copper was arguably more important as a strategic and domestic metal than iron.⁶⁰⁹ For arms production, especially in the construction of warships,⁶¹⁰ and in the production of domestic wares, furniture, statuary, and

⁶⁰⁷ Oppenheim (1969, 242) and Elat (1991, 33) both note 6th c. Mesopotamia accounts of tin transported overland to Mesopotamia from Syria; could this be a continuation of the eastward journey of western tin, or eastern tin reversing its tracks? Either is possible. Also note the 7-6th c. cache of tin and lead ingots found at Tel Ridan, near Gaza, some of which bear Phoenician alphabetic signs, perhaps another indication of Phoenicians recasting and redistributing tin from elsewhere (*NEAEHL*, 964).

⁶⁰⁸ Copper by itself is too malleable to be used effectively in weapons or tools, but with the admixture of tin or arsenic, the copper hardens greatly. Traditionally, bronze is an alloy of approximately 90% copper and 10% tin, although the ratio could and did fluctuate to as little as 2% and as high as 15% tin. Arsenic is equally as effective as tin in copper alloys, but much more toxic to work with and may have been, in some cases, even more difficult to procure than tin. Lead, which was sometimes added to copper or bronze, was not done so for metallurgical reasons, but rather to save money since both copper and tin were always rather expensive metals. See Moorey, 1999, 4, 19; Muhly and Muhly, 1989.

⁶⁰⁹ An indication, perhaps, of the importance of copper and bronze in the Iron Age, is that of the 341 catalogued metal objects from the Persian period excavations at Tel Michal, 253 were copper or bronze, while only 57 were iron. The copper/bronze object included arrowheads, tools, fasteners, vessels, and jewelry/cosmetic items (Muhly and Muhly, 1989).

⁶¹⁰ Treister (1996, 138ff.) suggests that by the end of the 6th c. the dramatic increase in copper/bronze demands in the Aegean and elsewhere was in no small part due to arms production,

general temple offerings, bronze was second to none.⁶¹¹ Copper ores, e.g., malachite and azurite, are found in many places in the Aegean and Levant; both regions had well developed local production centers.⁶¹² But the major eastern Mediterranean copper producers and exporters were found in Cyprus and eastern Anatolia; arguably the greater percentage of the copper in trade during the Persian period came from these two places than from anywhere else.⁶¹³ Unfortunately, evidence for Cypriot or Anatolian copper in trade for the Persian period is difficult to find. Shipwreck evidence is inconclusive,⁶¹⁴ as are the Semitic textual sources.⁶¹⁵ And, the one well known account of Cypriot copper used in the

particularly the trireme-building arms race. Each trireme had attached to its nose a bronze ram weighing approximately 200 kg; around 20 tons of bronze would have been needed to supply the rams for Athens first fleet of triremes in 490. If one considers that the total annual production of the western Cypriot copper industry was 10-20 tons (Treister, 1996, 33), Athens' demands for copper for its rams alone were enormous. Also see Casson and Steffy, 1991, and Murray, 1985, for ram casting, weights, and (re-)use of bronze.

⁶¹¹ See the sections below on furniture, vessels, and the like for extended discussions. Note however, that during the Archaic and Classical periods, some Aegean poleis, e.g., Athens, Corinth, Argos, Samos, and Ephesus, were revered for their bronze artworks, vessels, and arms, many of which were made, it has been argued, specifically for export. See Treister, 1996, 59-76, 200ff.

⁶¹² On Aegean copper sources and production centers, including Macedonia, the Argolid, and Euboea, see Treister, 1996, 21. Local Levantine production sites included Timna and Wadi Araba (Moorey, 1999, 246; cf. Practico, 1993, 66).

⁶¹³ Aubet, 1988; Treister, 1996, 189; Moorey, 1999, 12; also cf. Thphr. *Lap.* 25.

⁶¹⁴ Copper or bronze ingots have been reported on four Persian period shipwrecks, all of which were found in the western Mediterranean. See Parker, 1992, nos. 365, 820, 993, 1209. The 360 copper oxhide ingots found on the Late Bronze Age shipwreck are thought to have come from Cyprus (Bass, 1997, 154ff.). Western Mediterranean copper sources for Aegean and Levantine markets are possible, but it is difficult to know the sources specifically or what percentage of the total copper in trade in the eastern Mediterranean the western copper would have been (see Treister, 1996, 144).

⁶¹⁵ Ezekiel (27:13) does not record trade in copper or bronze per se, but bronze (*kelai neḥosheth*) from Ionia; in the Ahiqar customs account, as noted above, a number of Phoenician ships are recorded bringing sometimes large (up to 10,000 *karsh* = ca. 1 metric ton) shipments of copper/bronze or more specifically, *nḥsh shlmy'*, Shalmaite copper/bronze. The meaning of the term *shlmy'* is disputed. Porten and Yardeni propose that it is a (unknown) toponym, while others suggest it means "of good quality" (see Briant and Descat, 1998, 72, n.52 for discussion).

Aegean dates to the extreme end of the Persian period.⁶¹⁶ Nevertheless, given the copper needs of the Aegean and Levantine worlds and the proximity of the Cypriot and Anatolian sources, suggestions that the Athenian Cimon's campaigns in Cyprus in the mid-450's were for the sake of securing copper supplies, may not be too far off the mark.⁶¹⁷ If so, we might also consider copper as a reason for the protection the Athenian navy afforded merchantmen returning from the Levant during the Peloponnesian War (Thucyd. II.69).

Lead

The most common source of lead (Linear B *mo-ri-wo-do*; Grk. *molibos/molybdos*; Heb. *'ofereth*) in antiquity was the ore galena (lead sulphide, PbS). As most galenas are also silver bearing, the ore was worked primarily for its silver content, often quite low, e.g., only grams of silver per ton of lead.⁶¹⁸ Lead therefore came mostly from the same mines and regions as silver (see below). One of the least expensive and ubiquitous metals, lead still was in great demand for its varied uses and so was traded. The specific uses of lead compounds, e.g., white lead, red lead and galena are discussed under red pigments above. Pure lead, on the other hand, had domestic and industrial uses, but was arguably more extensively employed aboard ships than anywhere else, where its characteristic weight, malleability and resistance to corrosion would have been

⁶¹⁶ The building accounts of the sanctuary of Demeter and Kore at Eleusis (IG II² 1675), dated ca. 337, mention that the copper/bronze to be used comes from Marion in Cyprus. See Raptou, 1999, 151, for discussion.

⁶¹⁷ Treister, 1996, 277.

⁶¹⁸ For an overview of lead in the ancient Mediterranean see Eisman, 1980.

appreciated. For this reason small stores of lead were kept aboard ships along with the tools, extra lines and sails.⁶¹⁹ Cast lead provided the weight in the wooden anchors of antiquity,⁶²⁰ and also served for fishing net and sounding line weights as today; pounded flat, lead sheets acted as temporary patches, or when used to cover the entire underside of a vessel, as protection against destructive toredo worms.⁶²¹ These flat sheets also acted as note pads for sending communiqués between traders.⁶²² Perhaps as early as the Persian period, lead was also used to construct bilge pumps on vessels.⁶²³ Hence every ship afloat, every port, and every shipyard required stores of lead to operate effectively. In the Levant, where galena ores were rare (or at least unworked), lead must have been imported, likely from either the Aegean or farther west, e.g. Iberia. Ezekiel (27:12) includes lead in the list of metals shipped from Tarshish (Tartessos). The Persian period wreck close to the Spanish Isla Grosa (Bajo de la Campana) carried along with its tin consignment, some quantity of “fusiform” lead ingots

⁶¹⁹ Parker (1992) list several dozen ancient Mediterranean wrecks carrying some quantity of lead, generally a small quantity that obviously was for shipboard use. Also see Gibbins, 2001, 295.

⁶²⁰ Wooden stocks, hollowed and the cavities filled with lead, were the most common type of anchor throughout the Classical and Roman periods. As every ship carried several anchors, if not dozens, the lead needed to keep up with the demand for new and replacement anchors would be enough to ensure large and steady supplies of lead into every port. On ancient anchors see Casson, 1971, 250ff. Note also the tale of greedy Phoenicians in Iberia preparing for the voyage home, their ships already overloaded with silver, who resorted to replacing the lead in their anchors with silver in order to carry still more of the precious cargo (Diod. Sic. V.35.4-5).

⁶²¹ Flattened lead strips from the Porticello shipwreck, dated ca. 400, provide the earliest evidence for lead sheathing or lead patches, but as preservation of the hull was so poor it is uncertain if the entire hull was sheathed. The earliest conclusive evidence for full lead sheathing is from the Kyrenia shipwreck, dated ca. 315. See Eisman and Ridgway, 1987, 16; Steffy, 1985, 83-84, 98.

⁶²² The practice was common throughout the Mediterranean region. See Sanmarti-Gregó and Santiago, 1987 and 1988; Wilson, 1997-98; Vinogradov, 1998.

⁶²³ One of the earliest is from a wreck dated ca. 280 found near ancient Halicarnassus. See Pulak and Townsend, 1987, 37.

and lead ore, metals perhaps ultimately intended for eastern customers.⁶²⁴ There is yet no textual citation or archaeological find to offer proof of Aegean lead being shipped east, but we can be reasonably sure such was the case. One of the few indigenous products that Athens had to spare, and certainly would have been delighted to sell by the ton to any trader, was Laurion lead.⁶²⁵

Silver, Gold and Coinage

As the two primary precious metals of antiquity, long admired, hoarded, exchanged and eventually coined, gold (Grk. *khrysos*; Heb. *dahev*; Aram. *dhb*) and silver (Grk. *argyros*; Heb. *keseḥ*; Aram. *ksf*) per se have attracted a vast amount of comment, ancient and modern, as have the objects made from the metals.⁶²⁶ Here we will limit ourselves as much as possible to only the movement of the metals from west to east, or vice versa, but this discussion is complicated by the fact that these metals, more than other metals during the Persian period, were valued as money--a store of wealth and medium of exchange--aside from

⁶²⁴ Parker, 1992, no.83.

⁶²⁵ Among the cargo of the Porticello wreck were at least two dozen lead ingots, several of which were tested and shown to be from Laurion (Eisman and Ridgway, 1987, 53ff; also good generally for the discussion of the ancient lead trade). That lead would be shipped west into a region potentially supplied by Iberian lead, should not worry us. As Stos-Gale (2001, 67) observes “...the cargo of metal did not necessarily represent the ‘need’ for it at the other end of the ship voyage—it is a simple marketing opportunity to carry on your ship whatever might have value for exchange.” In the case of lead there would almost certainly be a market for it in any port. On Laurion lead production see Treister, 1996, 253.

⁶²⁶ Electrum, a naturally occurring alloy of gold and silver in varying proportions, was another precious metal, but was not widely traded or used outside of the Aegean. The first Mediterranean coins were minted with this metal; during the 5th c., two important Aegean trade coins, staters from Cyzicus and Lampsacus, continued the electrum tradition. Neither series has been found in the Levant or Egypt in any large numbers (cf. *IGCH* 1654-55), likely because the region had no use for or experience with the metal. See Figueira, 1998, Chp. 3 for an overview of electrum use and coins.

any industrial or artistic uses they may have had.⁶²⁷ Even so, the application of the concept of money to silver and gold in antiquity is not always clear cut.⁶²⁸ For example, silver, as Xenophon explains (*Poroi* III.2), is a commodity--an object of trade--that can be exported in bulk from Athens and can turn a profit wherever it is sold.⁶²⁹ In such a case, the concept of silver as a commodity takes precedence over silver as money.⁶³⁰ Most any silver and gold object, including coins, ingots, worked vessels and bowls, furniture, statues, etc., could potentially act

⁶²⁷ Other metals, iron particularly, had served as money before the Persian period in the Aegean due to the intrinsic value assigned to the metals. By the Persian period, however, silver, gold, and electrum alone were considered money metals. Bronze, used in various token coinages in the Mediterranean towards the end of the 5th and beginning of the 4th c., although it was used in coins, it was not valued the same way. The value of the coins was mandated by the state and had nothing to do with intrinsic metal value. The ancient attitude towards the precious metals (vis-a-vis other commodities) is summed up by Xenophon (*Poroi* IV.7): "No one ever yet possessed so much silver as to want no more; if a man finds himself with a huge amount of it, he takes as much pleasure in burying the surplus as in using it."

⁶²⁸ Here it should be made clear that money, i.e., a store of wealth and medium of exchange, does not always equal coinage, nor does coinage, especially in antiquity, always equal money. An economy can be monetized, i.e., using *some* object as money, without using coins or even precious metals. How or what a society used as money is/was determined by any number of factors: convention, tradition, availability of materials, economics, etc.

⁶²⁹ It generally is assumed that by *argyrion*, the silver of export, Xenophon means Athenian tetradrachms (e.g., Gauthier, 1976, 77ff.). At the beginning of the passage, Xenophon does draw an analogy of traders in other ports having to spend all their local coins (*nomismata*) on a return cargo before setting sail since the coins are not profitable or useless beyond the local borders (*ou khrêsima ekso*). Unless they spend the coins there they lose profit. But at Athens they can exchange (? *antekhagein*) their incoming cargo for other cargo, or can export *argyrion*, presumably the Athenian coins they have obtained from selling their cargo. But on this point the text is not clear. *Argyrion* can mean "coin," but often when it does, as in Thucydides (e.g., II.13.3: *argyrion episêmion*), a modifying adjective often makes this clear; conversely an adjective can also indicate the *argyrion* is uncoined (*asêmon*). There is hedge room here for seeing this *argyrion* in more than one way: a lot of silver comprised purely of Athenian tetradrachms, a mixed lot of (Laurion) silver which might include ingots and coins, or an number of other combinations.

⁶³⁰ Perhaps another way of thinking about this dual nature of precious metals during this period is not along the lines of a commodity-money dicotomy, but rather emphasizing one or the other natures of precious metal as money, i.e., as (1) a store of wealth and (2) an exchange medium. While physically in trade, like a commodity, the metal's role as a store of wealth would take precedence, while its role as an exchange medium lies dormant.

(simultaneously) as money or as a commodity.⁶³¹ Value beyond the intrinsic metal content could be added to some of these objects by convention or artistry,⁶³² but all the objects could be reduced, by fire if need be, to metal as a medium of exchange with the added value ignored.⁶³³ Thus, the line between money and commodity often was blurred. A coin like the Athenian tetradrachm, for example, minted presumably as money, might be treated as a commodity,⁶³⁴ or as money, could command a profit in exchange like a commodity.⁶³⁵

⁶³¹ Cf. Von Reden, 2002.

⁶³² Value exceeding that of the metallic content of an object could be due to any number of reasons: its value as an heirloom, e.g., ancient coins which are collected today; to the reputation of the producer of the object, e.g., Phoenician chased silver bowls; to law or custom, e.g., the mandated value of a coin above its intrinsic value (but generally this value held only so long as the coin was used within the borders of the state; beyond the borders, the coin was valued by metallic content alone, except possibly in the case of some internationally recognized coins like the Athenian tetradrachm). The added value was maintained only in a limited fashion: if a consumer could be found who was willing to pay for both the intrinsic and added value. If not, the added value would be done away with.

⁶³³ That all precious metal objects, not only coins and ingots, were thought to have monetary value is illustrated by a fragment from Aristophanes's *Babylonians* (Ar. fr. 68 K-A.; cf. Pollux X.85) where a debt of 200 drachmas is paid with a silver cup (cf. Von Reden, 2002). Also, note Thucydides (II.13.3-5), where Pericles, as the Archidamian War begins, enumerates for the Athenians their public monetary assets. These include not only 6000 talents of coined silver (*argyron episēmion*), but another 500 talents worth of "uncoined (*asēmion*) gold and silver in the form of private and public dedications, the sacred vessels (*iera skeuē*) for processions and games, the Median spoils and other such things." If the situation really deteriorated, the 40 talents of gold ornaments used in Pheidias' statue of Athena were designed to be removed and could be converted to currency. In 407/6, in fact, the gold plates on seven of the eight Nike statues on the acropolis were removed, melted, and converted to coinage. See Figuiera, 1998, 517ff; Hossis, 1990-91. Whereas those in eastern Mediterranean lands likely emphasized the monetary potential of precious metals in their attitudes and behavior, the Persians, on the other hand, when at home farther east, seem to have emphasized objectification/commoditization (Strabo XV.3.21), i.e., making pretty objects from the metal.

⁶³⁴ For coins as commodities, the French use the very germane term *monnaies marchandises*. Elayi (1992, 26), for example, has argued that most of the silver used in early issues of Phoenician coins, came to the Levant as Greek *monnaies marchandises*, specifically Athenian tetradrachms.

⁶³⁵ Athenian coins had a such a good reputation that they were often accepted beyond the borders of Attica at a value beyond their intrinsic value. Since the price, i.e. exchange value, of the Athenian coin was inflated by reputation or demand, anyone using the coin in exchange would effectively get more in return for what he was giving. See Le Rider, 2001, 264; Gauthier, 1976, 78-79.

What all this means, in terms of transfers of silver and gold from one region to another, especially in the Persian period, is that we cannot be too sure what form the metals took, nor how they were considered by the merchants or handlers who took them overseas. We would expect that most bulk shipments of silver and gold were in the form of coins or ingots,⁶³⁶ both of which could serve as commodities or money, but this might not always have been the case. Bulk shipments could also include worked silver and gold art or jewelry, perhaps booty meant for display, the crucible, or both. Whatever form the metals may have been shipped in, upon arrival at any destination, they might easily and quickly have changed shape, e.g., coins recast into ingots or ingots into coins. This fluidity of form and intent must be kept in mind as we consider the trade in gold and silver, since their trade, unlike that for any commodity discussed thus far, had the potential to be more chaotic for rather unique reasons. We will begin with silver, since it was of the two metals the more commonly used in exchange and coinage.

As mentioned above (see Lead) most of antiquity's silver was extracted from naturally occurring galena ores. The Aegean was blessed with many workable deposits, the most famous and productive of which were found in the Thracio-Macedonian region, on some islands, e.g., Thasos, Siphnos, and in Attica.⁶³⁷ Notable, abundant deposits were also found in Asia Minor. No such blessings were bestowed on the Levant; no significant deposits of workable ores

⁶³⁶ But see Isocrates XVII.35 and Demosthenes L.28 on the dangers of losing such shipments to pirates, shipwrecks, etc.

⁶³⁷ For a comprehensive, detailed breakdown of Aegean silver sources see Treister, 1996, 182ff. Of those mentioned here, all but Laurion were producing notable amounts of silver in the 6th century. Production on a large scale began at Laurion only in the late 6th c., at about the same time, the Siphnian source seems to have been exhausted.

were found in the entire 5th Satrapy, or in Egypt.⁶³⁸ It has long been argued, for that very reason, that early Phoenician westward exploration and colonization was focused on the pursuit of metals, silver and iron especially.⁶³⁹ Although the reasons for western colonization and exploration were more complex, Semitic and Greek textual sources still preserve the memory of an Archaic period western metals trade run by the Phoenicians, who carried the metals (as ingots or ores) east to the Aegean and Levant.⁶⁴⁰ By the Persian period, however, the ever-changing political map, with its alliances, wars, and indemnities, along with greater use and minting of coins in the west, may have pinched this eastward flow to some degree.⁶⁴¹ Precious metals from the far west still no doubt found their way east, just as eastern metals went west in circuitous exchange contexts, as coins or bullion used to pay for merchandise, trade taxes, mercenaries and so on, rather than what seems to be a more direct bulk trade of earlier times.⁶⁴² For the

⁶³⁸ Gale and Stos-Gale, 1981.

⁶³⁹ See Morris, 1992, 131ff.

⁶⁴⁰ Diodorus' (Diod. Sic. V.34.4-5) fanciful episode of Phoenician ships loading silver in Iberia suggests that the Aegean- and Phoenicia-bound silver was shipped in ingot form; Jeremiah 10:9 mentions worked silver (*kesefer meroḳa* ') from Tarshish (Tartessos) also suggesting ingots or some other bulk form; the root *rk'* means generally to hammer (flat). Also see Ezekiel (27:12) and Stesichorus (fr. 184 PMG) for silver from Tartessos.

⁶⁴¹ In the mid-6th c., Carthage achieved total independence from its mother city Tyre, and began in the following decades to assert itself even more forcefully in the western Mediterranean arena, especially in contests, commercial and military, with the Sicilian Greeks, while at the same time exercising more control over western Phoenician/Punic settlements. Although (Levantine) Phoenician and Carthaginian commercial relations continued, one wonders to what extent the precious metal flow east was affected by Carthage's own needs. Both Carthage and the Sicilians likely hoarded and spent considerable amounts of silver on their military activities. Moreover, following the Carthaginian defeat in 480 at the hands of Gelon, Carthage had to pay an indemnity of 2000 talents of silver. All of this is to say that during the Persian period larger amounts of western silver may have stayed in western hands, whereas previously more of it had passed to the east. See Kraay, 1962, 35-36; also Stos-Gale, 2001, 72; Bondi, 1999; Krings, 1998.

⁶⁴² Thucydides (VI.8), for example, mentions the transfer of 60 talents (over 1.5 metric tons) of uncoined silver from Sicily to Athens in 415 to pay Athenian naval salaries; Demosthenes

Persian period, the extent to which bulk shipments of fresh silver, compared to industrial metals like iron and tin, were shipped more or less directly from the west to the Levant is indeterminable. What seems less cloaked in uncertainty, however, is that large amounts of fresh silver left the Aegean for the Levant and Egypt as early as the 7th c.⁶⁴³

Silver in Egypt

The path Aegean silver followed to the Levant may often have been fairly direct; there are, nevertheless, suggestions that some of this silver detoured south to Egypt first.⁶⁴⁴ For Aegean silver exports, the evidence from Egypt, which is more abundant and varied than that for the Levant, is worth considering in detail since the mechanisms which brought the silver to Egypt, and the fate of the silver there, is also applicable more generally to the Levant.

Numerous hoards comprised of predominantly Archaic and Classical period Aegean coins have been found in Egypt, many of them among the largest hoards known from antiquity.⁶⁴⁵ As frequently observed, the earlier hoards dating roughly from ca. 500-460 (*IGCH* 1634-1647, *CH* 8.57) are characterized by remarkable diversity in the numbers of mints represented; in some cases as

(XXXII.5) relates a story of conspiring traders transferring a (large) amount of *khêmata* (coined silver?) to Marseille from Athens.

⁶⁴³ See Gitin and Golani, 2001.

⁶⁴⁴ Nicolet-Pierre, 2000, 116; Destrooper-Georgiades, 1996, 106.

⁶⁴⁵ Cf. *IGCH* 1632, 1634-1640, 1642-1652 and *CH* 8.57. *IGCH* 1649, "Tel el Mashkouta," had at least 6,000, perhaps as many as 10,000 Aegean-type coins.

many mints as there are coins (e.g., *IGCH* 1647).⁶⁴⁶ Well represented in these early hoards are issues from the northern Aegean mints, with smaller numbers of coins from central Greece, Asia Minor, Cyprus, and even Cyrenaica, appearing with some regularity. Only the large Asyut hoard (*IGCH* 1644, ca. 475) contains any Persian issues, in addition to a handful of Sicilian and other western coins. In these earliest hoards, in sharp contrast to the latter 5th c. hoards, the Athenian issues are virtually non-existent, only becoming more frequent towards mid-century.

It generally has been assumed that these early hoards were tied to the mercantile activity of the Greek emporium at Naucratis, or perhaps, as argued for the later 5th and 4th c. hoards, payments for Egyptian grain shipped to the Aegean.⁶⁴⁷ As valid as some of these explanations may be, only the Ahiqar customs account (dated 475⁶⁴⁸) provides any solid, contemporary evidence for explaining the presence of the silver in Egypt: duties on ships, cargoes, and personnel. The name of the port to which the record belongs to is unfortunately lost,⁶⁴⁹ but the duties applied to the incoming ships at this port may have been applied at other Egyptian ports as well.⁶⁵⁰ Ships were classified first according to

⁶⁴⁶ See, for example, Figueira's comments (1998, 31); those in *IGCH* (p. 225); and Howgego, 1995, 95ff.

⁶⁴⁷ Kraay, 1976, 72ff.; Garlan, 1989, 62ff.

⁶⁴⁸ Porten and Yardeni (cf. Yardeni 1994) suggest 475, while Briant and Descat (1998, 60ff) discuss the possibilities for a later, mid-5th c. date.

⁶⁴⁹ Memphis, Migdol, Tell Daphne, and Naucratis have all been suggested, see Briant and Descat, 1998, 91-92.

⁶⁵⁰ The Naucratis stele, and its mate recently (June, 2001) recovered from waters near the submerged ancient city of Heracleion, command a 10% duty in silver and gold from incoming Ionian ships. The original order likely dates from the time of Amasis, in the mid-6th c. See Posener, 1947, Briant and Descat, 1998, 77; Yahoo News (www.yahoo.com), June 7, 2001.

ethnicity, Ionian or Phoenician, secondly according to size (?), large and small.⁶⁵¹ Large and small Phoenician ships paid a 10% duty in kind on all goods imported; the large Phoenician ships paid an additional tax in silver called *ksp gbry'*, "Silver of the Men," perhaps equivalent to the Greek *epikephalaion*, a per capita tax on the crew. Export duties, again limited to the larger Phoenicians ships, were another "Silver of the Men" tax and a "departure/export of the sea" tax. All Ionian ships, on the other hand, paid twice (20%) the duty in kind; their large ships also paid the "Silver of the Men." Additionally, all Ionian ships, large and small, turned over a set amount of silver and gold according to ship size, and paid export duties. As Briant and Descat contend, these additional silver and gold taxes aimed solely at the Ionians could have only one purpose: to draw precious metals from the Aegean into Egypt.⁶⁵² The hoards of Aegean coins found in Egypt would imply that most of the duties were paid in coin; the evidence from the text makes this less certain.⁶⁵³

Only for the gold payments made by the Ionian ships are words used that could refer directly to coinage. The payment entries follow the same formula: *zhh sttrn* (number) *lzhb krsh* (number), "gold staters XX, (equal) to gold *karsh*/shekel/*hallurin* XX." Only two groups of values are given, both at a set rate: (1) 10 staters = 8 shekels, 15 *hallurin*, (2) 12 staters = 1 *karsh*, 6 *hallurin*,

⁶⁵¹ The terminology for the four classes of ships is not fully understood but seems to refer to size. For a discussion of this problem and the various taxes, see Briant and Descat, 1998, and Yardeni, 1994.

⁶⁵² 1998, 77-78.

⁶⁵³ For a general discussion of customs duties as a primary mechanism for moving coins overseas in antiquity, see Howgego, 1995, 93.

figures which give a weight for each stater of ca. 7 g.⁶⁵⁴ Aramaic and Demotic documents from Egypt dated to the last decade of the 5th c. use the term "stater," sometimes specifically "stater of Ionia," to refer to a silver coin, weighing about two shekels (ca. 17 g), very likely the Athenian tetradrachm.⁶⁵⁵ The gold stater in the Ahiqar text is not related to this later silver stater, or directly to any of the more common gold (coin) standards for the time. Briant and Descat suggest, however, that while this stater may not necessarily be a coin, or if it is then a less common Lydian stater, the tax nevertheless appears to target a particular standard;⁶⁵⁶ the stater payments are listed in whole units, while the Egypto-Persian equivalencies include fractions.

All silver payments, on the other hand, are listed only in terms of Egypto-Persian weights, which again include fractions. Like the gold payments, a number of the silver payments are also fixed according to ship size; the only silver payments which vary are those for "departure/export to the sea," likely because this tax was reckoned by the number or volume of product exported, which would vary from ship to ship. The fractional divisions in the fixed silver duties, some quite small in fact (ca. 0.05 g), might, like the gold duties, indicate that the tax was set with a particular foreign coin or standard in mind (e.g., 1 whole unit =

⁶⁵⁴ Briant and Descat (1998, 75), using 8.40 g for the value of the shekel, and 0.21 g for the *hallur*, calculate the weigh of each stater to be 7.03 g, for those in the first group, and 7.11 g for the second. The discrepancy may be due to rounding or rough equivalencies in the exchange. Their shekel weight, however, is at the lower end of those proposed. Using Porten's (1968, 65-66) values for the shekel (8.76 g) and *hallur* (0.22 g), the weights for each stater are 7.33 g and 7.41 g respectively. Admittedly, this is not an appreciable difference, and does still suggest that this stater, as a weight or coin, was roughly 7g.

⁶⁵⁵ Cf. Chauveau, 2000; *TADAE* I A4.2; B3.12.

⁶⁵⁶ Briant and Descat, 1998, 76-77.

fractional units).⁶⁵⁷ But, if this was the case, whatever this standard may have been, it does not seem to have been one commonly used in the Aegean; moreover, there is the possibility that one standard may have been targeted for the Ionian ships, another for the Phoenician ships.⁶⁵⁸ Whatever the standard, we cannot be certain that the expected medium of payment was coinage, especially since the probable date of the text (475) is at least a quarter century before the Phoenicians began minting their own coins. The Phoenician captains, if coin payments were expected, would then have been required to purchase or trade for the foreign coins before setting sail, certainly a possibility, but unlikely. In sum, there is no indication in the text that any silver payment was made by counting out a set number of coins to the harbormaster, which may have been the case for the gold duty. Instead, silver payments were to be made by weight in whatever form the silver might take, e.g., coins of various denominations and origins, ingots, possibly even jewelry. Such a scenario seems to be reflected in the "remarkable variety" of issues found in the early 5th c. hoards, many of which also include ingots and jewelry ("Hacksilber").⁶⁵⁹ Partial totals of the silver revenue generated in one year in this one port by the various taxes and duties are given in the text, sums which equal 383 gold staters and ca. 95 kg of silver (= ca. 5600 Athenian tetradrachms = ca. 3.5 talents). Such (incomplete) figures, help to explain how silver-poor Egypt was able to pay a yearly tribute of hundreds of talents of silver

⁶⁵⁷ Cf. Herodotus (III.89) on the gold and silver tribute due the Persian king. The gold was to be paid according to the Euboic standard, while the silver according to the Babylonian talent.

⁶⁵⁸ My attempts to calculate a common denominator standard for the figures given are inconclusive.

⁶⁵⁹ See Kroll n.663 below. Among the most impressive of these Hacksilber hoards is *IGCH* 1636, "Mit Rahineh," which contained 73 kg of Hacksilber in addition to its 23 coins. Also see Figueira, 1998, 44-45.

to the Persian king (Hdt. III.91), and how Egypt could be a source of the silver used in the construction of the king's palace at Susa.⁶⁶⁰

While some of the ingots and other pieces of Hacksilber found in the Egyptian hoards may have come from existing silver stocks in the Levant, some of the Hacksilber was derived from Greek coins, as partially melted examples from Egypt show (e.g., *IGCH* 1650). A Near Eastern (and Persian) practice required that incoming silver contributions to the state or a religious center, in whatever shape and size, be assayed, melted, further refined if need be, and cast into some (ingot-)form for storage until needed.⁶⁶¹ Concern over the fineness of the silver involved in transactions and other uses no doubt encouraged this practice, since the only way to insure a uniform grade and fineness for a mass of "anonymous" silver from a number of different sources was to assay, re-fine, and mark the metal.⁶⁶² There is no sure indication that the silver collected from Egyptian or Levantine import duties was handled in this fashion, but this should be considered in light of the fact that many Persian period hoards contain silver ingots of various shapes and Hacksilber not all of which could have come from Near Eastern sources alone.⁶⁶³ Moreover, the source(s) of silver used by the

⁶⁶⁰ Lecoq, 1997, sec. 11.

⁶⁶¹ Hdt. III.96; see Zournatzi, 2000, for comments on this practice.

⁶⁶² Joannes (1994) describes the various categories of silver used for payments in Neo-Babylon. In general from the 5th c. on, silver of more than 90% fineness was reserved for special uses, e.g., jewelry, that of 80-90% for monetary exchange, while that below 80% was deemed unfit for circulation (also see Le Rider, 2001, 30). The ingots were marked with official signs indicating to which grade they belonged.

⁶⁶³ E.g., *IGCH* 1636, 1637, 1639, 1640, 1644, 1645, 1647, 1650, 1651, 1652. Kroll (forthcoming) presents a detailed study of these hoards in conjunction with a recently rediscovered small hoard of ingots, Hacksilber, and Athenian tetradrachms stored at the ANS. Kroll rightly stresses the monetary nature of these hoards over any earlier interpretations suggesting the hoards were "silversmith's hoards" or the like. In the ANS hoard is a flattened dump with the exact weight of

Egyptian state for minting imitations of Athenian coins (see below) could very well have come from stores derived from duties and other taxes, which would have included Aegean silver.⁶⁶⁴ Some percentage of the incoming silver obviously escaped the crucible, possibly a larger percentage of coins than “anonymous” ingots or Hacksilber. Why the coins found in the early hoards were spared may have been due to a changing or developing attitude towards this particular form of silver in (international) trade.

One aspect of the initial conceptual shift that may have allowed coins to be treated more as coins in international exchange, i.e., permanent, individually counted versus altered, weighed objects, was faith in the metal content. If the metal could be trusted to be of acceptable fineness, the coin could continue to circulate, weighed or counted, without further assaying and refining.⁶⁶⁵ But even as the use of coins began to take hold, this faith was often shaken as cuts into the coins to check metal content shows.⁶⁶⁶ There is little doubt that the later

an Attic drachm. While Kroll notes that there is no sure sign that this and similar dumps found elsewhere are melted coins, it remains a possibility.

⁶⁶⁴ Note also the story told by Herodotus (IV.166) of an Egyptian ruler under Darius, Aryandes, who, so Herodotus claims, minted a silver coin so refined that it rivaled Darius’ gold daric in purity. Whatever or not the tale is true, it indicates, within an Egyptian context, both the refining of silver, presumably from stores at hand, and subsequently using this refined silver in coinage.

⁶⁶⁵ For a coin to be successful as a means of payment in international trade, the silver content would have to be on par with bullion or ingots proven (and provable) to be of high grade. A gradual recognition, perhaps through continual testing, may have eventually proved Aegean coins to be of a sufficiently high grade, and thus acceptable as is.

⁶⁶⁶ Coins from Egyptian and Levantine hoards, whether local issues or foreign, frequently have one or more deep slashes on either or both faces of the coin made by a knife or chisel. The purpose of these slashes, most likely, was to test the coin for a bronze or lead core. Hand in hand with the growing faith in coins and their metal content, and thus less testing of the metal, was the counterfeiting industry. Herodotus (III.56) records an attempt made by Samos to deceive the Spartans with electrum plated lead cores in 525, apparently the earliest such coins (but note that these coins may also have been an early local token coinage, see Osborne, 1995, 259). Athens produced silver-plated bronze coins during a silver shortage ca. 405; a large hoard of such coins, numbering in the thousands, was found in Piraeus in 1902 (see Kroll, 1996). Whether officially produced or not, the circulation of such coins to the Levant, where examples of silver plated

popularity of the Athenian tetradrachm in Egypt and the east was due to the fact that the Laurion mines produced a naturally very fine silver. Once this was widely known, there might be more hesitation to obliterate the coin since the metal would then become anonymous and lose all the marks that would immediately indicate its exceptional quality. As coin hoards show, and the Ahiqar text stresses, much of the silver reaching Egypt throughout the course of the Persian period came from the Aegean, with the Aegean source eventually narrowing to Athens almost alone.⁶⁶⁷ Given the nature of eastern Mediterranean trade routes, it is to be expected that (Aegean?) silver traveled from Egypt to the Levant, as coin finds show and the texts suggest;⁶⁶⁸ following this trail we now turn to the Levant.

Silver in the Levant

The hoards dating from the early to mid-5th c. found in the Levant (cf. *IGCH* 1478-82), show the same variety in composition as those from Egypt, suggesting a similar, indiscriminate use of weighed silver--various types of coins,

Athenian types are known (e.g., *IGCH* 1659), once detected, would have instigated counter-measures, like the slashing. Since such slashes are more common in eastern hoards, one wonders if counterfeiting was more prevalent there, or if the faith in the metal content of coins generally was so shaken by some bad coins, that the practice became second nature for those handling coins.⁶⁶⁷ Or at least it would seem by the contents of later hoards which contain disproportionate amounts of Athenian types, e.g. *IGCH* 1648-1649, 1652, 1659-1663. To what extent might this have been due to Athenian coins being among the only types of coins, or silver generally, reaching Egypt that was deemed worthy of saving from the crucible?

⁶⁶⁸ Cf. Nicolet-Pierre, 2000, 116; Destrooper-Georgiades, 1996, 106; Hdt. III.89; Lecoq, 1997, sec. 11. In Herodotus and the Persian text there is no indication of the form in which the silver passed through the Levant on its way to Persia from Egypt. The evidence of coins, e.g., Egyptian-made imitations of Athenian types, indicates a transfer of silver in a modified or altered state from whatever the original form may have been.

ingots, Hacksilber--for monetary transactions. As mentioned, towards the end of the 5th c. and throughout the 4th c., the characteristics of the hoards from Egypt and the Levant gradually begin to change. In Egypt, the variety of the earlier hoards gave way to hoards containing Athenian types almost exclusively and with less frequent occurrences of Hacksilber. In the Levant, the use of Hacksilber and ingots continued unabated, but the great variety of coin types of the earlier hoards gave way to another variety, with less emphasis on Aegean issues and more on local types.⁶⁶⁹ Coin circulation in Cyprus was limited almost without exception to Cypriot issues, some clearly made using Aegean silver.⁶⁷⁰ Elsewhere, the "virtual monopoly" Athenian coins enjoyed in Egypt is less prominent. While there does seem to be a preference for Athenian types when Aegean coins are found with later Levantine hoards, their numbers generally are few, being quite overwhelmed by issues from the Phoenician city states, Byblos, Tyre, Sidon and Aradus, and also local issues from Dor, Ashdod, Ascalon, Gaza, Judea, and Samaria, all of which started to produce coins towards the end of the 5th c.⁶⁷¹

⁶⁶⁹ In two early Levantine hoards, dating ca. 480, *IGCH* 1482 and *CH* 8.45, north Aegean and Athenian issues made up approximately 40% of the total composition of the hoards (north Aegean 11-17%; Athenian 26-27%), both of which included issues from Asia Minor and Cyprus (33% of both) and Hacksilber and ingots (ca. 30% of the composition)(for discussion see Hurter and Paszthory, 1984). In later 5-4th c. Levantine hoards, local issues generally make up a much larger percentage of the hoards than Aegean or other foreign issues, reflecting local circulation. See Elayi and Elayi, 1993, Fig. 1.

⁶⁷⁰ Coin use in Cyprus, as the hoard evidence suggests, was restricted to local issues, some of which were made by overstriking Athenian or Aeginetan coins. For a general overview of Cypriot coins and use, see Destrooper-Georgiades, 1987; for overstruck Aegean coins, Destrooper-Georgiades, 1996.

⁶⁷¹ Cahn was able to locate only 22 6-5th c. coins in Palestine from the north Aegean, Athens, Aegina, and Asia Minor in his 1984 study. In his forthcoming presentation of 11 Athenian style tetradrachms (most likely imitations) from Tel Michal, Ariel was able to locate, for the entire Persian period, a total of 36 Athenian coins found in Palestine. These figures, even when augmented by finds from Lebanon and Syria (see Elayi and Elayi, 1993, nos. I, II, XL, XLI,

As the phenomenon of coin use and production became embedded in the Levantine economy, the problems of procuring silver in a silver-poor region could only have been exacerbated. The Aegean, of course, was one likely source, and a flow of Aegean silver towards the Levant, perhaps equal to the flow towards Egypt, is illustrated by hoards from around Cilicia containing hundreds of Athenian tetradrachms;⁶⁷² the finds from Cyprus, noted above, also show Aegean silver moving towards the east. But the handful of Aegean coins found in Phoenicia, Judea, and Philistia, would seem to suggest that the flow became a trickle by the time it reached the mainland. Unless, as suggested by Elayi (1992), a large amount of imported Aegean silver went directly into local coin production. We will return to this theory momentarily, but first must take a closer look at another type of coinage produced in the Levant and often found in great numbers in the hoards. These are the imitations of (Greek) coins, particularly Athenian types, which complicate any theory of silver procurement and use in the region.⁶⁷³

By the later 4th c., hoards containing large numbers of pseudo-Athenian coins are found in the Near East, from Egypt to Afghanistan and as far south as

XLIII), give a total number of Athenian/Aegean coin finds well below 100. Only two recently discovered hoards, the “1989 Syria” (Elayi and Elayi, LVI) and “1992 Near East” (Elayi and Elayi, 1994) contain large numbers, ca. 150 and 40 respectively, of exclusively Athenian-type coins, many of which seem to be imitations. Both of these hoards, however, likely date to the period of Alexander’s intrusion into the region which had an immediate and significant impact on local coin circulation. In other words, these hoards may or may not reflect earlier, typical Levantine circulation.

⁶⁷² E.g., *IGCH* 1255, ca. 400, containing ca. 200 tetradrachms; *CH* 5.15, of the same date, with ca. 300 tetradrachms; *CH* 8.48, ca. 460, with 174 tetradrachms and 13 decadrachms; also see *IGCH* 1252, 1254, 1256, 1259, and *CH* 8.73, which held smaller numbers of Aegean coins.

⁶⁷³ What follows focuses solely on imitations of Athenian coins since these are the most numerous types of imitations, and the most identifiable. Imitations of other coin types, e.g., Persian, Phoenician and Syracusan, were also found in the Levant, mostly issues from Samaria. See Meshorer and Qedar, 1999.

Yemen.⁶⁷⁴ No study yet has been devoted to the pseudo-Athenian phenomenon in its entirety, in part, no doubt because of its magnitude and complexity.⁶⁷⁵ For the better part of a century, pseudo-Athenian coins were made in most every corner of the Mediterranean (and well beyond), some so faithfully reproducing their models that it is impossible, in many cases, to tell the real from the imitations. Others are horrible, "barbaric" copies, which sometimes are only vaguely reminiscent of the original. Many were clearly state issues, replacing or having in addition to the abbreviated Athenian ethnic on the reverse of the coin, a name or ethnic in Hebrew, Aramaic, Demotic, etc., as well as other non-Athenian marks or symbols. The variety of pseudo-Athenians is simply astounding, and for every type there was, no doubt, a different intention behind the producing the coin. One suggestion for the initiation of the pseudo-Athenian phenomenon is international demand; by the last decades of the 5th c. at least, the Athenian tetradrachm had become the coin of choice in international exchange to the extent that the world, as it were, could not do without it. As the Peloponnesian War raged on in the final decade of the 5th c., Athens' loss of slave mineworkers and easy access to Laurion essentially cut all silver production, and so all minting of tetradrachms. Presumably, one of the earliest series of imitations, very faithful reproductions and made of good silver, were made in Egypt in response to this curtailed Athenian output; if Athens could not keep up with the demand, then others would

⁶⁷⁴ The hoards with over 50 examples of imitations include, for Egypt: *IGCH* 1649, 1663; for the Levant: *IGCH* 1504 Elayi and Elayi, 1993, nos. XLIX; LVI; for Babylonia and Afghanistan: Iraq 1973, Nicolet and Amandry, 1994; for Yemen: ‘Abdullah, *et al.*, 1997; Davidde, 1995.

⁶⁷⁵ The most concise overview to date, with the exclusion of the Arabian material, is Figueira, 1998, Chp. 20

supplement the supply.⁶⁷⁶ These anonymous imitations, mimicking the originals closely in (most) every detail were obviously meant to circulate and be accepted as the real coin. But, was this simply to supplement the supply? What was the source of the silver?

If the Athenian tetradrachm, as the evidence suggests, commanded such a premium in international exchange, it was at the expense of all other coins types and forms of silver.⁶⁷⁷ One could therefore suffer significant losses if using non-Athenian types or ingots; and the larger the amounts of silver in questions, the larger the losses. The early (Egyptian) imitations might not necessarily have been produced in response to a dwindling supply from Athens, but rather an attempt to disperse stockpiled non-Athenian silver without incurring great losses in the process, and possibly of making a profit in the exchange. Producing high quality, anonymous imitations, identical in every way to the originals, would insure such benefits; poor quality, obviously non-Athenian coins would either not be accepted, or would be accepted only at a discount, thus entailing loss.

Moreover, the bounty placed on Athenian types would only have made them more desirable generally in areas growing accustomed to coins use, and thus may have encouraged the equation: Athenian types = true money, as the equation, Phoenician types = true money, was valid later on. Out of Philistia, Judea and Samaria came very poorly manufactured imitations of (mostly) Athenian types,

⁶⁷⁶ See Figueira, 1998, 529ff. for discussion and bibliography.

⁶⁷⁷ See Le Rider, 2001, 265; Le Rider also notes a 4th c. depreciation of Aeginetan coins in relation to Athenian issues. Also see Xenophon, *Poroi*, III.2, on the profits to be made overseas on Athenian silver (coins?).

many of which are anonymous, many designated by an ethnic or abbreviation.⁶⁷⁸ To modern eyes these coins are immediately recognizable as non-original; one presumes few in antiquity would have accepted them as real either. Perhaps to appease the community's sense of money as generally Athenian-looking, the rulers of these cities produced coins of this type, but strictly for local circulation.⁶⁷⁹ Either knowing the coins would have little value beyond the border, or intending it to be the case, the producers could be less careful with the execution of the coin, and possibly with the silver content as well, although this has yet to be shown by metallurgical analysis.

By the first quarter of the 4th c., the imitation phenomenon had grown so prevalent that pseudo-Athenian coins, as well as outright counterfeits,⁶⁸⁰ were appearing in the Athenian emporion and agora, prompting the state to respond with legislation on coin use.⁶⁸¹ The law calls for the placement of a *dokimastês* in the market to verify coins as acceptable for use, possibly excluding identifiable

⁶⁷⁸ For the Samaritan coins, see Meshorer and Qedar, 1999; for the Judean coins, see Meshorer, 1982; for the Philistia-Arabian issues, see Mildenberg, 1994, 1995, 1997, 2000.

⁶⁷⁹ Mildenberg, 1994 and 2000 especially, has repeatedly stressed that the issues of Samaria, Judea, and Philistia were strictly for local circulation, pointing not only to their (generally small) denominations, but also their quality and restricted find spots. With the exception of the Philistia-Arabian types, a few examples of which have been found in the Egyptian Delta, Judea, and Phoenicia, the coins did not travel far from where they were made.

⁶⁸⁰ While the intention which lay behind the production of many series of Athenian imitations was probably not aimed directly at fraud (i.e., low intrinsic value), those imitations that are made of silver-plated bronze cores, could have been. The only reason to hesitate about the intent of these coins is the possibility that many of them might have been official Athenian issues, produced under duress at the end of the Peloponnesian War (see Kroll, 1996, for a discussion of a very large hoard of plated coins found in the Piraeus which may be examples of this emergency issue). A few examples of plated tetradrachms are known from the Levant and Egypt, which raises questions concerning their origin: could these be some of the "official" Athenian coins that went abroad (inadvertently)? Or are these "real" counterfeits?

⁶⁸¹ The *editio princeps* of this law of 375/4 is Stroud, 1974. Figueira's discussion (1998, Chp. 21) is the most recent and offers an overview of the bibliography since 1974.

imitations, and confiscating counterfeits.⁶⁸² Again the primary concern seems to be with silver content; true Athenian coins, or at least those thought to be, could be trusted to contain good silver, the imitations not so. It may be that the problem, which in the early 4th c. still concerned imitations and counterfeits of an older 5th c. style of coinage, became so rampant and was causing such chaos in exchange, that it prompted subtle changes in the appearance of a new series of Athenian coins, the so-called *pi*-style, produced from the mid-4th c. on.⁶⁸³ For a time, at least, users would know the real Athenian coins from the pseudo-varieties. But it did not take long before imitators were incorporating the changes into their own products, once again confusing the issues.⁶⁸⁴

The numerous early series of Athenian imitations from Yemen, in conjunction with those series from Philistia (e.g., Gaza, Ascalon, Ashdod), gives the strong impression that the production and use of these particular series revolved around the Arabian (spice) trade. This is not to say that other regions, like Egypt and places in Asia Minor, did not have their own imitative traditions

⁶⁸² See Martin's comments (1991, 26) on what was acceptable for use and what was not.

⁶⁸³ Bingen's (1973) definitive study of the *pi*-style coinage, while good for stylistic variations, offers no reason why Athens would make subtle, yet distinctive changes to its coinage, as it had in the early 5th c. In the 5th c., imitations and counterfeits were likely not the problem they were in the 4th c., so the changes made then could be attributed more to taste or fashion. A deliberate move on the part of the Athenian mint in the 4th c. to retain the overall appearance of its well-received and tradition design, yet marked in a way that it could be readily distinguished from previous issues, may have been for the sake of assuring itself, if not others, that the issues were its own. A modern analogy is in the recent changes made to the US paper dollars, which were made in direct response to problems with counterfeiting of the older style dollars.

⁶⁸⁴ The most notable, and likely earliest responses, to the change in the Athenian designs, are found in a series of Egyptian imitations, the "Artaxerxes" series, which, following the Athenian example, switches mid-series from frontal to profile eye on the obverse (see van Alfen, 2000). Also, following suit, though not in imitations of Athenian coins, are issues from Aradus, which on a totally unrelated design, switches from frontal to profile eye, demonstrating perhaps just how influential the Athenian mint could be.

and reasons for minting such coins, but that the longest lasting and most fruitful traditions of Athenian imitations can be found in those cities and states stretching along the Arabian spice route, from Philistia to Yemen.⁶⁸⁵ There can be little doubt that these places received a great deal of silver, if not directly from Athens, than indirectly, as payments for goods or as duties.⁶⁸⁶ Herodotus is one of the first (III.5), but not the last Greek to mention the wealth of the Gazan trade (e.g., Plutarch, IX.25.8); at the other end of the spice route, the Sabeans were constantly mythologized for their abundant holdings, and for the masses of silver they received in exchange for a product that weighed so little (cf. Diod. Sic. III.47).⁶⁸⁷ The Nabateans, who were to become the middlemen in this trade after the Persian period, had already built up enough of a stockpile by the end of the 4th c. that they were able to buy their freedom from the Seleucids with 500 talents of silver and 129 tons of frankincense in 312 (Diod. Sic. XIX.94-100), an episode which illustrates the generous amounts of commodity and payment flowing in both directions. This influx of Athenian silver stimulated the early imitations and

⁶⁸⁵ E.g., a late 5th c. series of Athenian imitations bear representations of various Persian authorities (e.g., the “Tissaphernes” coin, with the Athenian ethnic on the reverse displaced by the letters, BAS, for *basileus*, “king”, see Figueira, 1998, 533ff.). Satrapal imitations, e.g., the “Artaxerxes,” “Sabaces” and “Mazakes” series also come from 4th c. Egypt; the “Mazakes” series was continued in Babylonia; see van Alfen, 2000. But, by the end of the 4th c. most of these Mediterranean series had ended, while in Arabia they continued well into the 2nd c., even replicating the “New Style” Athenian tetradrachms.

⁶⁸⁶ Retso (1997), in a very provocative essay, suggests that there may have been an alliance between Athens, some of the Cypriot cities, and Gaza, for controlling the spice trade in the Mediterranean. In this scenario, Athenian silver would be funneled directly through to Gaza, and presumably on to Arabia, to pay for the spices. Even without such an alliance, it is not difficult to imagine Aegean or Phoenician traders specializing in bringing Gazan-Arabian spice to the Aegean, and using Athenian coins in the exchange.

⁶⁸⁷ On Gaza’s wealth and position in the spice trade, see Katzenstein, 1994, and Giroud, 2000. In the Islamic period, central Arabia was, in fact, a silver exporter (Crone, 1987, 48), which meant the ancient Arabians were doubly lucky, having both native silver and highly valuable vegetable products it could export for more silver.

continued to foster the tradition well into the Hellenistic period, long after it had died out elsewhere. But significantly, while hundreds, if not thousands of imitations of Athenian coins have been found in Arabia, not one true Athenian coin has yet been reported, a situation much like that discussed above for Phoenicia and Philistia, though more extreme. If there was such a great influx of Athenian (and Aegean) silver to the Levant (and Arabia), what happened to it? And what is the relationship, if any, between this Aegean silver and the locally produced coinages?

At the dawn of the Persian period there was already in the Levant a great deal of silver used in monetary transactions in circulation,⁶⁸⁸ silver which likely had been fed into the region from the west, from Iberia and the Aegean, and possibly from the east as well, from Babylonia and Persia.⁶⁸⁹ The early 5th c. hoards from Cilicia, the Levant and Egypt suggest that the flow continued at a high volume; the later 5th and 4th c. hoards mostly do as well, but the advent of local coinages and imitations obscures the evidence. As mentioned, Elayi (1992) suggested that Aegean silver, shipped to Phoenicia in the form of *monnaies merchandises*, was used to establish the first issues of Phoenician coins in the mid-5th c.⁶⁹⁰ Some amount of Aegean silver not doubt was used in eastern

⁶⁸⁸ See, for example, the six hoards of Hacksilber, ingots, and jewelry, recovered from excavations at Tel Miqne all dated to that last third of the 7th c. (Gitin and Golani, 2001).

⁶⁸⁹ Stos-Gale, 2001.

⁶⁹⁰ Elayi, in fact, was not the first to suggest such a fate for Athenian and Aegean coins in the Levant. In their presentation of two early Near Eastern hoards, Kraay and Moorey (1968) explain that "...the (Levantine) mints would derive at least part of the bullion they needed from melting down imported foreign coin. The fall in the quantity of Athenian coinage in fourth century Near Eastern hoards does not necessarily mean that much less Athenian coinage was arriving than hitherto, but only that...more of it was being converted into bullion or into local coinage..." (227-228).

coinages, but whether or not the coins were directly imported for such a reason is more problematic. One reason, Elayi has proposed, for the Phoenicians to begin minting their own coins was for the sake of profit-making by the state; whether through differentiated trade/coin weights, as perhaps at Athens,⁶⁹¹ or the fees state mints withheld from a lot of bullion to be rendered into coins, states could make some amount of profit from issuing coins. But one wonders to what extent Athenian coins would be used for this purpose since their apparent premium in exchange would lessen any profits that the state could make in using their silver.⁶⁹² There are a number of variables to consider, but although it is problematic, partly because we cannot estimate how great or small these profits might really have been for the Phoenician cities, Elayi's proposal has ramifications elsewhere.

With respect to the production of coins in the Levant, where the economy was already monetized, and silver already in circulation before coinage, profit might also have motivated the Philistian and Arabian cities to imitate Athenian issues, perhaps using Aegean, even Athenian silver. With a few exceptions, particularly those from Egypt, imitations of Athenian coins generally did not circulate far beyond where they were produced. In fact, one often repeated reason for the production of Athenian imitations by foreign states, was that they were

⁶⁹¹ A fair amount has been written on Athens' bistathmic weight system, a 100 drachm mina, for weighing coins, and a 105 drachm mina for commodities, among which some scholars include uncoined precious metals. The difference between the two gives the coins an automatic 5% added value. In practice, however, the situation is more complex. See Le Rider, 2001, 259, and Kroll, 2001, 89, n.9.

⁶⁹² Again, Xenophon's remark (*Poroi* III.2) that anyone exporting Athenian silver can make a certain profit on it elsewhere, would discourage any notion that foreign states actively sought fresh Athenian silver for their own coinages. Unless, perhaps, they purchased the silver directly from Athens, with no middlemen, and sent it straight into their mints.

used to pay Greek mercenaries who expected to be paid in a familiar, trusted medium. Perhaps this was the case for a (very) few series of Athenian imitations, like those satrapal imitations from Asia Minor. But, in places like Arabia or even Gaza where the number of Greek mercenaries would be limited, other reason for these coins must be sought. Moreover, Athenian imitations generally do not appear to have migrated far from where they were made, quite unlike the coins they imitate. The limited circulation of the coins, and trading center contexts from which many of these coins originated, encourages the interpretation of trade and its associated profits as motivators for producing imitations. And too the smaller denominations were in all likelihood minted for local circulation, not international trade where a higher quality of production and metal would be necessities.⁶⁹³ In coins meant for only local circulation production quality could lapse and the silver content could be reduced, if not almost done away with.⁶⁹⁴ Silver, in cities like Gaza, was obtained through trade or taxes and that silver going into state coffers might have undergone the traditional testing and melting mentioned above. From these stores, both lower quality local coins and perhaps

⁶⁹³ Again, for arguments that the Philisto-Arabian, Judea, and Samarian coins were meant for local circulation only, see Mildenberg, 1994, 2000, and Meshorer, 1982.

⁶⁹⁴ A recently discovered series of smaller denomination Athenian imitations, likely produced at Dor, are silver plated bronze. The coins appear to be a satrapal issue, similar to the “Tissaphernes” series from Asia Minor; on the obverse of the coins from Dor is a similar Persian figure, on the rev the Athenian owl with ethnic. The only published example to date, a very poor specimen, is in Meshorer’s report (1995, no.10) on the coins from the Dor excavations. I thank Shraga Qedar, who is preparing a study of the coins, for allowing me to see 10 other, much finer examples of the coins, all from Dor. The implications of an officially sanctioned, silver-plated satrapal imitation from a city nominally under Sidonian control are quite interesting, but beyond the focus of the present study.

higher quality trade coins were produced, the proceeds being retained by the state.⁶⁹⁵

If not actually for profit, such actions would, at their core, demonstrate a desire on the part of the state to control the silver, whether by weight, form, or quality, as it passed through its realm. In a context where coin counterfeiters (state or private) were active, as were the armies of imitators and individual city-state mints, no state could be at all sure of the quality or origin of the incoming silver. If it expended the effort (i.e., assaying, coining), a state could only be sure of the silver it alone produced in whatever form, and in taking the effort the state might attempt to recoup any losses from bad silver intake, or make a profit on its output. When faced with stores of “Athenian” coins collected from taxes, for example, many of which may in fact have been Athenian, the whole group might have been condemned to be tested, melted, and refined for control purposes. In fact, it may have been that cities, like Gaza, issued (larger denomination) imitations with distinctive markings to assure itself and customers of the coin’s quality, something no longer entirely possible in anonymous “Athenian” coins.⁶⁹⁶ As coins passed in stages from Athens to Arabia, for example, at each stage there

⁶⁹⁵ Because coins used in international trade must be of better quality than those that can be imposed on a (captive) population, states have at times differentiated between coins produced for local use, of lower quality and metal content, and “trade” coins of better quality, weight and metal. One benefit of such a system, of course, is that a state can effectively impose a token, intrinsically worthless coinage in its closed local exchange system, and thus retain the bulk of incoming precious metals from overseas for its own coffers or oversea expenditures. See Kleeberg, 1995, 88ff. on the concept of the trade coin.

⁶⁹⁶ I would imagine that the only time a trader or state could be assured that the “Athenian” coins they were dealing with were authentic, was if the coins were obtained from Athens directly, perhaps in specially (sealed?) containers or lots. The profits that could be derived from shipping Athenian silver overseas from Athens, was the (one time?) assurance that this silver was Athenian; once dispersed, that assurance was lost. Die linked Athenian and northern Aegean coins in two earlier hoards (*IGCH* 1645 and 1478) gives credence to the idea of such special export lots.

was the possibility that a consignment could be melted and restruck for local control before being passed on, where again it could be melted and restruck. The farther from Athens, the less likely any original coins would survive intact.

The many facets of the west to east silver trade, a few of which have been explored above, require studies of greater length, and with more scientific analysis than is possible here. In sum, however, we can be reasonably confident that a considerable and steady flow of Aegean silver poured into the Levant during the Persian period, mostly in the form of coinage, probably to serve more as a means of exchange (i.e., money), than as an item of exchange (i.e., commodity). Once there, the coins were drawn into complex, and cyclical patterns of silver usage, some traditional, some adopted from the Aegean, which tended to encourage more the destruction of the coins, than their preservation. As for a silver trade (not booty or gifts) from east to west, the evidence is limited to a few *objets d'art*, and perhaps a number of eastern imitations finding their way to Athens.

Gold

The study of the gold trade is also hampered by many of the same problems as that for silver, but since gold was not as widely used for coinage or an exchange medium, the evidence for the Aegean-Levantine trade, if it existed, is far more restricted. Old Testament sources speak of gold coming into the gold-poor Levant from Ophir (e.g., II Chron. 8:18; I Kings 9:28), possibly somewhere

in North Africa,⁶⁹⁷ and from Arabia (II Chron. 9:9), but not from the Aegean. Slightly before the Persian period, the Phoenicians may have acquired gold from their interests in Thasos and elsewhere in the northern Aegean,⁶⁹⁸ but nothing from the Persian period indicates a continuation of this direct line to the Levant. The only indication of regular movements of gold from the Aegean (?) to the outside is found in the Ahiqar customs account discussed above. What is rather curious about the port authorities demanding gold in this case, is that there is essentially no evidence for gold being used as a metal of exchange in Persian period Egypt.⁶⁹⁹ What then happened to this gold? Could it have been included in tribute sent to Persia? Used for local artistic pursuits?

The Persian gold daric saw extensive use in the Aegean and at Athens,⁷⁰⁰ but supplies of the coin came into the Aegean from Asia Minor, where the coin was minted, rather than the Levant. Despite a few questionable passages in the Old Testament,⁷⁰¹ the daric does not seem to have enjoyed the same amount of circulation in the Levant as farther west. To date only one (late) daric has been

⁶⁹⁷ See Lipinski, 1992. Also note the story in Herodotus (IV.196) of Carthaginians/Phoenicians obtaining gold by means of silent trade on the Atlantic coast of Africa.

⁶⁹⁸ Hdt. VI.46-47; cf. Strabo, XIV.5.28; Morris, 1992, 143ff.

⁶⁹⁹ Gold does not figure at all as medium of exchange in any of the Aramaic papyri from Egypt. In terms of the hoard evidence, *IGCH* 1649, "Tel el-Maskhoutha," is the only Persian period hoard from Egypt to contain gold. During the Persian period, the Egyptians Tachos and Nectanebo produced gold coins, but these today are quite rare indicating that they likely saw limited circulation in antiquity.

⁷⁰⁰ See Le Rider, 2001, 193ff., on the presence and use of the daric in the Aegean and at Athens; Le Rider (196) also suggests that the gold of the gold plates of the Nike statues that were coined in Athens in 407/06 was mostly derived from darics.

⁷⁰¹ E.g., I Chron. 29:7; Ezra 2:69, 8:27. In all three cases the word appears in junction with gold; in I Chron. and Ezra 8:27, the word in the form *'darkonim* is a measure for gold objects, in Ezra 2:69, *darkmonim* appear to be gold coins. Editors and translators have shown reservation about the word(s), translating "daric" or "dram" or "drachm." In any event, the word is suspect, either as an anachronism or interpolation, or as something misunderstood. Since only one gold daric is known to have been found in Palestine, "drachm" may be closer to the truth of the matter.

found in the region,⁷⁰² compared to the many hundreds if not thousands from the Aegean and Asia Minor. In sum, there is very little evidence for any Aegean-Levantine gold trade in the Persian period, either east to west or vice versa.

⁷⁰² Mildenberg, 1994, 65. Also there is very little gold found period in any of the Levantine hoards. From *IGCH* 1488, “Al Mina, 1936,” came a piece of gold jewelry; from another discussed by Elayi and Elayi (1993, no. XXX) a gold bead.

CHAPTER FOUR

Animal Products, Livestock, and Slaves

IV.1 ANIMAL PRODUCTS

There are only a small number of commodities of this type. Ivory has already been discussed; marine purple and kermes red can be found in the previous chapter; wool and silk in the next chapter under Textiles. What remains are hides, marine shells, and ostrich eggshells.

Hides

Related to the trade in vegetable textiles (see below) was the trade in tanned and unprocessed animal hides and skins. With hair removed or left in place, hides, because of their intrinsic durability, served many functions,⁷⁰³ and for that reason were a major commodity in overseas trade—but not, it seems, in Levantine-Aegean trade. The Black Sea played the primary role in supplying the Aegean with goat, sheep and perhaps cattle hides;⁷⁰⁴ some of the Levant's supply likely came from parts of southern Asia Minor or farther east.⁷⁰⁵ It is possible that

⁷⁰³ For a list of mostly military uses, e.g., shields, tents, boots, saddles, harnesses, see White, 1984, 237; also see van Driel-Murray, 2000, who includes, shoes, sandals, various garments; other uses included prepared writing surfaces, transport bags and wineskins, ropes, shipboard fixtures, etc.

⁷⁰⁴ See, for example, Demosthenes XXXIV.10 where a ship takes on 1000 hides as deck cargo in a Black Sea port only to capsize because of the load; the number of hides, nor the stowage is treated as being exceptional.

⁷⁰⁵ Mesopotamian documents record leather imported from Tabal (i.e., Asia Minor); see Elat, 1991, 24. Phoenicia also served as a source of various types of hides for its Assyrian overlords in the 8-7th c., hides which were likely acquired from other sources (cf. *ANET*, 283, 290, etc.)

some more exotic hides, e.g., elephant, hippo, hyaena, seal and even dolphin,⁷⁰⁶ may have found their way into the east-west trade, but the evidence is lacking.

Marine Shells

A significant number of marine shells—from at least 61 different species—originating in the Indian Ocean and Persian Gulf region found their way to the Mediterranean from the Neolithic period onward.⁷⁰⁷ These shells, found in tombs and at sanctuaries throughout the Levant, the Aegean and even farther west, were frequently worked into beads, while some of the larger examples, sporting fine engraving and incising, may have been used as cosmetic containers. The 7th c. particularly saw a steep rise in the number of imported engraved giant clam shells (*Tridacna* spp.) which were dedicated at sanctuaries in Palestine, Cyprus, Rhodes, Samos, Chios, Aegina, Delphi, Corinth, Olympia, Italy and Cyrene.⁷⁰⁸ By the Persian period, the popularity of these *Tridacna* shells, to judge from archaeological finds, seems to have waned; nevertheless, there was enough interest in some circles to inspire terracotta copies in Athens in the late 5th c.⁷⁰⁹ The more popular imports during the Persian period were coweries (*Cypraea* spp.), nerites (*Nerita* spp.), and black-lipped pearl oysters (*Pinctada margaritifera*

⁷⁰⁶ Elephant hides are recorded as booty taken by the Assyrians from the Phoenicians in 8-7th c. (*ANET*, 283, 290); hippo hides are mentioned in trade in later sources (e.g., Pliny VI.174); Plutarch (*Mor.* 664c) notes the use of seal and hyaena skins for reinforcing the corners of sails aboard ships, a use predicated upon superstition; dolphin skin was used in Near Eastern cult (Levine, 1993, 166).

⁷⁰⁷ Reese (1991, table 1) was able to locate 61 species from published and unpublished excavation reports from the Mediterranean basin and Europe.

⁷⁰⁸ Reese (1988) and Reese and Sease (1993) list the known finds and provide bibliography.

⁷⁰⁹ See Corbett, 1949, pl. 99, fig. 120.

L.).⁷¹⁰ Tortoise carapaces (Grk. *khelônē*) from the hawksbill turtle (? , *Eretmochelys imbricata*) figure prominently in the *PME* as an Indian Ocean commodity.⁷¹¹ Other species, however, were available in the Mediterranean where they were used as sounding boxes in stringed instruments. Appearing in Levantine-Aegean trade during the Bronze Age,⁷¹² some carapaces (from the Indian Ocean?) no doubt appeared in later trade as well.

One other type of marine shell, originating in the Mediterranean, which might have been traded during the Persian period are the opercula (or “doors”) of the species *Phyllonotus trunculus* L. Closing off the open end of the shell when the animal draws within, the operculum (Grk. *onyx*; Heb. *sheheleth*?) is a small horny plate which was used in the Bronze Age as both a textile decoration and perhaps as an incense, a use which might have continued for centuries afterwards.⁷¹³

Ostrich Eggshells

Like marine shells, the large, decorated eggshells of the ostrich (*Struthio camelus* L.) appear in Mediterranean sanctuaries and tombs starting in the 3rd millennium. Imports of the shells continued apace throughout the Persian period,

⁷¹⁰ Reese, 1991, table 2; Micha

⁷¹¹ As Casson (1989, 101) remarks: “Tortoise shell receives more attention in the *Periplus* than any other object of trade.”

⁷¹² Bass, 1997, 166.

⁷¹³ A deposit of hundreds of the opercula appeared on the Uluburun shipwreck (Pulak, 1988, 5) indicating early Levantine-Aegean trade. Linear B *o-nu-ka*, corresponding to later Greek *onyx* (“nail” generally but also the murex operculum; cf. *LSJ*) appears in contexts which indicate its use as a textile decoration; see *DMic*, s.v. In Exodus (30:34) *onyx* (LXX; Heb. *sheheleth*) appears as an ingredient in the Holy Incense.

with finds reported from the Aegean (Samos, Chios, Crete, Rhodes, Olynthus, the Argolid, and Corinth), Egypt (Naucratis), and the west (Sicily, Tharros, Sardinia, Ibiza and Spain).⁷¹⁴ Although their range is much more limited today, in antiquity the ostrich was found all over North Africa, the Levant, Arabia, and Mesopotamia.⁷¹⁵ Early Levantine-Aegean trade in the shells is shown by the numerous example found on the Late Bronze Age Uluburun wreck.⁷¹⁶

IV.2 LIVESTOCK

One does not have to search far to find evidence for the trade in live herd animals—goats, sheep, cattle, hogs—in the eastern Mediterranean,⁷¹⁷ but there is nothing to suggest that much Aegean-Levantine trade in livestock existed. Specialty animals, especially expensive horses or hounds, might have seen occasional trade east-west; Cilician horses, for example, were among the most desirable.⁷¹⁸ Where there is better evidence for the trade in animals, however, is in exotic breeds, like monkeys, peacocks, and cheetahs.

In her study of the Indian peacock (*Pavo cristatus*; Grk. *taôs*) in 5th c. Athens, Miller determined that the birds were diplomatic gifts given to Athenian embassies rather than items of mercantile exchange.⁷¹⁹ More likely candidates for commodities were the African/Asian leopard (*Panthera pardus*; Grk. *pardalis*)

⁷¹⁴ Resse, 1985, 2000.

⁷¹⁵ Resse, 1985, 378.

⁷¹⁶ Bass, 1997, 165.

⁷¹⁷ E.g., Alexis *apud* Athen. XII.540d; Hermippus *apud* Athen. I.28a; Ezekiel 27: 14, 21.

⁷¹⁸ II Chron. 1:15-17 (cf. I Kings 10:28) records Solomon importing Cilician horses for use with chariots; Cilician horses also counted among the tribute given to the Persian king (Hdt. III.90).

⁷¹⁹ M. Miller, 1987; more recently, 1997, 189ff.

and cheetah (*Acinonyx jubatus*). Both cats, perhaps confused for one another, appear frequently on Attic vase paintings as status pets of wealthy young Athenians;⁷²⁰ they were well enough known that Aristophanes could speak of the leopard in the same breath as the more common sheep and bull.⁷²¹ Like the cats, monkeys (Grk. *kêbos/kêpos*; Heb. *tukkiyim*, *ḵoppim*) were also commodities; their trade began in the Bronze Age, as Minoan frescoes show,⁷²² and continued unabated into the modern period.⁷²³ Representations of monkeys from the Persian period, figurines and vase paintings, are numerous; many come from Cyprus and Rhodes.⁷²⁴ Most appear to be of the two major species of monkeys known and traded in antiquity, the Baboon (*Papio* spp.), from around Ethiopia, and the north African Barbary Ape (*Simia sylvanus*).⁷²⁵ As with the cats, the African origin of these monkeys suggests the primary outlet for exotic African animals was generally North Africa and Egypt;⁷²⁶ from there a portion of the trade went to the

⁷²⁰ See Ashmead, 1978, for illustrations and discussion. The cheetah especially has certain dog-like characteristics which enable them to be kept as companion pets.

⁷²¹ Ar. *Nub.* 347.

⁷²² Strasser (1997) identified the blue monkeys in the frescoes as Nubian vervets (*Cercopithecus* spp.; see also Preziosi and Hitchcock, 1999, 128); McDermott (1938, 105) had suggested the tanzania guenon, also a *Cercopithecus* species.

⁷²³ For the considerable trade in monkeys in Arabia and the Gulf during the Islamic period, see the *Encyclopaedia of Islam*, s.v. kird.

⁷²⁴ See McDermott, 1938, 25ff. A cylix in the Metropolitan Museum Cesnola collection (in New York) from Cyprus has the face of a monkey molded on one side (see McDermott, 1938, no.335; *BAR* Jan/Feb, 2001, 72).

⁷²⁵ McDermott, 1938, 55ff, 65ff. The baboon, sacred in Egypt, earned the named *kynokephalos* (“dog-face”) in Greek.

⁷²⁶ With the exception of the Barbary Ape trade; a port near Carthage bearing the name *pithekôn kolpos*, “port of Apes,” might have been known as early as the 4th c. See McDermott, 1938, 57-58. Hemmerdinger (1968, 244) notes that Greek *kêbos/kêpos* are Egyptian loan words. On Hebrew *tukkiyim* see the long article in *HAL*, s.v.

Levant and then circled to the Aegean,⁷²⁷ as the Rhodian and Cypriot monkey figurines indicate.⁷²⁸

IV.3 SLAVES

As early as the 6th c., the Levantine-Aegean slave trade was fully active; Ezekiel lists slaves among the imports from Ionia (27:13). The practice of this trade seems to have given the Greeks as nasty a reputation in the Levant for dealings in slaves,⁷²⁹ as the Phoenician had in the Aegean.⁷³⁰ But while Phoenicians and Greeks were slave dealers they also happened to be slaves to each other. Arcestratus (4th c.), the Aegean gourmand, for example, recommends having a Phoenician as a baker;⁷³¹ in the east Greek women were especially prized and were traded as far as modern Yemen.⁷³²

Unfortunately, however, aside from Ezekiel and Joel, there is no other explicit mention of the Aegean-Levantine traffic in humans. The frequently cited references to eastern slaves in the Aegean—Syrians, Cypriots, even a possible

⁷²⁷ Monkeys first appear in Greek literature as early as the 7th c. (Archil. frag. 89); vase paintings suggest that they were kept as pets (e.g., London E 171).

⁷²⁸ Solomon's Tarshish ships, returning from the west, brought back to the Levant two types of monkeys, *tukkiyim* and *ḳoppim* (II Chron. 9:21), Barbary Apes and Baboons from near Carthage and Egypt? See Meyers (1965, 55) on the meaning of the Hebrew; Steier's (*RE*, s.v. Pfau, col. 1415) suggestion that *tukkiyim* is etymologically related to the Greek word for peacock (*taōs*) has generally been abandoned in favor of a second monkey species. Also see the tribute lists of Ashurnasirpal II (883-859), where two types of monkeys are given as tribute by the coastal cities of Tyre, Sidon, and Byblos.

⁷²⁹ See Joel 3:6 for Jewish captives sold to *benai hayonim*, "the Sons of the Ionians."

⁷³⁰ This view of the Phoenicians was first voiced by Homer (*Od.* XV.425ff.), and the stereotype continued with Herodotus (II.54).

⁷³¹ *Apud* Athen. III.112c.

⁷³² On the possibility of Greek slaves in Sidon, see Elayi, 1988, 76; South Arabian texts dated from the 5th through 3rd c. mention hierodules from Ionia, who likely passed through Gaza (Robin, 1990; Raschke, 1978, 926, n.1114).

Arabian⁷³³—do not necessarily indicate active east-west slave trade in the 5-4th c., nor do they offer much in terms of showing how large the slave trade might have been or how it operated. Aegean and Levantine societies depended on slaves to a high degree, and so owned and traded large amounts of human property.⁷³⁴ And we know that the primary methods for acquiring slaves for trade was through war and piracy.⁷³⁵ For this reason, although we may say, for example, that a slave is from Syria, the place where the person first became a commodity and was traded likely had nothing to do with Syria per se; any slave that we know of could easily have been captured far from his/her home, and then passed through many hands and ports. Unlike other commodities, cities did not manufacture (indigenous)

⁷³³ Miller (1997, 82-83) has tabulated the 5th c. evidence (e.g., literary references and the Hermocopidai confiscation inscriptions) for foreign slaves in Athens. Phrygians and Thracians make up the bulk of those recorded with only a handful of Syrians and Persians and one possible Arabian. The evidence from the 4th c. (e.g., inscriptions from the mines at Laurion, literature, etc.) provides ratios which do not differ significantly from those for the 5th c. Again there are only a handful of Levantine peoples compared to Thracians and various Anatolian peoples (see Miller, 1997, 83; Isager and Hansen, 1975, 33). Also see Raptou, 1999, 157-58, for the evidence of Cypriot slaves in Athens.

⁷³⁴ The 4th c. figures for the numbers of slaves in Athens alone are, conservatively, in the tens of thousands (Isager and Hansen, 1975, 31; Osborne, 1995, 28). Despite the large numbers of resident slaves engaged in business, household tasks, mining, agriculture, etc., in most every Mediterranean town, the slave trade supplying these numbers received little comment in the ancient sources. Isager and Hansen (1975, 31-32) estimate Athens would have required ca. 6000 new slaves per year, half of whom would have been imported, in order to maintain their 4th c. slave population estimate of 150,000.

⁷³⁵ Economic hardship could also cause families to sell their children, or even the parents into slavery (see Braund and Tsetschladze, 1989, 116-118), but it is unlikely that large numbers of slaves entered the trade in this fashion. Wars could introduce numbers into the trade on a sporadic basis; piracy and kidnapping, on the other hand, would have provided a more steady means of acquiring slaves (see de Souza, 1995, 188-89 on the relationship of piracy and the slave trade; but note that he does not consider piracy a major source of slaves). Famous for its pirates in the Hellenistic and Roman periods, Cilicia, overlooking the sealanes between the Aegean and Levant, likely already was a pirates' nest in the Persian period (for the development of Cilician piracy see Ruah, 1997 and Rauh and Wandsnider, 2000). Spear points embedded in the flanks of the ship suggest that the late 4th c. Kyrenia ship's last voyage ended because of a pirate attack, perhaps Cilician pirates, who then scuttled the vessel after taking the crew hostage (*EUMA*, s.v., Kyrenia shipwreck). Also see Xen. *Oec.* VII.11 on the arms cargo ships carried to protect against such attacks.

slaves for export.⁷³⁶ Moreover, a slave's stated ethnicity might also have been fabricated, confused, or even forgotten.⁷³⁷ A slave's stated ethnicity, in other words, is not an indication of direct trade with his or her homeland or mother city. While we can be reasonably certain that the Aegean-Levantine slave trade continued after the 6th c., probably with the help of the Cilician and other pirates, there is not much actually to show for it.

⁷³⁶ Braund and Tsetschladze (1989) try to distinguish the ways in which people entered slavery, but still give the impression (e.g., 114) that certain areas, like Thrace, commonly "produced" indigenous slaves for export. Some clarification should be made. While the Aegean, like Thrace, seen from a larger perspective "produced" (Greek) slaves as well, individual cities within the Aegean, like Athens, did not produce slaves in the sense that the city sold hoards of its own citizenry on a regular basis into the trade, at least not in the post-Solonian world. In that sense, slaves in any given city were always foreign, i.e., acquired from some place else, even if a neighboring city. Homegrown slaves, likewise, would be the offspring of foreign parents, and would not necessarily be considered local "products."

⁷³⁷ Braund and Tsetschladze (1989, 119-121) have a fine discussion, with citations, on the problem of slave ethnicity. A slave's origin could be falsified if his/her origins might affect the price, confused if port of origin differed from birth origin, or forgotten, by slave and owner, if the slave was acquired when young.

CHAPTER FIVE

Manufactured Commodities

INTRODUCTION

Turning now to manufactured items,⁷³⁸ we are faced with an array of issues that did not, for the most part, complicate the discussions of raw materials in the previous chapters. As we have already seen with the imitations of Athenian coins, a manufactured object which looks “Athenian” might not be Athenian. Imitation, derivation, and adaptation of design, technique, and materials could occur, and did, in all the arts and crafts, not just with coinage. While specialists tend to be rather certain of the (general) origin of some manufactured objects, particularly more culturally attuned *objets d’art*, or ceramics made with a distinctive local clay, for a host of other items this degree of certainty cannot be obtained. Nor does scientific analysis of the materials in the object always resolve the issue; metals can be mixed, thus destroying the crucial atomic fingerprints of known ore deposits; raw materials, like clay or glass, can be transported abroad. Moreover, there was also a migration of craftsmen to go along with the migration of raw materials. Among the Phoenicians residing in Athens, for example, there may have been silversmiths using local metal to

⁷³⁸ There are a number of manufactured items and various *athyrmata* (“trinkets”), e.g., dildoes from Miletus (Aristophanes, fr. 592.16-28) and locks from Sparta (Aristophanes, *Thesm.* 423), that could have made it into Levantine-Aegean trade, but are not included here because of excessively poor evidence. Also included in this group are musical instruments. Although many of the Greek musical terms and names of instruments are foreign, (e.g., *nablas*, *phormigx*, *kitharis*, *lyros*, *kinyra*, *sambykê*, *tympanon*; cf. Masson, 1967, s.v.), there is no mention or indication of musical instruments being traded.

produce bowls identical to those their cousins were making in Sidon at the same time using imported Laurion silver. Which bowl do we label “Phoenician,” and more importantly, if one should surface in an archaeological excavation, how do we know the difference?⁷³⁹ Also, the exchange mechanisms moving manufactured objects about, while applicable in many cases to raw materials, likely were more varied, more frequently. Kings and states did on occasion make gifts of raw materials like ship-building timber, for example, but these items, with the exception of precious metals, were not common in (aristocratic) gift exchange, presents bestowed on family or lovers, dedications at sanctuaries, or prized booty.⁷⁴⁰ In short, although we may locate a “foreign” item in a text or in the ground, it may not be foreign-made, and if it is, it might not have been paid for—at least not with a monetary instrument. These are issues that we will return to in the final chapter.

V.1 PERFUMES

In most every Mediterranean culture during the Persian period, perfumes were an indispensable part of religious and profane daily life. Although they found use in burial rites and in ritual, where anointing the bodies of the deceased, holy images and religious personnel was often mandatory, perfumes were more

⁷³⁹ Traders, upon entering the Piraeus, were required to make a declaration to the *pentêkostologoi*, import duty collectors, who then made a record of the items and fees paid (Dem. XXXIV.7). It would be of interest to know if this declaration required naming the origin or place of manufacture for the imports, and if so, was this information passed on to the consumer in the agora?

⁷⁴⁰ At least this would seem to be the case during the Persian period. Raw materials, as the Uluburun shipwreck implies, were items of elite gift exchange during the Bronze Age. See also Cochavi-Rainey, 1999.

notoriously used in the secular activities of banqueting and seduction.⁷⁴¹ There were also more mundane uses for perfumes, like freshening clothes and bedding, and as medicines.⁷⁴² The popularity of perfumes throughout antiquity made them a major industry, and a major trade commodity. Like many of the other manufactured items discussed in this study, perfumes are difficult to locate in a trade context because the raw materials, the craftsmen, and the commodity itself all circulated simultaneously. Because perfumes were so popular, there is a great deal of evidence for perfumes in the Persian period, on their flavors, types, manufacture, and marketing, all of which has some bearing on the trade in perfumes. We will deal with these various strands of evidence shortly.

Mediterranean trade in scented oils has a long history; by the Late Bronze Age perfumed oils were a major focus of the palatial economies, both in terms of production and redistribution.⁷⁴³ Such controlled production and exchange of perfumed oils continued well into Archaic Age.⁷⁴⁴ In the Persian period, perfumed oils continued to play an important role in regional and local economies, but the scale and nature of perfume production and exchange had

⁷⁴¹ Perfume use in burials is a widely recognized phenomenon in both the Levant and the Aegean at this time as excavated perfume jars from burials and artistic representations show. Even so, the actual purpose of the perfumes, as offerings to the dead or to mitigate bad smells, is still in question (see Dayagi-Mendels, 1989, 132; Kurtz and Boardman, 1971, 103; and *ANET*, 312 on the burial of Nabonidus's mother, whose body is said to be sprinkled with perfumed oil). In temple ritual, perfumes were used to anoint the sacred images at Delos, Delphi, and Edfu in Egypt (Brun, 2000, 278, 286) and the priests and temple furniture in Jerusalem (Exod. 30:22-33).

⁷⁴² Shelmerdine, 1995; Thphr. *Od.*, 36, 58; Cant. 4:11; Ps. 45:8.

⁷⁴³ For Mycenaean production and trade of perfumed oils see Shelmerdine, 1985; Lucia d'Agata, 1997; Knapp, 1991. For the Near East, see Cochavi-Rainey, 1999.

⁷⁴⁴ As implied by Hezekiah's display to the Babylonians of his jars of perfumed oils stored in a warehouse along with his other treasures (Isaiah 39:2). In Homer, the use of perfumed oils is likewise restricted to the elites; presumably their production would be under elite control as well.

transformed. It is worth briefly considering these changes since they had an appreciable effect on the way in which perfumes were used and handled.

Most, if not all, Late Bronze Age perfume production was done under the control of direct palatial oversight, often within workshops inside or just outside of the palace itself.⁷⁴⁵ In the Levant especially, some forms of this elite perfume monopoly seem to have continued into the Persian period as suggested, for example, by the remains of what appears to be a royal perfume factory at En Gedi.⁷⁴⁶ At the same time, however, perfumers operating independently of royal or elite oversight came into being, as did guilds of such professionals.⁷⁴⁷ Concurrent with the appearance of independent producers was the "democratization" of perfumes; no longer were such scented goods reserved exclusively for the upper crust, but were now available to anyone who could pay the price. In both the Aegean and Levant the democratization of perfumes was more or less completed by the end of the 6th c. when specialized perfume shops begin to appear in the market places.⁷⁴⁸ The existence of these perfume shops, however, raises a number of questions related to the international perfume trade.

Perfume production was a highly skilled craft which carried with it a number of trade secrets, meaning, in other words, that there could be a sharp

⁷⁴⁵ Shelmerdine, 1985.

⁷⁴⁶ Mazar, *et al.*, 1966. Elite monopolies, especially those connected with the production of the ointments used in the Jerusalem temple, are attested in Talmudic sources (Babyl. Yoma, 38a); see also Neufeld, 1971, who claims that only the upper strata of Levantine society had access to perfumes in the Iron Age.

⁷⁴⁷ In his account of the returned exiles rebuilding the wall around Jerusalem, Nehemiah (3:8) notes that Hananiah *ben haraḳohim* ("of the perfumers' guild") was responsible for one of the sections. On such guilds see Mendelsohn, 1940.

⁷⁴⁸ Brun, 2000, 281. Note too that both Solon and the Lacedaemonians attempted to curb the growing popularity and use of perfumes (Athen. XV.687; cf. I.142b)

distinction between a perfume maker and a perfume seller;⁷⁴⁹ ancient Greek does make this distinction (*myrepsikoi* v. *myropoloi*).⁷⁵⁰ In a fragment of a speech by Lysias (*apud* Athen. XIII.612e), we learn of a man with seemingly no prior experience in perfumes seeking loans to set up a business for *myrepsikê*. Presumably this would mean acquiring slaves or hiring individuals skilled in the production of perfumes. Whether he then intended to sell these perfumes retail or wholesale (for export?) is not stated; perhaps both. In a (fragmentary) speech of Hyperides (*kata Athenogenous A*) we hear of the purchase of a slave whose specialty is perfumes (production or sales?); we also hear of his former master, an Egyptian named Athenogenes, perhaps an expatriate perfume guildsman. In this case, the speech implies that Athenogenes produced and sold perfumes; the business is called both an *ergasterion* and a *myropolion* (sec. 6). Probably there were some perfume makers, whether in the east or the Aegean, who specialized mostly in production for long-distance trade, and some more localized perfume producers/sellers who imported ingredients and specialty perfumes from

⁷⁴⁹ Secrecy among perfumers is noted in the Talmud (Babyl. Yoma, 38a). Exceptional talent in perfume making could lead, as today, to a perfume being named after the creator, e.g., the *megalleion*, said to be named after a Megallos of Sicily or Athens (Athen. XV.690f).

⁷⁵⁰ *Myrepsikos* is a compound word made of the elements *myro-* ("perfume") plus the verbal root *eps-* ("to boil"); *myropolos*, again a compound word, has as the final element, the verbal root *pol-* ("to sell"). The sellers acquired a notorious status in Classical Aegean society, partly because (excessive) perfume use, and hence any connection with perfumes, was seen as effeminate, but also because the shops were where trouble-makers often loitered and conspired while tasting the wares. See Faure, 1987, 166; Lewis, 1995; Soverini, 1997. Note also there was at the time of Solon (early 6th c.) a question of whether or not men should be engaged in perfume sales, let alone their use; women perfumers in 4th c. Egypt are known from artistic representations (Brun, 2000, fig.1; Athen. XV.687a). While spending too much time at the perfumers could give one a bad reputation, not spending any time there was seen as anti-social and thus gave equal cause for suspecting someone's character, or so the orators would have us believe (cf. Dem. *Arist.* A.786).

overseas.⁷⁵¹ Perfume shops could therefore conceivably range from tiny stalls selling pre-manufactured wares, to larger operations producing, mixing, and selling a wide variety of scented goods; such a range of perfume shops are found today in the suqs of Damascus and Aleppo. Whatever the scale of the shop, however, the costs of business overhead were considerable: perfume ingredients were not cheap, nor were the other pre-manufactured goods like imported perfumes and perfume bottles.⁷⁵²

How perfumes were transported, both over longer distances across the seas and over shorter distances across town, is an issue deserving more attention than it is often given. Generally, the explanation given for non-local finds of small ceramic, glass, metal, or alabaster (perfume) containers is that they were imported not for their own value but rather for the value of their contents. Perfumes, therefore, went abroad in small, non-bulk containers made in the same locale as the perfumes themselves. This can only be partially correct. High-value perfumes, like certain Egyptian types, no doubt were often shipped in smaller, low volume containers of great value, such as core-formed glass vessels or alabastra.⁷⁵³ This might be done for the sake of prestige or simply to preserve the perfume from spoilage. But, some perfumes were no doubt shipped in bulk metal, stone, ceramic or hide containers for redistribution into the smaller vessels in the

⁷⁵¹ Specialized production of perfume for export would be on analogy with "export ware" (see Fineware).

⁷⁵² The cost of the perfume shop in Hyperides speech was 42,000 drachmas, equal to the purchasing power of millions of US dollars today. Also see Brun, 2000, 278, 289, and 300-301 on the expenses of running perfumes shops.

⁷⁵³ The find of one alabastron on the 5th c. ship that sank at Tektas Burnu might suggest low volume perfume trade in such containers; the alabastron could also have been a personal affect of one of the crew. As yet no analysis has been done on the find to determine if it contained perfume when the ship went down (Carlson, 1999, fig. 12; personal communication).

perfume shops, as a scene on a mid-5th c. red figure *pelikê* from Athens illustrates.⁷⁵⁴ Moreover, small specialty containers, like those of alabaster and glass, might have been imported empty to be purchased and filled with a perfume of choice at the shops.⁷⁵⁵ We now turn to the perfumes themselves.

The popularity of perfumes, and their many uses, encouraged the invention of countless flavors of perfume, as is the case today. Unlike today, however, Persian period perfumes were manufactured as one of three basic types, wet to dry. Theophrastus (*Od.* 8) notes these three general categories of perfumes: perfume powders (*diapasmata, syntithentes*; made by mixing solid with solid), unguents and/or ointments (*myra, khrisma*; made by mixing solid with liquid), and perfumes (*myra*; made by mixing liquid with liquid). Unguents and perfumes, the wet varieties, used one or combined several types of oils as a base, in contrast to today's perfumes, which are mostly alcohol-based. As a result, almost every ancient perfume was consumable; perfumes were commonly mixed with wine, though rarely with food.⁷⁵⁶ These same qualities also made some

⁷⁵⁴ In the Ahiqar customs account, an Aramaic word for “jar,” *sp*, appears frequently as a container for oil. As Briant and Descat explain (1998, 70-71), this type of jar had associations elsewhere with perfumed oils and seems to have had a capacity of around 5 liters. While they are not certain in the case of the customs accounts if in fact the oil in these jars is perfumed, they do not deny the possibility. If so, we have here records of bulk perfumed oil shipments to Egypt from Asia Minor (?), ca. 475. The red figure *pelikê* illustrated in Sparkes and Talcott (1977, fig. 47) shows a man dispensing perfume from a jar of what looks to be about 5 liters through a funnel into a smaller, alabastron-type container. Also note a Palmyrene (Tadmor) tariff (dated A.D. 137) which charged different taxes on perfumes according to the method of transport: alabaster or goatskin containers. See Hassel, 1997.

⁷⁵⁵ Among the inventory of items in Athenogenes’s perfume shop, as noted by Hyperides (V.6), are *alabastra*, presumably empty, in addition to the perfumes and ingredients. A closed vessel form therefore does not necessarily mean it was shipped for its contents. These issues will be further explored below, when these containers are addressed separately

⁷⁵⁶ Thphr. *Od.*, 10, 44, 51, on perfumes in wine. A fragment of Antiphanes (*apud* Athen. XV.690a) speaks of a man at a perfume shop “tasting” (*geuomenos*) the perfumes. See also Cant. 8:2.

perfumes more susceptible to spoilage; thus certain precautions had to be taken during production, storage and transport to avoid this.⁷⁵⁷ The production of oil-based perfumes followed a number of courses, but generally included hot or cold steepage of the scented ingredients in the prepared oil.⁷⁵⁸ Perfume powders, on the other hand, were not so complicated to prepare, requiring little more than a (random) mixing of the dry ingredients on hand.⁷⁵⁹

Theophrastus (*Od.*) and Athenaeus (XV.676-691) are the best sources for enumerating the individual flavors of *myra* (liquid perfumes) and for identifying those that were likely transported as finished products, whether west- or east-bound.⁷⁶⁰ Theophrastus discusses 15 separate types of perfumes, Athenaeus 24, and between the two authors 11 types overlap. Since Athenaeus draws on post-Classical sources, a few of the types he lists can be considered later inventions, although he does not indicate the dates of invention. However, he does note at least six perfumes, not mentioned by Theophrastus, that were likely found in the

⁷⁵⁷ The large quantities of salt used in the manufacture of rose perfumes were to prevent the decay that could easily occur during the manufacturing process (Thphr. *Od.* 26; Dsc. II.53).

Theophrastus also notes (*Od.* 40-41) that perfumes could be ruined by exposure to heat and sunlight which is why certain materials for containers, e.g., alabaster and lead, because of their cool, closed properties were preferred for storing perfumes. One also had to be careful to keep insects away from stores of perfume since dead flies could make a bottle of perfume stink (cf. Eccl. 10:1).

⁷⁵⁸ Extended discussions of the manufacturing process of ancient perfumes can be found in Shelmerdine, 1985 and Brun, 2000. In addition to the special types of oils used, e.g., balanos oil and sesame, only special grades of oil were suitable for use in perfumes, thus perfumers, if olive oil was used for a base, would often render their own oil to insure acceptable quality (Brun, 2000, 300).

⁷⁵⁹ “As a matter of fact the custom is to use a mixture of many things (*hapanta khrontai*). Again in perfumes of this class the aim is not to make the mixture smell of some one particular thing, but to produce a general scent derived from all.” (Thphr. *Od.* 57, trans. Hort.).

⁷⁶⁰ Pliny (bk. XIII) and Dioscorides (bk. I) also discuss perfume manufacture and lists various types, totaling 28 between them, most of which were known to Theophrastus and Athenaeus’ sources. Here I limit myself to just Theophrastus and the Persian period writers found in Athenaeus.

5th and 4th c. Aegean; the total number of (roughly) Persian period *myra* noted therefore is 17. These are:

1) *amarakinon*: Marjoram perfume. Theophrastus (30) states that no actual marjoram is used to produce the perfume; the name is a misnomer. However, a fragment of Apollonius (*apud* Athen. XV.688f) claims that by the 1st c. (B.C.), marjoram, especially from Cos, was used in the perfume. Theophrastus also notes (31) that this perfume was colored with a dye, *khroma*, imported from Syria.

2) *basileion*: Unknown composition; noted only in Sappho (*apud* Athen. XV.690e).

3) *kinnamôminon*: Cinnamon perfume (Antiphanes *apud* Athen. XV.690a). An undated alabastron from Egypt bears the inscription: *Kinnamômon para Krinippou* ("Cinnamon [perfume] from [by?] K.").⁷⁶¹

4) *kyprinon* (*kypros?*): Henna perfume. Apollonius (*apud* Athen. XV.688f) says that the best henna for this perfume comes from Egypt, the second best from Cyprus and Sidon. Presumably, Theophrastus' *kypros* (25, 31, 42) is also a henna perfume.

5) *aigyption*: One of the most costly and difficult to make of ancient perfumes since it included such ingredients as myrrh and cinnamon (Thphr. 30, 38, 42, 44; Anaxandrides *apud* Athen. XV.689f; Achaëus *apud* Athen. XV.689b, etc.).

6) *erpyllinon*: Thyme perfume (Antiphanes, *apud* Athen. XV.689f).

⁷⁶¹ Amyx, 1958, 213, n.103.

7) *irinon*: Iris perfume, noted by Theophrastus for its medicinal properties (36), the endurance of its scent (38), and that it uses very few ingredients.

8) *megalleion*: With *aigyption*, one of the most expensive and troublesome perfumes to make, again because of the imported spices used for ingredients (Thphr. 28, 30, 31, 42; see also Aristophanes, Pherecrates, Strattis, Amphis, Anaxandrides *apud* Athen. XV.690f).

9) *nardinon*: Nard perfume (Thphr. 28; Antiphanes *apud* Athen. XV.690a).

10) *oinanthinon*: Vine-based perfume. Theophrastus observes that the best ingredients for this perfume come from Cyprus (27), a sentiment reiterated centuries later by Apollonius (*apud* Athen. XV.688e).

11) *phoinix*: Because of the confusion inherent in the Greek word *phoinix* (= red; Phoenician; date palm), it is unclear if this perfume is made from a date palm oil (distilled from the wood?, cf. Thphr.*Od.* 28), or if it might be a Phoenician import (or type), of unknown composition, as implied in Antiphanes' list of perfumes used by a woman bathing (*apud* Athen. XV.689f).

12) *psagdas* (*sagda*): Unknown composition; presumably an Egyptian import (Aristophanes, Eupolis, Eubulus *apud* Athen. XV.690e).

13) *rhodion*: A popular type, rose perfume was used in wine and was a suitable fragrance for men (Thphr. 42, 51). Apollonius noted that in his time the best roses for the perfume came from Phaselis, the best perfume, a century or so

before, from Cyrene (*apud* Athen. XV.688e, 689a). *Rhodion* might also refer to perfume from Rhodes, well-known in antiquity for its perfumes.⁷⁶²

14) *krokinon*: Saffron perfume. The best saffron for perfumes came from Aegina or Cilicia (Thrh. 27). See also “Saffron” above.

15) *sisymbriion*: Mint perfume (Antiphanes, frg. 106).

16) *staktê*: Myrrh oil perfume (see “Myrrh” above)

17) *têlinon*: Fenugreek perfume. Fenugreek, *Trigonella foenum-graecum*, is a native to southern Europe and Asia. Apollonius (*apud* Athen. XV.689a) claims that in ancient times (i.e., the Persian period?) Syria produced the best quality perfumes, especially fenugreek, although in his day this was no longer the case. Antiphanes (*apud* Athen. VI.257d-e), on the luxury of Cypriot kings, notes their use of “Syrian perfumes” (including fenugreek perfume?).

Despite some foreign names among these perfumes, how many of them were actually imported to the Aegean is not easy to determine; for Aegean exports of specific perfumes to the Levant we have virtually no evidence.⁷⁶³ Perfumes from Egypt had a very good reputation in the Aegean during the Persian period, as did, it seems, those from Syria. But rarely are such specific notices of the trade in perfumes given; rather famous recipes and their ingredients are mentioned, which could be replicated anywhere as long as the skills and ingredients were available. Some version of the famed *aigyption* (“Egyptian”) perfume, for example, could have been made (or imitated) in the Athenian shop of

⁷⁶² Burkert, 1992, 17; S. Morris, 1992, 132-33.

⁷⁶³ The *mshh bshm* (“scented oil”) noted in a number of Aramaic letters (e.g., *TADAE* I.A2.4, lns. 10-11) from 5th c. Egypt is thought to denote imported perfumes (cf., Grelot, 1972, 156). Athens was known as a perfumed oil exporter, as Antiphanes (*apud* Athen. 27e) states, but perhaps mostly a special (perfumed?) Panathenaic variety (cf. Athen. 688f).

Athenogenes, the Egyptian metec in Hyperides speech.⁷⁶⁴ Unless specified as imported, we have no way to distinguish the Athenian-made *aigyption* from the imported *aigyption*, both of which, imported and indigenous, might have been sold in the same shop. The same holds true for any of the *myra* listed above. Thus, while trade in *myra* is implied by the names of some perfumes and by foreign-type containers, like alabastra, we cannot be overly reliant on either of these as proof for the trade or its volume. The trade did exist, as it did before and continued after the Persian period, but for the moment it remains more in the shadows than clearly seen.

Powdered perfumes (*diapasmata*), unlike the wet varieties, are never mentioned explicitly as long-distance trade items. This may be due to their less sophisticated method of manufacture (cf. Thphr. 57); like today's potpourri, most anyone could throw some together. Nevertheless, if Hesychius is to be believed, two famed types of perfumes, *bakkaris* and *brênthinon*, were powdered varieties that may have been traded.⁷⁶⁵ Indeed, some of the earliest Persian-era trade in perfumes between the Levant and Aegean may have been in such powders. As Shelmerdine has argued, the Mycenaean and Homeric practice of using *myra* to scent clothes and bedding died out by the Classical period.⁷⁶⁶ One reason for this, not suggested by Shelmerdine, is that the use of powder perfumes, which may not

⁷⁶⁴ Another itinerant perfumer, a Phoenician, left graffiti marking his name and profession at Abydos sometime during the Persian period (*KAI* 49).

⁷⁶⁵ Hesychius, s.v. Trade in powdered perfumes is specifically noted in Song of Songs (Cant. 3:6): *'biketh rokel* = "the powders of the merchant" sold along with myrrh and frankincense.

⁷⁶⁶ 1995, 102.

have been widely available, if at all, before the Persian period, could have superseded the liquid varieties for such purposes.⁷⁶⁷

V.2 TEXTILES

Ancient textiles have received a great deal of attention in recent years, not only in the form of technical studies detailing production methods and means, but also considerations of the social aspects of clothing, tapestries, rugs, and the gender and status of those who made and used them.⁷⁶⁸ Our evidence for ancient textiles, while heavily dependant on literary sources, is greatly subsidized by the visual arts--vase paintings, sculptures, and reliefs--and by a few scraps of actual textile remains. We should also keep in mind that (coarse) textiles and related fibers served as sails and ropes for the thousands of ships plying the waters at any given time, and as sacks for the commodities carried onboard. But with all the attention paid to the finer, more exotic textiles, this later, industrial group has been essentially overlooked.⁷⁶⁹ All told textile production and trade must have

⁷⁶⁷ Cf. Thphr. 57. There are no references to powdered perfumes as such in Homer or Hesiod. Hipponax's mention of *bakkaris* (*apud* Athen. XV.690b, where it is said to smell like saffron), and the mention in Song of Songs are likely the earliest notices.

⁷⁶⁸ The most valuable study for production methods is Barber 1991. Since publication of this major work, focus has mostly shifted to the social and economic aspects of various types of textiles, e.g., Miller, 1997, Chps. 3 and 7; a series of papers presented at the AIA panel, "Dress and Gender in the Ancient World: Appearance and Reality," summarized in *AJA* 104 (2000), 355-56.

⁷⁶⁹ Very few have addressed the manufacture of sails and ropes for ancient ships, and to a lesser extent sacks. The materials, dimensions, and construction of ancient sailcloth and ropes, items which by their very nature required far more tensile strength and ability to endure abuse than ordinary textiles, are almost completely unknown (see Casson, 1971, 233ff; Morrison and Coates, 1986, 186; Charlton, 1996).

played a far greater role in ancient economies than the archaeological evidence and textual references admit.⁷⁷⁰

It is mostly the high value and highly worked garments, tapestries and rugs, that, like other prestige items, receive most of the attention in our sources, including the visual. Some items, like the famed Sybarite *himation*, the tapestries from the Jerusalem temple, those captured from Xerxes' tent following the battle of Plataea, and the *peploi* produced for the Panathenaic festival, were objects of wonder and awe.⁷⁷¹ Such items, we can be sure, rarely entered a trade context, or if they did, it was in the form of booty, not as a commodity. What may be considered more like mass-produced prestige textiles, e.g., purple-dyed robes, embroidered or elaborately decorated garments, wall hangings and bed spreads, were more readily available to those with means. It is, of course, difficult to gauge how great this demand may have been, and more important for this study, how many of these items were exported and imported.

Written sources for Athens, an exceptional and wealthy trading center, imply a robust demand for prestige textiles over the course of the 5-4th c. A young social climber in Aristophanes, for example, gives pointers to his rustic

⁷⁷⁰ One need only glance through the various sections of the *PME*, for example, to see that textiles were imports and exports expected at most every port. Unfortunately, we have no way of quantifying the importance of the ancient production and trade. In much earlier and later periods, some quantifiable evidence for textile economics exists, e.g., the Linear B tablets from Knossos and Pylos, and records from medieval Egypt, both of which show textile production and distribution were major sectors of these two very different economies. Frantz-Murphy (1981), in fact, has suggested that the economic prosperity of medieval Egypt hinged almost solely on the textile industry. Certainly in other areas of the eastern Mediterranean at earlier times, textile production must have been just as important for other communities. For the Persian period, there are hints here and there of textile production playing a major economic role in some places, e.g., Miletus and Gordion (Burke, 1997), but nothing as secure as one would hope.

⁷⁷¹ For commentary, ancient and modern, on these works, see Vickers, 1999, 25ff.

father on how to admire a host's tapestries, while at the same time dressing him in a Persian *kaunax* (*Vesp.* 1215); Plato meanwhile shakes his head at the overabundance of fine pillows and bed covers in Athenian homes (*apud* Athen. II.48b); and there are certainly many references to high-priced clothes of various sorts (e.g., Ar. *Vesp.* 1131ff.). Textiles generally were quite valuable; rich textiles many times more so.⁷⁷² While there were surely not many individuals in most communities who could have afforded fine imported textiles, those who could likely purchased enough examples on a regular enough basis to support the trade. Besides their use for display value, the wealthy probably bought large numbers of (fine) textiles for their intrinsic value, as investments of a sort. Among the Homeric elite, textile hoarding was common practice, as was the use of textiles as gifts within elite circles; such practices may have lived for generations afterwards.⁷⁷³

⁷⁷² Anna Taylor, in a colloquium given in Austin, Texas, 1 October, 1999, offered production figures and cost analysis for the manufacture of one, basic wool, Greek-style *peplos* by an individual: with a reliable wool supply, it would take approximately 280 hours just to spin the wool for one garment, and another two months working 50 hours per week to weave it. One person therefore could produce only six or so basic *peploi* per year each of which could be sold for nearly 10 drachmas, a considerable sum. Prices for embroidered or otherwise decorated and dyed garments could easily cost hundreds of drachmas, if not hundreds of thousands; we hear of one exceptional *peplos* in Carthage in the late 6th c. which cost 120 talents, that is 720, 000 drachmas (Polemon *apud* Athen. XII.541b), i.e., the equivalent purchasing power of several million US dollars.

⁷⁷³ E.g., *Il.* VI.288-95. The records of the auction in 414 of the very wealthy Athenian Alcibiades' confiscated estate, included 22 *himatia*, which may have only been the dregs of his actual ownings (Pritchett, 1956, 167, 190-210); the less well-to-do had to suffice with generally only one garment. See, for example, a 7th c. Hebrew ostrakon from Mevad Hashavyahu containing a complaint from a field worker to his overseer who had confiscated the man's only cloak; the poor worker was freezing (*NEAEHL*, II, 585). Also, with the development of the Greek temple through the course of the 7-6th c. centuries serving as, effectively, treasure houses and museums, fine textiles were dedicated and stored within; this could be considered another (communal) form of textile hoarding (cf., Eur. *Ion*, 1141ff.; Harris, 1995, 114ff.; Linders, 1972, 60ff).

It is, however, exceedingly difficult to make even a guess at what percentage of the overall textile trade the (international) trade in fine textiles may have been at any given time during the Persian period. Towards the end of the 5th c., Athenian fashion incorporated a number of oriental exotica, which the written sources often mention, and which scholars have sought to identify in the visual arts, e.g., the *syria*,⁷⁷⁴ Persian belts,⁷⁷⁵ *persikai*,⁷⁷⁶ *kaunakês* or *persis*,⁷⁷⁷ *khiton kheiridotos* or *sarapis*,⁷⁷⁸ *kandys*,⁷⁷⁹ *epëndytês* or *kypassis*.⁷⁸⁰ To these can be added the *kalasireis*, a long fringed, Egyptian cloak (Cratinus, fr. 30; Hdt. II.81⁷⁸¹), and the *exomidês* of Megara (Xen. *Mem.* II.7.6). We also hear of foreign *parapetasmata* (tapestries) in the Aegean,⁷⁸² as well as *dapides* and *hyphasmata*

⁷⁷⁴ A fine wool cloak, presumably from the Levant, as the name implies; Hesychius, s.v.; Cratinus, *PCG* IV, fr. 222; Miller, 1997, 153; 155, n.14.

⁷⁷⁵ Specifically, “persian belts of the wealthy” (Plato, *Hippias Minor* 368c7).

⁷⁷⁶ A type of women’s shoe; Ar. *Lys.* 229; *Thes.* 734; *Nubes* 149ff. This fashionable footwear was found also in Egypt: an Aramaic dowry contract dated October, 420, lists among the possessions of the bride a pair of *prsin*, “Persians” (*TADAE* II.B3.8, ln.20)

⁷⁷⁷ A very heavy wool cloak; Pollux (VII.60) says the cloak originated in Babylonia, while Aristophanes (*Vesp.* 1131-47) says, jokingly, that it comes from Ecbatana. See Miller, 1997, 154.

⁷⁷⁸ A colorful, patterned cloak, generally of wool. See Miller, 1997, 156-165, for an extensive discussion of the garment, textual and visual sources.

⁷⁷⁹ Originally a leather cape of sorts dyed purple. Examples dedicated at the sanctuary of Artemis Brauronia in Attica are also of (green) linen and possibly silk. Again, see Miller, 1997, 165-170, for discussion and possible visual examples.

⁷⁸⁰ Perhaps the *lubulte birme* noted in earlier Iron Age Assyrian texts as booty and tribute from the west (i.e., Syro-Phoenicia). If so, these were of elaborately and colorfully woven wool. Again, see Miller, 1997, 170-183, for extended discussion.

⁷⁸¹ The dowry mentioned above (n.776) also mentions a wool garment called *shbit*, which the editors suggest may mean “fringed,” worth seven shekels (approximately 14 drachmas).

⁷⁸² In Eur. *Ion*, 1141ff., the tapestries as said to be barbarian spoils, as were those recovered from the tents of the Persians after the battle of Platea (Hdt. IX.82). Persian, or better Median, tapestries are also mentioned by Aristophanes (*Ran.* 937). *Parapetasmata duo barbarika poikila* were dedicated at the sanctuary of Samian Hera (Miller, 1997, 167, n.112).

(rugs, throws),⁷⁸³ and *proskephalaia* (pillows).⁷⁸⁴ The Aegean appetite for fine foreign textiles was no doubt fed to some degree by Levantine producers; for generations Aegean Greeks recognized Phoenicia as a center of fine textile production and export,⁷⁸⁵ a reputation which held true in the Levant as well.⁷⁸⁶ Ezekiel (27) gives an idea of the quantities and types of textiles passing through Phoenicia in trade: fine linen from Egypt and Aram/Edom (27.7, 16), woolen saddle cloths from Dedan (27.20), and from farther east and south (Media and Arabia?) bundles or crates of multicolored/embroidered stuffs (27.23).⁷⁸⁷ Some of these items must have found their way to the Aegean, along with items from Cyprus,⁷⁸⁸ but whether Hebrew *glomai* ("cloaks"?, Ezekiel 27:24), for example, were the still the equivalent of 5th c. Greek *khlamydes* is open to question.⁷⁸⁹ Or

⁷⁸³ Hermippus (*apud* Athen. I.28a) mentions *dapides* from Carthage; similar items also came from places closer to home, e.g., Corinth (Antiphanes *apud* Athen. XII.525d) and Miletus (Ar. *Ranae* 542). See also Pollux X, where he lists different types of bed draperies.

⁷⁸⁴ Hermippus (*apud* Athen. I.28a), from Carthage.

⁷⁸⁵ E.g., the Sidonian textiles which Paris brings back from the Levant (*Il.* VI.288-95); Photius (s.v. *skapphas*) notes that *phoinikous khitonas* were carried on silver platters during the Athenian Panathenaic festival; also see the Souda, s.v., *Sidoniai stolai kai tapetes*.

⁷⁸⁶ Already in the Bronze Age, a Tyrian robe inlaid with rubies is mentioned in texts from Ugarit (Dahood, 1966, 275). In the 9th c., Ashurnasirpal II boasted of receiving 1000 garments of multicolored linen from Tyre, Sidon, and Byblos (*ANET*, 276). Cf. Psalms 45:9, where a Tyrian robe is among the royal gifts.

⁷⁸⁷ Interpretation of the textile vocabulary in this last verse especially is problematic (see Greenberg, 1997, 559ff.). The general sense, if not the precise meaning and locales, is clear: Tyre received great amounts of textiles for export from various regions around the Near East. Here too is a good place to note that textiles, often packaged in bales or, if more valuable in protective containers, could be seriously damaged when shipped in leaky wooden boats unless suitable precautions were taken (cf. Garoche, 1952, 89). Garoche also cautions against stowing cloth goods with chemicals or oils as spontaneous combustion may occur—a fate which seems to have befallen a cloth and chemical laden ship mentioned by Theophrastus (*de Lap.*, 68; see Caley and Richards, 1956, 219 for commentary).

⁷⁸⁸ See Raptou, 1999, 155-56, for the role of Cyprus in the Persian period textile trade.

⁷⁸⁹ Szmerényi (1974, 148) notes that Greek *khlamys* was an early Semitic borrowing. One piece of indirect evidence, noted by Braun (*CAH*, Chp. 36a, 27; cf. Masson, 1967, 93-94), for “massive” imports of textiles to the Aegean from the Levant during the Iron Age is the fact that the Greek word for clothes moth, *ses*, is identical with that in west Semitic languages (cf. Isa. 51:8).

for that matter, some progress might be made if equations could be found for a number of unknown textile terms found in 5th c. Aramaic letters from Egypt.⁷⁹⁰

Even with such relatively abundant evidence for the (fine) textile trade, we need to be cautious. One problem, as M. Miller has done well to illustrate, is that some “foreign” garments noted in Aegean sources were made locally, whether as direct imitations of popular foreign garb, or as adaptations.⁷⁹¹ It should be remembered that among the various craftsmen Pericles was said to have introduced to Athens from abroad were the *poiklitai* (“weavers of complicated fabrics”), many of whom could have made textiles indistinguishable from those imported.⁷⁹² Without a “made in X” label, or its equivalent, we cannot be sure if a *kaunakês* was actually made in “Ecbatana,” or in the Piraeus. Our ability to estimate the volume or extent of the west-bound textile trade, for that reason, becomes more complicated. For the east-bound trade, there is far less evidence, for finished garments particularly. Ezekiel (27:7) mentions the import of purple and blue textiles “from the isles of Elisha” (*m'yai 'lishah*), possibly someplace

⁷⁹⁰ Especially the letter *TADAE* I.A3.2, wherein are listed: 1 *sttn* tunic, 1 *w'sh* garment...1 *p'ks*, 1 dyed *srhls*.

⁷⁹¹ Miller, 1997, chp. 7.

⁷⁹² Plut. *Per.* XII.8. Some of these craftsmen may also have been slaves. The notorious Timarchus, for example, received among his inherited goods a shoe factory with nine or ten skilled slaves (turning out *persikai?* *lakonikai?*), a woman who wove fine goods specifically for the market, and a man skilled in embroidery (Aeschin. I.97-99). Unfortunately, there is no indication of where these slaves originated or where they had been trained. See also, Xen. *Mim.* II.7.6, where Socrates alludes to two men who kept slaves to make cloaks for the market. Although not a precise analogy, modern industrial business practice encourages the establishment of factories abroad, which produce goods little changed from those made at home, in order to save costs and avoid import duties. Most of the BMW and Honda cars now sold in the US, for example, are made in the US, although the companies are still based in Germany and Japan respectively.

close to or in the Aegean;⁷⁹³ a Babylonian text of the 6th c. mentions 4 1/2 minae of blue wool from Ionia.⁷⁹⁴ Finally, too, there is the 130 tons of 200-year-old purple-dyed cloth/clothing (?) from Hermione which Alexander found at Susa has already been discussed (Plut. *Alex.* V.36; see “Marine Purple” above).

So far we have considered mostly the finer, finished textiles in trade. But we should not forget the raw fibers, yarn, ropes, cables, as well as semi-finished bolts of cloth of various grades and material that were also traded. Some types of material may have come from regions quite far from the Mediterranean. Neither silk nor cotton, for example, is native to the Mediterranean, but both reached the area during the Persian period, perhaps passing through the Levant on their way west.

Until the discovery, in the 1960s, of true Chinese silk in a 5th c. burial in the Ceramicus in Athens,⁷⁹⁵ there was considerable doubt as to whether the diaphanous *amorginon khiton*, noted by Aristophanes (e.g., *Lys.* 150ff.), could be Chinese in origin. In her 1929 article, for example, Richtner reviewed earlier suggestions that *amorginê* cloth was a particularly type of fine linen, or mallow, before coming to the conclusion that the cloth was not from the Chinese mulberry silkworm, *Bombyx mori*, but rather a wild silk worm, *Antheraea pernyi*, found in

⁷⁹³ Commentators are far from any agreement on where Elisha may, some propose Ionia, others Cyprus, still others Carthage; see Greenberg, 1997, 550, for a summary of the arguments. Greenberg, however, finds the idea of Phoenicia importing cloth from the west strange considering its own local industry. But this should not be the case if we consider the concept of distance-value: Aegean fabrics would be exotic to the Phoenicians, even if their own were of more refined technique. Also, the LXX translation of verse 27:18, where white wool, is brought from someplace east of Phoenicia, inserts “white wool from Miletus.” Editors generally dismiss this emendation as unfounded.

⁷⁹⁴ Weisberg, 1982. However, Wiesberg thinks this must be a special case, since Ionian wool does not appear in other texts.

⁷⁹⁵ Hundt, 1969.

the Aegean and Levant;⁷⁹⁶ *Bombyx* was not cultivated in the Mediterranean, so the story goes, until some industrious Byzantine monks brought the eggs out of China in a clandestine operation.⁷⁹⁷ The cloth noted by Aristophanes, on analogy with the Roman *Coae vestes*, came to be known as *amorginê* because the island of Amorgos, on the trade route from the Levant, was where the raw material first entered the Aegean and was there worked into cloth.⁷⁹⁸ Analysis of the finds from the Ceramicus proved the silk to be Chinese; it also showed that the silk had been reworked at some point in a fashion akin to techniques found in northern Europe at the time.⁷⁹⁹ Roughly contemporaneous finds of silk in southwest Germany and in kurgan burials in the Altai mountains have led Barber to argue that whatever amount of Chinese silk, in the form of bolts or reworked clothes, reached the Aegean, it did so by way of northern routes through the Black Sea.⁸⁰⁰ The later Silk Road, of course, passed farther to the south, ending in modern Syria.⁸⁰¹ Unfortunately, aside from the word *meshi* found in Ezekiel (16:10, 13), often translated as “silk,”⁸⁰² and the cloth from the island of Amorgos—not on the Black Sea trade routes—there is little else that points directly to the Levant

⁷⁹⁶ Panagiotakopulu, *et al.*, review the evidence for Aegean silkworm species; they also suggest (p. 428) that Linear B *tu-na-no*, a term designated a special type of cloth, might refer to (indigenous) silk.

⁷⁹⁷ Barber, 1991, 32.

⁷⁹⁸ Richtner, 1929, 31; cf. Blümner, I, 1875, 202.

⁷⁹⁹ Barber, 1991, 31-32; Good, 1995, however, casts fresh doubts on the identification of this silk as Chinese.

⁸⁰⁰ 1991, 205.

⁸⁰¹ Cf. Thorley, 1971.

⁸⁰² See Greenberg (1983, 278-79) for discussion; Greenberg expresses doubts that silk was known in western Asia in the 6th c., but see the following note.

playing a part in shipping silk, in quantities great or small, to the west at this time.⁸⁰³

For cotton (*Gossypium herbaceum*; Grk. *sindôn*, Semitic, *ktn*⁸⁰⁴), a native of India, the evidence is equally confused. Herodotus (III.47) records a gift of a corselet sent by the Egyptian king Amasis to the Spartans, which was hijacked enroute by the Samians; the corselet was made partially of cotton. Later on, while enumerating the finest products of the remotest corners of the world, he includes cotton in the list and notes its superiority to wool (III.106). As rare and exotic as cotton may have been for Herodotus and other Greeks of his time, cotton did reach the Aegean, as more textile finds from around Athens have proven. A 5th c. burial excavated in Attica in the 1950s uncovered a fragment of true eastern cotton, along with fragments of other exotic textiles, like hemp.⁸⁰⁵ By the mid-1st c. A.D., cotton textiles from India were no longer so rare or exotic; the *PME* records large amounts of cheap-quality cottons shipped west through Arabia and Egypt.⁸⁰⁶ Similar trade routes may have been in place earlier, as the cotton used by Amasis may indicate. Cotton might also have reached the Aegean via more

⁸⁰³ Richter (1929) also argued that the *medikê esthês* noted by Herodotus (I.135, III.84, VII.116) and Xenophon (*Cyrop.* VII.40) should be considered silk, thus opening the door to a greater circulation of silks in the Near East and Levant. Miller (1997, 78) sees little problem with the idea of Chinese silk, in some unfinished state, passing through the Levant and on to Amorgos where it was re-worked. She also suggests (79) that silk, in Achaemenid contexts, was probably familiar in Ionia before and after the revolt in the mid-490s, and that the Athenians likely first met true silk in the booty they collected from the Persian Wars. Good, 1995, is highly skeptical of silk appearing in the Mediterranean this early.

⁸⁰⁴ Semitic *ktn* has at various times, in Hebrew, Aramaic and Arabic, been used to translate “cotton” (its primary meaning today) as well as “linen,” and (linen) shirts (cf. Zohary, 1982, 78; *Encyclopaedia of Islam*, s.v., kattan). However, another Hebrew word *karpas* likely stood for cotton during the Persian period.

⁸⁰⁵ Zisis, 1955; see also Barber, 1991, 32-33.

⁸⁰⁶ See Casson (1989, 292-93) for discussion.

northerly routes, from India through Media and on to the Levant. Only once in the Old Testament is cotton (*karpas*) noted (Esther 1:5-6), in a description of the Achaemenid palace at Susa, suggesting that the Persians could have developed a taste for the fabric, which was then passed to their subjects farther to the west.

Levantine-Aegean trade in more mundane textiles types, like linen and wool, or coarser grades of textiles, is more difficult to identify. Certain types of wool, like the famed Milesian wool,⁸⁰⁷ may have been traded in a raw or raw-dyed state, as the references from Ezekiel (27:7) and Babylonia mentioned above may imply.⁸⁰⁸ The large numbers of wool garments noted in various 5-4th c. Aramaic documents might indicate that Egypt was a major market for Aegean (or Levantine) wool.⁸⁰⁹

Far more important than wool, at least from a strategic standpoint, for both Levantine and Aegean customers was flax (linen; Grk; *byssos*, *linon*, *othonê*; Heb. *kitan?*, *shesh*, *buts*), especially the supplements to native production provided by Egypt. *Linum usitatissimum* L., a Levantine native, was likely introduced to both

⁸⁰⁷ On the far-flung fame and trade of Milesian wool, see Athen. XII.519b; Ar. *Ran.* 544, *Lys.* 729; Schol. Aelian, *Nat. Anim.* XVII.34, etc.

⁸⁰⁸ Trade in raw, unspun wool, is most clearly illustrated by a 4th c. inscription (*JGSK* I, 15), found in Chios, setting the rules that wool-dealers are to follow in the market place, among which is the injunction against selling wool when it rains, to preclude the wet, and thus heavier wool, from commanding a higher and unfair price. See also Theocritus, *Adon.* 18ff, where a husband brings home (worthless) raw wool from the market for his wife to spin. In Demosthenes (XXXV.34), we hear of a ship carrying one or two *angeion erion* (hampers of wool), a packaging method which suggests raw wool.

⁸⁰⁹ Egypt was traditionally known for its flax production, not its wool, so much so in fact that statements by Herodotus (e.g., II.81, noting Egyptian religious prohibitions regarding wool) have been taken to imply that no wool was to be found in use in Egypt—at least by the native Egyptians. Wool garments are much more frequently mentioned in the Aramaic documents than linen, a curiosity in light of Egypt's linen production (Porten, 1968, 87ff.; also note p.75 which lists a wool garment 28 times more expensive than a linen garment), which may indicate external trade. During the Roman period, Egyptian textile industries experienced a major shift from linen to wool (van Driel-Murray, 2000, 300).

Egypt and Greece at an early date; but it was Egypt that developed linen production methods, very demanding and time consuming, most extensively and thereby surpassed production in other regions.⁸¹⁰ Raw linen fibers (Grk. *styppeion*) and the coarser woven-grades came to be important naval commodities used for sailcloth, for caulking material, and rope production.⁸¹¹ For the ship building industries, commercial and military, in both the Levant and Aegean access to Egypt's flax would have been quite important, if not actually contested.⁸¹² Various grades of linen clothing may have passed at times from the Levant to the Aegean, or vice versa, without official control or attention, but it is difficult to imagine linen naval supplies doing so without drawing comment.⁸¹³ Legally or illegally, Levantine naval linens, ropes and the like (made in Egypt?) may have found their markets in the Aegean, or those from the Aegean their markets in the Levant.

⁸¹⁰ Vogelsang-Eastwood, 2000, 269-276.

⁸¹¹ Casson, 1971, 233ff; Morrison and Coates, 1986, 186ff.

⁸¹² The Phoenician ships in Ezekiel (27:7) fly Egyptian linen sails; Hermippus (*apud* Athen. I.27f) likewise notes sails, presumably linen, imported to Athens from Egypt. In Aristophanes' *Frogs* (ln.362), *lina* (= linen sails?) are among the naval stores which could not be traded to the enemy. Some indication of the scale of Egyptian production of naval linen can be gleaned from Polybius (V:89): after the 3rd c. earthquake at Rhodes, Ptolemy promised the Rhodians, among other things, 3,000 talents of *styppeion* and 3,000 pieces of sailcloth. Well into the modern period, the trade in raw, unspun Egyptian flax continued unabated for use, undoubtedly, in shipbuilding (Guo, 2001, 90, n.39; 95).

⁸¹³ See Whitby's (1998, 120ff.) comments on the protection, legislation and encouragement that Athens used to entice mostly foreign shippers to bring grain to Athens; similar enticements may have applied to those shipping Egyptian linen. Aristophanes (*Ran.* 362ff.) notes bans on exporting critical (military) naval stores, e.g., sails, leather oar-seals, and pitch, to the enemy.

V.3 FURNITURE

The movement of fine furniture within the discrete spheres of the Levant and Aegean is well attested. Although Athenian workshops produced fine furniture,⁸¹⁴ the wealthy looked elsewhere for furnishings, especially to Miletus and Chios which both made reputable banqueting couches (*klinai*).⁸¹⁵ Alcibiades, as may be expected, had Milesian couches.⁸¹⁶ Xenophon's comments on Black Sea Thracians salvaging large numbers of *klinai* from shipwrecks in the region offers evidence for a substantial, continued and seaborne trade in furniture in the Aegean region.⁸¹⁷ The seaborne movement of furniture in the Levant is shown more directly by actual shipwreck evidence: bronze furniture fragments have been recovered from the waters near Atlit and Haifa.⁸¹⁸ Further evidence for east Mediterranean furniture trade immediately before and after the Persian period

⁸¹⁴Demosthenes (I.9-10) mentions a couch factory (*klinopoios*) which he inherited; the couches are wooden and seem to have had ivory inlays, as the stocks of raw materials he relates suggest. Meiggs (1982, 297) thinks the timbers mentioned were prefabricated couch parts made of special, imported woods like cypress, maple or box.

⁸¹⁵ Critias *apud* Athen. I.28b. Also note Plato, *Reb.* 372E, on the equation of couches with luxurious living in general. Simpson (1995, 1670) remarks: "The esteem in which furniture was held in the ancient Near East would seem greater than we in the 20th century might be able to imagine." Similar comments could no doubt be made about the contemporary Greeks.

⁸¹⁶ Pritchett, 1956, 228.

⁸¹⁷ *Anab.* VII.5.14. Besides the couches, chests and books are also among the items washed ashore. Xenophon implies that couches were shipped packed in wooden crates. Xenophon elsewhere (*Oec.* VIII.11-14) notes a unit of measure, the *dekaklinos*, meaning, "having space for ten couches," in reference to a cargo space aboard a Phoenician ship. Although the measure probably has nothing to do with the actual transport of couches, but rather a way of indicated large volumes, the association is nevertheless interesting. On this measure, see McCartney, 1934.

⁸¹⁸ Opposite the outlet of Nahal Oren, 7 km south of Haifa, remains of a 7th c. (?) cargo which included zoomorphic furniture parts, helmets, a bridle, and duck-shaped weights came to light (*NEAEHL*, 961). A zoomorphic bronze table leg, possibly Hellenistic, was recently found near Atlit (Merhav, 1996). We should consider, though, that these bronze pieces were being shipped as scrap metal.

comes from Samos,⁸¹⁹ where 7th c. Egyptian made bronze furniture fittings are known, and from the papyri of Zenon (3rd c.) which mentions a set of couches, tables, sideboards, and the like being imported to Egypt.⁸²⁰ One takes from all of this the impression that fine furniture certainly might have been traded between the Aegean and Levant, even if the evidence is currently lacking.⁸²¹

V.4 METAL OBJECTS

In the treatment of the raw metals above, the shipment of metals in ore, ingot, or coin form was the focus. Metals, of course, were also sent overseas as finished products, as statues, weapons, tools, jewelry, furniture and so on. As noted, however, the intrinsic value of the metal at times might have overridden the added value of the object's form, adding one degree of complication to the study of the metal objects trade. Do the bronze statue fragments from the Porticello shipwreck (late 5th c.), for example, represent a shipment of fine art or

⁸¹⁹ Davis, 1981, 72. Also note the Assyrian tribute and booty records which show movement of fine furniture inland from the Levantine coast. See *ANET*, 275, 282, 288.

⁸²⁰ *P.Col.Zen.* I 59014.

⁸²¹ Eastern furniture was found in the Aegean during this period, as literary evidence indicates, but as booty rather than trade commodities (e.g., Hdt. IX.82.2; Xen. *Anab.* IV.4.21; IG II² 1394.11-14; see comments by D. Thompson, 1956, 290; Miller, 1997, 53ff.) This furniture, however, does not seem to have affected tastes in general Aegean furniture consumption or production, at least not until later in the 4th c. (Kyrieleis, 1969, 145ff.); the situation in Macedonia is still less clear. Persian-type furniture is known from the tombs at Pella and Pydna, but whether this might reflect actual furniture imports, the migration of artisans, or transference of form through iconography, e.g., seals, has yet to be determined (see Paspalas, 2000). Aegean furniture, on the other hand, like Aegean ceramics, might have had a following in the Levant. The only substantial pieces of furniture recovered from (land) sites in Syro-Palestine have been larger bronze components, like those from Tel Farah south (see Iliffe, 1935) and Samaria (Tadmor, 1974). Remains of wooden furniture, with ivory inlays, are known from a 7th c. tomb from Salamis, Cyprus; the furniture is thought to be imported from Phoenicia (Karageorghis, 1989, 68).

scrap metal?⁸²² This intrinsic worth of most any metal object was enough to insure that it would be desirable, and so could be disposed of in a variety of exchange systems, added value or not, e.g., actual mercantile trade,⁸²³ booty,⁸²⁴ gift-giving,⁸²⁵ or tribute.⁸²⁶ On the production end, a high volume of output comparable to ceramics, for example, would not be expected because of the intrinsic value of the metal that went into these objects, especially precious metal plate. These items were expensive to produce and so it is quite likely that most were made to order, rather than made in high volume, indiscriminately for export.⁸²⁷ This then adds yet another degree of complication, for even if the production of high-cost metal objects was comparatively low-volume, the value of the objects would generally ensure their maintenance over a prolonged span of

⁸²² Eisman and Ridgway (1987, 111) assume that there were three or more statues on board, shipped as art, not scrap. Treister (1996, 253-54) prefers to see the statues as scrap.

⁸²³ A silver mug found at Dalboki in Thrace has on its base what appears to be a commercial graffito, suggesting organized trade in plate vessels. See Johnston, 1978, 12, and Treister's comments, 1996, 261.

⁸²⁴ Cf. Miller, 1997, Chp. 2, and Treister, 1996, 262ff., on the massive wealth of silver and gold booty in various forms trading hands throughout the Persian period.

⁸²⁵ This might include diplomatic gifts, e.g., the gold *phialê* mentioned in Lysias XIX.25, and the silver bowls in Dem. XLIX.22, or the 120 + gold and silver vessels sent by the Persian King to a Cretan gentleman in the 5th c. (Athen. II.48f.). Gifts also include dedications by foreign nationals to sanctuaries overseas, e.g., the 120 gold bricks, 360 gold bowls, golden statues, etc., dedicated to the sanctuary at Delphi by Croesus (Diod. Sic. XVI.56.5-7; cf. Hdt. I.50-51).

⁸²⁶ As the metal bowls brought to the Persian King in the Persepolis Tribute Relief. See n.839 below.

⁸²⁷ See the comments by Starr, 1977, 85; Vickers, 1990, 618; and by Treister 1996, 262, on the local manufacture and trade in Locrian bronze mirrors. Nicocrates of Colonus appears several times in the Parthenon Treasury lists from the late 4th c. as a metalsmith commissioned by the temple treasurers to make vessels from silver recycled from other silver dedications (Harris, 1988, 331 esp.) From Akko, a Phoenician inscription actually preserves the initial order for a lot of metal vessels from a shrine to a guild of artisans (Dothan, 1985). The mention of "Corinthian" bronzes, e.g., Athen. IV.128d (a platter), Athen. VI.236b (jars, *kadoi*) hints that there may have been a bronze industry at Corinth geared towards export, but aside from a few references, not much else is known about it. Might this have been a quarter, like the potter's quarter at Athens, producing a large volume of wares for local and foreign consumption? Or one or two workshops producing items which happened to find its way overseas?

time. Each new metal wine set, for example, was added to the pool of heirlooms, second hand sets, and booty already in circulation. Thus modern finds of jewelry, metal plate, even arms, in trade contexts (e.g., shipwrecks) might equally represent re-circulation of second-hand goods (some hundreds of years old) or shipments of new, commissioned orders for overseas customers; such scenarios don't really apply to other commodities, like perfumes or foodstuffs, where newness (= freshness) was of paramount importance.⁸²⁸ For these reasons we really have no idea of the history or modes of circulation of any individual metal object recovered in modern excavations, or even mentioned in various texts.⁸²⁹

For this study, these complications must be considered since they confute any evidence for repetitive, continued mercantile exchange of metal objects. As in the centuries before, metal objects continued to travel east to west to east, but the mechanisms moving the objects, aside from the often mentioned gifts or capture of booty in our textual sources,⁸³⁰ are not always clear.⁸³¹ For the Persian

⁸²⁸ Pliny, however, notes (XXXIII.139): “The fickleness of human taste brings about remarkable changes in silver vessels, since no one workshop finds favor for long.” New plate no doubt was made constantly and in line with the latest trend even in the Persian period. But such objects would maintain value and could still be traded (and hoarded) decades or centuries later, like old metalware is today.

⁸²⁹ We have to bear in mind too the fact that craftsmen migrated and how that might affect the evidence. E.g., the Greek silversmiths residing in Kerch producing wares for Scythian patrons (see Strong, 1966, 87). On the migration of metal craftsmen generally during the Persian period, see Treister, 1996, 237ff.

⁸³⁰ Tribute, of course, is repetitive, but operates under its own mechanisms which are beyond our focus here.

⁸³¹ See, for example, the comments concerning various fine bronzes found on the El Sec shipwreck (dated ca. 375). Shefton suggests that perhaps we should regard “these high quality singletons as ‘introductory gifts’ specially destined for the local ruler who at the journey’s end would have to sanction or even take over the distribution and onward dispatch the mass of pottery and other quantity goods” (“Discussion” in Rouillard and Villanueva-Puig, 1989, 140). Such remarks illustrate the problems of contextualizing fine metal ware when it is found in a transit/trade setting.

period, the most conspicuous traded metal artifacts fall under the general categories of vessels, *thymiateria* (incense burners), furniture, *objets d'art*, and arms/armor.⁸³²

There are, under the heading of vessels, a number of individual categories of vessel types and materials of composition, e.g., cups, bowls, cauldrons, etc., of gold, silver, bronze, or iron. Often associated with these vessels in archaeological and textual sources are utensils like ladles and strainers, possibly components of a larger set.⁸³³ The social and monetary worth of these items is something stressed again and again in the texts: they were dedicated at sanctuaries and stored there with an eye towards their worth as bullion;⁸³⁴ individuals likewise kept them as stores of wealth and for display,⁸³⁵ as a diplomatic gesture, or tribute, precious

⁸³² These are the major metal object categories for which there is some evidence however small, direct or circumstantial, for mercantile trade. For other metal objects, e.g., tools and nails, there is no hint of international trade, though it might have occurred. Metal furniture will be dealt with under Furniture below.

⁸³³ Fine silver and bronze ladles, strainers, and censers have been found in several Persian period Palestinian graves (e.g., Tel Fer'a south, Gezer) associated with metal bowls; all of these items likely constituted partial or complete symposia sets, likely of Phoenician manufacture (Stern, 1982, 144-47; on wine sets, see Moorey, 1980). A 5th c. Aramaic memorandum from Egypt (*TADAE* III.C3.13) records a number of silver and bronze cups (*ksin*) and "sprinklers for libations" (*tlpkn*, i.e., ladles?). A value or weight in staters is given below the "sprinkler" entry which may be the value or weight of the item.

⁸³⁴ See Miller, 1997, 43ff.; Treister, 1996, 262ff.; Harris, 1995, 46ff, 65ff.99ff., etc.; and Vickers, 1990 for Aegean references and comments. The Old Testament records similar practices, e.g., II Chron. 4:1-22; Jer. 52:17-20; Num. 7:13-89; Ezra 5:14-15 mentions the return of the sacred silver and gold vessels to the Jerusalem sanctuary by the Persians which had been looted by Babylonians decades before. Also see *TADAE* IA4.7 on gold and silver vessels taken from the Jewish sanctuary in Elephantine, in Egypt, and the four bowls with dedicatory inscriptions to the goddess Han-'Iiat found with the Tel el-Maskhuta coin hoard (Dumbrell, 1971). In contrast to Aegean sources, however, no text from the Levant makes clear the connection between the bowls and their (potential) monetary value.

⁸³⁵ E.g., Lysias (XII.11) who kept in a chest three talents of silver, 400 Cyzicene staters, 100 darics, and four silver bowls; on the social use and display of fine metalware, see Plut. *Alc.* 4; Alexis (*apud* Athen. XI.502f); Antiphanes (*apud* Athen. XI.500e); when visiting the home of another, it was considered polite to comment on the host's displayed metalware. See Diphilus (*apud* Athen. VI/236b) and Ar. *Vesp.* 1214.

bowls were a standard gift;⁸³⁶ silver *phialai* also were prizes for victors in games and horse races.⁸³⁷ In the Aegean and Levant, the (aristocratic) demand for personal, exotic vessels possibly encouraged a reciprocal flow of metalware in the 6th c.;⁸³⁸ Ezekiel highlights the eastward mercantile flow of this exchange.⁸³⁹ The situation in the aftermath of the Persian Wars is murkier; following the Persian defeats at Plataea (479) and Eurymedon (ca. 469), Aegean sanctuaries and homes were inundated with heaps of vessels of all types taken as booty.⁸⁴⁰ The sudden, more widely accessible presence of these rich vessels in the Aegean stirred imaginations and desires. Attic potters copied many of the Oriental metal forms in their ceramics; we can only guess that similar imitations were produced in

⁸³⁶ Athen. II.48f; Lysias XIX.25; Dem. XLIX.22; in the Tribute Bearers relief at Persepolis, Ionians, Bactrians, Parthians, Babylonians and Lydian all bring bowls and vessels, presumably of gold and silver (see Wilber, 1989, 79-80).

⁸³⁷ Pind. *Ol.* IX.90; *Nem.* IX:51.

⁸³⁸ Scores of engraved “Phoenician” metal bowls are known in the Aegean from religious and burial contexts dating from the 9-7th c. (Markoe, 1985), showing that there was precedence for the transport of eastern bowls to the Aegean. Direct 6th c. evidence is more scarce, but scholars have noted that the beginning of Athenian ceramic imitations of “Achaemenid” metalware (in some cases probably included Phoenician) began within a generation of the Persian conquest of Anatolia, and have stressed that Athenian aristocrats of the time had likely developed a penchant for these exotic vessels just as their predecessors had (see Miller, 1997, 151). Some supplies of this plate may have been manufactured in Asia Minor (e.g., Phrygia, see Brimingham, 1961).

⁸³⁹ Vs. 27:13: Greenberg translate the verse (parentheses mine): “Javan (*yawan* = Ionia), Tubal and Meshech (*tubal* and *meshek* = central and south eastern Anatolia)—they were your dealers in human beings and bronze vessels (*kelai nehosheth*) [that] they gave you as imports (*nathnu m'rabek*).” It is not entirely clear what the expression *nathnu m'rabek* means, since the word *m'rab* appears in the Old Testament only in Chp. 27 of Ezekiel. As Greenberg (1997, 551) argues, the way that he translates the passage best fits the scholarly tradition and context. But Lipinski, 1985, offers an alternative suggestion (not well received—in fact, not even recognized by Greenberg) which confuses both direction of movement and purpose. Lipinski translates (1985, 218): “Ionia, Tabul and Mushki were your dealers. In exchange for slaves and vessels of bronze, they offered your shipments.” The only merit in Lipinski’s interpretation of the passage is that there is far more evidence for “Phoenician” bowls reaching the Aegean in the Archaic period than the reverse. But, we should not discount Aegean wares travelling east; the Persepolis Tribute Relief illustrates the reality, albeit under a different mechanism, of an eastward flow in Aegean metal ware. Greenberg’s solution for the passage is followed here because it is the more cautious, and more convincing.

⁸⁴⁰ Vickers, 1990; Miller, 1997, 43ff.

Aegean metalshops as well,⁸⁴¹ possibly by migrant Oriental craftsmen. While there was ample demand in the Aegean for foreign metalware of any type, direct evidence for east-west exchange after the Persian Wars intent on satiating this demand eludes us. Levantine centers continued to manufacture the metalware that had long made them famous, but the products seem to have circulated only in the east.⁸⁴² Similarly, there is little that immediately suggests commercial imports of Aegean metal vessels into the Levant after the 6th c.⁸⁴³ Aegean fineware ceramic vessels, on the other hand, are found in large numbers throughout the Levant, the implications of which, if determinable vis-a-vis metalware, would give insight not only to trade mechanisms, but social values as well.⁸⁴⁴

⁸⁴¹ The imitation of “Persian” metalware by Athenian potters, with or without an intermediary metal imitation, was first argued for most vehemently by Vickers a number of years ago and has spawned a series of replies for and against the theory. Vickers' fullest presentation is found in his 1994 book (with bibliography of earlier studies); a more recent treatment of the problems is Miller's (1997, Chp. 6), who is more hesitant about the question of an intermediary or concurrent metalware step in the process.

⁸⁴² A 5th c. Phoenician ostrakon inscription from Akko, commissioning over 200 vessels and items of various types, is striking because many of the vessels terms, e.g., *pkst* (= *pyksis*?), *lpm* (= *lebês*), *lgmm* (= *lagynos*) appear to be Greek loan words of common Greek vessel shapes. Because of the volume of Greek ceramics reaching the Levant, and along with the ceramics the words for the individual pieces as well, it could be that the Phoenician metalworkers here copied Greek ceramic forms, a twist on Greek potters copying oriental metal forms. One of the graves at Deve Hüyük produced two aryballoids made of sheet bronze; might these be examples of such imitations? (see Moorey, 1975). Other evidence for Persian period Levantine manufacturing comes from Kition where a 4th c. bilingual (Greek and Phoenician) epitaph marked the resting place of “Limyrnos the Lycian, the cupmaker...”, a migrant craftsman (*CIS I*, 45). There also is evidence from Egypt, e.g., a late 4th c. scene on the walls of a tomb near Petosiris (near Tuna el-Jebel) showing a Persian-type carinated bowl being hammered into shape (Lefebvre, 1923, pl. VIIb); Katzenstein (1979, 30) suggests that some of the Phoenician silver bowls with Egyptianizing elements were manufactured by Tyrians at Memphis.

⁸⁴³ Strong (1966, 77-78) notes a number of silver *phialai* from Cyprus of “Greek form” dating to the early 5th c., but there is nothing to prove they are imports rather than local products.

⁸⁴⁴ There are no graves in the Levant yet found which have produced Aegean plate or bronzes, and certainly nothing like the treasure hoard burials from around the Black Sea, e.g., the Rogozen hoard found in 1985-86 producing over 150 silver plate items (see Cook, 1989). Was Aegean metalware too expensive, or too expensive for the quality and/or design? Vickers' (contentious) calculation of ca. 1:1000 for the price ratio of painted pottery:silver vessel, if correct, may have

For cast metal items in iron and bronze, like mirrors, candelabra, and *thymiateria*, there often is a recognition in the studies devoted to the subjects that local metalworkers were stylistically influenced by foreign design in similar objects, but few venture to discuss Aegean-Levantine trade in these items.⁸⁴⁵ In her exhaustive study of Aegean *thymiateria*, for example, Zaccagnino documents the heavy influence Phoenician examples had on their Aegean counterparts during the 5-4h c., but can offer no evidence for actual imports.⁸⁴⁶ Often expensive and ubiquitously found in eastern Mediterranean female graves, bronze mirrors from one region to the next share traits and influences, but do not appear to have been imported from afar.⁸⁴⁷ Jewelry, especially the finer, more intricate pieces of silver and gold, traveled overseas, only to be confused with similar local pieces or imitations.⁸⁴⁸

somehow been a factor (1990, 616). Levantine customers may not have wanted to, or been able to pay such prices for Aegean metalware, but found the exotic ceramics an absolute bargain.

⁸⁴⁵ Internal Levantine trade, on the other hand, has been attested for a number of items, e.g., the various large bronze *thymiateria* and candelabra, likely of Phoenician manufacture, found in Palestinian tombs (Stern, 1980). Similar interregional metalware exchange occurred in the Aegean as well, e.g., Antiphanes, *apud* Athen. I.27d, on *lebes* from Argos shipped to Athens.

⁸⁴⁶ 1998, see p.69ff., especially.

⁸⁴⁷ *TADAE* II.B2.6, a marriage contract, includes a bronze mirror worth one shekel; for burial finds, see Stern, 1982, Chp. 3 (the two mirrors Stern illustrates, figs. 247 and 248, are labeled “Cypriot-style” and “Egyptian-style” again denoting influence, and lack of modern certainty as to where the objects were produced; see Congdon (1981, 8-9) on the influence (but not trade) of Near Eastern and Egyptian mirrors on Aegean products.

⁸⁴⁸ Persian jewelry has been found in limited numbers in the Levant (see Stern, 1982, 151, for findspots); a considerable amount of Persian jewelry was taken as booty during the Persian Wars, but does not seem to have been widely worn or imitated in Greece until the later 5th c. (see Miller, 1997, 57-58). Phoenician jewelry does not seem to have had the same influence during the Persian period (Culican, 1986, 363-84, 541-47). The Aegean-type fibula was quite popular in the Levant and was widely imitated (Stern, 1982, 153).

The duty of supplying arms and armor to mercenaries and private soldiers often fell on the state (in the Near East);⁸⁴⁹ finely wrought pieces, like Alcibiades' ivory-inlaid shield (Athen. XII.534e), were private commissions from arms workshops, like that owned by Demosthenes' family.⁸⁵⁰ Various motions passed in Athens in the 4th c. imply that there was a healthy arms trade within the Aegean,⁸⁵¹ but the shipment of arms as commodities between the Aegean and Levant is more difficult to prove. The many Greek helmets found off the Levantine coast,⁸⁵² and the many notices of eastern (i.e., Persian) arms in the Aegean are no doubt spoils or relics of battles and not of trade.⁸⁵³

Bronze statues were frequently put aboard ships, often it seems as booty.⁸⁵⁴ Many bronze statues dating to the Persian period have been pulled from the sea, sometimes in association with shipwrecks,⁸⁵⁵ but again determining the reason why they were put on board—as booty, commodity, or scrap—is pure guesswork. Large worked marbles (statues, stelae, sarcophagi) were shipped

⁸⁴⁹ See Joannes, 1982, for rationing of arms to mercenaries by the Neo-Babylonian state; Roy, 1967, suggests a continuation of the practice by the Persian kings.

⁸⁵⁰ Dem. I.9; cf. Ar. *Pax* 1210ff, 1250ff.

⁸⁵¹ E.g., Dem. XIX.122, 286; cf. Plato, *Leg.* 742A, 950D; Pindar (*apud* Athen. I.28a); for the arms trade in the early Iron Age Levant, in chariots and horses, see II Chron. 1:17.

⁸⁵² Radan, 1961; Kingsley and Raveh, 1996, 59.

⁸⁵³ For Persian arms as spoils in the Aegean, see Miller, 1997, 46ff. The Greek-style arrowheads found in the Levant, again, were likely influenced by those from the Aegean and not direct imports (Stern, 1982, 154). We should also be cautious about interpreting any arms found on a shipwreck as items of trade, since Xenophon explains that cargo ships often carried a large supply of arms to fend off pirates (*Oec.* VIII.14).

⁸⁵⁴ E.g., the colossal bronze statue of Apollo seized by the Carthaginians in Sicily and sent to Tyre in 405 (Diod. Sic. XIII.108), or the tyrannicide group taken from Athens by the marauding Persians in 480, which was recovered from Persepolis by Alexander when he sacked the king's palace over 150 years later.

⁸⁵⁵ E.g., the famous Riace bronzes (see Moreno 1999), the "Poseidon" in the Athens National Museum, the Porticello bronzes noted above, and six, now lost bronze statues looted from a Persian period (?) wreck near Tyre (Parker, 1992, no.1184).

from the Aegean as commodities to Levantine consumers, so it would not be unreasonable to think an occasional second-hand or newly commissioned Aegean bronze statue made it to the Levant as a commodity rather than as booty.⁸⁵⁶ Bronze statuettes also traveled over seas and land, sometimes very great distances: a late 6th c. hoplite statuette has been found in Aden (Yemen),⁸⁵⁷ but no other contemporary Aegean bronze figurines are known in the east, nor are eastern examples known in the Aegean.⁸⁵⁸

V.5 GLASS

Following its immediate post Bronze Age lull,⁸⁵⁹ the long tradition of glass making and glass working industries in Mesopotamia, Phoenicia, and Egypt was recharged at some point in the 8-7th c.⁸⁶⁰ By the middle of the 5th c., glass objects of various types—vessels, beads, pendants, raw ingots—were becoming a more common sight in Mediterranean cities, but perhaps expensive enough to

⁸⁵⁶ The famous bronze (head) of Apollo discovered at Tamassos might have been a commercial import from the Aegean destined to be a royal dedication (see Raptou, 1999, 140; Buchholz and Untiedt, 1996, figs. 62-63). *TADAE* I.A6.12 is a letter ordering statues (or statuettes?) to be made for a Persian official by sculptor brought to Egypt from Susa for the task; the letter also calls for a group of earlier statues be sent to the official. It is a pity that information is lacking about the six statues said to come from a wreck near Tyre (Parker, 1992, no. 1184); could these have been Aegean? The statue trade during the Roman period is better known; the *PME* (sec. 28) notes statues (*andriantes*) among good shipped from the Mediterranean to the east; in Palmyra (Tadmor) a fiscal law set the tax on imported statues at half the value of their metal weight (Bounni and Al-As'ad, 2000, 28).

⁸⁵⁷ Raschke, 1978, 926, n.1114.

⁸⁵⁸ Parlaska, 1989. All the published Persian period bronze figurines from the Levant, unlike the terracotta types (see below), are either Egyptian or Phoenician (Stern, 1982, 177).

⁸⁵⁹ See Nicholson and Henderson, 2000, on Egyptian Bronze Age production; Oppenheim, *et al.*, 1970, for Mesopotamian/Levantine production.

⁸⁶⁰ Moorey, 1999, 207; Grose, 1989, 73.

keep them from common households.⁸⁶¹ Where the workshops producing these objects were located is an unresolved issue, but it is generally agreed that the glass that went into them was produced solely in eastern centers.⁸⁶² Ancient glass is a soda-lime-silicate compound, the raw materials for which came from special deposits of sands and alkalis found only in certain limited regions in the Near East and Egypt.⁸⁶³ No glass was made in the Aegean during or before the Persian period, either because the raw materials were not recognized as available, or because the expertise was lacking.⁸⁶⁴ Glass working, on the other hand, likely did occur in the Aegean, but to what extent and in what form is yet to be shown.

The most ubiquitous type of glass commodity found all around the eastern Mediterranean during the Persian period were the small core-formed vessels, produced frequently, but not exclusively in Greek shapes like *oinochoai* and

⁸⁶¹ On glass, in whatever form, as a luxury commodity see Vickers, 1996.

⁸⁶² Nenna, 1998, 699-700. The sharp distinction between glass making and glass working (i.e., producing objects from glass) must be kept in mind throughout the discussion presented here. As E.M. Stern notes: "Like gold- and silversmiths who did not refine their materials themselves, glass-workers did not make their own raw glass, and they probably had little understanding of how it was made" (1999, 35). Theophrastus (*de Lap.* 29, 49), in fact, gives the impression that he thought glass was some type of natural stone; see Caley and Richards, 1956, 120, 162, for comments.

⁸⁶³ Some modern glass is pure silica (SiO₂), but the melting point of silica at over 1700 °C was well beyond the capabilities of ancient furnaces. The addition of an alkali (e.g., potash, natron, etc.) served as a flux to significantly reduce the melting point to below 1000 °C. Lime (CaO) was added to the mixture to stabilize the resulting compound. Silica is readily available as desert or beach sand and the alkalis were either manufactured (e.g., potash) or came from well-known deposits, e.g., Wadi Natron. Locating the source of lime, however, is more of a puzzle. Chemical analysis of ancient glasses shows lime's presence in the mix, but ancient glass recipes make no mention of its addition. For this reason, several scholars have proposed that lime was not deliberately added, but rather appeared as an impurity in the sand which came from only particular sand deposits (Nicholson and Henderson, 2000, 197). This might explain comments by Strabo (XVI.2.25), Josephus (*BJ* X.2.188-191), Pliny (XXXVI.190-193) on a special patch of sand located between Akko and Tyre which was prized by glass makers (see also Brown, 1969, 106, for comments).

⁸⁶⁴ E.M. Stern, 1999, 35.

hydriskes.⁸⁶⁵ Similar multi-colored core-formed vessels (not in Greek shapes) were made in the east during the Bronze Age;⁸⁶⁶ the technique was revived at some point in the late 7th or early 6th c. in Mesopotamia.⁸⁶⁷ Production, so current thinking concludes, then quickly moved west to Rhodes, where there was a major center for over a century and a half (ca. 550-400).⁸⁶⁸ At least one scholar has now also suggested a Macedonian, and other Aegean production sites based on the large numbers of core-formed bottles that have come to light in 6-5th c. burials there.⁸⁶⁹ However, the nearly exclusive focus on Rhodes as the (major) production center, and the current focus shifting to the Aegean, is based on a number of shaky, and even hellenocentric assumptions. What follows it not meant to exclude Rhodes as a core formed production site, since glass-related industries seem to have had a long history on the island,⁸⁷⁰ but only to show how Rhodio-centric the arguments have become, and to re-emphasize the likelihood of

⁸⁶⁵ Barag (1985, 59) suggests that they might represent the first instance of a mass-production of glass vessels in antiquity. Hundreds of examples of these vessels are known, found in the western Mediterranean, the Black Sea region, but most examples to date have come from the Aegean and Levant, mostly from burials (e.g., the over 80 examples found in 6-5th c. burials at Pydna in Macedonia, see E.M. Stern, 1999, 37, n.80). The core formed vessels have been extensively studied by Harden, 1981; McClellan, 1984 and 1992; Barag, 1985; and Grose, 1989. In this short space it is impossible to do service to their fine and detailed studies; rather I offer observations on some of the underlying assumptions in their conclusions.

⁸⁶⁶ See the example illustrated in Barag, 1973.

⁸⁶⁷ Harden, 1981, 55; Moorey, 1999, 207.

⁸⁶⁸ Harden, 1981, 55; Barag, 1985, 57; Nenna, 1998, 697.

⁸⁶⁹ E.M. Stern, 1999, 37; cf. Ignatiadou, 1990-1995; Nenna, 1998, 696.

⁸⁷⁰ Rhodes seems to have been a center for the production of faience perfume bottles a century or so before the Persian period (Webb, 1978, 5). While faience making and glass making share many of the same materials and techniques, they are different enough that a faience maker would likely not be able to produce glass. Even if Rhodes was producing faience, it still would be importing glass for the production of core form vessels.

Levantine, specifically Phoenician production of core-formed vessels during the Persian period.⁸⁷¹

It was G. Weinberg who first presented arguments, “on admittedly slight evidence,” for a 6-4th c. Rhodian glass factory for core-formed vessels.⁸⁷² She based her arguments on the finds of a Hellenistic (3rd-2nd c.) glass bead factory, which was the focus of her 1969 report, and the numerous core-formed vessels found on the island, especially the “poorly made cored vessels in Rhodian graves, particularly an extremely defective *amphoriskos* from Kameiros,” which seemed to indicate local production.⁸⁷³ Rejects, in other words, might be fine for the local population, but would not be shipped overseas. Subsequent scholars have built upon Weinberg’s claim; none have questioned its validity. Harden, for example, sees “strong evidence” for the development of his Mediterranean Group I core-formed vessels (ca. 550-400) evolving on Rhodes;⁸⁷⁴ the colored disk found near the bottom of the handles of some vessels is seen as a Rhodian trademark;⁸⁷⁵ but

⁸⁷¹ Harden and McClellan are careful to suggest that Syro-Palestinian workshop were probably responsible for some of their categories, but in subsequent literature Syro-Palestine has been seriously downplayed as a source vis-a-vis Rhodes and East Greece.

⁸⁷² Weinberg, 1969. As she explains herself, the idea first came to her in 1966 before the bead factory was discovered; the factory find seemed to confirm her earlier hunch. Earlier, Haevernick (1960) suggested the dot found at the base of some handles was a Rhodian trademark; see below.

⁸⁷³ Weinberg, 1969, 143, n.3

⁸⁷⁴ 1981, 60. The strong evidence is ultimately based on Weinberg's assumptions. Harden also speculates that perhaps as early as the 7th c. one, maybe two Mesopotamian glass workers decided to leave their homes and set up shop in Rhodes giving birth to the new center (p.55). After the rebirth of core-formed techniques in Mesopotamia in the 7th c., there seems to have been a halt in production for 50-100 years in the east, which then was revived again with the Mediterranean Group I series sometime in the (mid-)6th c. At the end of the 5th c., Mediterranean Group I production came to an abrupt halt; Group II, using different techniques and having a somewhat different repertoire began sometime in the 4th c., perhaps after Alexander (E.M. Stern, 1996; Grose, 1989, 115).

⁸⁷⁵ See Harden (1981, 95) following Haevernick, 1960. The reasons for assigning this trademark to Rhodes are circular: these vessels were made on Rhodes (as Weinberg suggested), therefore this mark must indicate Rhodian manufacture.

more vehement arguments for Greek (i.e., Rhodian) manufacture lie in their shape. Thus Grose: “[t]he thoroughly Hellenic character of the earliest forms...should dispel once and for all the notion that these vessels were made in either Egypt or Phoenicia.”⁸⁷⁶ Most recently, E.M.Stern has corroborated such opinions by supporting not only Rhodes as a production center, but also including one or more speculative workshops in the eastern Aegean islands or even on the mainland, with no mention of Levantine production.⁸⁷⁷

Grose's arguments in favor of an Aegean or Rhodian manufacturing center based on the Greek forms of the Group I vessels assumes, of course, that non-Greeks would not produce anything with such a “thoroughly Hellenic character;” nor would Greeks, conversely, produce objects so completely un-Hellenic as core-formed kohl tubes.⁸⁷⁸ This dual range of forms, one Greek and another non-Greek, in vessels sharing the same materials and production techniques requires explanation. Either both sets were produced in one locale, i.e., Rhodes, and were separated at the docks, one group going east, the other west, or there were eastern centers producing the more “oriental,” and western centers producing the Greek shapes.⁸⁷⁹ The question of Rhodes aside, there is no real reason--except modern

⁸⁷⁶ 1989, 110. By “earliest forms” he refers to Harden’s Mediterranean Group I.

⁸⁷⁷ E.M. Stern, 1999, 37. As we have seen (under Natron), Briant and Descat (1998, 95) suggested the natron exported from Egypt was meant for the (presumed) Rhodian glass *making* industry.

⁸⁷⁸ The more common Greek shapes are *amphoriskoi*, *aryballoi*, *oinochoai*, and *hydriskes*. Many authors appear to claim the core formed alabastra as a Greek shape as well, but more correctly, this is an eastern or Egyptian shape, not native Aegean. Alabastra and kohl tubes then should both be counted among the eastern shapes. Of all these forms, only the kohl tubes seem to have had a limited distribution. They are found throughout the Levant, but not in the Aegean (see Barag, 1975). All the other shapes are widely dispersed both in the east and west. See Grose, 1989, 76ff.

⁸⁷⁹ The desire to hold onto Rhodes as a major, if not the major, production center, requires its inclusion in any scenario. Thus, Barag (1985, 59), argues that the kohl tubes found in the east were imports from Rhodes rather than made in Phoenicia. Others, like Grose (1989, 79) have

bias--why Levantine workshops could not have produced Greek shapes, especially in light of their millennium-old glass working traditions. Athens, of course, produced a number of commodities in a variety of media imitating eastern objects; we have already seen Levantine imitations and adaptations of Greek coins, sculptures, and will soon note the ceramic imitations. Those living in the Levant had a strong penchant for things Aegean, especially fineware ceramics, as the thousands of sherds found at most every coastal and hinterland site in the Levant will attest. The Greek form of these glass vessels can perhaps be seen as a fetishizing, in miniature,⁸⁸⁰ of the chic, exotic Greek shapes, in a medium that was thoroughly eastern. This aspect of the core-formed vessels seems to escape those who argue for Greek manufacture; *only* the shape, much reduced in size, is Greek, every other aspect of these vessels is Levantine/Egyptian, including their kohl tube and alabastron cousins. Also, the well-known and well-traveled glass beads and pendants share an obvious affinity with the core formed vessels; the colors and types of glass are identical as are many of the techniques used to make them.⁸⁸¹ While scholars are willing to concede that Phoenicians were responsible

attempted to divorce the kohl tubes from the same tradition as the Greek-shaped vessels, both chronologically, suggesting much earlier or later dating, and geographically, arguing that they came from far beyond the Mediterranean to the east, i.e., Babylonia.

⁸⁸⁰ One clue that these tiny vessels were cherished as display objects, regardless of the contents, are the glass display/support stands that are sometimes found with those shapes, e.g., *amphoriskoi*, that could not stand on their own; see Weinberg, 1992, 20, fig. 1.

⁸⁸¹ In her study of the pendants, Seefried (1979) noted the strong likelihood, in the absence of direct proof, for their manufacture in the Phoenician homeland and in Carthage. The distribution of finds is concentrated primarily in the Levant and Punic west; very few pendants are known from Rhodes, none from the Aegean proper, although curiously, a high number of later types (4-3rd c.) are known from southern Russia. Excavations of earlier Iron Age levels at Tyre in the 1970's seems to have uncovered evidence for glass bead production at the site ca. 700 (see Brill, Appendix E, in Bikai, 1976). Moorey (1999, 211) notes examples of a Persian period glass "eye-

for the beads and pendants, which circulated mostly in the east and Punic west, they are much more reticent when it comes to suggesting that core formed vessels were produced in the same workshops, for reasons which again seem to be based on the Weinberg-Rhodian tradition.⁸⁸²

The claims that there might have been Macedonian or other Aegean production centers should really be minimized, at least until archaeological proof of a workshop can be provided.⁸⁸³ To say that these objects were produced in Macedonia or elsewhere simply because large numbers have been found there, would be no different from claiming that there was a production center at Dor for the mass of Athenian pottery found at that site. The same reasoning (large number of finds = production site), it will be recalled, was one of the tenets of Weinberg's initial arguments. One other tenet, that mediocre or misshapen glass vessels would not be exported from the region of production, also cannot stand. Not all of Athens' fine ware exports, after all, were of the highest quality.

The ever west-ward shift in views of core-formed vessel production should be reconsidered. The Greek shapes of some vessels, as finds in the east show, appealed as much to Levantine customers as to Aegean. The impulse to mimic Greek shapes in miniature was probably a Levantine phenomenon at first,

beads" being traded as far east as China. On Aegean finds of glass beads, see Tatton-Brown (in Harden, 1981) who also argues for Phoenician manufacture.

⁸⁸² E.g., Erickson, 1998, 835.

⁸⁸³ E.M. Stern, 1999, 37. Stern writes: "To judge from the large numbers of core-formed glass vessels belonging to Mediterranean Group I that have come to light throughout Greece during excavations, and in recent years especially in northern Greece, the existence of several manufacturing centers on the mainland, including Macedonia, is an increasingly attractive hypothesis for their origin." Hypothesizing local production centers to explain large numbers of finds of a commodity that might well be imported should not be our first avenue of interpretation. Nenna (1998, 696) tires to have it both ways: "Je parle ici d'atelier alors qu'on n'a découvert jusqu'à aujourd'hui aucun vestige d'atelier à proprement parler."

with the vessels produced initially for a strictly Levantine consumer base, much in the same way Athenian potters mimicked some Persian shapes for their home market.⁸⁸⁴ Once aware of their existence, Aegean consumers obviously were attracted to the glass vessels; their appeal in the Aegean is not hard to explain. Trinket- and toy-like in their imitation of larger Greek forms, and made of exotic, colorful materials, the vessels were irresistible. In fact, it may be irrelevant if they were actually intended to hold perfumes; their value as trinkets for display may have superceded any practical use.⁸⁸⁵ Mass-production of the vessels in Phoenician workshops, many of which likely produced the beads and pendants as well, plus a proximity to sources of raw glass would be consistent with the evidence for earlier Levantine glass working, and the evidence for Syro-Palestine and Cyprus being major glass producers and exporters in the decades immediately following the Persian period.⁸⁸⁶ While we should not discount the possibility of Rhodian (or Aegean) core-formed glass working, using imported Levantine glass, our approach towards locating Persian period production sites, especially in the absence of archaeological proof, should include Syro-Palestine on an equal, if not greater footing. We should also consider that if the bulk of the vessels were

⁸⁸⁴ See Miller, 1997, Chp 6. Another possibility is that the Greek shaped vessels were meant to be export ware, i.e., shapes that would be of interest to Aegean customers. Attic pottery workshops were attuned to foreign consumer interest as seen in the creation of such export ware as the "Cypro-jug" for Cypriots (see Perreault, 1989, 166-68), and the "Nicoethenic" amphoras for the Etruscans (Miller, 1997, 69).

⁸⁸⁵ The assumption has always been that these vessels were produced as perfume containers, although no scientific analysis that I am aware of has tested for actual contents. Vase paintings do strengthen the assumption, showing the bottles in bathing or toilette scenes (e.g., Boardman, 1989, fig. 232). However, the trinket-value of these bottles should not be overlooked. The glass stands sometimes found with the bottles (see Weinberg, 1992, 20, fig. 1), and especially the embossed gold stand (Grose, 1989, 112, fig. 62) would serve practically for support, but the stand materials (glass, gold) suggest use for display as well.

⁸⁸⁶ McClellan, 1987.

produced in the Levant, the volume of core-formed glass imports in the Aegean and their social importance there might have, to some degree, balanced the imports of Aegean fine ware in the Levant.

However, core-formed vessels were not the only glass items shipped to the Aegean from the east. The Athenian temple inventory lists and archaeological finds include "Achaemenian" bowls, jewelry, ingots of raw glass, and pieces of sculpture. Like the core-formed vessels, the "Achaemenian" or "Persian" vessels have drawn considerable attention,⁸⁸⁷ not only for their high artistic and (presumed) monetary value, but also for the spectacular finds in Black Sea region and North African elite burials.⁸⁸⁸ Transparent drinking bowls and related vessels were considered by the Greeks to be a sign of Persian luxury;⁸⁸⁹ by the 4th c., the bowls seem to have become increasingly available in the Aegean,⁸⁹⁰ possibly due to local production.⁸⁹¹ The glass used, however, would have come from the Syro-Palestinian coast; Sidon was famous for its colorless glass.⁸⁹² Imports from the Levant of raw colorless glass, shipped as ingots,⁸⁹³ were also utilized by the

⁸⁸⁷ The general term for the cast and cold-cut vessels varies as much as the different form and likely production sites (see E.M. Stern, 1999, for a discussion of the various shapes). See Markoe (1985, 96-98; 200, 157) on the likelihood of Phoenician manufacture, at least for the earlier 8-7th c. of the vessels.

⁸⁸⁸ See Vickers and Bazama, 1971; Oliver, 1970; Makhardze and Saginashvili, 1991.

⁸⁸⁹ The earliest mention of such bowls is Ar. *Achar.* 74 (425) where the embassy to the Persian king just back in Athens relates the luxuries they saw and sampled.

⁸⁹⁰ E.M. Stern, 1999, 42.

⁸⁹¹ *Ibid.*, 43. She suggests the glassware was begun as a sideline by well-known silversmiths, e.g., Mentor.

⁸⁹² *Ibid.*, 35.

⁸⁹³ Ingots of raw glass are known from Persian period textual records (e.g., the *khyta* from the Asclepion inventories; see E.M. Stern, 1999, 23), and archaeological finds (e.g., the two red glass ingots from Nimrud; see Barag, 1985, 107-109). The late Bronze Age Uluburun shipwreck carried about 175 discoid glass ingots, mostly cobalt blue in color (Bass, 1987, 161).

Greek sculptor Pheidias for use in his chryselephantine statue of Zeus, as the remains of his activities at Olympia show.⁸⁹⁴

In sum, we can be certain that glass was exported to the Aegean from the Levant, but determining the ratio of finished articles to raw glass among the exports depends ultimately upon finding the glass workshops where the core-formed and "Achaemenian" vessels were made. The apparent sudden demise of Mediterranean Group I core-formed glass production ca. 400 hints that some calamity, economic or political,⁸⁹⁵ befell the region(s) where the vessels were produced; the calamity might have been simply changing fashion. After a production run of nearly 15 decades, the core-formed vessels may have seemed too old-fashioned to attract much interest.

V.6 MARBLE STATUES, SARCOPHAGI, AND STELAE

Alongside the trade in blocks of unfinished marble sent from the Aegean to Levant was also a one-way trade in finished, or partially finished marble statues, sarcophagi, and stelae. A handful of statues and their fragments found in the Phoenician homeland and Cyprus demonstrate well enough that marble works finished in the Aegean were transported east.⁸⁹⁶ Unlike their metal counterparts,

⁸⁹⁴ Shiering, 1991, 14-16; 157. How exactly the glass fits into the composition is unknown. An earlier use of glass to embellish a sanctuary may have been multi-colored jewel-like inserts in architectural components of the Erechtheion in Athens (Stern, 1999, 37).

⁸⁹⁵ Grose (1989, 115), for example, offers events surrounding the Peloponnesian War, or the formation of the Rhodian *koinon* in 408 as possibilities.

⁸⁹⁶ A marble kouros from the end of the archaic era (520-485) was unearthed in Marion, Cyprus, and various other fragments from Cyprus may be from larger works (Raptou, 1999, 66, 73ff., 139ff.). A large, complete marble "pseudo-rostrum" of ca. 350 was found at the Eshmoun temple near Sidon in the 1970's and is thought to be an Athenian piece, possibly an Athenian dedication. Debate concerning the date, function, origin, and ethnicity of the craftsmen, however, is still

however, these statues and stelae did not have great intrinsic or reuse value; their value was to be found predominantly in their art. For this reason, it is easier to imagine these objects finding their way east either as special (paid) commissions or as secondhand art in trade. Although even if this was the case, we have no way to judge their frequency in the east-west trade.

The most controversial group of sculptures is the anthropomorphic marble sarcophagi. Over 100 examples of these are known, most of them found in Phoenicia, but with a few finds elsewhere: in the east at Soloi, Amathus, Kition, Gaza, Memphis, Alexandria, and in the west, at Solonte in Sicily and Cadiz in Spain (both still within the Phoenician cultural orbit).⁸⁹⁷ The earliest examples date from the decades immediately following the Persian Wars (ca. 470-440), with the later stylistic phases running to the end of the 4th c. Stable isotopic ratio analysis of the marble of four examples has confirmed a long held *communis opinio* that the primary, if not sole marble supplier for all the sarcophagi was the Aegean island of Paros.⁸⁹⁸ It comes as no surprise that several unfinished examples of these sarcophagi have been found on the island.⁸⁹⁹ Scholars also tend to agree that because these large coffins were made of an imported prestige stone, they must have been quite expensive and so could only have been afforded by the upper crust of Phoenician society; poor man's versions were made of local stone

largely unsettled. For the most recent treatment, with a synopsis of earlier discussions, see *Stones and Creed*, 18-23, 166, fig. 10; where a date of ca. 350 is given, and a reluctant leaning towards Greek (Athenian) origin is offered.

⁸⁹⁷ The bibliography on the sarcophagi is vast, with many 19th c. A.D. contributions. The most important, comprehensive and recent studies are Elayi and Haykal, 1996; Haykal, 1996; Karageorghis, forthcoming (I thank Karageorghis for allowing me to see an advance copy of this work).

⁸⁹⁸ Karageorghis, forthcoming, n.42.

⁸⁹⁹ See Schilardi, 1973.

and terracotta.⁹⁰⁰ Where opinions diverge most sharply, however, is on the ethnicity of the men who carved the facial details on the lids of the marbles, and whether they were finished before transit from Paros.

The arguments are mostly subjective, determined by one scholar's sense of what is truly "Greek" in style and technique and what is not. Hermary, for example, presents a case for two distinct stylistic phases, an earlier 5th c. phase the work of Greek sculptors alone, and a later 5-4th c. phase, more debased than the first, the work of Phoenician and Cypriot artisans, who learned from Greeks.⁹⁰¹ Elayi, on the other hand, rejects the notion of any Greek sculptor having a hand in the final production of any of the extant sarcophagi, positing instead workshops in Amrit and/or Sidon where Phoenicians turned out the finished pieces.⁹⁰² Variations on one theory or the other range between these two, but all share the same implied, if not openly stated exclusivity; one or the other ethnic group was responsible for carving and transporting each sarcophagus. This is an issue that will not be resolved any time soon, partly because all of the theories are equally valid. Rather than posit that a hard ethnic division was

⁹⁰⁰ See Hermary, 1987, 59ff.; Elayi and Haykal, 1996, 120.

⁹⁰¹ Hermary, 1987, 61.

⁹⁰² Her arguments were first put forward in 1988; most recently, while commenting on a new sarcophagus find from Beirut, she (and Sayegh) remark: "[Elayi's] attribution aux sculpteurs phéniciens, plus ou moins formés aux techniques de la sculpture grecque, qui repose sur solides arguments, est aujourd'hui largement suivie, même si quelques auteurs s'efforcent encore de défendre la vieille interprétation hellénocentriste de sculpteurs grecs pour les exemplaires de qualité, avec des arguments insuffisants" (2000, 274). Elayi is quite right to call attention to hellenocentric interpretations which do often mar any discussion of the group, although her Phoenicio-centrism also is rather extreme. See, for example, Karageorghis's (more generous) remarks in his forthcoming article: "Although a small group of marble sarcophagi attains something of the perfection of Greek art, the present writer hesitates to accept that all these were made by Greek sculptors."

central to the production and transport of the sarcophagi, we should look for more permeable ethnic membranes, and theories.⁹⁰³

A number of the sarcophagi have Greek and Phoenician characters carved on them; even more instructive is a marble disk, recovered from the sea off Paros, with random Greek and Phoenician characters on one face.⁹⁰⁴ The bilingual character of the disk is suggestive of either Greeks trained in Phoenician or Phoenicians trained in Greek; whatever individual or group was responsible for the disk was likely responsible for the sarcophagi as well. If it was a group, we need not suppose that it was composed of Phoenicians or Greeks alone, but a commercial *koinon*, or company of individual Greeks and Phoenicians working together to supply a Levantine demand for fancy marble sarcophagi.⁹⁰⁵ This was a niche market, so to speak, with steady commissions over time.⁹⁰⁶ It is not too difficult to imagine that one *koinon*, the company's duties passing from one (half-

⁹⁰³ Karageoghis (forthcoming) and Schilardi (1973) are willing to concede Phoenician involvement on some level, mostly transportation, in the production and distribution of the coffins, but still, when pressed, maintain fairly strict ethnic divisions in labor.

⁹⁰⁴ Presented for the first time by Karageorghis, forthcoming.

⁹⁰⁵ Levantine and even Aegean trade companies of this time have not yet been studied in depth (for a recent study of Hellenistic Greek associations, see Gabrielson, 2001). While one often has the impression that ancient trade was conducted along ethnic lines, a cursory look at the maritime court speeches of Demosthenes shows that this was not the case (see Hansen, 1984, Table 2); traders of many ethnicities borrowed and lent money together, sailed together, and we can imagine, formed companies together on a more informal basis than the types of associations based on shared religious and ethnic backgrounds. Companies in the Levant seem to have been family-based; a Phoenician inscription from Kition mentions several generations of father and son *rb shrshrm*, translated “chef des agents commerciaux” (*Kition* III, B45, 97 = *KAI* 34; see also Elayi and Seyegh, 2000, 310; and Elayi, 1988, 87 on familial trading alliances). Given the fact that at least one community of Phoenicians lived and worked in the Aegean (at Athens) during the Persian period, we should expect more elsewhere (see Baslez, 1987).

⁹⁰⁶ A little over 100 of the sarcophagi have been found to date covering a time span of well over a century. Even if this number represents only a fraction of the total number shipped in the 5-4th c., still the actual average number of coffins shipped likely did not exceed more than one or two per month (if even that) over the course of many decades. Such low volume in such a specialized article would suggest an organization devoted to producing and handling these items, likely passed from generation to generation.

breed⁹⁰⁷) generation to the next, with “offices” in both Paros and an eastern center, might have been responsible for the entire corpus of sarcophagi we now possess. The artists used at any one time to carve the lids may have been hired on an ad hoc basis, or at the request of the buyer, who might also have dictated a style or expression to use. In other words, artists of any ethnicity, Greek, Phoenician, or anyone else for that matter, could have been employed at any point during the coffin’s journey from quarry to tomb. In trying too hard to enforce a Greek-Phoenician divide in the production of this group of artifacts, scholars have overlooked the possibility that these marbles, conversely, might be vestiges of Greeks and Phoenicians working in associations so tightly bound that ethnicity was of no consequence.

If a *koinon* was responsible for the sarcophagi, the manner in which the sarcophagi were shipped, rough or fully finished, was probably determined by any number of factors, e.g., consumer wishes, availability of sculptors on Paros or at the destination, and so forth. In the end, it was probably much easier to move an artist to the unfinished marble, than vice versa, or to send the artist along with the marble to ensure the job was completed as desired.⁹⁰⁸

⁹⁰⁷ A bilingual Phoenician-Greek stele from Athens on display in the Piraeus Museum (no. 3582 = *KAI* 56 = IG II² 8440) marked the final resting place of Eirene, of Byzantium. Every other Phoenician-Greek bilingual stele from Athens of this time (late 4th c.) presents a Phoenician whose Phoenician name is translated into Greek; in the 3rd c., the practice was to transliterate the names. Here the woman’s name is Greek and is transliterated into Phoenician, the only example of this known, indicating that this woman was in all likelihood not ethnically Phoenician, but Greek, or mostly so. Perhaps Eirene was the Greek wife of a Phoenician, or a half-Greek daughter. In any case, she lends evidence to the possibility of Greeks and Phoenicians not only forming families together, but trading families. See also Coldstream, 1993, for Greek-foreign intermarriages.

⁹⁰⁸ Because of the presence of the unfinished sarcophagi on Paros, the realm of possible scenarios for this group of coffins is much greater than another, probably related marble coffin-type, the

V.7 ALABASTER VASES

Immediately recognizable by its distinctive form, the alabaster vase (Grk. *alabastos*, *alabastros*⁹⁰⁹), a round-bottomed, cylindrical vessel with a flanged lip, was so widely popular in the eastern Mediterranean that many centers produced versions of it, and many more produced imitations in other materials, like glass,⁹¹⁰ metal,⁹¹¹ ceramics,⁹¹² and stone.⁹¹³ The alabastra and their imitations are found in significant numbers in most every corner of the ancient Mediterranean and its hinterland.⁹¹⁴ The type originated in Egypt at an early date,⁹¹⁵ where there are abundant local supplies of alabaster stone; Egypt, or more specifically Naucratis,⁹¹⁶ continued to be a producer in the Persian period. Evidence for

thékê, also found in Phoenicia. In their studies of this group, Ferron (1996), and Elayi and Seyegh (2000, 273), argue for only Levantine production, but using imported marble.

⁹⁰⁹ See Amyx, 1958, 213, n.101, on the two forms of the name. Another type of vessels, more popular in the Levant than Aegean, like *pyxides* and cosmetic palettes, were also made of the stone alabaster, but seem to have circulated only in the east (see Ben-Dor, 1945; Barag, 1985).

⁹¹⁰ Amyx, 1958, 214, n.110; glass examples from Athens are illustrated in Weinberg, 1992, 44, figs. 5 and 10. A glass alabastron, denoted by the zig-zag pattern typically found on core formed glass vessels, appears illustrated on a red figure *amphoriskos* by the Eretria Painter (Boardman, 1989, fig. 232). Also see Harding, 1950, and Stern, 1980, for glass examples from the Levant.

⁹¹¹ A bronze alabastron is known from Til Barsip (Stern, 1980); four terracotta examples with gold overlays are exhibited in the Cyprus Museum, Nicosia.

⁹¹² Athenian potters began to imitate the form, sometimes with figures, in the late 6th-early 5th c. (see the black figure example illustrated by Boardman, 1974, fig. 268, and the white ground examples in Boardman, 1975, figs. 208, 209). Ceramic alabastra, perhaps locally made, are also known from Rhodes and Phoenicia, see Culican, 1986, 129-30.

⁹¹³ Marble and limestone alabastra are known from Athens, some quite large, and some solid “dummy” alabastra; the solid ones were likely made exclusively as grave offerings (Kurtz and Boardman, 1971, 99, 101). A very large (ca. 30 cm tall) 5-4th c. example made of green serpentine found in Jerusalem is on exhibit in the Herodian Quarter Museum (Jerusalem).

⁹¹⁴ For finds from Babylon, see Moorey, 1999, 55; for the Black Sea, see Carter, 1998, 757ff.; for the west Mediterranean, see Culican, 1986, 128ff; also Vickers and Bazama (1971, 76ff.) for a very large (40 cm. high, 17.5 cm in diameter) 5th c. example from Cyrenaica.

⁹¹⁵ See Amyx, 1958, 214, n.105 for discussion.

⁹¹⁶ Möller (2000, 163) comments on the production at Naucratis, including the many thousands of alabastra drill cores found there by Petrie, dating after 500.

alabastron production, using imported raw material, comes also from Babylonia⁹¹⁷ and Athens;⁹¹⁸ Phoenicia and Cyprus are suspected producers.⁹¹⁹

There is no reason to doubt that alabastra were meant to contain perfume, and possibly other costly (semi-)liquids.⁹²⁰ There is, however, reason to question the long held assumption that these vessels were used primarily to transport perfumes in long distance trade.⁹²¹ As argued (see Perfumes), textual and figural evidence allows that at least some, if not all, of these vessels could have been shipped overseas empty to be filled on demand by perfume-shop customers.⁹²² The fact that such an awkward type of vessel would achieve such a level of popularity in so many scattered regions, and be copied in so many different ways,

⁹¹⁷ A Persian period alabastra workshop was found at Babylon (Moorey, 1999, 55).

⁹¹⁸ Alabastra drill cores, indicating local production, were found in a 5-4th c. level on the Pnyx (Ajootian, 1989, 255).

⁹¹⁹ Stern, 1982, 143; Carter, 1998, 757. Phoenicia was in all probability also producing an array of imitations as well, including glass and ceramic versions (Culican, 1986, 129ff., 191f.).

⁹²⁰ Textual evidence (e.g., Hdt. III.20; Crates *apud* Athen. VI.268a), inscriptions (e.g., an alabastron from Egypt with an inscription indicating cinnamon perfume within, see Amyx, 1958, 213, n.103), and vase paintings (e.g., a bather holding an alabastron, Boardman, 1989, fig. 156) confirm perfume as contents. In the Levant, a number of alabastra have been found with slender “kohl sticks” suggesting the eye makeup was also occasionally held in the vessels (Stern, 1982, 149). This might be true, but we should also keep in mind that similar applicators were used for daubing perfume (Hill, 1965).

⁹²¹ E.g., Moorey, 1999, 55. Some of the larger alabastra, e.g., the example from Cyrenaica reported by Vickers and Bazama (1971, 76ff.) and some from Babylonia with markings for measurements (Stern, 1982, 149) may have been used to transport perfumes. A 2nd c. AD tariff from Tadmor (Palmyra) notes a distinction in taxes between perfumes imported in goatskin (bottles?) and alabaster vessels (Hassel, 1997); one would assume these would be larger bulk trade, rather than smaller personal-use vessels. One alabastron was found on the 5th c. Tektas Burnu shipwreck (Carlson, 1999), perhaps for personal use by one of the crew rather than a commodity in trade.

⁹²² See above, n.754. Benson (1996) has tried to link a particular type of ceramic alabastra with figured decoration, the so-called “Negro” and “Amazon” alabastra, to myrrh perfumes specifically. Whatever the merits of his case, it is the only example of an argument positing a close association between a potter and a perfumer, which would be necessary if the vessels were intended primarily for transport.

places emphasis on the vessel itself, not the contents, as the focus of attention.⁹²³ Individual perfume-shops might have taken pride in the variety of styles, materials, and origins of the alabastra they displayed; customers might have turned into collectors, craving variety and freshness in an age-worn design.⁹²⁴ Every center that produced “alabastra” likely produced a fair number for export, creating a vast trade in the vessels, with or without perfume inside.⁹²⁵ With some examples, however, like those made in Athens using imported Egyptian stone, it may be impossible to tell the Athenian-made alabastron from the Egyptian; the imitations in other materials are more likely show their origins than any alabaster vessel.

V.8: TERRACOTTA FIGURINES

Figurines, especially terracottas in the shapes of popular dieties, were a common feature of ancient Mediterranean religious life. Offered as souvenirs or for dedication on the spot at sanctuaries and elsewhere, many hundreds have been

⁹²³ Alabastra are not able to stand on their own because of their rounded bottoms. For storage (and display?) an *alabastothékê* was used, some type of wooden (?) platform or cabinet which could support the vessel upright (see Amyx, 1958, 213, n.101). Most examples of the vessels also have two small loops below on the shoulders through which a cord could pass in order to suspend the container in the hand or on a wall-hook (e.g., Boardman, 1989, figs. 156, 232). For storage or handling, the form was not the most user-friendly design, which might have, in fact, been part of its appeal.

⁹²⁴ Hyperides (V.6) includes among the inventory of a perfume shop *alabastra* which could be vessels of all materials and sizes.

⁹²⁵ See Culican (1986, 130, n.30) on the possibility of alabaster, ceramic and glass types from Syria being traded as far west as Sicily. As there are no native alabaster sources around Athens, the alabastra found there had to be either local products of imported stone, or imports from a Levantine or Egyptian workshop. Although Attic *lekythoi* and *askoi* are found in great numbers in the Levant, no ceramic Attic alabastra have yet been reported from the Levant. The shape may not have seemed as exotic as that of the *lekythos*, for example, as so was not as desirable.

found in the Levant in Persian period temples, *favissae*, buildings, and graves.⁹²⁶ Of these a good portion have been labeled “western” or “Greek” style because they more closely resemble Aegean types figurines than local Levantine types. Presumably, some of these figurines were imported directly from the Aegean. Others were locally made with imported moulds, or were simply local imitations of those found in the west.⁹²⁷ The production and trade of figurines could be big business; a late 5th c. shipwreck found a few kilometers north of Akko was carrying an estimated 5,000-10,000 terracotta figurines from Sidon (possibly) to ritual centers in the west.⁹²⁸ While some clay analysis of “western” style figurines has been attempted, it still is not a common enough practice to demonstrate where the figurines were actually manufactured.⁹²⁹ With the presence of Greek-types moulds in the east, we cannot be too certain that some (most?) of the western types were not local imitations. If not proof of actual Levantine-Aegean trade, the

⁹²⁶ The largest numbers are from the *favissae*, pits dug next to sanctuaries for the deposition of old dedications for the purpose of making room in the sanctuary for new offerings. Nearly 200 figurines, for example, were found at Tel Tsippor in northern Israel (see *NEAEHL*, s.v.).

⁹²⁷ While there is evidence for moulds being transported, at least within the Phoenician world (see Gubel, 1998), clay moulds of imported figurines would have been easy enough to make by simply pressing wet clay on the figurine. Therefore, the moulds as well as the figurines made from them could be considered imitations. For mould finds in Cyprus, see Raptou, 1999, 100f.; for Phoenicia, see Elayi and Sayegh, 1998, 222, 283.

⁹²⁸ The scattered assemblage known as the Shave Zion shipwreck yielded several hundred of the estimated thousands of figurines, varying in size (13 –140 cm) and style, many showing the sign of Tanit which suggests that the cargo was bound for Carthage or another western center. Analysis pointed to a source near Sidon for the clay used (see Parker, 1992, no. 1078; *NEAEHL*, vol. 3, 958). Another possible 5th c. wreck found near Tyre (“Tyre G”) also was carrying a more limited number of figurines, one nearly 40 cm tall (Parker, 1992, no. 1190).

⁹²⁹ Negbi’s (1964) “mineralogical and palaeontological analyses” (presumably visual rather than mechano-chemical analysis) of the Tel Tsippor figurines concluded that at least 50% of the western group was imported, some possibly from Rhodes. Rhodes was also offered as the origin for a “massive” 5th c. Attic-type terracotta found at Sukas, based on stylistic grounds (Riis, 1960, 127). For the Greek-type figurines from Stern’s thoroughly modern excavations at Dor, no analysis, save basic visual analysis, is published for the terracottas from Areas A and C (Stern, 1995, Chp. 7). We have yet to see if analysis will be offered for the figurines from the Area G “Greek” *favissa*.

figurines are nevertheless significant for showing the degree to which Aegean art penetrated daily and religious life in the east.⁹³⁰

V.9: FINEWARE CERAMICS

One of the purposes of this study is to take the spotlight off of fineware ceramics as evidence for Aegean-Levantine trade, if only momentarily, in order to locate other commodities. Even so, some discussion of the ceramic finds is warranted.⁹³¹ While we can be certain of these ceramics as markers of the trade, long held assumptions about what else they might tell us about the trade, the traders who carried them, the consumers who used them, and the value of the ceramics themselves need reassessment. We will first briefly examine the ways of approaching these issues before turning to the ceramic finds.

At the outset it must be stated that I ascribe more to the Vickers-Gill school of downplaying the ancient exchange value of these ceramics, than to the Boardman school which assigns a value approaching that of metal ware.⁹³² Some

⁹³⁰ None of the “western” type figurines have yet been shown to be associated securely with any resident Greek or Greek population. Stern’s claim to have found evidence for a Greek sanctuary at Dor, based on four Greek-style figurines found in a *favissa* in Area G requires further evidence to be convincing (Stern, 2000, 169ff.). Perhaps the most dramatic illustration of a Semitic population’s penchant for Greek figurines is the disproportionate numbers of Greek-type figurines found at Kition, a Phoenician city, compared to the numbers found thus far in the Greek cities of Cyprus (Raptou, 1999, 101).

⁹³¹ Virtual no Levantine pottery of any type is known from the Persian period Aegean; only three (coarseware) Phoenician-Palestinian vessels from the Agora excavations have come to light (Miller, 1997, 73). What follows therefore focuses solely on the west to east trade.

⁹³² A series of articles in the late 1980’s and early 1990’s, instigated primarily by Vickers attempts to show the influence of metalware on ceramics (e.g., Vickers, 1985, 1994), had also as a central theme the monetary value of ancient, mostly Attic painted and non-painted ceramics within a trade context. Vickers and Gill opt for purchase prices drastically reduced (in obols vs. drachmas) from those offered by Boardman (e.g., 1988a and 1988b). See Tables A and B in Gill, 1991, for a comparison of prices between the schools. No consensus on ancient pottery values has since been reached.

(painted) ceramics on occasion might have fetched a higher price, for any number of reasons, or might have cost more in the Levant than what they were sold for in Aegean markets. This is to be expected. Nevertheless, the thousands, if not tens of thousands of fineware ceramics that were unloaded in Levantine ports during the Persian period were not the most valuable commodities shipped from the Aegean; they only happen to be the commodities for which we have the most evidence.⁹³³ Absolute monetary value, however, is not necessarily a direct correlate to social value. Even if these pots were “cheap” compared to metalware, this would not diminish their appeal as attractive, exotic, and affordable items for use or display by most every strata of society. There is nothing yet to prove that ownership of Aegean ceramics in the Levant was limited to only the higher strata of society, as silver plate presumably was. Rather, the common occurrence of Aegean ceramics in excavated habitation settings of all types, military to rich to more humble, suggests the opposite. Aegean pottery filled a niche: not as crude or inexpensive as some (local) ceramics,⁹³⁴ not as excessively expensive as plate, but still attractive and having style.⁹³⁵ In the modern U.S., the tableware found at Pier One Import stores provides a useful analogy.

⁹³³ Gill's (1991) arguments for ceramic prices, based on graffiti, ship lading, and latter comparanda, in my opinion, tips the balance in favor of lower values for (Attic) ceramics everywhere as commodities.

⁹³⁴ In fact one suggestion for the popularity of Aegean ceramics in the east was their very favorable comparison to the clunky and crude nature of the local ware.

⁹³⁵ "It is a mistake to confuse value and tradibility," so Miller (1997, 71) remarks on the healthy trade in coarseware cooking pots within the Aegean. Aegean ceramics simply did not have to have a value approaching that of true luxury items for them to be traded to the east. Although he doesn't delve into the issue of value, Shefton's picture of the "sophisticated expectations on the part of Phoenician urban society, willing recipients of high-grade Attic prestige pottery" (2000, 80-81), still implies a higher monetary value per item and more limited consumer base than suggested here. Elayi and Sayegh (1998, 332) avoid branding Aegean pottery a true luxury

Discussions of Greek fineware in the Iron Age Levant are also, most unfortunately, tied to the question of a Greek (colonial) presence in the region. The link between Greek ceramics and Greeks in the east has only grown stronger in the decades since Woolley's excavations at Al Mina in the 1930's,⁹³⁶ when he proposed, based on the finds of Greek pottery, some even stacked in a "warehouse," that the site was a Greek mercantile establishment.⁹³⁷ More recent arguments emphasizing the local population at the site have downgraded the entrenched view of Al Mina from a Greek "colony,"⁹³⁸ to "trading post,"⁹³⁹ to (now) one of many examples of Levantine *enoikismos*, Greeks living alongside the locals.⁹⁴⁰ In such arguments Aegean fineware is inevitably the key to "proving" Greek presence at an eastern site.⁹⁴¹ Waldbaum has attempted to show the fallacy of this view,⁹⁴² but has met with only middling acceptance in some

commodity, preferring to call it "demi-lux," indicating high social value, but lower monetary value.

⁹³⁶ Woolley, 1938. "Al Mina" has become the common printed version of the Arabic, *al-Mina*, meaning simply, "the port." There are several sites with the name along the Syro-Lebanese coast; this one, at the mouth of the Orontes, lies in disputed territory currently held by Turkey, but claimed by Syria.

⁹³⁷ 1938, 15

⁹³⁸ Boardman, 1957, 24.

⁹³⁹ Boardman, *Overseas*³, 43. See Graham (1986), Elayi (1987) and Waldbaum (1997) for views which erode the significance of any Greek presence at the site.

⁹⁴⁰ Stern, 2001, 519-20. Stern actually implies Al Mina was a colony (p.519), but goes on (p.520) to speak of similar examples of *enoikismos*.

⁹⁴¹ Riis's oft quoted remark reaches the apex of this line of thought (1970, 129): "It has rightly been emphasized by Professor Cook that the Orientals did not care for Greek pottery, and that where it occurs in the East it is a sign of Greeks living there, as merchants or mercenaries. Above all, this may have held true of the drinking cups, betraying Greek owners just as wine glasses in the modern Orient indicate the presence of Occidentals in some way or another."

⁹⁴² Waldbaum 1994 and 1997. It should be remembered that while we have considerable evidence--mostly bilingual, Phoenician-Greek inscriptions--for a (Cypro-)Phoenician presence in Athens, there is virtually no Phoenician pottery found anywhere in the city. Pottery does not equal people. Waldbaum concludes her 1997 article: "...we do not have evidence for a fully Greek cultural context at any site in either Syria or Palestine. Whoever the merchants were, it seems that Phoenicians or other peoples of the Levant enjoyed a penchant for elegant imported pottery." (And

circles. In his latest, popular volume on archaeology in the Holy Land, Stern (2001), in the section on Persian period imported pottery (p. 518ff.), continues to talk of “Greek colonization on the coasts of Phoenicia and Palestine.” Until irrefutable evidence of a significant Greek presence in the Persian period east is produced, it is best to leave that question open, and better still to leave pottery completely out of it.⁹⁴³

Although very good, recent attempts have been made to quantify and categorize the Aegean imports in the Levant, for both Syria and Palestine, their results still must be taken *grano (gravi) cum salis*.⁹⁴⁴ Since the Aegean ware can be readily separated from local ware, dated often to within a decade of manufacture, and can be categorized in many cases by paint(er) and shape, meaningful region-wide statistics are possible, so one would think. But in the past, excavators have not been as careful with their Aegean finds as their more modern counterparts; many of the finds still, decades later, remain unpublished in

a little later) “Did the Greeks in the East make their presence felt in any significant way, other than as purveyors of attractive tableware and other commodities? Or did the sophisticated easterners simply ignore them as western barbarians?” Bien touché.

⁹⁴³ This study is not the place to pursue the issues of Greeks in the east. But, further signs that the link between a Greek presence in the Levant and their pottery will not soon be broken can be found in Shefton (2000, 81, n.22), who in a long note calls attention to the scarcity of any Greek ceramics tied to Greek cult usage (i.e., no Greeks), but also recognizes an unpublished *psykter* shaft, unparalleled east of Rhodes, in storage from the 1930's Atlit cemetery excavations (i.e., possible Greeks). See also Adelman, whose presentation at the 1995 *AIA* annual meetings (abstract *AJA* 99 [1995], 305), entitled “Greek pottery from Ascalon, Israel: Hints of Presence,” suggested that while the totals of Aegean fineware sherds from Ascalon seems impressive, it only represents 0.4% of all pottery finds, thus offering only weak evidence for a Greek presence. However, the two Aegean cooking pots found provide stronger evidence for a Greek presence based on the assumption that cooking pots were of such low value that no one would trade them, rather Greek settlers would bring them from home. On the fallacy of this assumption, see Miller, 1997, 71.

⁹⁴⁴ Clairmont (1955) was the first to attempt an area-wide survey of Aegean imports. More recently, Wennig (1981), Perreault (1986) and Lehmann (1998, focusing on Syria and Lebanon) have tried to provide broad and conclusive surveys of the material, tracking down much that has not yet been published from earlier excavations.

warehouses and no one really knows the quantity or quality of what lies unseen. Moreover, the excavators of the coastal sites Dor and Ascalon, both under current study, have competing claims for having uncovered the largest numbers of (Attic) fineware sherds anywhere in the Levant.⁹⁴⁵ Only a fraction of these finds have been published to date (from Dor; Stern 1995), and we can expect that even when they are finally published, still newer finds, e.g., from the on-going French excavations in Gaza,⁹⁴⁶ could easily upset the statistical basis of any previous conclusions. And, of course, one reason why there now appears to be so many more finds of Aegean ceramics in Palestine versus Syria, is that a disproportionate number of sites have been excavated (and published) in the south compared to the north.⁹⁴⁷ In sum, although it may seem less scientific, more impressionistic approaches to the Greek fineware problem in the Levant as a region, like those recently offered by Shefton (2000), should perhaps be undertaken until the pool of numbers used for statistical analysis achieves balance.

⁹⁴⁵ E. Stern and G. Gilmor, personal communication.

⁹⁴⁶ Giroud (2000) already reports over 2000 sherds of Attic fineware found at Blakhiya; compare this to the 850 diagnostic sherds from Dor Areas A and C presented by Marchese (1995).

⁹⁴⁷ When Clairmont published his study of Aegean fineware finds from the Levant in 1955, the bulk of the material known to him came from Syrian and Lebanese, not Palestinian sites. Therefore, he felt confident to conclude that “[t]he scarcity of the finds from the Phoenician-Palestinian coast makes it doubtful if there existed any trade relations at all between Greeks and those areas” (1955, 90). Today, the situation is quite different. There have been dozens of Persian period excavations in Israel over the last four decades producing vast quantities of Aegean ceramics (Stern, 1982, lists 57 Palestinian sites producing Aegean ceramics, at least a dozen more sites have been added to the list in the last 20 years); during the same period, excavations along the Syrian and Lebanese littoral came to a near standstill (for Aegean finds in the north, see Lehmann, 1998). The impression one now has of the fineware trade is that Palestine was the focus of the fineware trade, not the northern region; a reversal of Clairmont's conclusions. Only very recently have excavations resumed on a larger scale along the Lebanese and Syrian littoral; their finds could again change the picture.

One such problem of the statistical approach and its ever-changing data set can be readily seen in the presumed decline of Aegean fineware imports in the decades immediately following the Persian Wars. The late 7th c. saw an unprecedented level of fineware ceramic trade in the Levant, with Rhodes, Cos, Cnidus, Chios, Samos, Lesbos, etc., supplying their wares;⁹⁴⁸ this trade continued mostly undiminished throughout the 6th c. By 500, as happened elsewhere, Attic products began to dominate the imports, soon effectively ousting all others; the volume of Levantine imports of Attic ware also grew steadily through the 5th c., except, it seems, for an area-wide lull from ca. 470-450.⁹⁴⁹ Scholars have been quick to point out the surest reason for this lull: continued hostilities between east and west in the wake of the Persian Wars.⁹⁵⁰ The problem is that the lull may not have been real. Aside from a highly controversial redating of Attic red figure ceramics,⁹⁵¹ which, if accepted, would mean a burst of trade activity rather than a lull immediately post-480, there is also the fact that, even with the traditional ceramic dating, not all finds from the Levant support diminished fineware trade. The recent excavations in Beirut, for example, have found no evidence for diminished imports, but rather a steady increase in volume from ca. 500

⁹⁴⁸ It has frequently been observed that these ceramics are the only pre-Persian period Aegean commodities found in the Levant. See Waldbaum, 1994.

⁹⁴⁹ For an overview of Palestinian imports, see Stern, 1982, and 2001. Perreault (1986) was the first to recognize the possibility of the lull, which since has become embedded in the literature. The lull would seem to be supported by more recent finds, e.g., from Tel Michal (Marchese, 1989, 150) and Dor (Marchese, 1995, 171-72), which show a steeply climbing rate of Attic imports from ca. 450 until ca. 350, when they drop off as dramatically as they begin (see Marchese, 1995, Table 4.7 for a graphic illustration). Raptou (1999, 36) suggests there was a post-480 lull on Cyprus as well.

⁹⁵⁰ E.g., Marchese (1995, 171).

⁹⁵¹ See Gill, 1988, 180.

onwards.⁹⁵² Again, statistical conclusions are highly suspect, and can be rapidly unseated.

Even with such provisos, what can be said about Aegean fineware in the Levant is still rather significant. With little exaggeration, the finds unearthed to date in Palestine and Syria easily support tens of thousands of (mostly Attic) red figure and black gloss vessels reaching those regions during the Persian period.⁹⁵³ A portion of these traveled farther east, to Persian palatial sites, e.g., Susa, and Jordan, but the greater portion of the ceramics remained within or close to the coastal regions.⁹⁵⁴ Very few of these ceramics appear in burial contexts (which accounts for so few complete finds); more often they are found in domestic⁹⁵⁵ or what seem to be mercantile domains, e.g., seaside warehouses.⁹⁵⁶ We know that these vessels were sometimes shipped in crated lots, likely from single workshops.⁹⁵⁷ The quality of the goods was often very high; some vessels were designed for export generally, some for the Levant specifically.⁹⁵⁸ There seems, based on statistical evidence, to have been a region-wide preference for certain

⁹⁵² Elayi and Sayegh, 1998, 140.

⁹⁵³ Shefton (2000, 79), in fact, has suggested tens of thousands of Castulo cups alone. Even with such large figures, some perspective must be kept in mind. Large coastal sites like Dor and Ascalon might produce potentially thousands of Aegean-Attic fineware vessels, but these are only a very, very small percentage (0.4% at Ascalon, see Adelman, 1995) of the total number of ceramic finds including the locally made wares.

⁹⁵⁴ See, for example, the various maps of finds published in Elayi 1988, Stern, 1982 and 2001, which show very clearly that finds are concentrated to within a coastal strip of ca. 40 km wide.

⁹⁵⁵ Marchese (1989, 150) suggests social stratification of users at Tel Michal, but elsewhere this cannot be shown with any certainty. Marchese's arguments also presume a high monetary value for the ceramics.

⁹⁵⁶ For "warehouse" finds see Stern, 2001, 518-19 (Akko, Jaffa) and Perrault, 1993 (Al Mina, Bassit).

⁹⁵⁷ See Stern, 2001, 518-19. The large late 5th c. Alonnesos shipwreck seems to have carried black glaze cups and plates in crates (Hadjidaki, 1996, 590 and fig. 10).

⁹⁵⁸ See Shefton, 2000, 78-79. Castulo cups and the late black-figure cups decorated in silhouette style, he suggests, were produced as export ware, the latter perhaps for the Levant.

shapes: lamps and drinking forms, particularly bowls, cups, and kraters, were widely popular, less so were the small closed *aryballoi* and *askoi*.⁹⁵⁹ In Palestine, an unparalleled concentration of pattern *lekythoi* could indicate a more localized preference for this one shape.⁹⁶⁰ Aegean ceramics had a strong influence on local ware on the shape of local as early as the 7th c.; by the 5th c. many types were directly imitated.⁹⁶¹ As for the trade, finds from Cyprus suggest Hellenic cities like Marion in the north, and Phoenician cities in the south, like Kition, might have been transshipment points for ceramics continuing to the east;⁹⁶² Phoenician and Greek inscriptions on some fragments can add nothing more to the identity of the handlers, or even the consumers.⁹⁶³

While the finds of Aegean-Attic ceramics in the Levant are significant, we should be careful not to overplay their significance. It is not too likely that these cups and kraters, as fine as some are, represented the major or most important commodity that the Aegean sent to the Levant. Nor do they necessarily represent direct contact, since crates of fineware could easily have been moved from ship to ship and from trader to trader. The thousands of Aegean fineware cups, for example, that reached the Levant over the course of nearly two centuries no doubt

⁹⁵⁹ See, for example, Marchese's (1995) tables 4.1 and 4.2, which show very high numbers of *skyphoi* and bowls at Dor compared to small closed and other forms. See also Shefton, 2000, 77ff.

⁹⁶⁰ See Shefton, 2000, 78, for the most recent discussion.

⁹⁶¹ Marchese (1989, 130 and 150), for example, discusses locally produced imitations of Attic fish-plates and lamps. The imitation of Athenian ceramics, like the imitation of Athenian coinage, seems to have been a widespread phenomenon throughout the eastern Mediterranean. See Berlin and Lynch, forthcoming (I thank Andrea Berlin for allowing me to see an advance copy of the article).

⁹⁶² See Raptou, 1999, chp. I.

⁹⁶³ For an overview of the Greek and Phoenician inscriptions found on fineware and the problems of using them as evidence for trader ethnicity, see Waldbaum, 1997, 8-10.

arrived one or two crates at a time; a “filler” cargo tucked in among other items, but never the main consignment.⁹⁶⁴

⁹⁶⁴ See Gill, 1991. Also, 5th c. shipwreck evidence, e.g., Alonnesos (Hadjidaki, 1996) and Tektas Burnu (Carlson, 1999), offers unequivocal support of this view.

CHAPTER SIX

Conclusions

INTRODUCTION

In the Introduction, I noted that earlier scholarly biases had either downplayed or ignored Persian period Levantine-Aegean contact.¹ J. Elayi, M. Miller and others have done well to show that contact, both economic and cultural, continued throughout the Persian period, as it did in the centuries before and after.² But, while they have demonstrated the existence of contact, greater specificity as to its nature, and its modes and mechanisms, has been wanting. In the previous chapters, I examined one aspect of the economic interaction, commodities, and have shown that the number of commodities possibly involved in the trade was large—approximately 200 items³—and that many of these goods were likely funneled through the Levant and Aegean from places farther away; to the east goods came from as far as South East Asia (see Table 2: A), to the west they came from as far as Spain (silver, cinnabar), and perhaps England (tin). While there have been a number of studies devoted to commodities in (Levantine-Aegean) trade during the Bronze and Iron Ages,⁴ there has not yet been an attempt at a comprehensive compilation or survey of the material for the Persian

¹ See, for example, M. Miller's comments (1997, 65): "[T]here is a perception among Classicists that the suppression of the Ionian revolt, if not the original Achaemenid take-over of the Levant and Anatolia, created a hiatus in the old tradition of extensive trade."

² E.g., Elayi, 1988; M. Miller, 1997; Bisi, 1987; Stern, 2001; Raptou, 1999.

³ Table 1 lists 125 *classes* of commodities. A number of these classes—art works, fineware, fuller's earths, furniture, glass, gold, silver, metalware, perfume, terracottas, textiles, wine, and oil—contain within numerous individual examples of the class which are discussed in chapters 1-5, e.g., the 17 individual perfumes. The total number of individual commodities discussed plus roughly accounting for things like the various individual fineware vessels traded, but not discussed, gives the (conservative) figure of ca. 200 discrete commodities.

period.⁵ For this reason there is no prior *communis opinio* concerning the comprehensive results of this study to use for comparative purposes or argumentation. Although the results of the study in Chapters 1-5 fulfill the purpose of ascertaining the identity and origins of the commodities, they also can serve as the basis on which to explore the implications and significance of these data. Further comments on the historical, social, and economic aspects of the commodities are possible without delving too deeply into other issues of Levantine-Aegean trade, like taxation, financing, trade routes, exchange systems, etc., which are beyond the bounds of this study.

This chapter is presented in four major sections. In the first, I examine two issues, the eastern Mediterranean Persian period economic expansion and what I have termed the “democratization” of the access to commodities, which help to define the interrelated social and economic contexts through which these commodities moved. Next I present an initial analysis of the material presented in Chapters 1-5 and Tables 1-9. This analysis is meant to serve as a preliminary synthesis of the material and while the observations found in the analysis are informative in their own right, highlighting certain patterns and elaborating upon the discussion in the first section, they cannot stand alone as final conclusions since they mask problems that will be addressed in the third section. There I address these problems from a more nuanced, theoretical stance drawing heavily upon Appadurai’s (1986b) approach to commodities and consumption. Finally, concluding observations are found in section four.

⁴ E.g., Cline 1994; Bass, 1997; Lambrou-Philipson, 1990; Knapp, 1991; Kopcke, 1990.

⁵ M. Miller (1997), Raptou (1999), and Stern (1982) have offered studies on different aspects and groups of commodity material, Miller on Persian and Persian-inspired goods in Athens, Raptou on goods in trade between Cyprus and Athens, and Stern on the archaeological remains of commodities (e.g., ceramics, terracottas, etc.) found in Israel. None of these studies however attempts a comprehensive survey as does this one.

I. CONTEXTS

One frequently occurring trope in Greek comedy is the (long) list, like the Hermippus fragment (*apud* Athen. I.27e-28a), enumerating various *things*, often with their origins and qualities included. These lists appear in a number of different contexts within the plays, but generally they have some connection to the market, like the cook's grocery list.⁶ Whatever their dramatic or literary function may have been, these lists share the common trait of highlighting *agatha* for the audience from their material world, some quite mundane, others more exotic. Without a comprehensive study to guide us, it is impossible to provide at this point an overall ratio of mundane to exotic goods in these lists, or even how many of the goods were imported to Athens; some lists, like the Hermippus fragment, enumerate solely imported goods, others like a long fragment of Anaxandrides (*apud* Athen. IV.131d) mention a handful of obviously imported goods (e.g., frankincense) along with many that might have been grown or produced locally.⁷ But while lists, or even the mention of various goods, are nothing new to ancient literature,⁸ the inclusion of *all* types of commodities in these comedic lists is noteworthy. When Homer, for example, spoke of goods he gravitated towards the prestige items, like weapons, silverware, and fine textiles,

⁶ The Hermippus fragment lists 24 foodstuffs and manufactured items. In the same section of Athenaeus (I.27d-28d), there are additional lists by Antiphanes, Pindar and Eubulus enumerating mostly manufactured goods, e.g., jars, pans, carts, beds, and processed foodstuffs like cheese, from various locales within and without the Aegean. For grocery-type lists, see Alexis *apud* Athen. IV.170a (19 spices including sesame and silphium); Anaxandrides *apud* Athen. IV.131d (99 things, mostly foodstuffs, but also myrrh and frankincense); Mnesimachus *apud* Athen. IX.402f-403d (77 items, mostly foodstuffs, but also cassia, cinnamon, frankincense, myrrh, and storax); cf. Antiphanes *apud* Athen. I.27d, VII.309d, XI.500e; Arist. *Achar.* 873ff; Menander *apud* Athen. IV.146e-f, XI.484d. Many more lists are found elsewhere in Aristophanes and the fragments of other comedians.

⁷ I intend to complete a separate study of these lists. Given their sheer number (ca. 200 in Athenaeus alone) and the variety of goods found in them (many from internal Aegean trade), a separate study of the lists is warranted and is not necessarily compatible with this study since many of the goods were likely grown/produced locally. The focus on foodstuffs in many of the (extant) lists is also a characteristic for which I have no explanation at this stage. For a recent treatment of food in comedy, see Wilkins, 2000.

owned and traded by his elite protagonists.⁹ In Persian period comedy these prestige items appear but so does everything else imaginable. In fact, one can almost detect in these lists, because of their exuberance, a celebratory undertone, in this case a celebration of bounty. This would not necessarily be the bounty reaped from the soil of Attica, but rather the bounty of both locally available and imported goods in the agora. If this is correct, we might conclude that for the first time in (western) history, we have records of consumer glee, and the attendant joys of shopping: in Athens there was an abundance of novelties, of things to be owned or consumed.¹⁰ This bounty of imported exotica and other goods in the agora no doubt gave the Athenians a general sense of wealth, well-being, and importance.¹¹ In a verbal exchange between the Sausage Seller and a slave in Aristophanes' *Knights*, for example, the slave pointedly links seaborne commerce (i.e., its imported commodities and taxes) with Athens' happiness and well-being. Pointing to the cargo ships (*holkadas*) and markets (*emporía*) in the Athenian-controlled Aegean, he asks the Sausage Seller, as a representative of Athens: *pôs oun ou megalôs eudaimoneis?* ("How can you deny that you're happy/well/flourishing?"; the verb *eudaimonein* encapsulates all of these

⁸ E.g., the famed Catalog of Ships in Homer (*Il.* II.494-759), or Old Testament genealogies, e.g., Gen. 10.

⁹ E.g., the silver Sidonian mixing bowl given to Telemachus by Menelaus, the costliest and most beautiful of the things stored in his house (*Od.* IV.614ff.).

¹⁰ On the pleasures of consumption, especially the consumption of novelties, see Aristoxenus, the 4th c. philosopher (*apud* Athen. XII.545e): "Since novelty has a mighty power to make pleasure seem greater, it is not to be ignored...for this reason many kinds of food have been invented, many kinds of cakes, many kinds of incense and perfume, many kinds of garments and rugs, of cups too, and other utensils; for all these things do, in fact, contribute a certain pleasure..." (trans. Gulick). For a more recent appraisal of such pleasures, including the joy of shopping in antiquity, see Davidson, 1997, 204.

¹¹ Cf. Aristophanes who coins the term *plouthygieia*, "wealth-healthiness" to describe what the goddess Athena pours over Demos (i.e., the Athenian populace; *Knights* 1091), and what the birds will give to humankind (*Birds* 731).

meanings).¹² A market diminished, on the other hand, or more systematically emptied, was demoralizing and depressing.¹³

Looking back to a time before such bounty, the Greeks seem to have had a general sense that a substantial amount of economic expansion, hand in hand with a greater variety and volume of available commodities, had occurred in certain cities and perhaps the entire Aegean over the course of the later 6th and early 5th c. Alexis (the historian, *apud* Athen. XII.540d) notes that the late 6th c. tyrant Polycrates enriched Samos by importing goods from many other (Aegean) cities; Clearchus (*apud* Athen. XII.540e) remarks that “he literally filled Hellas (*ontôs eneplêse tèn Ellada*) with all kinds of foods that tempted to sensuality and incontinence” (trans. Gulick). The “filling” metaphor is also used by Aristophanes (*Knights* 813-15): Themistocles found Athens half-empty (*epikheilê*), filled her all the way up (*epoiêsen tèn polin mestên*), and “he added new seafood dishes to her menu while taking away none of the old” (trans. Henderson). With the filling of Athens and Greece came a general prosperity, as articulated by Diodorus Siculus (XII.1.3-4): “every city of Hellas enjoyed such an abundant prosperity (*euporia*) that all men were filled with wonder at the complete reversal of their fortune. From this time over the next fifty years (ca. 480-430) Greece made great advances in prosperity (*eudaemonia*)” (trans. Oldfather).¹⁴

Towards the end of the 5th c., Aristophanes portrays a general prosperity permeating most levels of Athenian society. The playwright’s urbanite, but still

¹² See Diod. Sic. XVI.41.4 for another example of trade (*emporía*) bestowing *eudaemonia* on a city, in this case Sidon. On the abundance of the Athenian market, see also Thucy. II.38.2; Isoc. *Panegyricus*, 42.

¹³ See the discussion of Aristophanes’ *Acharnians* in the Introduction.

¹⁴ Writing many centuries later, Diodorus, a notoriously bad historian, might have enjoyed a degree of historical perspective. However, the accuracy of his perspective depends almost entirely on the quality of his sources, which for this passage are unknown.

arguably common characters¹⁵ possess perfumes and makeup, saffron-dyed dresses, and fancy slippers (*Lys.* 46-48); Milesian woolens (*Lys.* 728); and “invisible wealth” (*aphanê plouton* vs. landed, visible wealth) in gold darics and silver (*Eccl.* 602-03). The hard, working life has not disappeared (*Pl.* 510-16), but one’s labor is rewarded with much more than agricultural produce. Further indications of Persian period growth and prosperity in the Aegean are found in the archaeological record.¹⁶ Evidence compiled by I. Morris, e.g., skeleton and house sizes, numbers of shipwrecks known and other quantifiable data, indicates that a considerable sustained and aggregate economic growth occurred during the 6-4th c.; “standards of living rose sharply,” Morris concludes.¹⁷

This economic expansion and change in the standard of living was not limited to just the Aegean. Contemporary Semitic textual sources on prosperity in the Levant are non-existent, and although Greek sources illustrate a well-off Persian period Phoenicia, they are mostly late.¹⁸ Where there is greater evidence

¹⁵ The socio-economic status of many of Aristophanes’ characters is difficult to determine. Some, like Strepsiades (in *Clouds*), appear on the cusp of different levels; having married up socially, but still lacking funds due to his poor background, he has accrued massive debts trying to keep up the expensive, elitist habits of his wife and son, habits which are not his own.

¹⁶ Growth and prosperity are already visible in the archaeological record by the 7th c.; for an extended discussion, see Tandy, 1997, chp. I. Sherratt and Sherratt, 1993 and 1998 offer surveys of and comments on general economic growth in the Mediterranean during the 1st millennium BC.

¹⁷ Morris, 2001, 28. A great deal of Morris’ work is based on (statistical) quantification of archaeological evidence, which places his conclusions within a category that is difficult to assess. Using various, mostly statistical approaches, numerous scholars, like Morris, have presented studies quantifying everything within the ancient economy from ceramic production and distribution to coin production, and even the consumer base (i.e., population). The success of these attempts is highly debatable: in many cases we do not have enough examples of a particular item to form a good statistical base, nor can we be guaranteed that new discoveries will not immediately, and drastically, upset earlier conclusions. For a particularly vitriolic counter to recent attempts to quantify ancient coin production, but also good generally for highlighting the major pitfalls of any attempt to quantify ancient economic evidence, see Buttrey and Buttrey, 1997. Nevertheless, quantification of the available evidence, even if the results provide only a generalized view of the ancient reality (something which does not sit well with the Buttreys), can still be useful because of these generalized views, or impressions, as de Callatay (1995) has argued. In sections that follow, I too present quantified evidence, but I do so only with the intention of offering an impression of what might have been, not *wie es eigentlich gewesen war*.

¹⁸ E.g., Diod. Sic. XVI.41.1-5; Elayi (1990) collects and discusses what (little) Phoenician and later Greek textual evidence there is for Persian period prosperity (cf. p. 72) in the region. The

for an increase in Levantine prosperity, however, is in the archaeological record. This evidence shows that following the defeat of the Babylonian empire by the Persians in the mid-6th c., the satrapy Beyond the River saw an explosive growth, as new (coastal) cities were founded and abandoned towns were re-inhabited. Excavations at many of the sites in the region (e.g., Acco, Ascalon, Tel el-Hesi) have revealed similarities in the stratigraphy: extensive destruction levels dating to around the beginning of the 6th c., followed by decades of either abandonment or small, rough settlements built upon the ruins of the earlier cities; by the 5th c. the towns are rebuilt, generally on a much larger scale than the pre-Babylonian cities. Along the southern (Israeli) section of the coast, sites like Acco, Dor and Ascalon have 2-3 meters of Persian period strata containing multiple phases of building, rebuilding and civic expansion;¹⁹ the remains of seaside warehouses, sometimes with rows of amphoras still stacked within (e.g., grid 50 at Ascalon), suggest that much of the growth was related to (maritime) trade. Although some inland sites, like those in Galilee, do not show the same level of rapid growth, or any growth at all, nevertheless grave goods, monuments, sarcophagi, and even finds of Attic pottery found in hundreds of places throughout the region indicate an overall rise in general Levantine standards of living.²⁰

The reasons for the Persian period economic expansion in the eastern Mediterranean are highly complex and not well understood; nor did the expansion necessarily affect every community or individual in the same way. Some places, like Athens and Ascalon, grew large, wealthy, and powerful; others simply did not. Whatever the reasons for the expansion, here we can only note a number of interrelated phenomena that were contributing factors. In fact, most of these phenomena can be seen as elements in an overarching physical and social

picture of a thriving Tyre which Ezekiel (27) portrays dates to a few decades before the Persian period, so is not contemporary.

¹⁹ See Stern, 2001, bk. III for a concise overview of these and other sites.

infrastructure which served basically to move commodities more efficiently and at a greater volume. The Persian period saw the full development of built-up harbor complexes (*emporía*) that could lade, receive, and process goods at a greater volume and rate.²¹ Perhaps in response to these harbor works, much larger warships and freighters than ever before appeared on the seas. Thucydides, for example, mentions a *myriophoros* (VII.25), a ship of 10,000 talents burden (= 250 tons), which would place this vessel among some of the largest wooden ships ever built. Off of the island of Alonnesos in the Aegean, recent excavations have brought to light the largest pre-Roman period ship yet known, a late 5th c. vessel of ca. 130 tons burden carrying a cargo mostly of wine.²² As for warships, the *trireme*, a Persian period development, was larger than previous warships by a factor of nearly 2; warship size throughout the period continued to grow culminating in the “fours” and “fives” of the later 4th c. Straddling the line between a social institution and a technological development, coinage, especially small change, came to be widely used in facilitating transactions,²³ and played a role in the development of sophisticated financial institutions that emerged in the

²⁰ Elayi and Haykal, 1986 (especially p. 120); Harding, 1950; Iliffe, 1935; Khalil, 1986; Moorey, 1975; Stern, 1971, 1980, 1982 (especially p.82ff.).

²¹ Herodotus (III.60) claims that the Samians were the first (Greeks?) to build a large, artificial harbor, ca. 540. Cf. Thucy. I.93 for the building-up and fortifying of Piraeus in the beginning of 479/78. A number of decades earlier (ca. 600) the Corinthians built the *diolkos* for hauling goods (or ships?) across the isthmus (Strabo 8.2.1). In the Levant, a few sophisticated harbor complexes appeared during the early Iron Age, perhaps providing the model for the works in the Aegean. By the Persian period, most every reasonably large coastal city could boast of a built-up harbor, some quite elaborate (Raban, 1997). For an overview of Persian period harbor development, see Blackman, 1982; Garland, 1987.

²² Hadjidaki, 1996.

²³ Kim (2002) and Schaps (1997) revisit the question of small change (i.e., small silver fractions of larger denomination coins) in the ancient Greek economy, particularly the questions of when it was introduced and what the social ramifications of its use were. Contrary to earlier opinion, Kim argues that small change appeared at the same time as the earliest, large denomination coins. Early coinage as a whole, he continues, was not a monetary instrument limited to just the wealthy (i.e., those whole could afford to own the larger denominations) who used it in high-value transactions, but was used by all levels of society in all types of transactions, especially low-value (daily) transactions like those in the market place. Also see Howgego (1995, 18) for the relationships between early coinage and trade.

marketplace.²⁴ Whatever the state of international sea-law at this time,²⁵ in Athens, at least, by the mid-4th c., the legal system accommodated the market with the establishment of special maritime courts.²⁶ More specialization in the legal system mirrored more specialization in the marketplace as well.²⁷

Although most of our evidence for trade-related institutions, like banks and special courts, comes from Athens, we can imagine that similar institutions were found throughout the (eastern) Mediterranean, just as coinage and built-up harbors were. All of these phenomena point to the existence of well established, even interrelated market economies operating in the Mediterranean by the 4th c.; no doubt in many places these economies were in place decades before.²⁸ Despite the fact that there were other, earlier periods in the region, like the Late Bronze Age, that saw measures of economic expansion, the Persian period stands out dramatically, as it does in so many other ways, not only for the apparent volume and scale of trade, but also for the range of available commodities and the accessibility of these goods to a wider consuming population.

In Athens, the Persian period economic expansion ran concurrently with the development of a radical democracy and the ideology of equality, which in turn tempered the reaction to the abundance of goods in circulation.²⁹ Before the Persian period, certain classes of goods, like fine textiles, silver plate, and perfumes, seem to have been made unavailable, whether for social, political, or

²⁴ See Cohen (1991, 11-22 especially) for the relationship between the operation of Athenian banks of the 4th c. and coinage as one type of money.

²⁵ See Vélissaropoulos, 1980, chp. IV, III and IV.

²⁶ Cohen, 1973.

²⁷ E. Harris, 2002.

²⁸ Bresson, 2000; Figueira, 1994.

²⁹ In what follows I use terms like mass, elite, non-elite, etc., generally without trying to apply closer definitions. Clarifying social and especially economic status distinctions in Persian period Athens—the focus of most of our source material—is quite difficult. See Davidson, 1997, 227-238.

economic reasons, to all but the elite.³⁰ These and other “luxuries” are the goods one sees circulating among the Homeric aristocrats; in the poems, and no doubt in reality, there was no venue open in the (gift-) exchange systems where non-elites would have access to these goods—except through violence. Markets, of course, were a (peaceful) venue open to non-elites, but some fundamental political and economic shift had to have taken place for these “luxuries” to end up in the market along with the garden vegetables and farm tools.³¹ When and how this shift took place is quite difficult to trace even for a better-documented society like that in Athens. The evidence clearly shows, however, that by the end of the 5th c., there were no longer any social or political barriers which determined the types of goods that people might own. While there were extreme differences between wealth and poverty that might have seemed at odds with the political and social notions of equality,³² in the market it was only one’s economic situation, not the more exclusive categories of birth or political office, which determined access to the full range of commodities. Furthermore, elite conspicuous consumption (in Athens) was avoided or frowned upon, in part because it was seen as transgressing equality.³³ In the world of commodities, this would have also had

³⁰ The evidence for this is mostly negative. In the pre-Persian period Old Testament books and in Homer, it is only the elites who possess, use, and exchange commodities like perfumes, metalware, arms, fine textiles, etc. Letters between ruling elites in the Late Bronze Age which detail items sent as gifts support this view (Cocahvi-Rainey, 1999). Even if markets existed in the Late Bronze Age, where non-elites could find a range of goods, it is difficult to imagine how items like perfumes, arms, and fine textiles would appear there in trade, since the ruling elite, as the Linear B tablets show, completely controlled the production and distribution of these goods.

³¹ For some of the mechanisms by which certain commodities considered exclusively elite become more widely available, see Appadurai (1986b, 23ff., 29ff.).

³² Addressing this issue, Foxhall (2002, 210, 220) calls it the “paradox of the polis,” i.e., the inability to resolve political egalitarianism with economic inequality. On the comic stage, Aristophanes (*Eccl.*) resolves the paradox with a communist economic, social and sexual revolution.

³³ While no doubt employing “utopian” rhetoric in his view of the past, Demosthenes (III.25-26) points to the modest (*sôphrones*) elites of the 5th c. as men who abided by the spirit of the constitution (*en tōi tēs politeias êthei menontes*), i.e., democratic egalitarianism, and did not build flashy houses—who stand in contrast to the elites of his time (4th c.). Their good estate (*eudaemonia*), he goes on to say, was partly due to equality (*isôs*) among themselves. As for

the effect of making it appear to the masses, through a top-down lowering of class consciousness,³⁴ that there were none of those restricted, elite-only types of goods seen in Homer. In sum, a social and political climate encouraging equality, together with the development of the market and its monetization, especially in the form of small denomination coins,³⁵ helped to create what I shall call the “democratization” of commodity access.³⁶

Numerous examples from the comedies illustrate the “common man,” like Chremylus in Aristophanes’ *Wealth*, acquiring items that in the age of Homer (and Hesiod?) would likely be out of their reach.³⁷ Having come into new wealth, Chremylus purchases a heap of goods (*agathôn sôros*, 804), foodstuffs (white barley, figs, wine, olive oil), but more importantly for our purposes, perfumes and bronze and silver saucers, dishes, pots and fish plates to replace the poor man’s

actual 5th c. evidence, Thucydides notes (I.VI.3) that the well-off Athenians (*eudaimones*) gave up their pretentious clothes at some point in the mid-5th c. (?) for *metriai esthêti*, common-type coverings which were in his day the fashion (*es ton nun tropon*). In the same passage Thucydides also notes that the wealthy among the Lacedaemonians (*hoi ta meizô kektêmenoî*) were the *first* (Greeks) to bring their way of life in line with that of the common people (*pros tous pollous isodiaitoi malista katestêsan*), implying that modesty among (Greek) elites was generally expected. Again, however, this may be the ideal and not the reality: I. Morris (2001, 31) suggests, basing his conclusions on the archaeological evidence of house construction, that by the end of the 5th c. this period of elite restraint, if it ever existed, was nearing its end (as was the radical democracy); by the mid-4th c. the elites were building big houses and showing off, but not without drawing censure (see Dem. *Ag. Meidias*, 158-159).

³⁴ In his discussion of social and economic class in Athens, Davidson (1997, 234) suggests that the society fostered an “ideological class blindness” which resulted in the lowering of class consciousness.

³⁵ Kim, 2002.

³⁶ This phenomenon was without question the culmination of a long process beginning generations before; by the end of the 5th c. in Athens, all the economic, political and social elements were in place for the full manifestation of the phenomenon. Sherratt and Sherratt (1998, 340) have suggested that there was a Late Bronze Age/early Iron Age “bourgeoisification” of the consumer base, i.e., those possessing and using elite-types goods. This concept is not the same as what is argued here; trickle-down gift giving and a presumed back room production of knock-off elite goods does not entail open access to all goods in a market.

³⁷ E.g., the old man in Menander *apud* Athen. IV.166a; the fishermen in Menander *apud* Athen. XI.11.484d; and Anticleon (Ar. *Vespes*, 1123-1169) trying on a *kaunakês* and *lakônikai*.

ceramics. Another example, one laden with socio-political overtones,³⁸ is that of Demos in Aristophanes' *Knights*, doused with perfume, wearing exotic clothes, and drinking expensive wine from expensive goblets. The last image we have of Demos in *Knights* is of him wearing fine linen, a *tettigophora* (a golden grasshopper-shaped brooch), and smelling of myrrh, while being hailed (sarcastically) the Monarch of Greece. Thucydides tells us (I.VI.3) that older, wealthy (*eudaemonoi*) men only a short while before gave up this costume for something less pretentious. The common man of the later 5th c. is here arrayed as an elite of an earlier, Marathonian generation, when they were more like (conspicuously consuming) Homeric aristocrats; the common man, in other words, has been transformed into one of the most august, pretentious, gift-giving snob types in anyone's recent memory. And this is done mostly through his access to commodities.

These examples illustrate the fact that *anyone* with the cash in hand could go to the market (in Athens) and purchase perfumes, fine textiles, silver plate, Arabian spices, and the like. Anyone, that is, who had admittance to the agora which in Athens would be freely granted to male citizens. Metics and slaves, however, might have had more difficulty being admitted. Anaxandrides (*apud* Athen. VI.263c), for example, suggests that slaves had only a limited access to the agora.³⁹ While it is clear from comments in a speech of Demosthenes' (*Ag. Euboulides*, 30-31) that metics were not allowed to be vendors in the agora, it is not clear whether or not they had full access for shopping purposes. Nevertheless, certain groups might be excluded solely for political reasons, e.g., the Megarians from Athens (Thucy. I.67). For those who could get into the agora, money, not

³⁸ Kallet (forthcoming) suggests that the transformed Demos is meant to be read on at least a couple of different levels: as an old-style Athenian elite imitating an oriental potentate, and as the contemporary *demos tyrannos*, i.e., the Athenian political body wielding great wealth and power. I thank Kallet for allowing me to see an advance copy of the chapter.

political or social status, was the only factor limiting access to commodities.

Davidson notes:

The market-place was viewed as a demotic space, a zone of participation. The market for sex, for wine, for fine foods was a complex system with a range of prices from very low to very high and something for everyone in between... What separated you from the better goods was merely a few coins you happened to be lacking that day, not your status.⁴⁰

While a poor man receiving a windfall, like Chremylus, could obtain the “better goods,” i.e., traditional elite-type commodities, the market made accommodations even for those with less than heroic budgets. The ways in which this was done are significant since they illustrate the “middling” ideologies of fairness and equality permeating the *agora*, the core of the economic sphere. One method, which perhaps saw an organic evolution, was the production of a qualitatively broad range of commodities; the second, entirely premeditated, was through state regulation.

In his study of technical specialization in Athens, in which he identified roughly 170 agora-related occupations, E. Harris notes that:

The agora did not cater just to the affluent but to all Athenians... [t]he extensive level of horizontal specialization was therefore generated not by the elite’s taste for luxury goods but by a widespread demand for a broad range of commodities.⁴¹

In the agora one could find not only the full range of low- to high-brow goods, as Harris suggests, but also a qualitative range within one class of the commodities. For example, Lynceus of Samos, a 4th c. comic playwright (*apud* Athen. XI.469b-

³⁹ Anchises speaking: “Slaves, my good sir, have no citizenship anywhere... today there are many men who are not free, but tomorrow they will be registered at Sunium, and on the day after they have full admittance to the agora” (trans. Gulick).

⁴⁰ 1997, 237.

⁴¹ 2002, 78.

c) comments on a type of metal cup, *hedypotides*, which the Rhodians manufactured to compete with a similar type made at Athens: “but whereas the Athenians made this style only for the rich, on account of the weight of the metal contained in them, the Rhodians enabled even the poor to share in this beautiful luxury, because of the lightness of the cups” (trans. Gulick). The whole phenomenon of commodity imitation, which spread quite vigorously during the Persian period, also played a role in this vertical differentiation of commodity quality and price.⁴² Not only cups but a host of other commodities were offered in a variety of grades from the (cheap) knock-offs to the acknowledged best. It is tempting to think that extreme vertical grading of this sort developed either in response to or in conjunction with the democratization of commodity access. While a grading of commodities obviously occurred in earlier exchange contexts, commodity imitation was much more severely limited before about the 7th c. (see below); it would also be difficult to imagine a place in the Late Bronze Age aristocratic gift exchange systems for a quasi-prestige good, like the Rhodian *hedypotides*, catering to a particular low-budget consumer niche. More grades meant that the consumer could rise, in the commodity hierarchy, as high as a budget or personal preference would allow. With more choices available some leveling of commodity access took place vis-à-vis personal economic situations and desires. Perhaps more importantly, the grades also meant, thanks to imitations, that a (poor) consumer could enjoy the social prestige that certain goods conveyed in certain circles, but at bargain prices.⁴³

⁴² The concept of commodity imitation, specific examples of imitative commodities and their relation to Persian period markets will be discussed below.

⁴³ See below for a discussion of Isomachus’ parable (Xen. *Oec.* X.3) in which imitation purples, counterfeit coins and gilt necklaces are used to project a social image. Determining which goods portrayed which images in which circles is a highly complex task and is best left for another study. Here I can note, however, that purple robes and gold jewelry would likely be seen as prestige items in most social circles in Athens, thus those wearing imitations of the objects would hope to acquire a measure of prestige by means of their deceit.

Undertones of equality were also found in the realm of quantity, not just quality. In order to insure the citizen body's fair and equal access to quantities of commodities, the distribution of many goods were controlled through (democratically enacted) laws and price setting. And since (some groups of) non-citizens, as discussed above, could be physically denied access to the agora, fair and equal access to the commodities, like political equality, likely became a right of citizenship; the *demos* were the primary shareholders in the market's bounty. Comedy provides glimpses of such controls: in Alexis (*apud* Athen. VI.226a-b) a wealthy politico proposes a price-setting law on fish so that "old man and ancient hag and infant child will buy fish at a fifth of the price, as is right (*kata tropon*)" (trans. Gulick);⁴⁴ in Corinth, according to Diphilus (*apud* Athen. VI.227f-228a), sumptuary laws not only prevented the squandering of estates, but also kept a wealthy visitor from buying prodigious amounts of fish (*oukhi metriôs*)⁴⁵ for one meal and thereby depriving others of their share of the daily catch; in response to the actions of another rich fish-glutton in Antiphanes (*apud* Athen. VIII.342f-343a) one exasperated market-goer shouts, "it is not democratic (*ou dêmotikon*) what he's doing, greedily grabbing so much," and more laws are proposed. Off the comic stage, market controls on grain distribution are well documented.

In the 4th c., the 10 Athenian *sitophylakai* (*Ath. Pol.* 51.3) determined wholesale prices and the amounts of grain that individual dealers could handle in a day.⁴⁶ How far this practice extended to other commodities during the Persian

⁴⁴ The reading *pemptês*, "fifth," is uncertain; if it is the correct reading, I assume that a fifth of the recent, likely high market prices for fish are meant. The point of the passage is clearly to illustrate the culling of political favor by fixing low prices on commodities much in demand. Another example of politically motivated price-fixing, on silphium in this case, can be found in Ar. *Knights*, 893.

⁴⁵ Note that the fishermen in Menander (*apud* XI.484d) boasting of their hoards of newly acquired gold and silver cups and purple robes, say that they are well-off beyond measure (*euporoumen oude metriôs*), implying they have more than their fair share of the goods.

⁴⁶ On these controls see Figueira, 1986; 5th c. evidence for the *sitophylakai* is lacking. However, in his Loeb translation of Ar. *Knights*, Henderson (p.281, n.29) suggests that *pyropipês* is "slang for one of the official cereal inspectors, who might be blamed for prices increases."

period is not known. Centuries later, during the 1st c., Athenian *agoranomoi* were charged with determining maximum prices on a range of goods, in addition to their duties as quality inspectors.⁴⁷ In Aristophanes, where the *agoranomoi* appear for the first time, they act as little more than policemen keeping order in the market (*Achar.*, 723, 824, 968). Price setting by the *agoranomoi* in the Persian period Athenian agora, as the comic examples noted above illustrate, would likely have received little opposition from consumers wanting their share of the *agatha*. As Davidson has aptly observed:

This was not, however, a system that was supposed to benefit the traders...[t]his was a ‘free market’ for consumers only, a market of participation in which fixed prices might easily find a role.⁴⁸

Outside of Athens, home of a radical democracy and egalitarian ideology, it is difficult, if not impossible, to know how far the democratization of commodity access extended in the Aegean and in the markets of the Levant. Archaeology can, as I. Morris argues (2001), indicate higher standards of living in a city or region compared to previous periods, but the artifacts found in houses and tombs tell us very little, if anything, about the markets through which they passed; and while the socio-economic status of the owners might be inferred from the excavation context, very often these inferences rest on shaky foundations. It has been frequently noted that the widespread distribution and excavation contexts of Attic fineware in the Levant suggest that these goods were available to the non-wealthy;⁴⁹ perfume, as discussed in chapter 5, also seems to have been more widely available. Both these examples might point to market situations similar to that found in Athens, but there is no way to be certain without corroborating texts.

⁴⁷ Bresson, chp. 9.

⁴⁸ 1997, 292.

In concluding this section we should once again note that a number of significant developments occurred in the economies and markets of the eastern Mediterranean which appear to have culminated in the Persian period. A fairly rapid and momentous economic expansion bestowed on many communities and families a (steep) rise in the standards of living. From the perspective of commodities, this likely meant, as will be shown in more detail below, that a greater number of commodities were in circulation during the Persian period than earlier periods, both in terms of overall numbers and in terms of volume.⁵⁰ Changing social and political patterns, at least in Athens, also meant that more people had freer access to a wider range of goods than in the centuries before the Persian period. Some communities, like Athens, also took measures to enforce this democratization of commodity access through state regulation. With more regulation aimed at the consumption rather than production end of a commodity's trajectory (like today), the community betrayed its primary concerns: more of everything for everyone.

II. ANALYSIS

In Table 1 the column "Date" gives the earliest era when the commodity class appears in our evidence in Levantine-Aegean trade.⁵¹ Given the limitation of our sources these dates are, for the most part, only rough approximations;⁵²

⁴⁹ See Risser and Blakely (1989, 135) for an overview of findspots, which include tombs, remote agricultural sites, military sites, and dwellings of various types and sizes within cities.

⁵⁰ As discussed below, approximately 42 new classes of commodities appear in the Persian period compared to previous eras. While it is impossible to provide comparative figures for volume of trade, the developments in trade infrastructure mentioned above, e.g., ship size, harbor facilities, monetization, likely aided and also reflected area-wide increases in the volume of goods being moved about.

⁵¹ See below for the distinction between a commodity class and singular examples. Also, it needs to be stressed that the Date refers to Aegean-Levantine trade only, not Levantine-Egyptian trade, for example.

⁵² While I base the era in the Date column on the earliest textual or archaeological evidence indicating Levantine-Aegean trade, I have sometimes made a guess which seems to best suit the evidence. For example, while there is archaeological evidence for pepper in Bronze Age Egyptian tombs, nothing yet points to Levantine-Aegean trade in the spice until the Persian period. Hence I

also approximate are the numbers of commodities appearing for the first time within a certain era. Nevertheless, with this in mind, there seem to be certain *impressions* of chronological patterns and development discernible.⁵³ First, about 40% of the commodities classes from all regions found in Persian period Levantine-Aegean trade are known from the Bronze Age trade.⁵⁴ Given the quality of the evidence for and the seemingly large scale of Bronze Age exchange, this should come as no surprise.⁵⁵ Of these the “ubiquitous” commodities, those originating from both the Levant and Aegean simultaneously, are the largest group, followed by those from the Levant and Aegean respectively. Arabia and the Middle East seem to have supplied only sesame, marine shells, myrrh, and calamus, while the Far East provided ebony, indigo (?), ivory, lapis lazuli and tin. Through the course of the Iron Age era immediately after, a number of commodities (14) are added to the Bronze Age roster,⁵⁶ including items from Arabia (e.g., frankincense) and more spices from the Far East (eaglewood, sandalwood, nard). Furthermore, certain metals (e.g., iron, silver, lead) begin to make more of an appearance in trade.

When we turn to the Persian period, however, we see an appreciable jump in the numbers of “new” commodity classes (42). Once again the Far East and Levant provide major new additions to the total number of commodities in

give “PP” in the column rather than “BA.” What evidence there is for the date is provided in the individual essays the previous chapters.

⁵³ “*Impressions*” needs to be stressed; both the nature of the evidence—full of lacunae and chronologically vague—and the perils of quantifying this evidence (see n.16) make any results more hard and fast than impressions impossible.

⁵⁴ 51 out of the 125 classes found in Table 1.

⁵⁵ The evidence for Late Bronze Age trade and commodities—archaeological and textual—is generally richer and more varied than it is for the Iron Age; the evidence also indicates that trade, however we define it for that period, occurred on a what appears to have been a large scale; see Bass, 1997; Cline, 1994; Pulak, 1988; Sherratt, 1991; Cochavi-Rainey, 1999.

⁵⁶ From the Far East: eaglewood, nard, sandalwood, silk; none from the Middle East; from Arabia: frankincense; from the Levant: antimony, crimson; from the Aegean: silver, lead; from the ubiquitous category: iron, ochre, quartzes, raisins, slaves.

trade,⁵⁷ the Middle East and Arabia a handful (galbanum, ladanum, peacocks), while the rest come from the Aegean, Asia Minor, Egypt/North Africa and the “ubiquitous” category.⁵⁸ As noted in the previous section, a sharp rise in the number of new commodities in general circulation (in the Aegean) during the Persian period can also be inferred from a handful of texts; both the Samian tyrant Polycrates (Athen. XII.540d) and the Athenian Themistocles (Ar. *Knights*, 813-15) were said to have “filled” their respective parts of the Aegean with commodities. Our 42 new commodity classes could easily have accompanied the other goods filling parts of the Aegean.

While this increase in the number of commodities in general circulation likely reflects one aspect of the economic expansion noted at the beginning of this chapter, some caution again must be exercised. The source material for the Persian period is far richer than it is for earlier periods and so might distort our perceptions. For example, one apparent pattern for Persian period additions is the increase in the numbers of pigments and chemicals, which might reflect an actual increase in the trade of these industrial items,⁵⁹ but could also mean that later “scientific” writers, e.g., Theophrastus, were more apt to mention the commodities than was, say, Homer. Even so, for a fair number of these commodities--cats, cotton, peacocks, rice, silk--there is little doubt that they were introduced to Levantine-Aegean trade during the Persian period.⁶⁰ Furthermore,

⁵⁷ Amomon, beryls, bitumen, cardamom, cassia, cinnamon, corundum, costum, cotton, silk, nutmeg, pepper, pearls, rice, tumeric, azurite, camel’s thorn, cedar, cinnabar, dates, greenearth, gypsum, malachite, verdigris, semidalis.

⁵⁸ From the Aegean: fuller’s earth, marble, styrax, sugar of lead, terracottas; from Asia Minor: lykion, touchstone; from Egypt/North Africa: balanos oil, castor oil, cats, natron; from the ubiquitous category: alkanet, lichens, salt, sulphur.

⁵⁹ From the Levant these are: antimony, azurite, cinnabar, greenearth?, gypsum, malachite, verdigris?; from the Aegean: fuller’s earth; from the ubiquitous category: alkanet, lichens, sulphur?

⁶⁰ The lack of any combination of archaeological, visual and textual evidence before the Persian period for these goods, plus the way they are discussed by contemporaries (e.g., Theophrastus, *HP* IV.4.10 on rice; Herodotus III.47 and 106 on cotton) makes it quite certain that these were Persian

at least one heavy and bulky item, marble, appears for the first time in the east bound trade; the few Lebanese cedar baulks that made it to the Aegean also appeared no earlier than the Persian period. More will be said about commodity types below.

Greater precision in the chronology of Levantine-Aegean commodity movements within the Persian period is more difficult to discern. A small number of items--amomon, cardamom, camel's thorn, costum, lykion, and nutmeg--may not have appeared until the very end of the period. Other commodities, mostly manufactured items subject to the whims of fashion like certain types of clothing and perhaps core-formed glass bottles, may have disappeared around the same time, if not beforehand. If we can consider, making allowances for the nature of the evidence, the full list of items in Table 2 as a possible snapshot of classes of goods in circulation at any given moment during the Persian period, it is clear that a far greater number of classes, roughly 3:1, were moving westward compared to those moving east.⁶¹ When considered more closely by region of origin, the Far East (Table 2, A:1) and the Levant (A:4) were the largest contributors to westbound goods (18 + 25 = 43 of 54 total), while Arabia and the Middle East offered just six and five classes respectively. The number of Levantine classes (25, + ubiquitous) might be expected; the large number from the Far East (18), however, is more unexpected, especially in light of a decided academic bias against recognizing the Far Eastern-Mediterranean trade this early;⁶² the commodity evidence clearly shows this trade did in fact exist. We have no figures, of course, for the volume of goods coming from the Far East, and so

period introductions. For the fuller discussions, see the individual essays in the preceding chapters.

⁶¹ The quantification of the evidence in this paragraph is meant, again, to convey an impression, rather than offer cold figures on the reality of trade. For my thoughts on quantification of ancient economic data, see n.16.

⁶² Raschke, 1978, 653; Crone, 1987, 45.

cannot compare the overall importance of these goods in trade in relation to the others from Arabia, the Middle East, and the Levant.

The roughly 5:1 ratio of east-westbound classes is large enough to appear quite significant,⁶³ but what this figure actually represents is difficult to determine. While it may be tempting to use these figures to posit some sort of trade imbalance, i.e., imports of greater value than exports, it must be remembered that what is quantified here is class type, not necessarily direct equivalencies or volume. It is worth noting, however, that at first glance these numbers correspond in a general way to a posited imbalance in Rome's eastern trade many centuries later, as well as the imbalance in east-west medieval trade.⁶⁴ In the Roman trade, focus has often been limited to a number of classes of goods—primarily silver and gold—that were taken east to India and China, while much larger numbers of classes, mostly spices, silks, gems and the like traveled west.⁶⁵ The tallies of classes, then, do not appear much different from the situation during the Persian period. A closer examination of the Roman trade reveals that there were, of course, more goods than just bullion shipped east. Ferguson mentions slaves, marine purple, amber, storax, henna, glass, and jewelry among the items sent to China.⁶⁶ The *PME*, our primary source for the Indian trade, lists various grades of textiles, glass, metalware (including tools), slaves, livestock, iron, tin, lead, copper, saffron, henna, storax, realgar, antimony, and orpiment as goods sent towards India from the Roman Mediterranean.⁶⁷ A more “balanced” picture of trade, then, seems to come into view. But, again, it was not

⁶³ This is calculated from the total number of east to west goods, 54, (Table 2:A), and the total of Aegean to the east goods, 10 (Table 2:B) which gives an actual ratio of 3.35:1. I have not included the “ubiquitous” goods or the Asia Minor and Egyptian goods in this figure; the addition of the ubiquitous category to each side does nothing for the final ratio, as does the addition of the Asia Minor and Egyptian goods which also were travelling in both directions.

⁶⁴ For the medieval imbalance, with the east sending to Europe large amounts of spices, silk and other exotica in exchange for silver primarily, see Bautier, 1992, 292, 301.

⁶⁵ Miller, 1969, chp. 13; Young, 2001, 201.

⁶⁶ 1978, 590.

numbers of commodity classes that caused the sense of imbalance, but rather the eastward drain of bullion, in other words more money, was paid to the east than to the west. Whatever the numbers of commodities in east-west circulation, Pliny (VI.101; XII.84), for one, was concerned with the hundreds of millions of Roman sesterces the east drew out from the Mediterranean each year. *Tanti nobis deliciae et feminae constant*, he concludes with moralistic finger wagging. Later ages faced similar problems with eastern bullion drainages: Queen Elizabeth I allowed the East India Company to take precious metals abroad only if an equal amount was returned;⁶⁸ by the 19th c. A.D. the Chinese would accept virtually nothing but silver trade dollars from European and American companies in exchange for teas, silk, spices and porcelain.⁶⁹ While the extent of the Roman bullion drain, and thus the trade imbalance, has been seriously questioned,⁷⁰ there is no question that the precious metal flow was eastward, never westward, and that the metals were used almost exclusively to pay for the westbound commodities.

The eastward precious metal drain also seems to have been occurring during the Persian period. Among the 10 commodities originating only in the Aegean is silver (Table 2: B). As noted in the section on silver, gold and coinage in chapter five, precious metals were themselves commodities, but their specialized use as money meant that they could be exchanged for many other classes of other goods, nor were they limited in the range of classes to which they could be made equal. What the 5:1 ratio in the numbers of east versus westbound commodities could represent then is the primary use of silver (and Aegean gold?) as payment for westbound commodities; hence the disparity in the numbers of

⁶⁷ See the lists in Casson, 1989, 38-43.

⁶⁸ Miller, 1969, 217.

⁶⁹ Kleeberg, 1995, 88.

⁷⁰ Raschke (1978, 622-637) concludes that, in fact, the perceived trade imbalance, if it actually existed, was much smaller than previously thought. For a different perspective, one focusing more on the species drain, see Harl, 1996, 297ff.

classes. The hoards of Persian period Aegean coins (and their imitations) found in Arabia, Mesopotamia, and even Afghanistan imply their use in such west-east commerce, especially since they traveled as far east as the goods they may have been exchanged for traveled west.⁷¹ It is therefore tempting to propose a precious metal drain to the east as a major exchange mechanism in Levantine-Aegean trade, perhaps one that even encouraged more classes of goods to be found in the east for exchange with the metals. We should, however, approach this theory with great caution. We cannot be certain that Aegean silver was always the medium of exchange for purchasing Aegean-bound cargoes; different exchange systems may have been operating as well as different exchange media.⁷² Furthermore, much of the silver could have been recirculated back to the Aegean as payments or taxes.⁷³ Also, there was no Pliny of the era to draw attention to the eastward bullion drain; but this could have been a matter of knowledge (discussed below) or apathy.

Turning now to commodity types, one can see that while the Aegean's exports were not as numerous as the imports from the east, most (70%) of what was exported (according to Table 2:B) was either manufactured or heavily refined: fineware, iron, lead, finished marble (e.g., stelai), silver, sugar of lead, and terracottas.⁷⁴ A much smaller number of manufactured goods—mostly glass

⁷¹ The earliest series of Bactrian coins were imitations of Athenian owls, executed in an excellent style. That these coins were imitated as far east as Bactria (roughly modern Afghanistan) certainly implies their acceptance and use in that part of the world. This coinage is generally dated to the immediate post-Alexander period, ca.325-300, but the dates are not certain (Bopearachchi, 1998, 1).

⁷² Barter, for example, is the only form of exchange found in Dicaeopolis' (comic) international market (*Ar. Achar.* 719ff.). Also, Athenian coinage is not found in significant numbers in the Black Sea region, Thrace or Macedon, all areas where Athens conducted extensive trade during the Persian period (Howgego, 1995, 95). This may suggest other exchange media or systems were used.

⁷³ See Howgego (1995, 94) for the large role customs duties played in the movement and recirculation of ancient coin.

⁷⁴ This does not include the items from the ubiquitous category (Table 2:E), e.g., arms, metalware, perfumes, textiles, and wines. Also, the distinction between some of these categories, e.g., manufactured and semi-processed is not easily determined. Wine, for example, is the product of an elaborate and even artistic process. Is it then a manufactured product or semi-processed?

and alabaster vessels and processed metals and pigments (Egyptian Blue, copper, tin)—were traded west.⁷⁵ The bulk of the items in westbound trade were raw or semi-processed: nearly one third of these goods are spices; pigments, dyes and other chemicals comprise about one-sixth of the total; the remainder consists of miscellaneous materials like raw ebony and ivory. The Aegean's raw and semi-processed exports to the east, if the metals are excluded, were quite limited: amber, fuller's earths, unfinished marble and styrax.

The title "raw and semi-processed" implies that most of these items were destined for use in industry elsewhere. Pigments, dyes and chemicals were meant to be used in other projects, as were blocks of ebony and uncarved ivory.⁷⁶ Combined these industrial goods make up about 25% of the total numbers of commodities in westbound trade, which is roughly the same percentage for the eastbound industrial goods.⁷⁷ Although 25% is a significant figure, it is difficult to know what to make of it. Raw and semi-processed goods, as the Uluburun shipwreck amply illustrates,⁷⁸ were present in Levantine-Aegean trade from an early date; and as might be expected, many of the same raw materials, like ebony and ivory, are present during the Persian period as well. While a number of new pigments seems to appear in Persian period trade, their apparent novelty, as mentioned above, could be due to faulty (textual) evidence. The only raw material we can be certain did not appear in the trade in large volume before the Persian period is Aegean marble, one of the few indigenous raw commodities of which there was an abundance.

⁷⁵ Again, this does not include items from the ubiquitous category (Table 2:E), like perfumes, textiles, and metalware, which no doubt appeared in westbound cargoes.

⁷⁶ Industrial metals, like copper, tin, lead, and iron, could be included in this list; however, the amount of refining required to produce an ingot of copper, for example, warrants the inclusion of the metals under "manufactured" rather than "raw or semi-processed."

⁷⁷ As with the trade "imbalance" discussion above, here I also use only the goods found in Table 2: A, B to calculate these figures. Only two raw industrial goods, fuller's earth and unfinished marble, appear in the list out of the total 10, i.e., 20%. Once again, these figures do not constitute trade volume, but simply discrete commodity types.

Since the two figures, 25% and 20% for west- and east-bound raw materials, effectively cancel one another, we are left, since the remaining types of goods do not form large cohesive groups, looking at spices (ca. 33% of the trade) from the east, and the manufactured goods (ca. 70% of the trade) from the west at the core of the Levantine-Aegean trade.⁷⁹ Most of these spices and manufactured goods could be labeled “luxuries” (see below).

One thing that is immediately striking about this observation is that those goods generally considered to be important high-volume commodities in internal Aegean and Levantine trade—grain, wine, fish, and (olive) oil—do not appear prominently at all in Aegean-Levantine trade. As noted, some quantities of wine and oil were shipped east and west, but on what appears to be a rather small scale; fish products cannot be found at all. What foodstuffs there were in this trade were mostly “luxury” types originating in the east: rice, sesame, dates, *semidalis*. Of these, the presence of rice seems minimal, while sesame, dates, and *semidalis* were used in the Aegean mostly for special occasions, like weddings, indicating their comparative rarity and expense.

Timber, likewise an important commodity in internal Aegean and Levantine trade, plays virtually no role in the east-west trade. One reason for this, as suggested above, is that the use of timber to build navies made it a strategic commodity, and thus one which the Persians and Phoenicians would be keen to restrict. Other militarily important commodities like pitch, tow, and iron, also do not seem to have been extensively traded east to west, although, Egyptian linen and Cypriot copper likely were. The extent of these exports cannot be known, but it is worth reiterating that Persian hegemony in both Egypt and Cyprus was unstable, and Athenian involvement in revolts in both places during the 5-4th c., could have made access to quantities of linen and copper easier at times, no

⁷⁸ See Bass, 1997, for a detailed discussion of the raw materials found on the wreck.

matter what the Persians' policy might have been regarding these types of commodities. The Athenians, and no doubt other Aegean powers, also seem to have kept close watch on the movement of strategic commodities. Aristophanes (*Frogs* 360-63), for example, berates a fellow for shipping forbidden goods (*t'aporrêt'apopempei*) from Aegina to enemy Epidaurus; included in the list are trireme oarport sleeves (*askomata*), sails (? *lina*), pitch (*pitta*), and general naval supplies (*krêmata tais nausin*); in *Knights* (279) another man is accused of smuggling *zômeumata* ("plank steaks," a pun on *hypozomata*, anti-hogging cables) for Peloponnesian triremes. Despite this apparent internal Aegean movement, there is no evidence for strategic commodities leaving the Aegean for the Levant.⁸⁰

Strategic commodities can be considered an extension of "necessities;" at the other end of the spectrum are luxuries.⁸¹ This spectrum will be more fully explored below, but for the moment if we review the commodities found in Tables 1 and 2, ca. 75% of them could be described as luxury or semi-luxury goods.⁸² Of the non-luxury goods, well over half of them are the industrial dyes, pigments and chemicals, and non-precious metals (tin, iron, copper) discussed above, in addition to common oils, like castor oil. Examined by producing region, the classes of goods from the Far East and Arabia (Table 2:A, 1 and 3) are, with the exception of tin, exclusively luxury goods. The same generally seems to be the case with the goods from the Middle East (Table 2:A, 2). A greater mix of luxury and non-luxury goods is found in the commodities

⁷⁹ Manufactured goods from the east are a cohesive group, forming ca. 9% of the trade, but are greatly overshadowed by the spices and so are not included in the "core."

⁸⁰ As noted above (p. 242), a number of Greek helmets have been found in waters off the Levantine coast; these likely reflect the remains of battles fought rather than arms shipments.

⁸¹ I use the term "luxury" as traditionally understood in this section for the sake of convenience. In section III ("Commodity Types"), the term is called into question.

⁸² In reference to the commodities found in trade between the Persian Empire (which included the Levant) and the Aegean, M. Miller (1997, 65) notes that the "goods in question tended to be luxury items."

originating closer to the Mediterranean, those from the Levant, Egypt, and the Aegean (Table 2:A, B, C). The significance of these observations depends on how we define a “luxury,” which is something we will return to below.

Lastly, attention needs to be drawn to imitative commodities, particularly in reference to luxury goods. The modern perception of commodity imitation generally dictates that luxury goods inspire the production of (deceitful) imitations. As can be seen in Table 1, “Copy’d,” some traditionally defined luxury goods, like marine purple and saffron dyes, some gems, frankincense, myrrh, ebony, ivory, and nard were imitated. But imitation was not limited to just these goods. Industrial commodities, like azurite, cinnabar, fuller’s earths, malachite, natron, ochre, and other goods difficult to classify, like some fineware, textiles, and coins, were widely imitated as well. Imitation then was clearly a phenomenon found across the commodity spectrum and therefore deserves closer study (see below), particularly since it has the potential to disrupt perceptions of trade, both ours and those in antiquity.

To conclude this preliminary analysis, we have seen that the geographic extent of Levantine-Aegean trade did not change appreciably since the Bronze Age: the Far East and Arabia, as well as Egypt and the Middle East, contributed to the Late Bronze Age trade. Diachronic change, at least from the perspective of commodities, was found primarily in the individual additions to the overall number of commodities in trade. The general impression that the types of commodities were predominantly luxury goods encourages us to label Persian period Levantine-Aegean trade as mostly a luxury trade, and this is basically congruent with assessments of the nature of Levantine-Aegean trade for other periods. Although Late Bronze Age international (gift) exchange included raw materials—like metals, glass, and spices--these and the other manufactured goods

were considered elite prestige goods.⁸³ The prestigious nature of this trade does not seem to have changed during the Iron Age.⁸⁴ While there does not appear to have been a significant change in the nature of the goods traded over time, the exchange systems and societies through which they flowed did change. A democratization of commodity access occurred, as noted in the previous section, which means that the trade might not have been as elite and prestigious as it once was; “luxuries” centuries before, could have been commonplace by the Persian period.

Armed with a basic synthesis of the material and preliminary conclusions, we will now revisit a number of the topics raised in this section from a more theoretical standpoint in order to gauge the accuracy of the conclusions as well as their inherent assumptions. While the overall picture of Persian period Levantine-Aegean trade is not greatly altered by what follows, the way in which we view this picture is more nuanced. We begin by looking at commodity movements in time and space (commodity flow) and how both modern and ancient perceptions of this could be altered by knowledge of commodity origins and authenticity, and then consider ways in which cultural attitudes towards the goods might also affect perceptions, specifically in relation to commodity types.

III. THEORETICAL PERSPECTIVES

A. Commodity Flow

Before defining what I mean by “flow,” it is necessary to highlight the fact that most commodities can be considered both as a class (e.g., frankincense) and as an individual object (e.g., a lump of frankincense resin). In studies of the way commodities move through time and space it is generally the class of a

⁸³ See Cochavi-Rainey, 1999. The Late Bronze Age Uluburun ship, Aegean-bound from the Levant when it sank, which had abundant prestige and luxury goods among its cargo (Pulak, 1988, 35), could be the remains of one of these types of exchanges. Also see Bass, 1997.

commodity which is meant, not the individual specimens.⁸⁵ Conversely, recent studies of the concept of commodity, have focused more on the individual example (*viz.* Kopytoff's commodity "biography") than on the class. In doing so, these studies have also argued that from a theoretical perspective every commodity can be said to have its individual trajectory from production/origin to consumption.⁸⁶ While this trajectory is presented as an abstraction and is used mostly to define the nature of a commodity (vs. a non-commodity) within a society, most elements of the concept can be incorporated into a way of looking at the movement of commodities in real time and space. Thus we can define "flow" as the movement of a commodity in real time and space joined with its conceptual trajectory from origin to consumption.⁸⁷

Ideally, a study of commodity flow would track individual specimens rather than classes. The reason for this is that discussions of class movement tend towards gross generalizations which have little significance. We can say, for example, that frankincense as a class originated in Arabia, was shipped through the Levant and consumed in the Aegean. Such a statement, in fact, tells us very little about the flow. If it were possible to trace the flow of a collection of individual packages of frankincense from Arabian production to Aegean consumption, for example, we would likely see the individual packages passing through a number of quite different exchange and cultural contexts. Some packages may be bartered, others paid for with coin; some may be consumed by the *demos* in religious rites, others by elites in symposia. From these myriad tales

⁸⁴ See Tandy, 1997, 65; Kopcke, 1990, *passim*.

⁸⁵ See Appadurai (1986b, 16) for a discussion of commodity class vs. singular examples.

⁸⁶ See Introduction, p. 8.

⁸⁷ This use of flow of commodities is to be distinguished from Appadurai's, where he states, for example, that the "flow of commodities in any given situation is a shifting compromise between socially regulated paths and competitively inspired diversions" (1986b, 17). Appadurai is primarily concerned with the social definition and use of commodities; my use of flow incorporates this concept while at the same time seeks to define the geographic movement of commodities in real time and space.

of individual flow, more meaningful generalizations about the production, consumption, and movements of a class of commodity could then be formulated. As it stands, however, the nature of our evidence usually will not permit this, leaving us to start from generalizations rather than specifics. This means too, that although the concept of flow is best suited to singular examples rather than classes, here it must be expanded to accommodate classes as well, but always with the intent to narrow the focus when possible, and eliminate gross generalizations. Also with this expanded view, care must be taken not to confuse flow with undifferentiated and non-specific commodity movements (e.g., “the Arabian spice trade”) or with trade routes.⁸⁸ Using this concept of flow as the basis for the following discussions, we now will look at how knowledge could affect the perception of flow.

B. Knowledge of Flow

The physical point of consumption in commodity flow is sometimes easier to identify than the point of production. The reason for this quite often is due to knowledge or awareness of the flow. For example, trade connections between the Far East and the Mediterranean are well documented for the Hellenistic era and especially the Roman period.⁸⁹ Serious doubt, however, has been expressed at times concerning the reality of extensive contacts before Alexander.⁹⁰ While it is difficult, if not impossible to gauge with precision the volume of the goods

⁸⁸ There is, in fact, little here that I can say about the trade routes, i.e., the specific roads or searoutes over which the commodities flowed. One reason for this, is that even when we have evidence for long distance trade routes, we cannot be sure or even assume that the same class of commodities invariably followed the same routes at all times throughout the Persian period. In fact, one fatal flaw with the presentation of trade routes, particularly with maps, is that they tend to imply that there was only one route that commodities could follow between certain points, and that route generally would be the most direct. In reality the number of routes in simultaneous use, some of which were no doubt quite indirect, would likely exceed this single possibility. Additionally, the physical characteristics of a route, especially an overland route, were apt to change as the local or regional geo-physical, political and economic situation changed.

⁸⁹ See Raschke, 1978.

⁹⁰ Raschke, 1978, 653ff.; Crone, 1987, 45.

coming from the Far East during the Persian period, the cumulative numbers of commodities identified in this study, 18 total (see Table 2:A), as coming from the Far East indicates the reality of the trade. These goods likely followed two general(ized) routes, one to the Mediterranean going overland through Persia and Mesopotamia, while the other went across the Indian Ocean to Arabia and then northward.⁹¹ Whichever way the goods might have reached the Mediterranean, often few there seemed to know anything of their true origins, hence the ancient confusion surrounding the origins of some commodities which in turn has fueled modern skepticism.

Take, for example, the cases of cinnamon and silk. Herodotus (III.110-111), as noted above, is our only contemporary source to mention the origin of cinnamon, and since he marks Arabia rather than the Far East, serious debate has arisen over just what Herodotus meant by “cinnamon.” Scholars, like Crone, who accept Herodotus at face value refuse to recognize the existence of Far Eastern cinnamon in the Mediterranean as early as the Persian period, if at all until the modern era. Others, like Casson, are more willing to accept that Herodotus might have made a mistake, or was simply repeating what was known in the Aegean about this spice.⁹² The situation with silk is not much different. Aristophanes’ *amorginon khiton* (*Lys.* 150) was obviously a silk-like material, but was thought, as the name implies, to have originated on the island of Amorgos. Until the actual archaeological discovery of Chinese silk in a burial in Attica, scholars argued that this Amorgine silk was the product of a local, inferior silk worm and could not have been Chinese. If Aristophanes meant the Chinese product by *amorginon khiton*, little was obviously known about its origins as the name would indicate.⁹³ Similar skepticism about Persian period imports, at least until the archaeological

⁹¹ The existence of a seaborne connection between Arabia and the Indian subcontinent this early is a matter of serious dispute. See Crone, 1987, 45; de Romanis, chap. I.

⁹² See pp. 47-53 above.

⁹³ For the fuller discussion, see p. 229 above.

discovery of actual examples of the material, has followed lapis lazuli and cotton.⁹⁴

Ignorance of commodity origins in antiquity was no doubt rather commonplace, unlike today where (in the US) laws and labeling require that origins be made clear. Also today we generally know far more about the places where commodities originated than consumers did in antiquity. While this knowledge would not affect the reality of commodity flows, it could affect the presentation of them. By the mid-5th c., for example, Mesopotamia and Persia, although exotic lands from a western perspective, were nevertheless within the realm of firsthand experience for many living in the Aegean or the Levant.⁹⁵ Thus more was known not only about the *orientalia* coming from these regions, but also about their producers. Arabia and the Far East, on the other hand, were lands yet to be visited by enough people from the Mediterranean for corroborative reports dispelling fantasy to be widely circulated.⁹⁶ Although “Arabia” was firmly imprinted on the Mediterranean psyche as a source of spices,⁹⁷ so little was actually known of the place--especially to the Greeks—that in early (and later) reports Arabia Felix was Arabia Fabulosa, a Wonderland with mythical beasts and unparalleled luxuries.⁹⁸ India, at the extreme eastern end of the *oikumenê* (Hdt.

⁹⁴ See pp. 164 and 231 above.

⁹⁵ Herodotus (VII.151) alludes to one of the first (non-Ionian) Greek embassies to visit a Great King in Persia, ca. 450 (cf. also the embassy to Sardis in 508/7, Hdt. V.73). Throughout the Persian period, (non-Ionian) Greek embassies to the Persian king became quite common. See, for example, the comic ambassadors in Aristophanes just back from Ecbatana (*Achar.* 61).

⁹⁶ For those who actually visited India or Arabia, the desire to embellish the report of the experience must have been irrepressible; Herodotus has often been accused of just such a thing, if not outright lying about his visits to the Levant and Egypt. Note too that according to Herodotus (IV.44), Darius chose Scylax of Caryanda to explore the Indus because he trusted the man and his companions to tell the truth (*toisi episteue tèn alêtheièn ereein*); nevertheless, in what survives of this report, scientific truth, at least our perception of it, does not seem to have been a primary concern (Tzetzes, *Chiliades*, 7.629-36).

⁹⁷ Hdt. III.107; II Chron. 9.1-28.

⁹⁸ See Hdt. III.107. Herodotus, in fact, calls Arabia “the most distant to the south of all inhabited countries.” See Romm (1992, *passim*) for a fuller treatment of how the extremity of these geographic localities encouraged the equally extreme presentation found in our sources.

III.106) was a land of equal, if not greater wonder.⁹⁹ There can be no doubt that the lack of direct, common knowledge about either Arabia or India had an effect on how Greeks and other Mediterranean people (mis-)perceived the specific geographic source and production of the Indian and Arabian commodities they consumed,¹⁰⁰ as was the case with cinnamon and silk. The greater the degree of the unknown, the more outlandish the story: thus, for example, the multiple genera of flying creatures guarding the spice plants in South Arabia (Hdt. III.107.).¹⁰¹ Indeed, contemporary audiences listening to Herodotus might scoff at stories of flying snakes chasing off Attic beekeepers from the honey pots on Mt. Hymettos--unless they were Arabians or Indians. For Herodotus to claim that cinnamon and cassia were Arabian products (III.110-111), or for Theophrastus to label tumeric (*khroma*) Syrian, makes sense since they knew no better. The limits of their knowledge, however, should not unduly impede ours; there is little reason to doubt that commodities flowed towards the Mediterranean from the Far East during the Persian period, perhaps to the same extent as they did in later centuries when more was known about the distant lands where cinnamon and silk originated and about the trade that brought the goods to the Mediterranean.¹⁰²

The ancient consumer's knowledge of geographic origins could, in sum, be far off the mark, which in turn could greatly confuse the picture of commodity flow from our perspective. In addition to faulty geographic knowledge, faulty knowledge about the producer's intent and that of the traders handling the goods

⁹⁹ See, for example, Hdt. III.98ff. and the fragments of Ctesias' *Indika* (FGH 688 F45-52). Romm (1992, 86), among others, has argued that Ctesias "seems to have composed his *Indika* primarily to entertain rather than inform his Greek audience." Similar arguments have been made about Herodotus.

¹⁰⁰ See too the quasi-mystical presentation of Ophir, a distant and wealthy Indian or Arabian locality (?), in the Old Testament (e.g., I Kings, 9.24-28) which supplied gold, gems, spices, and monkeys to Judea.

¹⁰¹ Note too the fox-sized, gold-digging ants found in India (Hdt. III.102-105). In passing (III.105), Herodotus mentions gold mines in India, but mining as a method of gold collection is less common (!, *spaniôteros*) in India than taking it from the ants.

could also weigh on consumer perceptions and on ours; *things* were not always what they seemed to be.

C. Commodity Imitation

Among the state officials overseeing the operations of the Athenian market, as noted in the first section, were 10 *agoranomoi*, five installed in the Piraeus, another five in the city. Their duties, proscribed by law, were to insure that all goods offered for sale were pure (*kithara*) and unadulterated (*akibdēla*) (*Ath. Pol.* 51). In addition, an Athenian law, dated 375/74, set up other officials, *dokimastai*,¹⁰³ to deal with the adulteration of one specific item within the market place: the Athenian owl coinage used in exchange.¹⁰⁴ We can be sure that the Athenians of the 4th c. were not the only Mediterranean consumers concerned with the quality of their coinage and what it would buy, and so can presume that there were other officials of this sort in place in most markets and ports throughout the area.¹⁰⁵ In fact, one does not have to look far in ancient texts to see that the markets were indelibly stamped with the reputation of being a hive of cheats and liars,¹⁰⁶ who perpetrated countless dubious schemes on their (un)suspecting customers.¹⁰⁷ Wary and angered, the consumers no doubt

¹⁰² By the Roman period, cinnamon and silk were known to be Far Eastern commodities; see Strabo XVI.782; Casson, 1989, 16.

¹⁰³ From the verb *dokimazō*, to verify.

¹⁰⁴ Stroud, 1974.

¹⁰⁵ E.g., the *odelonomoi* in 5th c. Troezen (*BCH Suppl.* 22, p. 235).

¹⁰⁶ For example, on meeting a Greek embassy, Cyrus said (according to Herodotus, I.153): “I’ve never yet feared men who have a place set apart in the middle of the town where they perjure themselves and deceive one another.” Although an invented comment, Cyrus here expresses what was no doubt a common 5th c. sentiment on the morality of the agora; see the collected references in Knorringa, 1922, 49-51. Also, the more successful one was in trade, the worse the reputation; for generations the Phoenicians, the most reputed traders, were also the most detested (e.g., Hosea 12:8; Hom. *Od.* XIV.287ff.).

¹⁰⁷ E.g., arranging in a basket layers of fresh figs on top of rotten ones (Alexis *apud* Ath. III.76e); selling wool, which was sold by weight, damp or wet (*IGSK* I 15); for a collection of other examples, see Knorringa, 1922, 47-48. An otherwise unknown Lynceus of Samos (4th-3rd c.) wrote a treatise called “How to Buy in the Market” (Athen. VI.228c), perhaps in part as a guide book to known ruses and how to avoid them?

clamored for policing of the traders and for vengeance when cheated; hence the laws calling for fair weights,¹⁰⁸ pure goods, and fine silver.

Imitations, however, were not only linked to deceit for the sake of financial gain, but also to social deceit. Ischomachus' parable (Xen. *Oec.* X.3) makes it clear that bad coinage (*argyrion kibdêlon*), gilt necklaces (*hormous hypoksyulous*) and imitation-purple clothes (*porphyridas eksitêlous phaiên alêthinai einai*) could be used to trick people (*eksapatan*) into believing one was better off than he or she actually was (*hôs pleiô esti moi tôn ontôn*). The consumer, in this case, was not tricked, but was using imitations to project an inflated, deceitful image. In other words, some imitations in the marketplace were known to be imitations, either through word of mouth or presentation, and were sold as such. This obviously complicates our approach to the phenomenon; as does that fact, as we saw above, that not all imitated goods were "luxury" purples and necklaces (see also Table 1, "Copy'd" and Appendix 2).

This apparent proliferation of the imitation phenomenon to other commodity types might have reached its full(er) potential with (democratized) market economies and the Persian period economic "boom." Artistic imitation existed in the Bronze and Iron Age, but the economic aspects of the copying phenomenon, especially counterfeiting, had no place in the economies of elite gift exchange largely at play in those eras.¹⁰⁹ One's reputation as a host or friend would not endure if the items offered were discovered to be false. For this reason, no items patently counterfeit are known from these earlier periods, nor are there

¹⁰⁸ In addition to the laws and officials mentioned above, *metronomoi* were also installed, who made sure all weights and balances used in the market were fair and up to standard (*Ath. Pol.* 51). In the Old Testament, there are a number of warnings to traders about the use of fair weights, e.g., Deut. 25:13, Lev. 19:36.

¹⁰⁹ On the political importance of international gift exchange in luxuries (i.e., not imitative or counterfeit goods) during the Bronze Age, see Knapp, 1998, 203. During the middle ages, the political importance of the gift between high ranking individuals continued, as did the necessity of making sure that what was given was of the highest quality; see Raby, 1995, and Milwright, 2001.

any textual references to such goods.¹¹⁰ Markets, which provided the opportunity for anonymous (deceitful) exchanges, also offered greater latitude for the development of imitations and counterfeits. As noted above, one aspect of the democratization of commodity access was the production of different grades of goods for different budgets. If one could not afford real or top grade purple, for example, one could attempt to partake in the prestige of the commodity by buying low grade or imitative versions, as in Ischomachus' parable. Since the Persian period was arguably the first period in Mediterranean history to see widespread market trade, it was likely the first period to face widespread copying of anything one might have thought worth the effort of imitating or counterfeiting. It was also likely the first period to face tension in the marketplace between simultaneously encouraging the trade of imitations and discouraging them with legislation and inspectors.

From the purposes of this study the imitation phenomenon is problematic for a couple of reasons. First, of course, is the problem of how to define "good" (non-deceitful) and "bad" (deceitful) imitations categorically, and secondly, how to distinguish between any imitation and the real goods in circulation. This last problem is rather significant. With archaeological artifacts it is generally a simple matter to determine if an item was imitative or not; but we cannot tell if it was a "good" or "bad" imitation. In the textual record, on the other hand, we cannot tell if the "purple" mentioned in one of our sources was imitation purple or the real stuff; many examples of commodity flow found in our textual sources therefore might refer to a hidden, parasitical trade in counterfeits or imitations rather than

¹¹⁰ One exception would seem to be blue-colored glass imitating lapis lazuli, which seems to have been just as valuable as the real material (Bass, 1987, 161-62, and p. 164 above). In textual sources, particularly inventories of gifts sent to others, the distinction between real lapis lazuli and imitation is clearly noted (cf. Cochavi-Rainey, 1999, 103ff.). Also, as at other times, the imitations of ceramic forms and styles was prevalent, but the intention here would seem to have been more with the realm of artistic expression, than economic trickery (see Papadopoulos, 1997). Deceit likely took place in exchange, but it would have been more a matter of quantity rather than quality.

the trade in bona fide goods. This disjunction found in both types of evidence has the potential to greatly upset our view of the commodities in trade; things might not have been as they seem to us in terms of origins, composition, or even consumption. Unfortunately, there is little that we can do about the problem; our evidence is what it is. However, we can at least work through the problem of definitions, which I have done in Appendix 2. There I conclude that the definition of good and bad imitations is, in fact, rather fluid and depends not so much on the intent of the producers, but rather the knowledge concerning the commodity available to both parties within the context of a transaction.

The ancient consumer's response to the phenomena of imitation and counterfeiting varied. As today, counterfeiting and other deceitful schemes were deemed serious enough to warrant the institution of official countermeasures. However, the practice of good imitation seems to have been essentially ignored. In fact, consumers, traders, and officials may not have cared greatly about the authenticity of a particular commodity, perhaps because there was no way to know or verify its origins. Their concern, on the other hand, would have been more focused on its ability to fulfill certain specifications and expectations. For example, a customer wanting "Egyptian" perfume might not have cared (or have been able to know) if it was in fact produced by a particular workshop in Egypt. So long as the perfume fulfilled the customer's expectations of what the Egyptian type was, its authenticity, at least the way that we define it, did not matter.¹¹¹

Finally, another thing to consider in terms of the proliferation of imitations and counterfeits, is that a reasonably high proportion of the comparatively few goods shipped from the Aegean--fineware and coarseware ceramics, coinage, and terracottas—were copied. Where it can be determined, all the copies seem to

¹¹¹ The modern world has a fetish for authenticity, so it does matter, legally and socially. The only perfume legally permitted to carry the name Chanel No. 5, for example, is the one offered by the French producer; nor is it likely that anyone using a copy of the perfume would advertise the fact.

have been produced in the Levant for local consumption. While this indicates the local popularity of the real goods in the east, it also is significant for demonstrating that imitations and counterfeits generally did not originate in the same places as the bona fide goods. Distance from the production center of the real goods might have been a factor in where and why imitative goods were made. Greater distances not only would have made the real goods potentially harder to come by and so would have encouraged local imitations to supply demand, but also would have made counterfeiting easier since locals might not have been familiar with the details of the real goods.

D. Commodity Types

In the second year of the Archidamian War (430/29), Athens sent out a squadron of six triremes to Caria and Lycia in order to collect money, and to stop Peloponnesian privateers from molesting merchant ships coming from Phaselis and Phoenicia (Thuc. II.69). Thucydides makes no mention of the cargoes involved, and so has given cause to speculate on what it was that these ships were carrying that the Athenians thought it worth their while protecting. Given the context of the newly started war and the specific mention of enemy privateers, discussions have generally looked towards what may be called strategic materials.¹¹² Elayi, for example, has suggested that the ships were carrying grain, minerals, or timber.¹¹³ However, a closer look at the types of commodities coming from the east, as well as the formation of commodity typologies, might suggest otherwise.

Commodities are often listed under two general headings, necessities and non-necessities, i.e., luxuries (= primary and secondary); “strategic” materials would fall under the rubric of necessities, but with the additional sense that they

¹¹² E.g., Elayi (1988, 73): “L’action lacédémonienne impliquait que cette route d’approvisionnement était vitale pour Athènes puisque l’organisation de sa protection était assurée par l’Etat: vitale pour quelle raison?”

are goods necessary for an attempt to win a battle or war.¹¹⁴ The classification of individual commodities within this binary system has generally followed rather traditional lines which go back at least to the time of Plato. Necessities (*anagkaia*) are those goods which sate the necessary appetites/desires (*anagkaioi epithymiai*, *Rep.* 558 D), such as hunger and the desire for warmth. Unnecessary appetites or spendthrift desires (*analôtikai*, *Rep.* 559 C), which belong in Plato's unflattering analysis to the democratic man (*dêmokratikos*, 559 D),¹¹⁵ are those which seek varieties of food and unnecessary things, and in the end are harmful to the body and soul (*Rep.* 559 B-C). The bad moralistic overtones chained to "unnecessary things" have not been shaken off to this day; in antiquity they were particularly bound to *orientalia*. In his *Laws*, for example, Plato marks specifically two groups of commodities as unnecessary (*mêdenos anagkaiou*), frankincense and other foreign spices, and marine purple and other non-indigenous dyes; these goods are not to be imported into his ideal city (847 C).

This traditional approach to luxuries and necessities permeates most classifications of commodities in trade, particularly those in Levantine-Aegean trade.¹¹⁶ However, this approach is inherently too rigid and therefore faulty since it cannot account for a change in context causing individual commodities to switch from one category to another. During a war, for example, commodities previously considered to be luxuries could be reclassified as necessities, or in times of peace, wartime necessities might be thought of as superfluous. Nor can it account for socially (not bodily) defined necessities, which in fact frankincense

¹¹³ *Ibid.*, 74.

¹¹⁴ Among the only necessities (*anagkaia*) that Plato allows to be imported into his ideal city in his *Laws* (847 D) are strategic goods like arms and the raw materials necessary to produce them.

¹¹⁵ It is tempting to try to link Plato's democratic type to the democratization of markets argued above, but I am not sure how far the connection could be pushed.

¹¹⁶ E.g., M. Miller, 1997, 65.

seems to have been in Persian period Athens and the Levant.¹¹⁷ Addressing these issues, Appadurai has suggested another way to define the categories:

I propose that we regard luxury goods not so much in contrast to necessities (a contrast filled with problems), but as goods whose primary use is *rhetorical* and *social*, goods that are simply *incarnated signs*. The necessity to which *they* respond is fundamentally political. Better still, since most luxury goods are used (though in special ways and at special cost), it might make more sense to regard luxury as a special “register” of consumption...than regard them as a special class of thing.¹¹⁸

He goes on to list the five identifying signs of this “register” which include restriction to elites, complexity of acquisition, the signaling of complex social messages, and specialized knowledge of proper consumption. The usefulness of this model is that the focus is shifted to the (social) consumption of a commodity, rather than its presumed inherent production or exchange value. This allows for greater fluidity in commodity typologies since it is not the commodity itself that determines its status, but rather the specific geographic, temporal and social context in which it is consumed. Although not explicitly stated by Appadurai, the concept of register of consumption also implies not just two either/or types (i.e., luxury and necessity), but many registers along a continuum between two or more extremes, however we choose to define them. In other words, some objects could be considered “semi-luxurious” or “semi-necessary” (for lack of better terms) or some grade thereof, depending on the degree of their elite restriction, social signaling, and so forth.

¹¹⁷ In the passage from *Laws* mentioned above (847 C), Plato acknowledges that frankincense is used in religious rites (*hosa pros theous*). Whatever Plato’s (negative) attitude may have been towards popular religion, and therefore towards the use of spices in religious rites, his contemporaries seem to have felt that no celebration or rite was complete without offering some frankincense to the gods, therefore making the spice a necessity (Menander *apud* Athen. IV.146f; Antiphanes *apud* Athen. VII.309d; cf. Athen. I.9e). For Levantine ritual see, for example, Exod. 30:34-38, and the further discussion in Nielsen, 1986. Also see the numerous incense burners found throughout the eastern Mediterranean at this time, many of which appear to have cultic associations; see Zaccagnino, 1998; Nielsen, 1986; cf. Gitin, 1989.

One problem, as noted in chapter five, with Aegean fineware ceramics in overseas trade, for example, is how one classifies them: luxury goods or not? By approaching the issue from the perspective of social consumption, rather than purely market value (both of which are not necessarily related), we might see that in some contexts they were luxuries, in others these same objects were not. Geographically and temporally, the different contexts might not be widely separated; an Athenian cup in one town, for example, might have been prized, while in another up the road it was *déclassé*. Commodities like Athenian ceramics within a general Levantine context, or core formed glass bottles in an Aegean context, certainly carried social significance, but how much in any given time and place likely was subject to change. Using a sliding scale of registers then we are able to discuss with greater accuracy their luxury, semi-, or non-luxury status within any context, if the evidence allows.

In addition, a similar framework of consumption registers could be sought for defining “necessities.” From the perspective of (social) consumption, these necessities might include not only those items necessary for maintaining the security of life at a basic level (e.g., Plato’s *anagkaia*), but also those items necessary for maintaining social status and mental well-being.¹¹⁹ It may well have been, for example, that in certain contexts, e.g., (elite) symposia and gymnasia, perfume was a *de facto* necessity, despite our, and some ancient authors’ desires to label it otherwise. Or, if a person had obtained a particular social or political status, certain types of clothes, e.g., marine purple dyed robes, might be a necessity in order to maintain the image of power and status; no head of state today, for example, would dare hold press conferences wearing tattered T-

¹¹⁸ 1986, 38 (all italics are his).

¹¹⁹ It no doubt is anachronistic to speak of “mental well being” in reference to the pre-Freud ancient world, but the term encapsulates the sense of being (reasonably) content and free of major stress in their daily, normal lives. In terms of this sense and its relation to commodities, we might say that if, for example, someone was used to a daily routine which included the consumption of

shirts and worn blue jeans. The (dark, expensive) suit, or its feminine equivalent, is a necessity. These are, of course, examples of individual commodities within specific contexts, which is the ideal for the analysis of commodity flow (see the discussion of flow above). At this level, it would be possible to find examples where almost any item could be considered a necessity to someone. However, determining whether a commodity class was considered generally a necessity in a particular society requires, ideally, the corroborating evidence of many such examples of individual flow. Frankincense seems, according to the evidence we have, to have been considered a necessity in many Persian period societies as a whole;¹²⁰ it would be difficult to say the same for purple clothes, despite numerous individual examples where it might have been the case.

Our basic definition of necessities would then be open to a far broader range of goods than it has been traditionally, and so could include “luxury” goods. But defining the signs of the register(s) of necessity is perhaps more difficult than they are for luxuries since this depends in most cases on subtle social cues which may be lost to us. For example, some classes of objects, like clothing, are notoriously prone to fickle and rapidly changing fashion; being so far removed from the vogue of the day, how can we tell what was a necessity at any given moment? Miller (1997), for example, has documented the 5th c. adoption in Athens of certain types of eastern-style clothes. But the *kaunakês*, which was a “necessity” for a time in the 420s, was no doubt old fashioned and forgotten a couple of decades later.¹²¹ One thing to bear in mind is that while fashion can create a necessity, as we have just seen, in doing so it can also cause necessities and luxuries to become one. To take an example: in order for elites to maintain status, all elites might be socially required to obtain particular commodities which

certain commodities, the removal of those commodities from the routine would likely cause stress and disrupt one’s sense of basic contentment.

¹²⁰ See pp. 36-37 above.

¹²¹ See Ar. *Wasps* 1131ff.; Miller, 1997, 154.

simultaneously fall under the criteria for luxury goods; today, for example, certain marks of automobiles fall into this category, in antiquity, certain types of metalware or textiles might have. Not just elites, however, are subject to such necessities; at all levels of society, there are certain “must have” goods, many of which are fashionable at the moment, that define one’s station. Unless one “keeps up with the Joneses,” one is likely to fall a social notch or two in the eyes of the community. This, of course, complicates the definition of signs of the registers of necessity. Further difficulties might also arise from rapidly changing contexts, such as a war, where the signs and registers shift, and luxuries, for example, can be or become immediate necessities (i.e., strategic goods). Peacetime luxury foods, *semidalis* and dates for example, might be pushed into military service (cf. Thuc. VII.39); postwar fashions might not recognize the earlier status the goods enjoyed.

What all this is meant to show, in sum, is that the criteria for defining necessities (i.e., primary goods) are by no means simple, nor can they be seen always in binary opposition to luxuries (i.e., secondary goods). As was the case with commodity imitation above, definitions are best sought in the contexts (of transaction, of consumption, etc.) where they matter most. Exploring the consumption and transaction contexts for all of the commodities listed in this study, and thus where on the scales of luxury and necessity the goods might fall within a particular context, would take us well beyond the scope of the dissertation. However, comments on a few (problematic) commodities are in order. As noted in section two, some groups of commodities, like pigments, dyes, and chemicals, are difficult to classify as luxuries or necessities using traditional definitions. To these might be added other commodities, like medicines, which could incorporate “luxury” spices and more mundane, common ingredients. Some pigments and dyes, like Egyptian blue and marine purple, because of the specialized knowledge and elaborate processes required to produce them, might

have been considered prestige luxury goods. On the other hand, ancient *miltos*, a far more common pigment, is more problematic. Its (presumed) use in Athens as a warship undercoating and as a multi-use paint would make it appear more like a necessity. But when used as a color on prestige architecture or funeral monuments, for example, the classification could be seen to shift more towards luxury status. In fact, one reason why some commodities, like *miltos*, present problems of classification is that, within a larger consumption context like Athens as a whole, they could appear simultaneously at many points along the luxury-necessities spectrum.

Returning to the episode, with which we began this section, of the Athenian triremes guarding westbound merchantmen, if protecting necessary cargoes was in fact the objective, it may not have been the cargoes we normally consider necessary, or even strategic.¹²² This also becomes more apparent when we look more closely at the three commodities—timber, grain, and minerals—that Elayi has suggested as possibilities. While shipbuilding timber might have been obtained from Athens’ allies in Caria or Lycia, it likely was not obtainable, as argued above (see Timber), from Phoenicia. Grain ships heading to Athens from Egypt wound round the eastern Mediterranean in a counterclockwise fashion, and so could have been among those coming by way of Phaselis. But again, if Phoenician commodities were meant, no grain except for *semidalis* would be present. Because bronze was used in weapons manufacture, copper from Cyprus and perhaps tin from farther east are two strategic commodities from the list

¹²² The only reason to doubt that the objective of the mission was to secure important cargoes, rather than ensure general safety, is that the Lacedaemonians that same year had begun a policy of slaughtering the crews of any Athenian or non-allied merchant vessels they captured in the waters around the Peloponnese (Thuc. II.67.2). The practice may have been extended to other shipping lanes in the hopes of terrorizing and disrupting all Athens-bound traffic, strategic or not. This seems to be suggested by the statement that the triremes were to protect the ships coming from “Phaselis, Phoenicia and the adjoining continent” (*tês ekeithen êpeirou*). No specific commodity type is mentioned, but only the ships following the sealane along the southern coast of Asia Minor.

worth considering. But given the fact that one or two ships could have carried nearly the entire estimated annual production of copper from Cyprus (see Copper above), other commodities had to have been present on the ships.

I would suggest that while some commodities necessary for the war were likely found on these west-bound ships, for the most part their cargoes remained the typical mixed lot of various goods,¹²³ including many goods that, once they reached the Aegean, were likely considered to be luxuries such as the dates and *semidalis* that Hermippus praises (*apud* Athen.I.28a). Other ‘luxury’ goods, like perfumes, might have been considered worth fighting for in order to maintain a “way of life.” In the modern US, for example, politicians have justified economic policy and the use of the military overseas in order to maintain the “American way of life,” which one could argue has less to do with the political process than it does with ensuring general prosperity and individual access to a wide range of (imported “luxury”) commodities, like televisions and automobiles.¹²⁴ In a similar vein, a case could be made for an “Athenian” or “Sidonian” way of life,¹²⁵ the product of decades of prosperity in which certain commodities gradually came to be thought of more as necessities than luxuries.¹²⁶ It would be hard to imagine, for example, Hesiod describing any wife of his day sitting around the house in saffron dresses, make-up, Cimberic gowns and dainty slippers. *Lysistrata*, of Aristophanes’ play by the same name (46-48), implies that in the 5th c. there was nothing unusual about this attire for the average Athenian housewife at all.

¹²³ On mixed cargoes, see Gibbins, 2001, 290.

¹²⁴ See, for example, a speech made by President George W. Bush at the White House on Oct. 23, 2001, and his father’s more notorious utterance, given before the 1992 Earth Summit in Rio: “The American way of life is not negotiable.”

¹²⁵ In fact, the notion of an “Athenian way of life” and the imported commodities that went hand-in-hand with it appears in the funeral oration of Pericles (Thuc. II.38.2), an episode dated 431/30 when Athens was at the height of her Persian period military and economic prosperity.

¹²⁶ For my generation in the US, for example, televisions and cars are necessities, while for my grandparents’ generation they were luxuries.

The point should also be made that only in extreme circumstances did war in antiquity have a lasting effect on long distance trade, i.e., disrupt it so completely and for so long that trade stopped entirely and markets dried up. Even in war, business generally went on as usual,¹²⁷ which in this case would mean continued trade in the roughly 200 commodities found in this study, whether they were considered individually to be luxuries, necessities, or strategic goods. The Peloponnesians' terrorizing any and all Athens-bound merchant ships in the first years of the Archidamian war might have been intended to create an extreme situation, one that would alter Athenian trade permanently. Since traders would quite literally be risking their lives if they headed towards Athens, some might have been encouraged to steer their ships and business elsewhere; if the threat could be maintained, Athens' market would eventually die.¹²⁸ By creating such an environment, the Peloponnesians would not only limit access to war materials, but more insidiously they would deprive the Athenians of their bounty, of their "Athenian way of life."¹²⁹ Tyrian purple and Arabian myrrh, in other words, could have been worth the risk of six triremes and their crews.

¹²⁷ See, for example, MacDonald (1982) on Attic ware continuing to find its way to Corinth during the Peloponnesian War. States would on occasion attempt or threaten to blockade an enemy's trade (Thucy. III.86.4; *Old Oligarch*, II.11-12), indicating continued wartime activity. War might even encourage trade: accompanying the Athenian armada that set sail for Sicilian disaster in 415 were a number of cargo ships that joined solely for the sake of trade (*emporias heneka*; Thucy. VI.44.1). Their cargoes were likely mixed as well (cf. VII.24, 39).

¹²⁸ Cf. Diod. Sic. XV.3 on Evagoras' use of such tactics to scare off trade from his enemies.

¹²⁹ For more on this "way of life" see below. One assumption here is of course that sea-borne terrorism (and piracy?) was part of the Spartan state war strategy. Thucydides never expressly says it was, but II.67, 69 and other passages (e.g., III.41.1) suggest as much. MacDonald, (1984) discusses privateering in the 5th c. as a type of terrorizing, guerilla action. As war raged on five years later, because of events not directly related to this policy, the Athenians' access to some of their well-loved regional commodities was so limited (i.e., declared contraband) that it gave them cause to grumble about their altered way of life. Thus in Aristophanes' *Acharnians*, produced in 425, the protagonist Dicaeopolis re-establishes trade with the suppliers and so regains something of the way of life that he and others had before the war.

IV. CONCLUDING OBSERVATIONS

In light of the fact that very few traditionally defined necessities appeared in Persian period Aegean-Levantine trade, the temptation to describe it as a luxury trade is strong. However, this temptation is based on our own assumptions of what luxuries and necessities are, and do not consider how the goods were perceived by the ancient consumers. Since this study's focus has been primarily on the production end of commodity flow, rather than on transactions and consumption wherein the fuller picture of commodity classification can be found, it would be premature to offer a general label to describe the trade here. Furthermore, our knowledge of the flow of these commodities from the point of origin to consumption is often predicated on ancient faulty knowledge and perceptions found in our textual sources. Much of what we think we know, in other words, could be illusory, or obscuring the reality.

Even with these caveats, which require fuller treatment elsewhere, the basic pattern of Persian period Levantine-Aegean trade which emerges from the data presented here is clear: foodstuffs and timber played a minimal role in the trade, the bulk of the items sent west were (high value) raw and semi-processed goods, including industrial commodities like ebony, ivory and various pigments and chemicals. More than half of the raw goods heading west were spices, which were perhaps the most important component of the western trade. Only a limited number of metals, mostly copper and tin, and manufactured goods were traded west, which stands in significant contrast to the proportion of manufactured goods, like marble art, terracottas, and fineware ceramics, traded east (most of which were imitated, see Table 1, "Copy'd"). Precious metals, especially silver, left the Aegean perhaps as the most important and valuable commodity the Greeks could offer the east; an early precious metal drain to the (far) east, as happened in later centuries, might have already been underway by the Persian period. The contrast of this Levantine-Aegean trade with internal Aegean and

Levantine trade, in which foodstuffs and timber for example were heavily represented, is notable. To pursue the significance of this observation more work on regional Aegean and Levantine commodities in trade should be done, as well as work on the modes and mechanisms of trade operating in various areas, including the role played by the Persian and Athenian Empires in these modes and mechanisms.

While the imperial animosities, real or fabricated, between Persia and Athens obviously did not stop Levantine-Aegean trade, there are hints that both empires exercised their power over trade within their territorial domains to restrict certain aspects of it in respect to one another. One suggested mechanism which could have curtailed Levantine timber (and bitumen?) exports to the Aegean, for example, were restrictions on the export of strategic goods. Likewise, no timber or pitch is seen flowing towards the Levant. These and other possible restrictions might have tempered the trade to the point that strategic goods, which could have included foodstuffs like grain, were off-limits, leaving only the “luxury” goods. Even in the case of these goods, however, an empire might have extended its might in order to protect trade, perhaps not only to preserve a way of life, but also its tax revenues. Aside from the revenue generated by general trade taxes, both empires might have at times levied special taxes specifically against each other’s traders and vessels; the Ahiqar customs document clearly shows that there was precedence for the practice.¹³⁰ Aside from these possibilities, it is difficult to tell, at least from the perspective of commodities, if other (internal) imperial measures, like Athens’ (apparent) attempt to dictate the use of Athenian measures, weights, and coinage in her empire,¹³¹ had any significant effect on Levantine-Aegean trade.

¹³⁰ See chapter 5, silver, gold, and coinage.

¹³¹ See Figueira, 1998. The Persian Empire, it should be noted, seems to have left issues of weights and coin use alone, allowing individual cities to determine their own usage.

Whatever the modes and mechanisms were, as well as the nature of the trade, the roughly 200 commodities presented here were at the core of it. Individually and *en masse* they also were central to a general economic expansion in eastern Mediterranean economies and a suggested democratization of commodity access. With all these goods things (*pant'agatha*), neighbors might have asked one another, how could you not be happy (*pôs oun ou megalôs eudaimoneis*)?

APPENDIX ONE

The Tables

The following nine tables summarize the conclusions of the preceding chapters. **Table 1** gives a general overview of these conclusions. In the first column the English name of the commodity is given. In this table, and the others, where a commodity name appears along with another in parentheses with the sign "*", e.g., "Asafoetida (*Galbanum)," the first term ("Asafoetida") is a sub-group of the second; refer to the name in parentheses ("Galbanum") for further information. The scientific identification ("ID"), where applicable, appears in the second column. In columns 3-8, the following headings and abbreviations are used: "Text" refers to the presence of either Greek ("G") or undifferentiated Semitic ("S") textual evidence for the commodity; "Arch." refers to the presence of archaeological evidence.¹ Under the heading "Date" the general era of the first attestation of Levantine-Aegean trade in the commodity is given: BA = "Bronze Age," i.e., the later Bronze Age to about 1200 B.C.; IA = "Iron Age," which is divided into IA I (ca. 1200-1000 B.C.), IA IIA (ca. 1000-850 B.C.), and IA IIB (ca. 850-546 B.C.); PP = "Persian Period" (546-332 B.C.). "Origin" refers to the general area where the commodity originated; under this heading the term "ubiquitous" means the commodity is commonly found in all the regions under consideration. "Cop'd" (= "Copied") indicates that there is evidence for the

¹ Those commodities having "n.1" under this heading are attested by indirect, not direct, archaeological evidence. For example, incense altars are an indirect attestation of incense spices, perfume bottles of perfume, etc.

copying, imitation, or adulteration of the commodity (see chapter 6, "Commodity Imitation," for further discussion). Finally, "page" gives the page number in the text where the primary discussion of the commodity in question can be found. **Table 2** gives a tabulated breakdown of the origins and general trade flows of the commodities; for further information on each of the commodities, here listed by their English designation, refer to either Tables 1 or 3. **Tables 3-9** provide comparative vocabulary listings for the commodities; in the first column of each of these tables is the lead language for that table. Thus in Table 3, for example, one can find the commodities listed alphabetically by their English terms in the first column, with the equivalent Linear B, Ancient Greek, Hebrew, Aramaic ("Aram."), Phoenician ("Phoen."), and South Arabian ("SA") terms, where they exist, in the subsequent columns. All of the lead language commodity terms are alphabetized according to the alphabet of that language, not according to their Roman transliterations. In Tables 4-9, the English term is provided in the second column, so the user can then make quick reference to the English term in Table 1 for the scientific identification and further information.

Table 1

ENGLISH	ID	TEXT	ARCH	DATE	ORIGIN	COP'D	PAGE
Alabaster	alabaster*	G/S?	yes	BA	Levant, Egypt	yes	159
Alkanet	<i>Anchousa tinctoria</i>	G/S?		PP?	ubiquitous		120
Almond (oil)	<i>Amygdalus communis</i> *	G/S	yes	BA	ubiquitous		79
Alum	(various)	G		BA	Egypt		152
Amber	amber	G	yes	BA	Europe		161
Amomon	<i>Amomum sublatum</i>	G		PP?	Far East		66
Antimony	antimony	G/S	n.1	IA?	Levant?		150
Art works	N/A	G	yes	BA	ubiquitous	yes	
Asafoetida (*Galbanum)							63
Azurite	copper carbonate hydroxide	G?	yes	PP?	Levant	yes	145
Balanos (oil)	<i>Balanites aegyptica</i>	G		PP?	Egypt		79
Balm (*Myrrh)							37
Balsam (*Myrrh)							37
Bdellium (*Myrrh)							40
Beryls (emerald)	beryl	G/S?		PP?	Far East?	yes?	162
Bitumen	bitumen	G/S	yes	PP?	Levant, Mid East		156
Black Cumin	<i>Nigella sativa</i>		yes	BA	Levant, Egypt		76

ENGLISH	ID	TEXT	ARCH	DATE	ORIGIN	COP'D	PAGE
Calamus	<i>Acorus calamus</i> *	G/S	n.1	BA	Arabia, Levant		53
Chalcedony	(various)	G/S?	yes	BA	ubiquitous		162
Camel's Thorn (aspalathus)	<i>Alhagi</i> spp.*	G		PP	Levant?		74
Cardamon	<i>Elettaria cardamomum</i>	G		PP?	Far East		66
Cassia	<i>Cinnamomum cassia</i>	G/S		PP?	Far East		47
Castor Oil	<i>Ricinus communis</i>	G/S		PP	Egypt		78
Cats (leopard, cheetah)	<i>Panthera pardus, Acinonyx jubatus</i>	G		PP	Africa Asia Min?		206
Cedar	<i>Cedrus libani</i>	G/S		PP	Levant		101
Cerrusite (*Ochre)	lead carbonate						134
Chalk (*Gypsum)	calcium carbonate						148
Cinnabar (vermilion)	mercury sulphide	G/S?	yes	PP	Levant	yes	134
Cinnamon	<i>Cinnamomum zeylanicum</i>	G/S		PP?	Far East		47
Copper (bronze)	copper	G/S	yes	BA	Levant?		172
Corundum (ruby, sapphire)	aluminum oxide	G/S?		PP	Far East		163
Costum	<i>Saussurea lappa</i>	G/S	n.1	PP?	Far East		58
Cotton	<i>Gossypium herbaceum</i>	G/S?	yes	PP	Far East		231
Crimson (kermes)	<i>Kermococcus vermillio</i>	G/S		IA IIA	Levant, Asia M.		126
Cumin	<i>Cuminum cyminum</i>	G/S		BA	Aegean, Levant		76

ENGLISH	ID	TEXT	ARCH	DATE	ORIGIN	COP'D	PAGE
Dates	<i>Phoenix dactylifera</i>	G/S		PP?	Levant		92
Eaglewood	<i>Aquilara agallocha</i>	S?		IA IIA	Far East		55
Ebony	<i>Dalbergia</i> spp.*	G/S	yes	BA	Far East, Africa	yes	106
Egyptian Blue	calcium copper silicate	G	yes	BA?	Levant, Egypt		146
Figs	<i>Ficus</i> spp.	G/S		BA	ubiquitous		92
Fineware	N/A	G/S	yes	BA	Aegean	yes	261
Frankincense	<i>Boswellia</i> spp.	G/S	n.1	IA	Arabia, E.Africa	yes	33
Fuller's Earths	(various)	G/S		PP	Aegean	yes	147
Furniture	N/A	G/S	yes	BA	ubiquitous	yes	234
Galbanum	<i>Ferula</i> spp.	G/S		PP	Mid East		63
Galena (*Antimony)	lead sulphide						150
Galingale	<i>Cyperus</i> spp.	G		BA	Aegean, Levant		67
Garnet	garnet	G/S?		BA?	ubiquitous		161
Glass	silicate compound	G/S?	yes	BA	Levant Egypt	yes	243
Gold (coin)	gold	G/S	yes	BA?	ubiquitous		200
Grass, Lemon (*Calamus)							54
Green Earth	celadonite		yes	PP	Levant		144
Gypsum	calcium sulfate dihydrate	G/S?		PP	Levant		148

ENGLISH	ID	TEXT	ARCH	DATE	ORIGIN	COP'D	PAGE
Henna (camphire)	<i>Lawsonia inermis</i>	G/S		BA	Levant?		68
Hides	(various)	G/S		BA?	ubiquitous		203
Indigo	<i>Indigofera tinctoria</i>	S?	yes	BA?	Far East		124
Iron	iron	G/S	yes	IA IIB	ubiquitous		167
Ivory	< <i>Loxodonta</i> spp.*	G/S	yes	BA	Far East, Africa	yes	106
Jewelry	N/A		yes	BA	ubiquitous	yes	
Khrysokolla (*Malachite)	copper silicate						142
Ladanum	<i>Cistus</i> spp.	G/S	n.1	PP	Arabia		60
Lapis Lazuli	lapis lazuli	G/S?	yes	BA	Far East	yes	164
Lead	lead	G/S	yes	IA IIB	Aegean, Far West		174
Lichens	<i>Rocella</i> spp.*	G/S?		PP	ubiquitous		123
Linen	<i>Linum usitatissimum</i>	G/S	yes	BA	Egypt		233
Litharge (*Ochre)	lead monoxide						134
Lykion	<i>Rhamnus petiolaris</i> *	G	n.1	PP?	Asia Min.	yes?	75
Madder	<i>Rubia tinctoria</i>	G/S?	yes	BA?	ubiquitous?		121
Malachite	malachite	G/S?	yes?	PP?	Levant?	yes	142
Marble	marble	G/S?	yes	PP	Aegean		157
Marine Purple	(various)	G/S	yes	BA	ubiquitous	yes	127

ENGLISH	ID	TEXT	ARCH	DATE	ORIGIN	COP'D	PAGE
Mastich (*Terebinth)							70
Metalware	(various)	G/S	yes	BA	ubiquitous	yes	235
Minium (*Ochre)	lead tetroxide						134
Monkeys (apes)	(various)	G/S		BA	Africa		207
Myrrh	<i>Commiphora</i> spp.	G/S	n.1	BA	Arabia, Levant	yes	37
Nard (spikenard)	<i>Nardostachys jatamansi</i>	G/S		IA IIB	Far East	yes	62
Natron	potassium carbonate*	G/S		PP	Egypt	yes	153
Nutmeg	<i>Myristica</i> spp.	G/S	n.1	PP?	Far East		59
Ochre	iron oxides (various)	G/S?	yes	IA IIB?	ubiquitous	yes	133
Oil	(various)	G/S	yes	BA	ubiquitous		78
Orpiment	arsenic sulphide	G/S	yes	BA	Levant, Asia Min.		139
Ostrich (eggs)	<i>Struthio camelus</i>		yes	BA	Egypt, Levant		205
Peacock	<i>Pavo cristanus</i>	G		PP	Mid East		206
Pearls		G	yes	PP	Arabia?		164
Pepper	<i>Piper</i> spp.	G	yes	PP?	Far East		61
Perfume	(various)	G/S	n.1	BA	ubiquitous	yes	212
Pomegranate	<i>Punica granatum</i>	G/S	yes	BA	Levant		119
Quartzes (agate)	quartz	G/S?	yes	BA?	ubiquitous		162

ENGLISH	ID	TEXT	ARCH	DATE	ORIGIN	COP'D	PAGE
Quartzes (amethyst)	(various)	G/S?	yes	IA IIB	ubiquitous		165
Raisins	<i>Vitis vinifera</i>		yes	IA	ubiquitous		92
Realgar (*Orpiment)							134
Rice	<i>Oryza sativa</i>	G/S?		PP	Far East		90
Rock Crystal (*Quartz)							165
Safflower	<i>Carthamus tinctorius</i>	G/S?	yes	BA	ubiquitous?		118
Saffron	<i>Crocus sativus</i>	G/S?		BA?	Asia Min.?	yes	114
Salt	sodium chloride*	G/S		PP?	ubiquitous		95
Sandalwood	<i>Santalum album</i>	S		IA IIA	Far East		56
Sesame (oil)	<i>Sesamum indicum</i>	G/S		BA	Mid East?		90
Shell, Marine	(various)		yes	BA	Arabia		204
Shell, Tortoise	(various)	G		BA	ubiquitous		205
Silk	< <i>Bombyx mori</i> *	G/S?	yes	IA?	Far East	yes?	229
Silphium (*Galbanum)							63
Silver (coin)	silver	G/S	yes	IA IIB	Aegean Far West	yes (coins)	176
Slaves	N/A	G/S		IA IIB?	ubiquitous		208
Stibnite (*Antimony)	antimony sulphide						150
Styrax, Storax	<i>Liquidambar orientalis</i>	G/S?		PP	Aegean, Asia Min.	yes	72

ENGLISH	ID	TEXT	ARCH	DATE	ORIGIN	COP'D	PAGE
Sugar of Lead	lead acetate	G		PP	Aegean		152
Sulphur	sulphur	G/S		PP	ubiquitous		154
Sumac	<i>Rhus coriaria</i>		yes	BA	Levant		119
Sweet Flag (*Calamus)							54
Terebinth	<i>Pistacia</i> spp.	G/S	yes	BA	Levant, Aegean		70
Terracottas	N/A		yes	PP	Aegean?	yes	259
Textiles	(various)	G/S	yes	BA	ubiquitous	yes	223
Timber	(various)	G/S	yes	BA	ubiquitous		97
Tin	tin	G/S	yes	BA	Far East? West?		170
Touch stone	(see text)	G		PP	Asia Min.		159
Tumeric	<i>Curcuma longa</i>	G/S?		PP	Far East		116
Verdigris	copper acetate*	G?		PP?	Levant?		144
Wheat (<i>semidalis</i>)	<i>Triticum durum</i> *	G/S		PP	Levant		88
Wine	(various)	G/S	yes	BA	ubiquitous	yes	82
Woad (*Indigo)	<i>Isatis</i> spp.	S?	yes	BA?	ubiquitous?		124
Wool	wool	G/S		BA	ubiquitous		232

Table 2

A: EAST TO WEST

1) Far East (SE Asia, India, China, etc.)

Amomon
Beryls
Cinnamon/Casia
Corundum
Costos
Cotton
Eaglewood
Ebony
Indigio?
Ivory
Lapis Lazuli
Nard
Nutmeg
Pepper
Sandalwood
Silk
Tin
Tumeric

2) Middle East (Media, Mesopotamia, etc.)

Asafoetida
Bitumen
Peacocks
Rice
Sesame (oil)

3) Arabia

Calamus
Frankincense
Ladanum
Marine Shells
Myrrh
Pearls?

4) Levant

Alabaster
Aspalathus
Antimony?
Azurite
Balm (Myrrh)
Calamus
Camel's thorn
Cedar
Chalk
Cinnabar
Copper
Dates
Egyptian Blue
Galbanum
Glass
Green Earth
Gypsum
Henna
Malachite
Orpiment (Realgar)
Ostrich Eggshells
Pomegranate
Semidalis
Sumac
Verdigris

B: AEGEAN TO THE EAST (AND EGYPT)

Amber
Fineware ceramics
Fuller's Earths
Iron
Lead
Marble (raw and finished)
Silver
Styrax
Sugar of Lead
Terracottas

C: EGYPT/AFRICA TO THE AEGEAN AND LEVANT

Alum
Balanos oil?
Black Cumin
Castor oil?
Cats
Ebony
Egyptian Blue
Ivory
Linen
Monkeys
Natron

D: ASIA MINOR TO THE AEGEAN AND LEVANT

Crimson
Lykion
Saffron
Styrax
Touchstone

E: UBIQUITOUS

Alkanet
Almond (oil)
Arms?
Art works
Chalcedony
Cumin
Figs
Furniture
Galingale
Garnet
Gold
Hides
Jewelry
Lichens
Livestock
Madder?
Marine Purple
Metalware
Ochre?
Olive oil

Perfumes
Quartzes
Raisins
Safflower
Salt
Slaves
Sulphur
Terebinth
Textiles
Timber
Tortoise Shell
Wine
Woad
Wool

Table 3

ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	PHOEN.	SA
Alabaster		<i>alabastrós</i>	<i>shesh?</i>			
Alkanet		<i>ankhousa/ enkhoussa</i>	<i>ḥalamoth?</i>		<i>bouinesath</i> (late)	
Almond (oil)		<i>amygdalê</i>	<i>sheḳed, loz</i>		<i>shḳd</i>	
Alum	<i>tu-ru-pe-te-ri-ja</i>	<i>stypteria</i>				
Amber		<i>electron</i>				
Amomon		<i>amomon?</i>				
Antimony		<i>stimmi?</i>	<i>pok?</i>			
Azurite		<i>kyanos kyprios?</i>				
Balanos (oil)		<i>balanos</i>				
Balsam (*Myrrh)		<i>balsamos</i>				<i>bšm</i>
Bdellium (*Myrrh)		<i>bdellion</i>	<i>bedolah</i>		<i>bdlh</i>	
Beryls (emerald)	<i>pa-ra-ke-we</i>	<i>smaragdós?</i>	<i>bareḳeth</i>	<i>bareḳa</i>		
Bitumen		<i>naphtha, asphaltos, malthê</i>	<i>kofer, ḥemar, zepheth</i>	<i>zpt?</i>		

ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	PHOEN.	SA
Black Cumin			<i>ḥetzeh</i>			
Calamus	<i>ko-no, ko-i-no</i>	<i>kalamos</i> (<i>arômatikos</i>)	<i>ḳaneh</i>			<i>ḳlm</i>
Calcedony		<i>onykhion?</i>	<i>shebo?</i>			
Camel's Thorn (<i>aspalathus</i>)		<i>aspalathos</i>		<i>ḳindul</i> (late)		
Cardamon		<i>kardamomon?</i>				
Casia		<i>kassia, kasia,</i> <i>kitto</i>	<i>ḳiddah,</i> <i>ḳetsi 'oth,</i> (<i>ḳetsi 'ah</i>)			<i>slht?</i> <i>ḳblt?</i>
Castor Oil		<i>kiki, kroton</i>	<i>ḳiḳaion</i>	<i>tḳm/tgm</i>		
Cats (leopard, cheetah)		<i>pardalis</i>				
Cedar		<i>kedros</i>	<i>'rez</i>	<i>'rz</i>		
Cinnabar (vermilion)		<i>kinnabari</i> (<i>tingabarou</i>)	<i>shasher?</i>			
Cinnamon		<i>kinnamômon</i>	<i>ḳinamon</i>			<i>ḳblt?</i>
Copper (bronze)	<i>ka-ko, *140 AES</i>	<i>khalkos</i>	<i>neḥash</i>	<i>nḥsh</i>	<i>nḥsh</i>	
Corundum (ruby, sapphire)		<i>anthrax?</i>	<i>'dem?</i>			
Costum		<i>kostos</i>				<i>ḳšt</i>

ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	PHOEN.	SA
Cotton		<i>sindôn</i>	<i>karpas</i>	<i>ktn?</i>		
Crimson (kermes)		<i>kokkos</i>	<i>karmil?</i>	<i>tol'</i>	<i>shnt</i>	
Cumin	<i>ku-mi-no</i>	<i>kyminon</i>	<i>kammôn</i>	<i>kammôn</i>	<i>kmn</i>	
Dates		<i>phoinix</i>	<i>tamar</i>	<i>tmr</i>		
Eaglewood		<i>agallochon,</i> <i>aloe (late)</i>	<i>'haloth?,</i> <i>'halim</i>			
Ebony	<i>ku-te-so</i>	<i>ebenos</i>	<i>hebeni</i>			
Egyptian Blue		<i>kyanos</i> <i>aigyptios</i>				
Figs	<i>su-ko?, NI</i>	<i>sykon,</i> <i>iskhades</i>	<i>teenah,</i> <i>debeleth</i> <i>teenim</i>	<i>dblh</i>		
Frankincense		<i>libanos</i>	<i>lebonah</i>	<i>lebonah</i>	<i>lbn</i>	<i>libān</i>
Fuller's Earths		<i>kimolia gē</i>		<i>kimōlya</i> (late)		
Galbanum		<i>khalbanē</i>	<i>helbbanah</i>			<i>ḳblt?</i>
Galingale	<i>ku-pa-ro, *125</i> CYPERUS	<i>kypeiros,</i> <i>kypeiron</i>				
Garnet		<i>anthrax?</i>				
Glass	<i>ku-wa-no</i>	<i>hyalos?</i>	<i>zekōkith?</i>			

ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	PHOEN.	SA
Gold (coin)	<i>ku-ru-so</i> , *141 AURUM	<i>khrysos</i>	<i>dahev</i>	<i>dhb</i>	<i>dhb</i>	
Gypsum		<i>gypsos</i>	<i>shesh?</i>	<i>gts?</i>		
Henna (Camphire)	<i>*e-ti</i>	<i>kyperos</i>	<i>kofer</i>			
Indigo			<i>tekeleth?</i>			
Iron		<i>sidēros</i>	<i>barzel</i>	<i>brzl</i>		
Ivory	<i>e-re-pa</i>	<i>elephas</i>	<i>shen</i>			
Ladanum		<i>lêdanon</i>				<i>ldn</i>
Lapis Lazuli	<i>ku-wa-no</i>	<i>sappheiros?</i>	<i>sappir?</i>		<i>'kn'?</i>	
Lead	<i>mo-ri-wo-do</i>	<i>molybdos</i>	<i>'ofereth</i>	<i>('ofereth)</i>		
Lichens		<i>phykos</i>	<i>pok?</i>			
Linen	<i>ri-no</i>	<i>byssos, linon,</i> <i>othonê</i>	<i>kitan?,</i> <i>shesh, buts</i>			
Lykion		<i>lykion</i>				
Madder	<i>po-ni-ki-jo?</i>	<i>phoinix?</i>	<i>puah</i>	<i>puah</i>		
Malachite		<i>khrysokolla</i>	<i>nophek?</i>			

ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	PHOEN.	SA
Marble		<i>marmaros</i>	<i>shesh?</i>			
Marine Purple	<i>po-pu-re-ja</i>	<i>porphyra,</i> <i>haliporphyra</i>	<i>'rggaman</i>			
Mastich (*Terebinth)		<i>mastichê</i>				
Monkeys (apes)		<i>kêbos/kêpos</i>	<i>tukkiyim,</i> <i>koppim</i>			
Myrrh		<i>myrra,</i> <i>smyrna</i>	<i>môr/mor</i>	<i>môr</i>	<i>mr</i>	<i>mšrb,</i> <i>mrtn</i>
Nard (spikenard)		<i>nardos</i>	<i>nard</i>			
Natron		<i>nitron (litron)</i>	<i>neter</i>	<i>ntr</i>		
Nutmeg		<i>komakon</i>				<i>kmkm</i>
Ochre		<i>okhrê</i>	<i>shasher?</i>	<i>sherek?</i>		
Olive Oil	<i>e-ra-wo</i>	<i>elaion</i>	<i>shmn</i>	<i>shmn</i>		
Onycha (shell)	<i>o-nu-ka ?</i>	<i>onyx</i>	<i>sheheleth?</i>			
Orpiment		<i>arrhenikon,</i> <i>arsenikon</i>	<i>shasher?</i>	<i>zrnk</i>		
Peacock		<i>taôs</i>				
Pearls		<i>margaritas</i>				

ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	PHOEN.	SA
Perfume (general)		<i>myra, khrisma, diapasmata</i>	<i>boshem</i>	<i>bshm</i>		
Pepper		<i>peperi</i>				
Pomegranate		<i>sidios/side</i>	<i>rimmon</i>			
Quartzes (agate)		<i>onykhion?</i>	<i>shebo?</i>			
Quartzes (amethyst)		<i>krystallos?</i>	<i>'hlamah?</i>			
Raisins		<i>astaphides</i>	<i>tsemoqim</i>			
Realgar (*Orpiment)		<i>sandarax</i>				
Rice		<i>oryza (late)</i>	<i>minnith?</i>			
Rock Crystal (*Quartz)	<i>we-a-re-ja</i>	<i>hyalos?</i>	<i>zekokith?</i>			
Safflower	<i>ka-na-ko</i>	<i>knêkos</i>	<i>karkom?</i>			
Saffron	<i>ko-ra-ka</i> [?], *144 CROCUS	<i>krokos</i>	<i>karkom?</i>			
Salt		<i>hals</i>	<i>meleh</i>	<i>mlh</i>		
Sandalwood		<i>santalion (late)</i>	<i>'tse ha 'lmuggim, ha 'lgummim</i>			
Sesame (oil)	<i>sa-sa-ma</i>	<i>sêsamê</i>			<i>ssm</i>	

ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	PHOEN.	SA
Silk	<i>tu-na-no ?</i>	<i>amorginê</i>	<i>meshi?</i>			
Silver (coin)	<i>a-ku-ro</i>	<i>agyros, argyrion</i>	<i>keseḥ</i>	<i>ksf</i>	<i>ksf</i>	
Styrax, Storax		<i>styrax</i>	<i>naṭaf?</i>			
Sugar of Lead		<i>psimithion</i>				
Sulphur		<i>theion</i>		<i>kbr</i>		
Sumac		<i>rhous</i>				
Sweet Flag (*Calamus)		<i>skhoinos (euodês)</i>				
Terebinth	<i>ti-mi-t-, te-mi-t-, ki-ta-no</i>	<i>terebîthos, tereminthos, mastichê</i>	<i>'elah</i>			
Tin		<i>kassiteros</i>	<i>bedil</i>	<i>'bts</i>		
Touch stone		<i>lydios lithos</i>				
Tumeric		<i>khrōma?</i>	<i>karkom?</i>			
Verdigris		<i>ios</i>				
(Wheat) <i>semidalis</i>		<i>semidalis</i>	<i>soleth</i>	<i>semida (late)</i>		
Wine	<i>wo-no, *131 VINUM</i>	<i>oinos</i>	<i>yin</i>	<i>ḥmr</i>		

ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	PHOEN.	SA
Woad (*Indigo)			<i>tekeleth?</i>			
Wool	*145 LANA	<i>erion</i>	<i>tsemer</i>	<i>'mr</i>		

Table 4

LINEAR B	ENGLISH	GREEK	HEBREW	ARAM.	PHOEN.	SA
<i>a-ku-ro</i>	Silver	<i>agyros,</i> <i>argyrion</i>	<i>keseḥ</i>	<i>ksf</i>	<i>ksf</i>	
<i>*e-ti</i>	Henna (camphire)	<i>kyperos</i>	<i>kofer</i>			
<i>e-ra-wo</i>	Olive Oil	<i>elaion</i>	<i>shmn</i>	<i>shmn</i>		
<i>e-re-pa</i>	Ivory	<i>elephas</i>	<i>shen</i>			
<i>ka-ko, *140 AES</i>	Copper (bronze)	<i>khalkos</i>	<i>neḥash</i>	<i>nḥsh</i>	<i>nḥsh</i>	
<i>ka-na-ko</i>	Safflower	<i>knêkos</i>	<i>karkom?</i>			
<i>ki-ta-no</i>	(*Terebinth)					
<i>ko-no, ko-i-no</i>	Calamus	<i>kalamos</i> (<i>arômatikos</i>)	<i>ḳaneh</i>			<i>ḳlm</i>
<i>ko-ra-ka [?, *144</i> CROCUS	Saffron	<i>krokos</i>	<i>karkom ?</i>			
<i>ku-mi-no</i>	Cumin	<i>kymion</i>	<i>kammōn</i>	<i>kammōn</i>	<i>kmn</i>	
<i>ku-pa-ro, *125</i> CYPERUS	Galingale	<i>kypeiros,</i> <i>kypeiron</i>				
<i>ku-ru-so, *141</i> AURUM	Gold	<i>khrysos</i>	<i>dahev</i>	<i>dhb</i>	<i>dhb</i>	
<i>ku-te-so</i>	Ebony	<i>ebenos</i>	<i>hebeni</i>			

LINEAR B	ENGLISH	GREEK	HEBREW	ARAM.	PHOEN.	SA
<i>ku-wa-no</i>	Glass	<i>hyalos?</i>	<i>zekōkith?</i>			
<i>ku-wa-no</i>	Lapis Lazuli	<i>sappheiros?</i>	<i>sappir?</i>		'kn'?	
<i>mo-ri-wo-do</i>	Lead	<i>molybdos</i>	'ofereth	('ofereth)		
<i>o-nu-ka</i>	Onycha?	<i>onyx</i>	<i>sheheleth?</i>			
<i>pa-ra-ke-we</i>	Beryls (emerald)	<i>smaragdos?</i>	<i>bareketh</i>	<i>bareka</i>		
<i>po-ni-ki-jo?</i>	Madder	<i>phoinix?</i>	<i>puah</i>	<i>puah</i>		
<i>po-pu-re-ja</i>	Marine Purple	<i>porphyra,</i> <i>haliporphyra</i>	'rggaman			
<i>ri-no</i>	Linen	<i>byssos, linon,</i> <i>othonē</i>	<i>kitan?,</i> <i>shesh, buts</i>			
<i>sa-sa-ma</i>	Sesame (oil)	<i>sēsamē</i>			<i>ssm</i>	
<i>su-ko?, NI</i>	Figs	<i>sykon,</i> <i>iskhades</i>	<i>teenah,</i> <i>debeleth</i> <i>teenim</i>	<i>dblh</i>		
<i>ti-mi-t-, te-mi-t-</i>	Terebinth	<i>terebithos,</i> <i>tereminthos,</i> <i>mastichē</i>	'elah			
<i>tu-na-no</i>	Silk?	<i>amorginē</i>	<i>meshi?</i>			
<i>tu-ru-pe-te-ri-ja</i>	Alum	<i>stypteria</i>				
<i>we-a-re-ja</i>	Rock Crystal (*Quartz)	<i>hyalos?</i>	<i>zekōkith?</i>			

LINEAR B	ENGLISH	GREEK	HEBREW	ARAM.	PHOEN.	SA
<i>wo-no</i> , *131 VINUM	Wine	<i>oinos</i>	<i>yin</i>	<i>ḥmr</i>		

Table 5

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>adamas</i>	(*Corundum)?		<i>kadkod?</i>			
<i>agallochon,</i> <i>aloe</i> (late)	Eaglewood		' <i>haloth?</i> , ' <i>halim</i>			
<i>agyros,</i> <i>argyron</i>	Silver (coin)	<i>a-ku-ro</i>	<i>keseḥ</i>	<i>ksf</i>	<i>ksf</i>	
<i>ankhousa/</i> <i>enkhousa</i>	Alkanet		<i>ḥalamoth?</i>		<i>bouinesath</i> (late)	
<i>aigyption</i>	(*Perfume)					
<i>akantha hē</i> <i>Indikē</i>	(*Myrrh?)					
<i>alabastros</i>	Alabaster		<i>shesh?</i>			
<i>halourgē</i>	(*Marine purple)					
<i>hals</i>	Salt		<i>meleḥ</i>	<i>mlḥ</i>		
<i>amarkinon</i>	(*Perfume)					
<i>amomon</i>	Amomon?					
<i>amorginē</i>	Silk	<i>tu-na-no?</i>	<i>meshi?</i>			
<i>amygdalē</i>	Almond (oil)		<i>sheḳed, loz</i>		<i>shḳd</i>	

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>anthrax</i>	Garnet?					
<i>anthrax</i>	Corundum? (ruby, sapphire)		'dem?			
<i>arrhenikon, arsenikon</i>	Orpiment		<i>shasher?</i>	<i>zrnk</i>		
<i>aspalathos</i>	Camel's Thorn (aspalathus)			<i>kindul</i> (late)		
<i>astaphides</i>	Raisins		<i>tsemokim</i>			
<i>asphaltos</i>	Bitumen		<i>kofer, hemar, zepheth</i>	<i>zpt?</i>		
<i>balanos</i>	Balanos (oil)					
<i>balsamos</i>	Balsam (*Myrrh)					<i>bšm</i>
<i>bamma sardianakon</i>	(*Madder)?					
<i>basileion</i>	(*Perfume)					
<i>bdellion</i>	Bdellium (*Myrrh)		<i>bedolah</i>		<i>bdlh</i>	
<i>byssos</i>	(*Linen)		<i>buts</i>			
<i>gypsos</i>	Gypsum		<i>shesh?</i>	<i>gts ?</i>		
<i>daktylos</i>	(*Dates)		<i>tamar</i>	<i>tmr</i>	<i>tmr</i>	

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>dapidês</i>	(*Textile)					
<i>ebenos</i>	Ebony	<i>ku-te-so</i>	<i>hebeni</i>			
<i>electron</i>	Amber					
<i>elephas</i>	Ivory	<i>e-re-pa</i>	<i>shen</i>			
<i>ependytês</i>	(*Textile)					
<i>ereythedanon</i>	(*Madder)					
<i>erion</i>	Wool	*145 LANA	<i>tsemer</i>	<i>'mr</i>		
<i>erpyllinon</i>	(*Perfume)					
<i>ertis</i>	(*Henna)					
<i>erysiskeptron</i>	(*Camel's Thorn)					
<i>theion</i>	Sulphur			<i>kbr</i>		
<i>thymiateria</i>	(*Metalware)					
<i>indikon</i> <i>pharmakon</i>	(*Pepper)					
<i>ios</i>	Verdigris					

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>irinon</i>	(*Perfume)					
<i>iskhades</i> (<i>sykon</i>)	Figs	<i>su-ko?</i> , NI	<i>teenah</i> , <i>debeleth</i> <i>teenim</i>	<i>dblh</i>		
<i>kalamos</i> (<i>arōmatikos</i>)	Calamus	<i>ko-no</i> , <i>ko-i-no</i>	<i>ḳaneh</i>			<i>ḳlm</i>
<i>kaolinês</i>	(*Fuller's Earth)					
<i>kardamomon</i>	Cardamon?					
<i>kassia</i> , <i>kasia</i> , <i>kitto</i>	Casia		<i>ḳiddah</i> , <i>ḳetsi 'oth</i> , (<i>ḳetsi 'ah</i>)			<i>slht?</i> <i>ḳbli?</i>
<i>kassiteros</i>	Tin		<i>bedil</i>	<i>'bts</i>		
<i>kaunakês</i>	(*Textile)					
<i>kedros</i>	Cedar		<i>'rez</i>	<i>'rz</i>		
<i>kêbos/kêpos</i>	Monkeys (apes)		<i>tukkiyim</i> , <i>ḳoppim</i>			
<i>kiki</i>	Castor Oil		<i>ḳiḳaion</i>	<i>tḳm/tgm</i>		
<i>kimolia gê</i>	Fuller's Earths			<i>ḳimōlya</i>		
<i>kinamōminon</i>	(*Perfume)					
<i>kinnabari</i> (<i>tingabarou</i>)	Cinnabar (vermilion)		<i>shasher?</i>			

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>kinnamōmon</i>	Cinnamon		<i>ḳinamon</i>			<i>ḳblt?</i>
<i>kisthos</i>	(*Ladanum)					
<i>kitan</i>	(*Linen)		<i>ktn</i>			
<i>knēkos</i>	Safflower	<i>ka-na-ko</i>	<i>karkom?</i>			
<i>kokkos</i>	Crimson (kermes)		<i>karmil?</i>	<i>tol‘</i>	<i>shnt</i>	
<i>komakon</i>	Nutmeg					<i>kmkm</i>
<i>kostos</i>	Costum					<i>ḳšt</i>
<i>krokinon</i>	(*Perfume)					
<i>krokos</i>	Saffron	<i>ko-ra-ka</i> [?, *144 CROCUS	<i>karkom?</i>			
<i>krystallos</i>	Quartzes (amethyst)		<i>‘ḥlamah?</i>			
<i>kyanos aigyptios</i>	Egyptian Blue					
<i>kyanos kyprios</i>	Azurite?					
<i>kyanos scythes</i>	(*Lapis Lazuli?)					
<i>kyminon</i>	Cumin	<i>ku-mi-no</i>	<i>kammōn</i>	<i>kammōn</i>	<i>kmn</i>	

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>kypassis</i>	(*Textile)					
<i>kypeiros,</i> <i>kypeiron</i>	Galingale	<i>ku-pa-ro</i> , *125 CYPERUS				
<i>kyperos</i>	Henna (camphire)	* <i>e-ti</i>	<i>kofer</i>			
<i>kyrinon</i>	(*Perfume)					
<i>lagynos</i>	(*Fineware)				<i>lgn</i>	
<i>lebês</i>	(*Fineware)				<i>lp</i>	
<i>lêdanon</i>	Ladanum					<i>ldn</i>
<i>libanos</i>	Frankincense		<i>lebonah</i>	<i>lebonah</i>	<i>lbn</i>	<i>libān</i>
<i>linon</i>	Linen	<i>ri-no</i>	<i>kītan?</i> , <i>shesh, buts</i>			
<i>lydios lithos</i>	Touch stone					
<i>lykion</i>	Lykion					
<i>margarita</i>	Pearls					
<i>marmaros</i>	Marble		<i>shesh?</i>			
<i>mastichê</i>	Mastich (*Terebinth)					

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>megalleion</i>	(*Perfume)					
<i>miltos</i>	(*Ochre)					
<i>molybdos</i>	Lead	<i>mo-ri-wo-do</i>	<i>'ofereth</i>	(<i>'ofereth</i>)		
<i>myrra,</i> <i>smyrna</i>	Myrrh		<i>mōr/mor</i>	<i>mōr</i>	<i>mr</i>	<i>mšrb,</i> <i>mrtn</i>
<i>myrrhinê</i>	(*Chalcedony)		<i>kadkod?</i>			
<i>myrrhinê</i>	(*Quartz)?					
<i>naphtha</i>	Bitumen		<i>kofer,</i> <i>hemar,</i> <i>zepheth</i>	<i>zpt ?</i>		
<i>nardinon</i>	(*Perfume)					
<i>nardos</i>	Nard (spikenard)		<i>nard</i>			
<i>nitron (litron)</i>	Natron		<i>neter</i>	<i>ntr</i>		
<i>othonê</i>	(*Linen)					
<i>oinanthinon</i>	(*Perfume)					
<i>onyx</i>	Onycha	<i>o-nu-ka</i>	<i>sheheleth?</i>			
<i>onykhion</i>	Calcedony?		<i>shebo?</i>			

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>onykhion</i>	Quartzes? (agate)		<i>shebo?</i>			
<i>opopanax</i>	(*Galbanum)					
<i>oryza</i> (late)	Rice		<i>minnith?</i>			
<i>okhrê</i>	Ochre		<i>shasher?</i>	<i>sherek?</i>		
<i>panakês</i>	(*Galbanum)					
<i>parapetasma</i>	(*Textile)					
<i>pardalis</i>	Cats (leopard, cheetah)					
<i>peperi</i>	Pepper					
<i>persikai</i>	(*Textile)			<i>prsin</i>		
<i>porphyra</i> , <i>haliporphyra</i>	Marine Purple	<i>po-pu-re-ja</i>	<i>'rggaman</i>			
<i>proskephalaion</i>	(*Textile)					
<i>pyxis</i>	(*Fineware)				<i>pkst</i>	
<i>rhodinon</i>	(*Perfume)					
<i>rhous</i>	Sumac					

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>samia gê</i>	(*Fuller's Earth)			<i>tin shmwsh</i>		
<i>sandaraks</i>	Realgar (*Orpiment)					
<i>santalion</i> (late)	Sandalwood		<i>'tse</i> <i>ha 'lmuggim,</i> <i>ha 'lgummim</i>			
<i>sappheiros</i>	Lapis Lazuli?	<i>ku-wa-no</i>	<i>sappir'?</i>		<i>'kn'?</i>	
<i>sardos</i>	(*Quartz)?					
<i>semidalis</i>	Wheat (<i>semidalis</i>)		<i>soleth</i>	<i>semida</i> (late)		
<i>sêsamê</i>	Sesame (oil)	<i>sa-sa-ma</i>			<i>ssm</i>	
<i>sidêros</i>	Iron		<i>barzel</i>	<i>brzl</i>		
<i>sidios/side</i>	Pomegranate		<i>rimmon</i>			
<i>sillikypria</i>	(*Castor oil)					
<i>sindôn</i>	Cotton		<i>karpas</i>	<i>ktn?</i>		
<i>smaragdos</i>	Beryls? (emerald)	<i>pa-ra-ke-we</i>	<i>bareketh</i>	<i>bareka</i>		
<i>smaragdos</i>	(*Malachite)?					
<i>staktê</i>	(*Myrrh)		<i>tsori?</i>			

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>stimmi</i>	Antimony?		<i>pok?</i>			
<i>stypteria</i>	Alum	<i>tu-ru-pe-te-ri-ja</i>				
<i>styrax</i>	Styrax, Storax		<i>naṭaf?</i>			
<i>syria</i>	(*Textile)					
<i>sysymbrinon</i>	(*Perfume)					
<i>skhoinos</i> (<i>euodês</i>)	Sweet Flag (*Calamus)					
<i>taôs</i>	Peacock					
<i>terebithos</i> , <i>tereminthos</i>	Terebinth	<i>ti-mi-t</i> , <i>te-mi-t</i> , <i>ki-ta-no</i>	<i>'elah</i>			
<i>têlinon</i>	(*Perfume)					
<i>hyalos</i>	Glass?		<i>zekôkith?</i>			
<i>hyalos</i>	Rock Crystal? (*Quartz)	<i>we-a-re-ja</i>	<i>zekôkith?</i>			
<i>hyphasma</i>	(*Textile)					
<i>phoinix</i>	Dates		<i>tamar</i>	<i>tmr</i>		
<i>phoinix</i>	Madder?	<i>po-ni-ki-jo?</i>	<i>puah</i>	<i>puah</i>		

GREEK	ENGLISH	LINEAR B	HEBREW	ARAM.	PHOEN.	SA
<i>phoinix</i>	(*Perfume)					
<i>phykos</i>	Lichens		<i>pok?</i>			
<i>khalbanê</i>	Galbanum		<i>helbbanah</i>			<i>ḳblt?</i>
<i>khalkos</i>	Copper (Bronze)	<i>ka-ko</i> , *140 AES	<i>neḥash</i>	<i>nḥsh</i>	<i>nḥsh</i>	
<i>khelônê</i>	Tortoise shell					
<i>khroma</i>	Tumeric?		<i>karkom?</i>			
<i>khrysokolla</i>	Malachite		<i>nophek?</i>			
<i>khrysos</i>	Gold (coin)	<i>ku-ru-so</i> , *141 AURUM	<i>dahev</i>	<i>dhb</i>	<i>dhb</i>	
<i>psagdas</i> (<i>sagda</i>)	(*Perfume)					
<i>psimithion</i>	Sugar of Lead					

Table 6

HEBREW	ENGLISH	LINEAR B	GREEK	ARAM.	PHOEN.	SA
<i>'dem</i>	Corundum? (ruby, sapphire)		<i>anthrax?</i>			
<i>'haloth,</i> <i>'halim</i>	Eaglewood?		<i>agallochon,</i> <i>aloe</i> (late)			
<i>'ḥlamah</i>	Quartzes? (amethyst)		<i>krystallos</i>			
<i>'rez</i>	Cedar		<i>kedros</i>	<i>'rz</i>		
<i>'rggaman</i>	Marine Purple	<i>po-pu-re-ja</i>	<i>porphyra,</i> <i>haliporphyra</i>			
<i>bareḳeth</i>	Beryls (emerald)	<i>pa-ra-ke-we</i>	<i>smaragdos?</i>	<i>bareḳa</i>		
<i>barzel</i>	Iron		<i>sidēros</i>	<i>brzl</i>		
<i>bedil</i>	Tin		<i>kassiteros</i>	<i>'bts</i>		
<i>bedolah</i>	Bdellium (*Myrrh)		<i>bdellion</i>		<i>bdlh</i>	
<i>buts</i>	(*Linen)		<i>byssos</i>			
<i>dahev</i>	Gold (coin)	<i>ku-ru-so</i> , *141 AURUM	<i>khrysos</i>	<i>dhb</i>	<i>dhb</i>	
<i>debesh</i>	Date honey			<i>dbsh</i>	<i>dbsh</i>	
<i>hebeni</i>	Ebony	<i>ku-te-so</i>	<i>ebenos</i>			

HEBREW	ENGLISH	LINEAR B	GREEK	ARAM.	PHOEN.	SA
<i>helbbanah</i>	Galbanum		<i>khalbanê</i>			<i>ḵbli?</i>
<i>zekōkith</i>	Glass?	<i>ku-wa-no</i>	<i>hyalos?</i>			
<i>zekōkith</i>	Rock Crystal? (*Quartz)	<i>we-a-re-ja</i>	<i>hyalos?</i>			
<i>zepheth</i>	Bitumen		<i>naphtha, asphaltos, malthê</i>	<i>zpt?</i>		
<i>halamoth</i>	Alkanet?		<i>ankhousa/ enkhoua</i>		<i>bouinesath (late)</i>	
<i>hetzeh</i>	Black Cumin					
<i>kadkod</i>	(*Chalcedony)?		<i>myrrhinê?</i>			
<i>kadkod</i>	(*Corundum)?		<i>adamas?</i>			
<i>kammōn</i>	Cumin	<i>ku-mi-no</i>	<i>kymionon</i>	<i>kammōn</i>	<i>kmn</i>	
<i>karkom</i>	Safflower?	<i>ka-na-ko</i>	<i>knêkos</i>			
<i>karkom</i>	Saffron?	<i>ko-ra-ka</i> [?, *144 CROCUS	<i>krokos</i>			
<i>karkom</i>	Tumeric?		<i>khrōma?</i>			
<i>karmil</i>	Crimson? (kermes)		<i>kokkos</i>	<i>tol'</i>	<i>shnt</i>	
<i>karpas</i>	Cotton		<i>sindôn</i>	<i>ktn?</i>		

HEBREW	ENGLISH	LINEAR B	GREEK	ARAM.	PHOEN.	SA
<i>keseḥ</i>	Silver (coin)	<i>a-ku-ro</i>	<i>agyros,</i> <i>argyrion</i>	<i>ksf</i>	<i>ksf</i>	
<i>kitan</i>	(*Cotton)?					
<i>kitan</i>	(*Linen)		<i>kitan</i>			
<i>kofer</i>	Henna (camphire)	<i>*e-ti</i>	<i>kyperos</i> <i>naphtha,</i>			
<i>kofer</i>	Bitumen?		<i>asphaltos,</i> <i>malthê</i>	<i>zpt?</i>		
<i>kohl</i>	(*Antimony)					
<i>lebonah</i>	Frankincense		<i>libanos</i>	<i>lebonah</i>	<i>lbn</i>	<i>libān</i>
<i>loṭ</i>	(*Myrrh)?					
<i>meleḥ</i>	Salt		<i>hals</i>	<i>mlḥ</i>		
<i>meshi</i>	Silk?	<i>tu-na-no?</i>	<i>amorginê</i>			
<i>minnith</i>	Rice?		<i>oryza</i> (late)			
<i>mōr/mor</i>	Myrrh		<i>myrra,</i> <i>smyrna</i>	<i>mōr</i>	<i>mr</i>	<i>mšrb,</i> <i>mrtn</i>
<i>nard</i>	Nard (spikenard)		<i>nardos</i>			
<i>naṭaf</i>	Styrax?		<i>styrax</i>			

HEBREW	ENGLISH	LINEAR B	GREEK	ARAM.	PHOEN.	SA
<i>nataf</i>	(*Myrrh)?					
<i>nehash</i>	Copper (Bronze)	<i>ka-ko</i> , *140 AES	<i>khalkos</i>	<i>nḥsh</i>	<i>nḥsh</i>	
<i>neter</i>	Natron		<i>nitron (litron)</i>	<i>ntr</i>		
<i>nofek</i>	(*Beryls)?					
<i>nofek</i>	Malachite?		<i>khrysokolla</i>			
<i>sappir</i>	Lapis Lazuli?	<i>ku-wa-no</i>	<i>sappheiros?</i>		' <i>kn</i> '?	
<i>soleth</i>	Wheat (<i>semidalis</i>)		<i>semidalis</i>	<i>semida</i> (late)		
' <i>elah</i>	Terebinth	<i>ti-mi-t</i> , <i>te-mi-t</i> , <i>ki-ta-no</i>	<i>terebithos</i> , <i>tereminthos</i> , <i>mastichē</i>			
' <i>ofereth</i>	Lead	<i>mo-ri-wo-do</i>	<i>molybdos</i>	' <i>ofereth</i>		
' <i>tse</i> <i>ha'lmuggim</i> , <i>ha'lgummim</i>	Sandalwood		<i>santalion</i> (late)			
<i>pok</i>	Lichens?		<i>phykos</i>			
<i>pok</i>	Antimony?		<i>stimmi?</i>			
<i>puah</i>	Madder	<i>po-ni-ki-jo?</i>	<i>phoinix?</i>	<i>puah</i>		
<i>tsemer</i>	Wool	*145 LANA	<i>erion</i>	' <i>mr</i>		

HEBREW	ENGLISH	LINEAR B	GREEK	ARAM.	PHOEN.	SA
<i>tsemoqim</i>	Raisins		<i>astaphides</i>			
<i>tsori</i>	(*Myrrh)?		<i>staktê</i>			
<i>qaneh</i>	Calamus	<i>ko-no, ko-i-no</i>	<i>kalamos</i> (<i>arômatikos</i>)			<i>qlm</i>
<i>koppim</i> <i>qidah,</i> <i>ketsi 'oth,</i> (<i>ketsi 'ah</i>)	Monkeys Casia		<i>kêbos/kêpos</i> <i>kassia, kasia,</i> <i>kitto</i>			<i>slht?</i> <i>qblt?</i>
<i>qikaion</i>	Castor Oil		<i>kiki</i>	<i>tqm/tgm</i>		
<i>qinamon</i>	Cinnamon		<i>kinnamômon</i>			<i>qblt?</i>
<i>shasher</i>	Cinnabar? (Vermilion)		<i>kinnabari</i> (<i>tingabarou</i>)			
<i>shasher</i>	Ochre?		<i>okhrê</i>	<i>shereq?</i>		
<i>shasher</i>	Orpiment?		<i>arrhenikon,</i> <i>arsenikon</i>	<i>zrnik</i>		
<i>shebo</i>	Calcedony?		<i>onykhion?</i>			
<i>shebo</i>	Quartzes? (agate)		<i>onykhion</i>			
<i>sheqed</i>	Almond (oil)		<i>amygdalê</i>		<i>shqd</i>	
<i>shen</i>	Ivory	<i>e-re-pa</i>	<i>elephas</i>			

HEBREW	ENGLISH	LINEAR B	GREEK	ARAM.	PHOEN.	SA
<i>shesh</i>	Linen	<i>ri-no</i>	<i>byssos, linon, othonê</i>			
<i>shesh</i>	Alabaster?		<i>alabastros</i>			
<i>shesh</i>	Gypsum?		<i>gypos</i>	<i>gts ?</i>		
<i>shesh</i>	Marble?		<i>marmaros</i>			
<i>tamar</i>	Dates		<i>phoinix</i>	<i>tmr</i>		
<i>tarshish</i> <i>teenah,</i> <i>debeleth</i> <i>teenim</i>	(*Beryls)? Figs	<i>su-ko ?</i> , NI	<i>sykon,</i> <i>iskhades</i>	<i>dblh</i>		
<i>tekeleth</i>	Woad? (*Indigo)					
<i>tekeleth</i>	Indigo?					
<i>tekeleth</i>	(*Lichens)?					
<i>tol' shani</i>	(*Crimson)					
<i>tukkiyim</i>	Monkeys (apes)		<i>kêbos/kêpos</i>			

Table 7

ARAM.	ENGLISH	LINEAR B	GREEK	HEBREW	PHOEN.	SA
<i>'bts</i>	Tin		<i>kassiteros</i>	<i>bedil</i>		
<i>'rz</i>	Cedar		<i>kedros</i>	<i>'rez</i>		
<i>brzl</i>	Iron		<i>sidēros</i>	<i>barzel</i>		
<i>gts?</i>	Gypsum		<i>gypsos</i>	<i>shesh?</i>		
<i>dhb</i>	Gold (coin)	<i>ku-ru-so</i> , *141 AURUM	<i>khrysos</i>	<i>dahev</i>	<i>dhb</i>	
<i>dblh</i>	Figs	<i>su-ko?</i> , NI	<i>sykon</i> , <i>iskhades</i>	<i>teenah</i> , <i>debeleth</i> <i>teenim</i>		
<i>dbsh</i>	Date honey			<i>debesh</i>	<i>dbsh</i>	
<i>zpt?</i>	Bitumen		<i>naphtha</i> , <i>asphaltos</i> , <i>malthê</i>	<i>kofer</i> , <i>hemar</i> , <i>zepheth</i>		
<i>zrnik</i>	Orpiment		<i>arrhenikon</i> , <i>arsenikon</i>	<i>shasher?</i>		
<i>tin shmws</i>	(*Fuller's Earth)		<i>samia gê</i>			
<i>kammōn</i>	Cumin	<i>ku-mi-no</i>	<i>kyminon</i>	<i>kammōn</i>	<i>kmn</i>	
<i>kbr</i>	Sulphur		<i>theion</i>			
<i>ksf</i>	Silver (coin)	<i>a-ku-ro</i>	<i>agyros</i> , <i>argyrion</i>	<i>keseḥ</i>	<i>ksf</i>	

ARAM.	ENGLISH	LINEAR B	GREEK	HEBREW	PHOEN.	SA
<i>ktn?</i>	Cotton		<i>sindôn</i>	<i>karpas</i>		
<i>lebonah</i>	Frankincense		<i>libanos</i>	<i>lebonah</i>	<i>lbn</i>	<i>libān</i>
<i>mlḥ</i>	Salt		<i>hals</i>	<i>meleḥ</i>		
<i>mōr</i>	Myrrh		<i>myrra, smyrna</i>	<i>mōr/mor</i>	<i>mr</i>	<i>mšrb, mrtn</i>
<i>nḥsh</i>	Copper (bronze)	<i>ka-ko</i> , *140 AES	<i>khalkos</i>	<i>neḥash</i>	<i>nḥsh</i>	
<i>ntr</i>	Natron		<i>nitron (litron)</i>	<i>neter</i>		
<i>semida</i> (late)	Wheat (<i>semidalis</i>)		<i>semidalis</i>	<i>soleth</i>		
<i>'mr</i>	Wool	*145 LANA	<i>erion</i>	<i>tsemer</i>		
<i>'ofereth</i>	Lead		<i>molybdos</i>	<i>'ofereth</i>		
<i>puah</i>	Madder	<i>po-ni-ki-jo?</i>	<i>phoinix?</i>	<i>puah</i>		
<i>kindul</i> (late)	Camel's Thorn (<i>aspalathus</i>)		<i>aspalathos</i>			
<i>kimōlya</i>	Fuller's Earths		<i>kimolia gē</i>			
<i>shereḳ?</i>	Ochre		<i>okhrē</i>	<i>shasher?</i>		
<i>tḳm/tgm</i>	Castor Oil		<i>kiki</i>	<i>ḳiḳaion</i>		

ARAM.	ENGLISH	LINEAR B	GREEK	HEBREW	PHOEN.	SA
<i>tmr</i>	Dates		<i>phoinix?</i>	<i>tamar</i>		
<i>tol'</i>	Crimson (kermes)		<i>kokkos</i>	<i>karmil?</i>	<i>shnt</i>	

Table 8

PHOEN.	ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	SA
'kn'?	Lapis Lazuli	<i>ku-wa-no</i>	<i>sappheiros?</i>	<i>sappir?</i>		
<i>bdlh</i>	Bdellium (*Myrrh)		<i>bdellion</i>	<i>bedolah</i>		
<i>bouinesath</i> (late)	Alkanet		<i>ankhousa/ enkhoua</i>	<i>ḥalamoth?</i>		
<i>dbsh</i>	Dates honey			<i>debes</i>	<i>dbsh</i>	
<i>dhb</i>	Gold (coin)	<i>ku-ru-so</i> , *141 AURUM	<i>khrysos</i>	<i>dahev</i>	<i>dhb</i>	
<i>kmn</i>	Cumin	<i>ku-mi-no</i>	<i>kyminon</i>	<i>kammōn</i>	<i>kammōn</i>	
<i>ksf</i>	Silver (coin)	<i>a-ku-ro</i>	<i>agyros, argyrion</i>	<i>keseḥ</i>	<i>ksf</i>	
<i>lbn</i>	Frankincense		<i>libanos</i>	<i>lebonah</i>	<i>lebonah</i>	<i>libān</i>
<i>lgm</i>	(*Fineware)		<i>lagynos</i>			
<i>lp</i>	(*Fineware)		<i>lebês</i>			
<i>mr</i>	Myrrh		<i>myrra, smyrna</i>	<i>mōr/mor</i>	<i>mōr</i>	<i>mšrb, mrtn</i>
<i>nḥsh</i>	Copper (bronze)	<i>ka-ko</i> , *140 AES	<i>khalkhos</i>	<i>neḥash</i>	<i>nḥsh</i>	
<i>pkst</i>	(*Fineware)		<i>pyxis</i>			

PHOEN.	ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	SA
<i>shḳd</i>	Almond (oil)		<i>amygdalê</i>	<i>sheḳed</i>		
<i>shnt</i>	Crimson (kermes)		<i>kokkos</i>	<i>karmil?</i>	<i>tol'</i>	
<i>ssm</i>	Sesame (oil)	<i>sa-sa-ma</i>	<i>sêsamê</i>			

Table 9

SA	ENGLISH	LINEAR B	GREEK	HEBREW	ARAM.	PHOEN.
<i>bšm</i>	Balsam (*Myrrh)		<i>balsamos</i>			
<i>ḏrw</i>	(*Myrrh)?					
<i>kmkm</i>	Nutmeg?		<i>komakon</i>			
<i>ldn</i>	Ladanum		<i>lēdanon</i>			
<i>libān</i>	Frankincense		<i>libanos</i>	<i>lebonah</i>	<i>lebonah</i>	<i>lbn</i>
<i>mšrb, mrtn</i>	Myrrh		<i>myrra, smyrna</i>	<i>mōr/mor</i>	<i>mōr</i>	<i>mr</i>
<i>ḳblt</i>	Galbanum?		<i>khalbanē</i>	<i>helbbanah</i>		
<i>ḳlm</i>	Calamus	<i>ko-no, ko-i-no</i>	<i>kalamos (arōmatikos)</i>	<i>ḳaneh</i>		
<i>ḳblt</i>	Cinnamon?		<i>kinnamōmon</i>	<i>ḳinamon</i>		
<i>ḳšt</i>	Costum		<i>kostos</i>			
<i>slht</i>	(*Cinnamon)?					

APPENDIX TWO

Defining Imitations and Counterfeits

In order to establish a preliminary framework for approaching the definitions of imitations and counterfeits, it seems best to start with an examination of the central concern of the anti-counterfeit laws and the *agoranomoi*, the commodities. With the focus thus shifted, the first task should be to determine the parameters of impurity/adulteration, which for our purposes also includes the related concept of counterfeiting. Since concepts of this ilk—adulteration and counterfeit—are the pejorative cousins of another set, which includes the more positive terms imitation and adaptation, the relationship between both sets needs to be sorted out. At this stage we can give the entire group the family name “copying.”

In the case of manufactured goods the phenomenon of copying is common, and so has been addressed in various ways. However, the topic has been more at home in the study of those manufactured objects generally thought of as art, like sculpture or fine ceramics. Within the realm of these studies, when copies are detected, degrees of faithfulness to an original are sometimes noted. In a discussion of Athenian ceramics, for example, Margaret Miller draws attention to three degrees of non-originality:

Attic black-gloss vessels reveal a multifaceted receptivity, reflecting a variety of intensities of response from precise imitation to a superficial incorporation of foreign elements. One might articulate the full range of visible responses with the terms “imitation,” “adaptation,” and

“derivation.” Imitation describes a process of copying as accurately as possible given difference of technique and material. Adaptation occurs when modifications to foreign forms are introduced to allow for differences of use relating to differences in social practice. A tertiary level response is seen in derivation, in which a foreign approach to surface treatment or profile is applied to a traditional local form; the development suggests a shift in taste resulting from sustained contact with a foreign tradition.¹

While Miller’s primary concern is to address copying as a response to a foreign influence, her tri-partite schema is also useful for discussing the levels and modes of copying more generally, especially in terms of the artistic intent, as it were, latent behind the creation of an object. From this perspective, copying in stone and clay has an affinity with similar activities in non-tangible media, like literature. In the context of their art, for example, poets and other writers, then and now, frequently appropriate, allude to, or manipulate the words of others to achieve particular effects.² Beyond the context of artistic response, however, Miller’s schema is not fully reconcilable with those aspects of copying found in more economic oriented contexts. Within an artistic context, for example, “imitation” can be a fairly neutral term: a student or rival imitating a master to learn technique, for example. Imitation within an economic context can have similar neutral tones; but counterfeiting, or imitation with the intent to deceive and profit from the deception, does not. The same motivation—increased

¹ 1997, 135-36.

² See, for example, Hinds (1998), for the way Roman poets of the 1st c. B.C. and A.D. incorporated the texts of earlier Roman and Greek writers within their own work. Clever modes of copying can win high praise from critics; but because for (literary) artists there is a high price put on originality, they must also fight the universal human tendency to mimic too closely, a struggle which can cause neuroses in the worst of moments, or spawn creativity in the best, as argued by H. Bloom in *The Anxiety of Influence* (Oxford 1975).

economic gain--can also be ascribed to adulteration, a mixing of a less valuable substance (A) with one more valuable (B) in order to present the mixture as a unit of pure B, as was done with spices, like myrrh and frankincense, and pigments like ochre.³ But even in the midst of the market, not everything we might call a counterfeit or adulteration was meant for ill-gotten gain, nor were all imitations free from deceit, which means for our purposes that the terms require further clarification. Because coinage is one of the better studied classes of commodities, and was a commodity that was widely and visibly imitated, it can serve as a vehicle for clarifying these terms.⁴

As we saw in chapter 5, the intent behind the production of the various types of pseudo-“owls,” some of them exceptionally faithful copies made of high quality silver, was not always that of a counterfeiter. At times, it was in the minter’s best interest to produce coinage on par, in character and value, with the original. Of course, there were imitation owls that were not high grade, i.e., those of drastically reduced silver content, many of which have no more silver in them than a thin plating over a lead or bronze core. Common sense would generally dictate that these plated coins were counterfeits; but this is not always certain. If, for example, we state that the intent of plated coins was to deceive, we then run into problems with the categorization of those plated owls that were produced by the mint of Athens in 405 as an emergency coinage with the full knowledge of the

³ See pp. 303ff. above.

⁴ Note that coin (*nomisma*) is the only commodity specifically highlighted by Plato in the introduction to his section on counterfeits and adulteration in *Laws* (916 D).

community, to take one example.⁵ Other classes of goods discussed above—alabastra, perfumes, metal ware, ceramics, textiles, etc.—also inspired imitations or counterfeits, many of which were likely produced with the knowledge of the local community. Many “Atticizing” ceramics, for example, copies of Attic fineware produced in various parts of the Aegean and the Levant, have been found close to where they were produced; to the modern eye they are discernible as copies, and likely were in antiquity as well.⁶ Here again, if consumers were fully aware of the local workshops producing these “counterfeit” wares, deception would not be an issue. One key then to drawing the line between economically-motivated deception (counterfeit) and artistic endeavors (imitation) is consumer knowledge.⁷

Looking at the role of knowledge at both ends of the commodity flow, Appadurai highlights how proximity or distance can affect knowledge in relation to the production and consumption of goods.⁸ The proximity of producer and consumer obviously encourages shared knowledge of commodity types, their appropriate consumption, and cultural significance. But these links of shared knowledge are stretched as the distance, both geographic and cultural, increases.

⁵ Ar. *Frogs*, 725-26; *Eccl.*, 815-22. Also see Kroll, 1996. Aside from the well-known example of official Athenian plated coins, virtually no work has been done to try to identify other contemporary state mints producing “counterfeits” of their full-value coinage. Given the widespread Persian period practice of coining bronze- and lead-cored imitations (by private counterfeiters and states?) known to us by the numerous examples which have survived, it stands to reason that Athens was not alone in this.

⁶ See Berlin and Lynch, forthcoming. I thank Andrea Berlin for allowing me to see an advance copy of this work.

⁷ Note that in a section of *Laws* (916 C) dealing with deceit in the sale of slaves and livestock, Plato focuses on the knowledge of the buyer (*eidôis*) as the primary criterion for determining the right of restitution.

⁸ 1986, 41.

If the distances become too great, the links can eventually break and the trader conveying the goods then becomes the bridge between the producer and consumer. The bridge can be faulty, though: over time and space, all the relevant knowledge pertaining to the item, including its origins, might be lost in the succession of transfers between traders. By the time the point of consumption is reached, the sum total of the regional knowledge about an item, shared by both local traders and consumers, might be quite minimal. The knowledge bridge (entailing production intent, origins, initial purchase prices, proper consumption, etc.) might also be guarded by middlemen traders, a secret propagated to insure high profits. The modern theory of the “secret” of the cinnamon trade no doubt arose from a realization of the potential for a deliberate, profit-motivated break in the knowledge concerning this commodity.⁹ Although it likely was not the case with cinnamon, unscrupulous middlemen traders in long distant trade no doubt took advantage of their knowledge when they could. During the Roman period, for example, Scythian traders sold silk reworked in Syria back to the Chinese at high profits, once they had persuaded the Chinese that the Romans possessed better quality silk worms than they did.¹⁰ Ideally, both parties should have the same level of knowledge about the objects in a transaction; problems (and high profits) arise when they do not. What this means, in other words, is that every object can potentially be defined as an original, an imitation, or a counterfeit depending on what is known about it by the parties in a transaction.

⁹ See p. 300 above. But cf. Casson (1984) for whom the knowledge break in this case was not deliberate, but more the result of apathy.

¹⁰ See Ferguson, 1978, 591.

This observation offers a more focused context for delineating the parameters of imitations and counterfeits, and one that is detached from the production end of a commodity's flow. The ability to move the context of definition away from production is, in fact, important. For example, objects might be produced as counterfeits, with the intent to deceive, and so are made to target one (unsuspecting) consumer population. Taken out of that context, however, the significance of the counterfeit could be lost, and a different value attached to the item within a new context. Or from another perspective, the state-made Athenian bronze cored coins, mentioned above, once taken out of the Athenian context where they were known to be plated (i.e., imitations), and placed in a context where they were not, might then become actual counterfeits. A number of high-quality, but plated Athenian tetradrachms, for example, have been found in Egypt and the Levant, which raises the question, are these "official" Athenian issues which were purposely (or inadvertently) traded overseas?¹¹ Herodotus (III.56) also relates a story of the Samian Polycrates (6th c.) bribing the besieging Lacedaemonians to depart by offering plated lead-cored coins; Osborne suggests that the coins (like the Athenian plated examples) were minted only for internal use.¹² Foisting the worthless coins on the unknowing Lacedaemonians effectively made them counterfeits.

In all such cases, the point at which any imitative object has the greatest potential to become the manifestation of deceit is the actual moment of

¹¹ The unpublished coins, 15 of which are known to me, are in the collections of the Israel Antiquities Authority and the American Numismatic Society.

¹² 1995, 259.

transaction between two parties: one person knows that the object is not what he or she says it is, but pretends that it is, while the other has no idea. Hence, it is only in the specific context of a transaction that counterfeits and adulterations can be defined and separated from imitations and adaptations; if neither party truly knows, then no counterfeit or adulteration exists between them. We must also realize that, over the course of an imitative commodity's flow, the item could change hands many times, and so could change status many times, imitation (or "original") to counterfeit to imitation. This fluctuation could occur independently of the intent of the producer, or anyone tampering with the item along the way. From our perspective, this can complicate the way that we approach ancient commodities since our focus is generally narrowed to the production end of the flow, as is Miller's schema, rather than the later stages, which includes transactions, wherein the item would obtain a fuller cultural, social, and economic definition.

It is worthwhile asking, then, once a commodity reached a "protected" market like Athens, what role did state officials, e.g., the *dokimastai* or *agoranomoi*, play in defining the status of the goods in these transactions as a third party to them? The existence of these officials tells us that consumers and traders were aware of counterfeits, adulterations, and other schemes to deprive them of the full value of their contribution(s) to a transaction. Therefore if items were suspect, and an irresolvable conflict arose in the course of a transaction (whether before, during or after), the state officials acting as arbitrators would resolve the dispute with a binding judgment on the status of the goods, and the

trader.¹³ The official proclamation, condemning or approving the items for trade, would depend to a large measure on the ability of the contestants to prove deceit through empirical evidence (e.g., a test cut on a coin showing a bronze core), or general knowledge (e.g., widespread familiarity with a type of commodity or trader).¹⁴ Arbitration otherwise would be left in large measure to the subjectivity of the judge. In the more extreme cases where empirical evidence or other proofs made deceit incontrovertible, the official proclamation would do little to change the status of goods already suspected or privately condemned. But, in all other cases, a judgment could officially sanction counterfeited goods, or condemn originals, thus potentially altering the status of goods in a transaction. Harsh penalties could be inflicted on those not abiding by the decision, which no doubt left some disgruntled, more knowledgeable consumers/traders, in the unenviable position of having to accept items they felt were worthless.¹⁵ The officials, in effect, did little more than reinforce the community's collective knowledge and definitions of the range of commodities available. Towards the fringes of that knowledge, there was more room for commodity status to be officially altered, for better or worse.

With the parameters in place for defining imitations and counterfeits, we next can turn to the issue of which commodities types were generally imitated or counterfeited. The starting point of our search for parameters was Miller's

¹³ Cf. Plato (*Laws*, 917 D).

¹⁴ Cf. Plato (*Laws* 917 E) where the *agoranomoi* and *nomophylakes* conduct research on commodities and retail trade (*pythomenoi tôn empeirôn peri hekasta*) before writing laws concerning market behavior and adulteration.

¹⁵ The 375/4 law, for example, states that anyone who refuses the coins that have been certified by the *dokismastês* is to have all of the merchandise that he has on sale that day confiscated.

tripartite schema, which can serve as a launch point for this topic as well. Since her focus was to explain artistic modes of copying in ceramics and textiles, her schema best fits similar types of manufactured commodities. In other words, those items which are *not* the result of an elaborately planned manufacturing process, i.e., raw or semi-processed materials, really have no place in the schema. While this might be true for an artistic context, for an economic context it cannot be. Since we have identified the transaction as the context for defining the status of a commodity, it is there that we should look for commodity types vis-à-vis imitation and counterfeiting. Once we do, it is quite easy to conclude that anything that could enter a transaction, i.e., anything having economic value, might be imitated or counterfeited, if nature and ingenuity permitted. In fact, one fallacy best avoided, particularly when considering the problem from an economic perspective, is that only luxury or other expensive goods were those that were worth the trouble of (deceitful) imitation.¹⁶ In the Persian period traditionally defined luxury goods, like various spices, ebony and ivory, marine purples, and textiles, were, of course, imitated, some like purple no doubt with intent to deceive (Xen. *Oec.* X.3). But commodities such as pigments, terracottas,

¹⁶ We must take care how we define luxury goods (see “Commodity Types” in chapter 6). Miller (1997, 136) assumes the models for some of her imitations to be “prestige items of limited supply,” specifically foreign metal ware which Attic potters copied as best they could in clay. Such a statement has economic implications: the potters wished to profit from the current rage for foreign metalware by offering cheaper copies to non-elites. While examples of this type of profiteering can be found, then and now, this presumed intent may not always be correct. A workshop could have expanded its repertoire by imitation simply for the sake of novelty, or as a proof of its artistic abilities. The ceramic imitations of knuckle bone gaming pieces and seashells produced by Attic workshops illustrate both points; furthermore, neither was a prestige item of limited supply.

amphoras, and even finewares, which were also imitated, would not necessarily fall under the rubric of luxury goods.

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ABBREVIATIONS

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- ANEP* J.B. Pritchard, 1969, *Ancient Near Eastern pictures relating to the Old Testament* (Princeton).
- ANET* J.B. Pritchard, 1969, *Ancient Near Eastern texts relating to the Old Testament* (2nd ed., Princeton).
- CANE* J. Sasson, ed., 1995, *Civilizations of the ancient Near East*, 4 vols. (Scribner: New York).
- CH* *Coin hoards*, 1975-present (London, Royal Numismatic Society).
- DCH* D.J.A. Clines, ed., 1993-2001, *The dictionary of classical Hebrew*, 6 vols. ongoing (Sheffield).
- DMic* F. Auro Jorro and F.R. Adrados, (1985-1993) *Diccionario micénico* (Madrid).
- Docs²* M. Ventris and J. Chadwick, 1973, *Documents in Mycenaean Greek*, 2nd edition (Cambridge).
- EUMA* J.P. Delgado, ed., 1997, *British Museum encyclopedia of underwater and maritime archaeology* (London: British Museum Press).
- HAL* L. Koehler and W. Baumgartner, 1994, *The Hebrew and Aramaic lexicon of the Old Testament*, 4 vols. (Leiden).
- IDB* G.A. Buttrick, ed., 1962, *The interpreter's dictionary of the Bible*, 4 vols. (New York: Abingdon Press).

- IGCH* M. Thompson, O. Mørkholm and C.M. Kraay, 1973, *An inventory of Greek coin hoards* (New York: American Numismatic Society).
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- Löw, Pflanzennamen* I. Löw, 1881, *Aramäische Pflanzennamen* (Leipzig).
- LSJ* H.G. Liddel and R. Scott, 1968, 9th ed., *A Greek-English lexicon* (Oxford).
- ML* R. Meiggs and D. Lewis, 1988, 2nd ed., *A selection of Greek historical inscriptions to the end of the fifth century BC* (Oxford).
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- OEANE* E.M. Meyers, ed., 1997, *The Oxford encyclopedia of archaeology in the Near East*, 5 vols. (Oxford).
- PME* *Periplus Maris Erythraei* (L. Casson, 1989, *The Periplus Maris Erythraei: Text with introduction, translation and commentary* [Princeton]).
- RE* A. Pauly, G. Wissowa, and W. Kroll, 1894-1978, *Real Enzyklopädie der klassischen Altertumswissenschaft*. 34 vols. (Stuttgart; Munich).
- SEHWW* M.I. Rostovtzeff, 1953, *The social and economic history of the Hellenistic world*, 3 vols. (Oxford).

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