

DEMETRIUS I OF BACTRIA: AN ANALYSIS OF HELLENISTIC ROYAL POWER
THROUGH NUMISMATIC EVIDENCE

A Dissertation

Presented to

The Faculty of the Department

of History

University of Houston

In Partial Fulfillment

Of the Requirements for the Degree of

Doctor of Philosophy

By

Frances Ann Marcinkiewicz-Joseph

May, 2016

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ABSTRACT

Literary and archaeological evidence for the Hellenistic Graeco-Bactrian and Indo-Greek kingdoms is extremely sparse, and scholarship relies heavily on extant royal coins. Innovative methodologies are required to extract information from these coins and better understand the mysterious monarchs who ruled a series of small kingdoms in Central and South Asia. In general, the political strategy of Hellenistic monarchs was directed toward the maintenance and expansion of one's power. Therefore, political power is a valuable factor through which to assess the Bactrian kings. I developed a methodology that I term "power policy numismatics" for using ancient coins to measure political power. This involves treating and analyzing coins as pieces of government policy. Coins can function as policy in two ways. Firstly, they are physical pieces of policy, as they establish, legalize, and standardize a money economy. Secondly, coins contain "assertion policies," or deliberately designed packages of information with which a monarch could assert his or her rule. Viewing royal coins in this way reveals a monarch's administrative sophistication, military investment, and legitimization efforts. Combined, these policy aspects illuminate the power of their issuing monarchs. I apply this methodology to King Demetrius I of Bactria. Demetrius is crucial to the history of Hellenistic Central and South Asia. From the seat of power in ancient Afghanistan, Demetrius conquered and expanded south, across the Hindu Kush mountains, and established rule in ancient northwest India. He shifted the center of power to the Indian territories, and laid the groundwork for a significant Greek presence there for almost two centuries. His coins indicate a strong centralized government, a complex bureaucracy, and direct rule. They suggest a level of military investment greater than that of his predecessors and competitive with his large Seleucid neighbors. They also assert a governmental ideology that serves the interests of imperial hegemony. Evaluating coin policy helps to explain Demetrius' role as a power-player in the international system of the eastern Hellenistic world.

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Dedicated to my parents,
Henryk and Angela,
and my husband, Jijo.

Chapter 1: Introduction and Methodology

During the Hellenistic period of the ancient world, between 250 B.C. and 20 B.C., a series of 44 Greek-named kings and queens ruled a remnant of the territory conquered by Alexander the Great in Central and South Asia. From 250 until 145 B.C. the first series of those kings controlled a region in Afghanistan, then known as Bactria. After 145 B.C., the later kings ruled in an adjacent region to the south, now modern Pakistan, which was a section of the vast land called India.

Between 200 and 145 the kings held sway in both regions. Scholars often refer to the kings of the northern territory as Graeco-Bactrians, and those of the southern territory as Indo-Greeks, which makes it complicated to discuss those who ruled in both places. Hereafter, I will refer to the whole civilization as the “Bactro-Indo-Greeks” or “Bactrians,” for short. In many ways, the Bactro-Indo-Greeks are still a lost civilization. Besides a few paragraphs in ancient literature, a small number of stone and leather texts, and a few archaeological sites, most importantly the Hellenistic city at Ai Khanoum, Afghanistan, the evidence of this civilization’s existence is limited to coins. The Bactro-Indo-Greek coins are interesting in their diversity, finely detailed images, and clear multiculturalism, but to study and interpret the complexity of coins requires very different kinds of methodology than are appropriate for other sources.

Numismatists have done extensive work in identifying, organizing, and interpreting the diverse Bactrian coin types. Scholarship, however, has remained quite narrowly focused on the personal lives and traits of individual kings; the family lineages and chronology of groups of kings; and the geographical extent of each king’s rule. There is also a rising interest in the culture of the Bactrians, which was clearly some sort of hybrid and thus can illuminate questions of ethnicity and

identity. All of these foci—culture, personality, lineage, territory—can help tell us *who* the Bactrian kings were, but none can tell us *why* they were. In other words, how did a tiny secessionist kingdom survive in an era when imperial military might was everything? The Bactrians maintained a small independent kingdom for 100 years against the enormous Seleucid empire and the growing Parthian empire to the west, plus warlike nomads to the north and east. In the meantime, they managed to expand south across forbidding topography into India, where among a very different group of neighbors they managed to thrive for another 100 years. The last kings were still holding on long after the great Hellenistic empires began falling to Rome.

To move beyond the mere fact of the Bactrian kings' existence—beyond knowing who, when, and where they were—scholars must try to answer why they flourished, and this is a question of politics, specifically, the struggle for power. By looking at Bactria through the lens of political power, one can understand how the kings administered their domains, how they ran their militaries, and how they interacted with their subjects. One can also learn how a king may have gained, held, or lost power. Viewing Greek Bactria and India politically can in turn provide insight into the nature of Hellenistic, and more broadly, ancient politics, kingship, and society. It can help to explain why different civilizations ended up on different historical paths. To remove the lost civilization of Greek Bactria and India from a mere 'incidental' existence, it needs cause-and-effect explanations to fit it into the larger story of world history. I propose that the Bactrian royal coins serve as evidence of royal political power and in that capacity contribute to the history of Hellenistic Bactria and India.

Of the 44 known Bactro-Indo-Greek kings, one in particular, Demetrius I, stands out as especially significant to the political development of the Bactrian kingdoms. Demetrius represents the peak of Bactro-Indo-Greek rule, as he greatly extended the territory of the kingdom by conquering Northwest India between 200 B.C. and 190 B.C. The exact dates of his rule and extent

of his territory are estimated.¹ He ruled in both Bactria and India and a number of his successors attempted to do the same. He was responsible for moving the center of Bactro-Indo-Greek power from one international system—the Central Asian system—to another—the Indian system.

Demetrius' coins are notable because they introduce several new features. His portrait, which appears on the obverse, or front-side, of all of his silver coins is innovative. Instead of a simple head, the portrait is a bust, with cloth-draped shoulders. Further, his portrait bears an elephant-scalp headdress. This feature recalls early coins of the Hellenistic king of Egypt, Ptolemy I, which depicted Alexander the Great wearing an elephant scalp. It also recalls Alexander the Great's own coins, which show the bust of Heracles wearing a lion scalp. Demetrius issued coins in silver and bronze. Unlike his predecessors, Diodotus I, Diodotus II, and Euthydemus I, he did not issue any gold coins. His silver coins are abundant and mostly consist of the tetradrachms, a large denomination weighing 16.8 grams. All of Demetrius' coins are finely engraved with artistic detail.

There are very few firmly established facts about Demetrius, or any other Bactro-Indo-Greek king, for that matter. An outline of his kingship can be pieced together from brief descriptions in ancient texts, one stone inscription, and a handful of artifacts. The ancient historian Polybius of Megalopolis wrote that Demetrius was the son of King Euthydemus, usurper of the Bactrian throne. Before Euthydemus, the kingdom of Bactria was established by Diodotus I and his son, Diodotus II; the former was the satrap of the Seleucid province of Bactria, who, along with his son, rebelled against the empire and claimed independence. Later, the Seleucid emperor Antiochus III tried to take back the Bactrian province and besieged King Euthydemus. To break the siege, Euthydemus sent an envoy, Teleas, to negotiate a treaty. He also sent his son Demetrius to assist in the negotiations. According to Polybius, Antiochus was so pleased with the young

¹ Osmund Bopearachchi, *Monnaies gréco-bactriennes et indo-grecques: catalogue raisonné* (Paris: Bibliothèque Nationale, 1991), 453.

prince's "appearance, dignified bearing, and conversation," that he allowed Euthydemus to keep his kingdom and promised a daughter in marriage to Demetrius.² The ancient texts do not reveal if Demetrius did indeed marry a Seleucid princess. Another ancient writer, the geographer Strabo, wrote that Demetrius, while not yet a king but the "son of Euthydemus, the king of Bactria," conquered peoples in India.³ The author Justin mentioned a King Demetrius as the king of the Indians. He claimed that this king fought the Bactrian king Eucratides and lost his holdings.⁴ Numismatic evidence suggests that Eucratides ruled later than Demetrius I, however, and thus the king that he battled was more likely Demetrius II.⁵ A stone inscription from Kuliab, Tajikistan, dedicated to the Greek goddess Hestia, gives praise to the king Euthydemus, and also lists Demetrius as his son.⁶ The dedicator, a man named Heliidotus, called Demetrius "Καλλινικον," the Glorious Victor, which may be another reference to his conquest of India while still a prince. Demetrius did not use an epithet on any of his coins, but a later king, Agathocles, issued a series of commemorative or imitative coins bearing the portrait, imagery, and title of Demetrius, and which also bestowed the epithet, "Ανικητος," the Unconquered.⁷

There are a few pieces of material evidence that relate to Demetrius. A team of French archaeologists, under the direction of Paul Bernard, excavated an extremely important site near the village of Ai Khanoum, Afghanistan. Between 1965 and 1979, the archaeologists discovered a full

² Polybius, *Histories*, 11.34.

³ Strabo, *Geography*, 11.11.1.

⁴ Justin, *Epitome of Pompeius Trogus*, 41.6.

⁵ This remains a matter of controversy. Osmund Bopearachchi, for example, supported the idea that Eucratides battled Demetrius II, in *Monnaies gréco-bactriennes*, 49-54. On the contrary, L.M. Wilson argued that Demetrius II came after Eucratides and thus the latter usurped the throne from Demetrius I, in "King Demetrios of India and Eukratides of Bactria," *Oriental Numismatic Society Newsletter* 174 (2003): 17-23.

⁶ Paul Bernard, Georges-Jean Pinault, and Georges Rougemont, "Deux nouvelles inscriptions grecques de l'Asie centrale," *Journal des savants* (2004): 333-337.

⁷ Bopearachchi, *Monnaies gréco-bactriennes*, 179.

city from the period of Hellenistic Bactria.⁸ It contained architectural features such as a palace, gymnasium, theater, and a temple with both Greek and Persian traits. It was also rich in artifacts including pottery, statues, bronze implements, and coins. Scholars have estimated that the first Seleucid emperors built the city, and then it was taken over and used as a capital city by the Bactrian kings. The last Bactrian to occupy it was probably Eucratides I, before the city was abandoned and overrun by nomadic invaders from the North around 145 B.C.⁹ One artifact with a connection to Demetrius is a small bronze figurine of the god Heracles, standing, holding a club, and crowning himself with a wreath.¹⁰ All of Demetrius' silver coins bear an image of Heracles in exactly the same pose, except that the god also holds a lionskin along with a club. The similarity between the figurine and the coin image suggests that the former is also a product of Demetrius' reign, and that the depiction of Heracles in that particular pose was especially associated with this king. The presence of the figurine at Ai Khanoum is therefore evidence of Demetrius' own presence in the city—perhaps even ruling from there. Another important artifact is an actual die for striking Demetrius tetradrachms. A private collector bought the die at auction, and its provenance is not certain, but it is supposed to have come from Northern Afghanistan, and is likely from the

⁸ Paul Bernard, *Fouilles d'Ai Khanoum I (Campagnes 1965, 1966, 1967, 1968) Rapport préliminaire publié sous la direction de Paul Bernard* (Paris: Klincksieck, 1973); Jean-Claude Liger, R. de Valence, and Olivier Guillaume *Fouilles d'Ai Khanoum II, Les propylées de la rue principale* (Paris: Éditions de Boccard, 1983); Henri-Paul Francfort, *Fouilles d'Ai Khanoum III, Le sanctuaire du temple à niches indentées* (Paris: Éditions de Boccard, 1984); Paul Bernard, *Fouilles d'Ai Khanoum IV, Les monnaies hors trésors, questions d'histoire gréco-bactrienne* (Paris: Éditions de Boccard, 1985); Pierre Leriche, *Fouilles d'Ai Khanoum V, Les remparts et les monuments associés* (Paris: Éditions de Boccard, 1986); Jean-Claude Liger, Serge Veuve, and Guy Lecuyot, *Fouilles d'Ai Khanoum VI, Le Gymnase, architecture, céramique* (Paris: Éditions de Boccard, 1987); G. Samoun, Axelle Rougeulle, and Oliver Guillaume, *Fouilles d'Ai Khanoum VII, Les petits objets* (Paris: Éditions de Boccard, 1987); Claude Rapin, Jean-Claude Liger, and Guy Lecuyot, *Fouilles d'Ai Khanoum VIII, La trésorerie du palais hellénistique d'Ai Khanoum, l'apogée et la chute du royaume grec de Bactriane* (Paris: Éditions de Boccard, 1992); Guy Lecuyot, *Fouilles d'Ai Khanoum IX, L'habitat* (Paris: Éditions de Boccard, 2013).

⁹ Rapin, *Fouilles d'Ai Khanoum VIII*, 287-288; Lecuyot, *Fouilles d'Ai Khanoum IX*; Paul Bernard, "The Greek Colony at Ai Khanoum and Hellenism in Central Asia," in *Afghanistan: Hidden Treasures from the National Museum, Kabul*, ed. Fredrik Hiebert (Washington D.C.: National Geographic Books, 2008): 87, 104.

¹⁰ *Ibid.*, 113.

city at Ai Khanoum.¹¹ This means that not only was Demetrius ruling at Ai Khanoum, but he may even have had a mint located there.

Despite the details provided by these literary and material sources, Demetrius' monarchy remains obscure. We still do not know the nature of his rule, and whether he was successful. Illuminating the growth and power of Demetrius will bring about a better understanding of how he expanded his kingdom into Northwest India and what institutions he set up for his Indo-Greek successors. This dissertation pursues the connections between the numismatic features of Demetrius' coins and the king's political power.

Coins as a type of evidence, with repetitive imagery and only a few words, are inherently vague. Numismatic historians have often interpreted them without an effective historical method. Researchers must be careful not to get lost in speculation and imagination. Thus, in order to draw out the secrets of coins while maintaining their evidentiary integrity, one must apply a firm theoretical framework. With a strong theory, one can organize and assess the evidence of the coins and reach conclusions that are logical and supportable. The problem at hand is how to measure the political power of King Demetrius, and therefore political theory is an appropriate framework to apply. Specifically, in this multi-disciplinary approach, I will investigate the numismatic evidence in light of established International Relations theory.

Review of Bactrian Historical and Numismatics Literature

Bactrian historians and numismatists have had a long and arduous journey, the early part of which was limited to identifying and organizing extant coins. Such scholarship began in 1738 with

¹¹ Osmund Bopearachchi, "Deux documents exceptionnels en numismatique indo-grecque," *Cahiers numismatiques* 48, no. 189 (2011): 4.

Theophilus Bayer's *Historia Regni Graecorum Bactriani in qua simul Graecarum in India Colonialium Vetus Memoria*.¹² Bayer studied a coin of the king Eucratides that had been in a private collection. He was able to identify the king as one of the eight Bactrian kings mentioned in ancient texts. Bayer correctly attributed the coin, but did not analyze its features. Interest in coin collecting among Europeans continued throughout the 18th century and increased in the 19th century. As more Bactrian coins began to appear—of kings both present and absent in the ancient sources—numismatists such as James Prinsep and Raoul Rochette began describing them, placing the kings into a chronology, and suggesting possible relationships for the kings.¹³ Edward Thomas, in 1856, compiled a catalogue of known Bactrian coins,¹⁴ and wrote books and articles evaluating the coin legends and imagery. In one article he examined symbolism and mint marks.¹⁵ In his early analysis of coin messages, he pointed out how a new patron god was used when the first Bactrian king seceded from the Seleucid Empire. He also noticed that some coins carried two royal names, and he argued that they revealed a system of high kings and sub-kings. He also analyzed the artistic qualities of Bactrian coin portraiture.

Over time, with creativity and many forays into the wilderness of speculation, numismatic historians in the early twentieth century used the ever-growing body of coins to build an outline of Bactrian civilization. The fullest narrative is William Woodthorpe Tarn's 1938 work, *The Greeks in Bactria and India*.¹⁶ Tarn went beyond the general framework of who succeeded whom and who the sub-kings were. He sought to create a story of how these kingdoms came about, and in general,

¹² Theophilus Siegfried Bayer, *Historia Regni Graecorum Bactriani in Qua simul Graecarum in India Colonialium Vetus Memoria* (St. Petersburg: Academiae Scientiarum, 1738).

¹³ James Prinsep, "On the Coins and Relics Delivered by M. le Chevalier Ventura, General in the Service of Mahá Rájá Ranjít Singh, in the Tope of Manikyála," *Journal of the Asiatic Society of Bengal* 3 (1834): 313-320; Raoul Rochette, "Notice sur quelques médailles grecques inédites, appartenant á des rois inconnus de la Bactriane et de l'Inde," *Journal des Savants* (1834): 328-344.

¹⁴ Edward Thomas, "Catalogue of Bactrian Coins," *Numismatic Chronicle* 19 (Apr. 1856-Jan. 1857): 13-45, 49-63.

¹⁵ Edward Thomas, "Bactrian Coins," *Numismatic Chronicle, New Series* 2 (1862): 178-188, 259-267.

¹⁶ William Woodthorpe Tarn, *The Greeks in Bactria and India* (Cambridge: Cambridge University Press, 1938).

he attributed their formation to family relationships. For example, he stated that the first Bactrian king, Diodotus, not only seceded from Antiochus II, but married his daughter. He further stated that Euthydemus, who usurped the throne from Diodotus, in turn married Diodotus' daughter.¹⁷ While Tarn used the coins as evidence, he unfortunately did not use them in a scientific way, and the result is a narrative that is not supportable. Most later scholars attempted to correct Tarn's narrative, but his work nevertheless established a general focus in the field upon personalities and family relationships. An important successor to Tarn is A.K. Narain. His 1957 book, *The Indo-Greeks*,¹⁸ is a counterpoint to Tarn's work, which Narain viewed as wrongly favoring the spread of Hellenic culture into the Indian world. Narain's agenda was to prove that the Greeks failed to establish rule in what is modern India. In pursuance of this agenda, he showed an unrelenting preoccupation with territory, combining mintmarks, literature, and etymological traces to define boundaries. He sought in particular to limit the scope of Demetrius' conquests, with definitive statements such as "Demetrius certainly never conquered Carmania,"¹⁹ but his evidence is often an argumentum ex silentio, such as a lack of sufficient coins from a particular region. Territory, moreover, only provides partial information about a king's power. For the ancient world in particular, one can better understand power by looking at political structures and policies rather than territory. For example, a monarch may have a strong hold over his imperial core, and a much looser hold over the periphery, yet both are included in his territory.²⁰ Narain did in fact articulate a major problem of Bactrian politics when he stated that, "it was beyond the strength of Seleucus II

¹⁷ Ibid., 73.

¹⁸ A.K. Narain, *The Indo-Greeks* (Oxford: Clarendon Press, 1957).

¹⁹ Ibid., 24.

²⁰ Graham Shipley discussed the power-gap between the core and periphery in Hellenistic kingdoms in "Distance, Development, Decline? World-Systems Analysis and the Hellenistic World," in *Centre and Periphery in the Hellenistic World*, ed. Per Bilde et al. (Aarhus: Aarhus University Press, 1993), 271-284.

to re-establish Seleucid hegemony over Bactria and Sogdiana.”²¹ He did not follow through on the issue, however, by applying a political approach.

More recently, historians of Bactria have been cautious about writing full histories of the kingdom. Instead they have tried to better organize the coin evidence via catalogues and then make small but specific conclusions. Michael Mitchiner created catalogues of Bactrian and Indo-Greek coins in which he identified mints, territories, and basic chronology.²² Osmund Bopearachchi has published catalogues and books in which he used coin find spots, hoard distribution, mint marks, metal content, die linkage, and other specific data to establish details about the Bactrian and Indo-Greek kings. In his masterwork, *Monnaies gréco-bactriennes et indo-grecques: Catalogue Raisonné*, he presented a chronology of the kings and a map of their territories that is considered the standard in the field. He also presented translations of the ancient Indian Prakrit language, in the Kharoshthi and Brahmi scripts, which appears on the bilingual coins. Both Mitchiner and Bopearachchi made convincing arguments about the identities of non-Greek and syncretic gods. The catalogues have done much to organize Bactrian coins by king, type, denomination, metal, and mint.²³

Cataloguing is an important tool for the study of ancient coins, but it also has limits as a historical method. Catalogues group coins by issuers, denominations, image features, and control marks, among other aspects. This facilitates classification, and especially identification of coins for collectors. They offer detailed descriptions of coins, but do not always offer explanations of why or how coins were produced in certain varieties. At times, the strict order of a catalogue can become

²¹ Narain, *Indo-Greeks*, 18.

²² Michael Mitchiner, *Indo-Greek and Indo-Scythian Coinage*, 9 vols. (London: Hawkins Publications, 1975).

²³ Other major catalogues include Percy Gardner, *The Coins of the Greek and Scythic Kings of Bactria and India in the British Museum*, ed. Reginald Stuart Poole (London: British Museum, 1886); Osmund Bopearachchi, *Sylloge Nummorum Graecorum: The Collection of the American Numismatic Society, Part 9: Graeco-Bactrian and Indo-Greek Coins* (New York: The American Numismatic Society, 1998); Osmund Bopearachchi, *Indo-Greek, Indo-Scythian and Indo-Parthian Coins in the Smithsonian Institution* (Washington, D.C.: Smithsonian Institution, 1993); A.N. Lahiri, *Corpus of Indo-Greek Coins* (Calcutta: Poddar Publications, 1965).

so standardized within source literature that different permutations become obscured. It can be beneficial to the greater understanding of coin design, production, and circulation, if they are grouped and viewed in arrangements other than the catalogue standard.

Many numismatic historians have used the stylistic and minting features presented in the catalogues to analyze Bactrian coins, and they have done so in careful, considered ways to piece together small but important facets of the civilization. Their focus tends to remain on issues originally raised by Tarn and Narain, namely, personal attributes, family connections, chronology, and territory—especially mint locations. The kings that garner the most scholarly interest are the first Bactrian kings, Diodotus I, Diodotus II, and Euthydemus I, and also Eucratides I, because of the latter’s vast body of coinage. The kings Agathocles and Antimachus are usually studied for their issues of commemorative coins. C.-Y. Petitot-Biehler, for example, presented a coin hoard uncovered in the Afghan site of Ai Khanoum.²⁴ She categorized the coins according to type, and accounted for new types based on image-style and mint-marks. She proposed, for instance, that a die-artist transferred from one mint to another. She also suggested that Antimachus was connected to Agathocles and succeeded him. Adrian S. Hollis used coins to confirm a dynastic relationship that his predecessors had asserted.²⁵ Certain coins of Eucratides show portraits of his parents. Based on the mother’s name Laodice, her diadem, and apparent age in her portrait, he identified her as a Seleucid princess. In a 2007 article, Jens Jakobsson claimed that a king commemorating another king must indicate a family relationship.²⁶ He suggested that Agathocles and Antimachus must have had at least marital connections with all the preceding Bactrian kings.

²⁴ Claire-Yvonne Petitot-Biehler and Paul Bernard, “Tresor de monnaies grecques et greco-bactriennes trouve a Ai Khanoum (Afghanistan),” *Revue Numismatique* 6, no. 17 (1975): 23-57.

²⁵ Adrian S. Hollis, “Laodice Mother of Eucratides of Bactria,” *Zeitschrift für Papyrologie und Epigraphik* 110 (1996): 161-164.

²⁶ Jens Jakobsson, “The Greeks of Afghanistan Revisited,” *Nomismatika Khronika* 26 (2007): 51-88.

Demetrius, though an early Bactrian king who appears in ancient literature, has been the subject of very few scholarly works. His coins are often studied in conjunction with those of his father, Euthydemus I. In a 1951 article, A.D.H. Bivar attempted to arrange known Euthydemus and Demetrius coins into chronological order using die alignment, design features, and control marks.²⁷ Die alignment refers to the relative positioning of the obverse die and reverse die when striking a coin. He asserted that mint officials changed the die alignment of his father's coins from $\uparrow\downarrow$ (meaning that while the obverse die was positioned up, the reverse was positioned down) to $\uparrow\uparrow$ and then continued the practice in the mints of Demetrius. He argued that it was a purposeful change to distinguish the Bactrian kingdom from the Seleucids.²⁸ Besides Bivar's unexplained concentration upon die alignment, he mistakenly amalgamated all Bactrian coins bearing the name Demetrius and made chronological conclusions about coins now known to belong to later kings named Demetrius. In a 1981 article, Frank Holt examined the composition of a coin hoard from Ai Khanoum, focusing especially on its Euthydemus coins, but also its Demetrius coins.²⁹ He argued convincingly that the control marks on the Demetrius coins correlate to their chronological issue, as the portraits on the coins show distinct aging of the king. Colin Kraay attempted to straighten out the chronology of Demetrius coins even further and finalize the number of Bactrian kings named "Demetrius."³⁰ Kraay looked at literary evidence and coin imagery to identify individual kings, as well as hoard evidence to demonstrate period-based groupings. He concluded that there were three Demetrii, and that number has remained the standard. In 1989 D.W.

²⁷ A.D.H. Bivar, "The Bactria Coinage of Euthydemus and Demetrius," *Numismatic Chronicle* 6, no. 11 (1951): 22-39.

²⁸ *Ibid.*, 27.

²⁹ Frank Holt, "The Euthydemid Coinage of Bactria: Further Hoard Evidence from Ai Khanoum," *Revue Numismatique* 6, no. 23 (1981): 7-44.

³⁰ Colin Kraay, "Demetrius in Bactria and India," *Numismatica e Antichita Classiche* 10 (1981): 219-233.

MacDowall contributed a study of Demetrius I's bronze coinage.³¹ He examined the designs and monograms of the bronzes in relation to geographical distribution. Not only did he attribute three distinct bronze types to Demetrius I, but he demonstrated that the largest of the bronzes, unlike the other two denominations, was localized south of the Hindu Kush, in the Indian territories. Finally, Mariusz Mielczarek, in a 1993 article, revisited the mint marks and portraiture on coins of Euthydemus and Demetrius.³² He did not offer novel conclusions, but confirmed the attribution of Demetrius I coins and suggested that for a time, he minted simultaneously with his father Euthydemus.

Scholars have not yet examined the Demetrius coins as a whole body. Moreover, the existing studies of Demetrius coins evaluated the king merely in terms of his familial or chronological relations. Significantly, historians have fallen short of understanding the political position of Demetrius or any of the other Bactro-Indo-Greek monarchs. I will approach this last issue by viewing and utilizing the coins as evidence of political position, political intent, and political power. This evidence can be found in the various aspects of coins, including images, control marks, legends, metals, and weights.

Review of International Relations Literature

Coins provide historical evidence, but knowing what to ask of the evidence requires a theoretical framework, in this case political theory. First of all, kings and their coins must not be studied without context, as if they existed in a void. To understand how King Demetrius chose to

³¹ D.W. MacDowall, "The Copper Coinage of Demetrius, the Son of Euthydemus," *Journal of the Society for South Asian Studies* 5 (1989): 29-33.

³² Mariusz Mielczarek, "Some Remarks about the Coinage of Euthydemus I and Demetrius, Kings of Bactria," *Proceedings of the XIth International Numismatic Congress*, ed. Tony Hackens and Ghislaine Moucharte (Brussels: Societe Royale de Numismatique de Belgique, 1993) 299-303.

administer his government, and ultimately why he succeeded, he must be viewed as a member of a political system, which included Hellenistic monarchs who ruled simultaneously or in close succession, and non-Greek entities. The study of how monarchs, or any political actors, operate in a system of other actors is known as International Relations. The body of theory associated with this field has grown and developed over the past century, and has recently been refined to the point that it is fruitfully applicable to ancient societies.³³

The two competing theories of International Relations are known as Realism and Liberalism or Idealism. Realism declares that states, via their heads or administrations, are the actors in foreign policy, and that they rationally make policy decisions in the pursuance of self-interest defined as power. Realism assigns its origins to Thucydides, Machiavelli, and Hobbes,³⁴ and it was academically explicated in 1948 by Hans Morgenthau in his book, *Politics among Nations*.³⁵ In Liberalist theory, originated by Immanuel Kant, John Locke, and others,³⁶ the actors are competing groups within a society, and foreign policy decisions are based on the preferences of the majority or otherwise influential groups. The interests that states pursue are often economic or social and based on state cooperation. Liberalist authors such as Andrew Moravcsik have argued well for the applicability of liberalism to democratic and modern states,³⁷ but their theories require active civil societies that can influence their governments, and institutions that can cooperate across national borders.

³³ Prominent journals in the field of international relations include, but are not limited to, *International Organization*; *International Studies Quarterly*; *Review of International Studies*; *Foreign Policy*; *European Journal of International Relations*; *International Security*; *International Relations*; *Cambridge Review of International Affairs*; *Harvard International Review*; and *Yale Journal of International Affairs*.

³⁴ See Thucydides, *History of the Peloponnesian War*, 1.66-88; Niccolo Machiavelli, *The Prince*, 15 (for example); Thomas Hobbes, *The Leviathan*, 11.2, 12.8, 14.4, etc.

³⁵ Hans Joachim Morgenthau, *Politics among Nations: the Struggle for Power and Peace* (New York: A.A. Knopf, 1948).

³⁶ See for example Immanuel Kant, "Perpetual Peace: A Philosophical Sketch," (1795); John Locke, *The Second Treatise of Government*, (1689).

³⁷ Andrew Moravcsik, "Taking Preferences Seriously: A Liberal Theory of International Politics," *International Organization* 51, no. 4 (Autumn 1997): 513-553.

In the Hellenistic world, in contrast to the more democratic forms of Classical Greece, monarchical governments were the strongest actors in politics, and their interests superseded all others. Stanley Burstein concluded that the self-interest of Hellenistic monarchs was power, achieved through revenue collection and military expansion.³⁸ Susan Sherwin-White and Amélie Kuhrt also argued that the primary role of a king was to engage in conquest and expansion.³⁹ A number of authors have argued that Hellenistic kingship was “Eastern” in nature, meaning that the monarch was the divinely appointed embodiment of law and the state.⁴⁰ Although such arguments are flawed due to their Orientalist assumption that autocracy is synonymous with the East, the point remains that Hellenistic monarchy did not evolve directly from Greek philosophies of leadership, but rather Alexander the Great brought Macedonian military kingship into combination with Persian autocracy.⁴¹ The result was a style of government that placed law and social structure into the hands of a single person. Therefore, the Realist theory of International Relations is the most applicable for the Hellenistic world.

Morgenthau argued that policy-making is not based on personal motivation, philosophy, psychology, or emotion. It is based on rational, intelligent, willful decision-making. Even when leaders pursue a seemingly irrational policy, it is nevertheless based on the leader’s experience and is rational in his or her perspective, though it may be a “misperception of reality.”⁴² Morgenthau argued for the universality of Realist theory, and its applicability to different times and cultures in accordance with how a particular state defined its power. Kenneth N. Waltz, in *Theory of*

³⁸ Stanley Burstein traced the historiography of Hellenistic kingship to the conclusion that notions of democracy or social planning are not supported in the evidence, and autocratic militarism was the probable reality, in *The Hellenistic Period in World History* (Washington: American Historical Association, 1996) 6-9.

³⁹ Susan Sherwin-White and Amélie Kuhrt, *From Samarkhand to Sardis: A New Approach to the Seleucid Empire* (Berkeley: University of California Press, 1993), 129. See also, J. Joel Farber, “The Cyropaedia and Hellenistic Kingship,” *The American Journal of Philology* 100, no. 4 (1979): 500-501, 505.

⁴⁰ Erwin R. Goodenough, “The Political Philosophy of Hellenistic Kingship,” *Yale Classical Studies* 1 (1928): 84-87.

⁴¹ Calvin Wells McEwan, “The Oriental Origin of Hellenistic Kingship,” (PhD dissertation, University of Chicago, 1934), 23-26; Oswin Murray, “Hellenistic Royal Symposia,” in *Aspects of Hellenistic Kingship*, ed. Per Bilde, Troels Engberg-Pedersen, Lise Hannestad, and Jan Zahle (Aarhus: Aarhus University Press, 1996), 15-27.

⁴² Added to Morgenthau’s 5th edition (1978), 4-15.

International Politics, following upon Morgenthau, insisted that the rational actions of states cannot be analyzed individually, because much of a state's behavior depends on the security or threats that it faces from its neighbors.⁴³ Thus, he proposed a systems approach, known specifically as "balance-of-power" theory. He argued that states exist in anarchic, self-help systems, and to achieve self-interest (power) they are constantly acting to balance against others in the system who are doing the same thing. States "at a minimum, seek their own preservation and, at a maximum, drive for universal domination."⁴⁴ The result is usually a balance of power; one state can never become too powerful, because the other states will balance them by strengthening themselves and forming alliances with other members of the system. This emphasis on the *system* as more important than the actors in determining politics is called Structural Realism. Waltz and other scholars, in applying balance-of-power theory, often examined Europe in the 18th and 19th centuries, because it models balance-of-power theory very closely.

Balance-of-power theory is intended to be universal, and thus it should be applicable to the ancient world, especially to the Hellenistic states in which the pursuit of power was clearly an interest of kings. In recent decades, critics of balance-of-power theory have analyzed ancient international systems. Stuart Kaufman, in a 1997 article, argued that rather than a balance of power, international systems often ended up being consolidated by a hegemon, or fragmenting into weak units.⁴⁵ Besides needing security in an anarchic system, Kaufman identified three additional factors that affect a system's outcome: economic interdependence, a unit's political identity, and its administrative capabilities. A high level of economic interdependence, an accepted imperialistic identity, and a strong administration favor hegemonic behavior and success. Economic isolation, tribal or nationalistic identity, and a weak administration lead to multi-polarity or fragmentation.

⁴³ Kenneth Waltz, *Theory of International Politics* (New York: McGraw Hill, 1979).

⁴⁴ *Ibid.*, 118.

⁴⁵ Stuart J. Kaufman, "The Fragmentation and Consolidation of International Systems," *International Organization* 51, no. 2 (Spring 1997): 173-208.

Kaufman then confirmed these factors within various systems and periods of the ancient Middle East. He demonstrated that balances of power were usually not stable. States often pursued imperial actions to better control trade; units with tribal political identities were able to resist empires; and sophisticated bureaucratic forms helped empires last. Kaufman's look at the ancient Middle East provides an important alternative to balance-of-power theory. His use of history is only a cursory overview though, using broad, well-known historical facts. He does not use his political theory to actually uncover and illuminate history.

Victoria Tin-bor Hui⁴⁶ and later, a group of scholars including Hui, Kaufman, and William C. Wohlforth,⁴⁷ also examined balance-of-power theory in seven pre-modern world contexts, including several Hellenistic states (though not Bactria). Like Kaufman, they discovered that international systems, especially in the ancient world, often did not result in a balance of power, but instead resulted in hegemony by one system member. They explained this result by actions that happened on both sides—those of the potential hegemon, and those of the potential balancers. While Kaufman suggested administrative ability as an important factor, these authors center on it as the most crucial to consolidating several territories. Hegemons succeeded when they were able to self-strengthen their administrations through innovation, building a complex bureaucracy, and implementing direct rule.⁴⁸ By contrast, potential balancers failed to resist a hegemon when they could not form alliances, when they could not emulate the hegemon's administrative strengths, and when they were uncertain whence the threat of hegemony was coming.⁴⁹ Besides these conditions, Wohlforth, et al. emphasized that a stable, closed system helped a hegemon succeed because no new potential balancers were entering. When a system expanded, and new members became part

⁴⁶ Victoria Tin-bor Hui, "Toward a Dynamic Theory of International Politics: Insights from Comparing Ancient China and Early Modern Europe," *International Organization* 58, no. 1 (Winter 2004): 175-205.

⁴⁷ William C. Wohlforth et al., "Testing Balance-of-Power Theory in World History," *European Journal of International Relations* 13, no. 2 (2007): 155-185.

⁴⁸ Hui, "Toward a Dynamic Theory," 183, 188, 193-194; Wohlforth et al., "Testing Balance-of-Power," 159.

⁴⁹ Wohlforth et al., "Testing Balance-of-Power," 159, 175, 177-178.

of the system, the new pressures on the hegemon often caused it to fail.⁵⁰ Kaufman, Hui, and Wohlforth et al. successfully demonstrated their theoretical framework of hegemons succeeding throughout history, via a series of case studies. In turn, their framework can be a valuable tool in revealing Bactro-Indo-Greek history. Their criteria for successful hegemony can be applied to the evidence of the Bactrian kings and kingdoms, namely coins, to test whether a monarch such as Demetrius pursued hegemony, was a successful hegemon, or was struggling to survive and balance against powerful neighbors. As there is simply not the evidence to show how many wars Demetrius fought, who conquered whom, or who allied against whom, a new methodology using the Bactrian coins as evidence to measure hegemony will be valuable.

In their book, *International Systems in World History*, Barry Buzan and Richard Little also investigated hegemony and balance-of-power systems in the ancient world.⁵¹ While they agreed with authors like Hui that hegemons dominated in the ancient world, they contested one of the main tenets of Structural Realism, which states that a political system is made up of entities that exist in anarchy to one another. They argued that empires were the primary type of political entity in the ancient world, and while several empires were in contact with each other, those relationships were not the most important. Instead, the struggle for power and domination took place *within* empires, between the hegemonic core and the various types of peripheral entities under its sway, and thus empires were full political systems in themselves. They were hierarchic systems instead of anarchic.⁵² The authors described empires as “concentric circles of control, ranging from complete absorption at the core, through varying degrees of control over foreign, military, and domestic policy in the middle zones, to mere hegemony at the outer margins.”⁵³ Based on the

⁵⁰ Ibid., 178-179.

⁵¹ Barry Buzan and Richard Little, *International Systems in World History: Remaking the Study of International Relations* (Oxford: Oxford University Press, 2000).

⁵² Ibid., 230-232.

⁵³ Ibid., 177.

conceptualization of a political system presented by these authors, therefore, it is evident that in attempting to evaluate the power activities of Demetrius, one must analyze his activities and his scope of power within his kingdom, instead of simply comparing him with other neighboring emperors. The strength of his core and the length of its reach will thus give valuable insight into the success of Demetrius and the Bactrians.

Methodology

A new, political theory-based approach to Bactrian history requires a new numismatic methodology. In shaping this methodology, I begin with the assumption that all of the aspects of royal coinage, from the designs, imagery, and legends, to the weights, denominations, distribution, and overall production, were intentional and deliberate on the part of Demetrius or his administration. The “administration” refers to a group of people including the king and his top advisors or office-holders. Demetrius may not have made all the decisions about his coinage himself, but delegated the task to members of his administration, upon his approval. Many scholars agree, however, that monarchs were directly involved in coining decisions. Pseudo-Aristotle, in the *Oikonomika*, listed coining money and the details relating to it, such as denomination divisions, as a primary responsibility of a monarch.⁵⁴ G.G. Aperghis agreed and added the point that, for the Seleucids at least, kings issued different coin denominations for different economic purposes.⁵⁵ Otto Mørkholm saw intention in coin designs, suggesting that kings utilized symbolism; chose to have either realistic or idealized portraits; made allusions to art and

⁵⁴ Pseudo-Aristotle, *Oikonomika*, 2.1.3.

⁵⁵ G.G. Aperghis, *The Seleucid Royal Economy: The Finances and Financial Administration of the Seleucid Empire* (Cambridge: Cambridge University Press, 2004), 218-225. J.G. Manning argued the same for the Ptolemaic Empire, and emphasized that the fact of coining itself and requiring coin as payment, along with the iconography of coins, sent a royal message of institutional authority and legitimacy, in “Coinage as ‘Code’ in Ptolemaic Egypt,” in *The Monetary Systems of the Greeks and Romans*, ed. W.V. Harris (Oxford: Oxford University Press, 2008), 94-98.

history; and followed monetary fashion trends.⁵⁶ Susan Sherwin-White and Amélie Kuhrt suggested not only deliberation by monarchs in coin-making, but the loftier purpose of using coin messages to establish dynastic identity and legitimacy.⁵⁷ Some authors, such as Robert Hadley, have gone further and characterized Hellenistic coins as “propaganda.”⁵⁸ He argued that kings needed to “win the support” of their subjects.⁵⁹ Other scholars have argued against the influence of monarchs in controlling coin features. Robert Bracey, for example, has uncovered instances of coins or dies whose designs were altered from the original by engravers at work in the mint.⁶⁰

It is going too far to label Bactrian coins “propaganda.” That implies that rulers not only wished to, but maybe even had to, concern themselves with the opinions of their subjects. There is no evidence that these Hellenistic autocrats had such preoccupations. It is clear, however, that coins contain multiple pieces of information that would have been viewed and interpreted by a coin-using population. This was an era where communication technologies were few, and royal messages for public reading were usually carved on stone. Thus, while people today throw coins into a pocket without a glance, coins in the ancient world were one of the few governmental products that average people encountered. As a currency based on weight, Bactrian coins, especially silver ones, did not inherently need any sort of design whatsoever,⁶¹ yet their designs are

⁵⁶ Otto Mørkholm, *Early Hellenistic Coinage: From the Accession of Alexander to the Peace of Apamea (336-188 B.C.)*, ed. Philip Grierson and Ulla Westermark (Cambridge: Cambridge University Press, 1991), 25-33.

⁵⁷ Sherwin-White and Kuhrt, *Samarkhand to Sardis*, 22-23, 28, 63, 116, 129. Their focus is on the Seleucids. Robert Fleischer also saw kings as creating identities via coins, mostly through the portraits. They used the portraits to present personality traits, kingly qualities, divine qualities, and association with past rulers like Alexander. See “Hellenistic Royal Iconography on Coins,” in *Aspects of Hellenistic Kingship*, ed. Per Bilde, Troels Engberg-Pedersen, Lise Hannestad, and Jan Zahle (Aarhus: Aarhus University Press, 1996): 28-40.

⁵⁸ Robert Arthur Hadley, “Deified Kingship and Propaganda Coinage in the Early Hellenistic Age: 323-280 B.C.,” (PhD dissertation, University of Pennsylvania, 1964), ProQuest, 1-5. Louis C. West made the same argument about Roman emperors in “Imperial Publicity on Coins of the Roman Emperors,” *The Classical Journal* 45, no. 1 (1949): 19-26.

⁵⁹ Hadley, “Deified Kingship,” 2.

⁶⁰ Robert Bracey, “The Royal Image on Indian Coins,” *CCNB Newsletter* 44 (Summer 2008): 2.

⁶¹ Even the earliest known coins, the Lydian electrum pieces, have simple images, such as a lion’s head, and some bear one of two personal names. See Robert W. Wallace, “The Origin of Electrum Coinage,” *American Journal of Archaeology* 91, no. 3 (July 1987): 385-397. One can argue that *some* design is necessary for a coin to be currency, as it needs validation from its issuer.

diverse and detailed. There is no doubt that governments took advantage of coins as a mass medium to send out some information about itself. The individual information components, fused as they are on the compact, two-sided, portable unit of a coin, can be seen as broader message “packages,” and thus, the recipients had access to complex ideas. It follows that it was in the interest of a royal administration to control the information that circulated on coins by deliberately choosing or approving various designs. I give the term “output strategies” to these processes of decision-making and implementation to control coinage.

In a centralized, rational, imperial monarchy, like that of Demetrius I, an administration’s output strategy must advance its self-interest. Any planned course of action that a government initiates for its own advantage, for the public good, or as a response to a perceived problem, can be defined as a *policy*.⁶² An output strategy is a purposeful, planned process, more nuanced than mere propaganda, of creating and circulating information packages for both domestic and foreign audiences. Output strategy is therefore a form of policy. In consequence, the essence of the new methodology is to treat the Bactrian coins of Demetrius as manifestations of government policy.

Coins can function as policy in two ways. For one, they are physical pieces of policy; to design, produce, and distribute coins requires a plethora of decisions to make and implement, including their weight, shape, size, material, imagery, text, control marks, production rate, quantity, denominations, and distribution. Coins are the physical product of such a multi-faceted policy. After production, coins are instruments of implementing policy by establishing, legalizing, and standardizing a money economy. Consider as an analogy a military airplane. It is the physical manifestation of many government policies, ranging from the investment in materials to build it, to the design and engineering of it, to its implementation in military missions. Secondly, coins are

⁶² *Oxford English Dictionary Online*, s.v. “Policy,” updated September 2006, <http://www.oed.com>. See also, “Public Policy,” Center for Civic Education Online: Project Citizen, <http://new.civiced.org/pc-program/instructional-component/public-policy>.

carriers of policy. Whatever information the administration chooses to provide to coin-users can be conveyed through the medium of the coin. Just like any other government action, the message that an administration is asserting about itself requires policy to manage it. An assertion of leadership, how a leader is positioning himself or herself, the extent of one's rule, or official ideology, are all policies of self-assertion that could be implemented via the medium of coins. In the analogy of the warplane once again, this would include things like the text or flags on the plane, or even the sharp teeth painted on the nose to intimidate enemies. For coins, I have named these "numismatic assertion policies," or simply, "assertion policies."

In an innovative methodology, I use political theory to understand and interpret the meanings of King Demetrius' coin policies. International Relations theory, and in particular, hierarchic Structural Realism, is the most appropriate framework to apply to the ancient Bactro-Indo-Greek world. This type of theory has never before been applied to a civilization in which most of the historical evidence is coin-based. The principle of this new methodology is to recognize indicators of power and hegemonic activity within these "numismatic policy packages."

Kaufman, Hui, Wohlforth et al., and Buzan and Little set forth various criteria for monarchical power and hegemony in antiquity. Therefore, I will measure the diverse aspects of Demetrius' coins, both physical attributes and assertion policies, against several of these criteria. These criteria can be loosely divided into three groups: administrative control, resource management, and legitimizing ideology. The criterion of administrative control relates to the complexity of the king's bureaucracy; the capability for direct rule; and centralization of government. This will be measured via coin attributes such as design standards, design consistency, control mark use, and output of core vs. peripheral mints. The criterion of resource management will deal with the regulation of coin weights, the use of metals, and production quantities. The

criterion of ideology can be measured through iconography—whether the assertion policies behind Demetrius’ coin imagery promote legitimacy, power, and victory.

I call my methodology of evaluating coin policies in terms of power, “power policy numismatics.” It seeks to use coins to identify government policies that are associated with the gaining and concentrating of power for a political entity, in this case King Demetrius, within his imperial system. Conversely, the coins may reveal policies that result from a lack of power or a struggle to balance against a hegemon. For example, instances of coining decisions being made at the mint level rather than the royal level may be evidence of a weak state. If power policy numismatics is applied to King Demetrius I of Bactria, it will provide insight into his level of power, his ability to expand, and why he was particularly successful in his time.

The Coins

Ancient coins in the Hellenistic period were hand-struck. That means that each individual coin was made by a worker striking a hammer. The metal for the coins, whether gold, silver, or bronze, was melted and poured into disc-shaped molds. The molds created blank discs, or flans, of uniform weight that were then ready to receive their designs. Engravers would carve into dies the designs, in mirror image, for both the obverse (front) and reverse sides of a coin. Dies were short cylinders of iron or base metal alloys. The obverse dies were set into an anvil, and the reverse dies were struck by a hammer. Each blank flan was placed, one at a time, onto the obverse die in the anvil, and then with the reverse die above it, the worker would hit it several times with the hammer, until the image was impressed on both sides of the coin. A pair of dies could strike thousands of coins, although the reverse dies, in direct contact with the hammer, broke sooner than the obverse

ones.⁶³ At times, it is apparent when two coins carry the impression of the same die or dies, and this is known as die-linkage.

The body of Demetrius coinage that I examined for this study consists of 349 coins: 277 silver pieces and 72 bronze pieces. This comprises the total number of coins that were accessible to me either through personal viewing or clear catalogue images. The coins come from public museum collections, private holdings accessed through auction catalogues, and otherwise published specimens from ancient hoard-finds.⁶⁴ Among the coins of Demetrius there are three silver denominations, based on the Attic weight standard. Tetradrachms are the largest and average a weight of 16.8 grams. Drachms are 1/4th the weight of tetradrachms at 4.2 grams. Obols are the smallest silver denomination at .7 grams, 1/24th of a tetradrachm.⁶⁵ Bronze coins appear in three denominations and are also on the Attic standard. They consist of double-units, weighing 8.4 grams; triple-units, weighing 12.6 grams, and rare sextuple-units, coming in at 25.2 grams.

The six denominations of Demetrius coins carry four distinct types. In numismatic terminology, a type is a distinct pair of obverse and reverse images. All three silver denominations carry the same type: the king's portrait on the obverse, and on the reverse, the god Heracles, standing, crowning himself with a wreath, and holding a club and lionskin. This can be abbreviated as the Portrait/Heracles type. Each of the three bronze denominations has its own unique type. The double units have a Heracles/Artemis type. On the obverse is a portrait of bearded Heracles. On the reverse is a standing Artemis, holding a bow, and pulling an arrow from a quiver behind her shoulder. The medium-sized triple-unit bronzes are of the Elephant/Caduceus type, with an elephant's head, wearing a rope with a bell around its neck, on the obverse, and a simple, snake-

⁶³ Mørkholm, *Early Hellenistic Coinage*, 12-16.

⁶⁴ The full list of collection sources can be found in the catalogue appended to this work.

⁶⁵ Michael Mitchiner, *Indo-Greek and Indo-Scythian Coinage*, vol. 1, *The Early Indo-Greeks and Their Antecedents* (London: Hawkins Publications, 1975), 4-5; Graham Shipley, *The Greek World after Alexander, 323-30 BC* (London: Routledge, 2000), 21.

headed caduceus on the reverse. The large sextuple units are of the Shield/Trident type. On the obverse is the shield of Athena, with Medusa's head in the center; on the reverse is a plain trident.

Tetradrachms comprise the majority of extant Demetrius I coins. In the 277-coin silver sample, 155 (56%) are tetradrachms, only 15 (5%) are drachms, and 107 (39%) are obols. There are three possible explanations for this unequal distribution. Either tetradrachms survived better than others, especially drachms, over 2200 years, or were simply published better, or indeed tetradrachms were produced in greater numbers than smaller denominations. The answer depends on how different denominations were used, both in ancient and modern times, and is a mixture of both reasons.

Otto Mørkholm stated that the tetradrachm was the denomination used for trade in the early Hellenistic period.⁶⁶ Aperghis also claimed that tetradrachms were too large for the marketplace, and thus were the “principle medium of exchange...between the administration and its subjects,” plus it was the main denomination used for intra-regional and long-distance trade.⁶⁷ This is sensible, as tetradrachms were simultaneously valuable and portable; drachms were equally portable, but perhaps the value of traded goods made their denomination unnecessary. Trade was certainly an important part of the regional economy. The territory ruled by Demetrius, from the Oxus River in the north, through the Hindu Kush mountains, and around the Indus River in the south, became a central hub of the Silk Road in the Middle Ages, but the region had already been a major East-West trade route in ancient periods.⁶⁸ Throughout the Seleucid period, the emperors traded with India via the same region, and acquired their silver by exporting those Eastern goods to the western Hellenistic world.⁶⁹ One ancient source, for example, tells of Antiochus I trading figs

⁶⁶ Mørkholm, *Early Hellenistic Coinage*, 8.

⁶⁷ Aperghis, *Seleucid Royal Economy*, 220-221.

⁶⁸ Susan Whitfield, *Life Along the Silk Road* (Berkeley: University of California Press, 1999), 2-8.

⁶⁹ Aperghis, *Seleucid Royal Economy*, 76-78.

and sweets to the Indian Mauryan emperor Bindusura.⁷⁰ It is reasonable to suppose that Demetrius and other Bactrians also partook of trade through the territory, and thus tetradrachms comprised an important currency of exchange.

Many historians further agree that the primary purpose of tetradrachms in the Hellenistic kingdoms was specifically to pay their large militaries. Alain Bresson stated that in many Hellenistic states, major wars always correlated to peaks in coin minting.⁷¹ Aperghis argued that military payments were the primary state expenditure, and that “an army was maintained in order to exact tribute and fed off the process of this tribute.” He defended this with the points that for the Seleucid empire, 75% of the coins minted were tetradrachms, and that soldiers were paid about 7 or 8 tetradrachms per month.⁷² Tetradrachms could enter the general marketplace by paying them to soldiers, and then the Hellenistic governments could receive tetradrachms back via their subjects’ tax payments. Thus, as the largest normal silver denomination of Demetrius I’s coinage,⁷³ tetradrachms can be seen as the unit for his state transactions.

Finally, tetradrachms were also the primary unit kept by subjects in savings hoards.⁷⁴ Lower denominations tend to appear archaeologically in stray finds or emergency hoards. Bronzes could

⁷⁰ Athenaeus, *Deipnosophistae* 15.652F.

⁷¹ Alain Bresson, “Coinage and Money Supply in the Hellenistic Age,” in *Making, Moving and Managing the New World of Ancient Economies, 323-31 BC*, ed. Zofia H. Archibald, John K. Davies, and Vincent Gabrielsen (Oxford: Oxbow Books, 2005), 46, 48. There is a consensus among many scholars that war was the primary reason for Hellenistic kingdoms to mint coins in the first place. See François de Callataÿ, “Guerres et monnayages à l’époque hellénistique,” *Dossiers d’Archéologie* 248 (1999): 28-35. See also Colin M. Kraay, “Greek Coinage and War,” in *Ancient Coins of the Graeco-Roman World: The Nickle Numismatic Papers*, ed. Waldemar Heckel and Richard Sullivan (Waterloo, ON: Wilfrid Laurier University Press, 1984), 16. Christopher Howgego argued that there were other reasons for minting beyond state expenditure, including monetary reform, minting for individuals, and simply filling the supply of coinage. He conceded that military expenditure was nevertheless significant. See Christopher Howgego, “Why Did Ancient States Strike Coins?” *The Numismatic Chronicle* 150 (1990): 1-25.

⁷² Aperghis, *Seleukid Royal Economy*, 220-221.

⁷³ The tetradrachm was generally the largest Hellenistic coin with a few individual exceptions, such as the double-decadrachms minted by Amyntas and a 20-stater gold coin of Eucratides the Great. See Boppearachchi, *Monnaies gréco-bactriennes*, 102, 202.

⁷⁴ Mørkholm, *Early Hellenistic Coinage*, 21. Specific hoards showing a preponderance of tetradrachms include Qunduz, in which 605 out of 627 coins were tetradrachms; Ai Khanoum II, in which all 63 coins were tetradrachms; and Ai Khanoum III, in which 136 of 137 coins were tetradrachms. See respectively, Curiel and Fussman, *Le trésor monétaire de Qunduz* (Paris: Librairie C. Klincksieck, 1965); Petitot-Biehler, “Trésor de monnaies grecques”; Holt,

more easily stray because they had a higher coin “velocity.”⁷⁵ As they were used for small daily purchases, they changed hands quickly, and were not stored for long periods. Coin velocity also contributes to wear, which, combined with the dark color and small sizes of bronzes, and their susceptibility to corrosion, makes them difficult to find when dropped or later during excavations. Low denominations are therefore more easily lost to time than coins from purposefully buried hoards.⁷⁶

Just as people in the ancient world preserved tetradrachms, modern coin collectors and museums also buy and keep tetradrachms of Demetrius more than his other denominations. The most prominent numismatic dealer used in this study, Classical Numismatic Group, has listed at least 77 Demetrius tetradrachms between 1994 and 2014,⁷⁷ most of which were sold. Those same auctions contained only four different Demetrius drachms. One drachm in particular was listed in the 45th auction on March 18, 1998 with an estimated price of \$1,200; it did not sell and was listed again six months later in auction 47 with an estimated price of \$300.⁷⁸ This was one of the four drachms to appear in the twenty-year period, while the 77 tetradrachms were rarely listed more than once. It is also clear that little-circulated, bright coins are preferred by collectors, considering

“Euthydemid Coinage.” The exception is the hoard from Kuliab, Tajikistan, which contained 44 Demetrius obols, in contrast to five Demetrius tetradrachms and one drachm. See Osmund Bopearachchi, “La circulation et la production monétaires en Asie central dans l’Inde du nord-ouest (avant et après le conquête d’Alexandre),” *Indologica Taurinensia* 25 (1999-2000): 15-121.

⁷⁵ Elio Lo Cascio is an example of a scholar who used this term in the same sense of coin circulation. He argued that Roman gold coins had a low velocity, as they were used to store wealth rather than for transactions. See “The Function of Gold Coinage in the Monetary Economy of the Roman Empire,” in *The Monetary Systems of the Greeks and Romans*, ed. W.V. Harris (Oxford: Oxford University Press, 2008), 164.

⁷⁶ Christopher J. Howgego described it as “The greater difficulty of recovering them from the earth,” in “Ancient States,” 3.

⁷⁷ This count comes from available print catalogues and the online database of past sold items. See published print catalogues entitled *Public and Mail Bid Sale* (London: Classical Numismatic Group), for auctions 30 through 94, and printed catalogues of *Triton* sales 1 through 14. Certain individual coins were omitted because a catalogue for every auction was not accessible. See online database of electronic auctions at http://www.cngcoins.com/Coins_sold.aspx. Also see the CNG page “The Coin Shop” at http://www.cngcoins.com/Coins.aspx?CONTAINER_TYPE_ID=1&VIEW_TYPE=0.

⁷⁸ See *Public and Mail Bid Sale 45* (London: Classical Numismatic Group, 1998), 96 and *Public and Mail Bid Sale 47* (London: Classical Numismatic Group, 1998), 80.

that one the main details in a coin sale listing that impacts the price is the “grade.”⁷⁹ Modern people, therefore, also cause tetradrachms to be preserved and cared for more than smaller denominations. Academics, through research and publications, have attempted to overcome the favor toward precious metals in coin markets and collections. For example, the peer reviewed journal of the Royal Numismatic Society, *The Numismatic Chronicle*, presented in its 2010 issue seven articles pertaining to silver coins, in contrast to ten articles dealing with bronze coins.⁸⁰

There are clear reasons why both ancient and modern people kept tetradrachms over smaller denominations, but that does not explain why there are also more surviving obols than drachms. The obols in this study comprise 39% of the silver coins, which is significant compared to the paltry 5% for drachms. In both museum collections and coin dealer listings, obols appear in greater numbers than drachms. The Kuliab hoard, which had an unusually large number of Demetrius obols (44), only contained one Demetrius drachm. With such a low monetary value, it is not logical that obols would be saved more than drachms, whether by ancient people or modern.

Perhaps obols were not simply preserved in favor of drachms, but along with tetradrachms, were actually produced in greater numbers. This possibility may be explored by analogy with current United States paper money production. Paper money is more appropriate for comparison than U.S. coins, as the minimal worth of coins is rendering them nearly obsolete. Paper bills themselves are diminishing in favor of credit cards, but they are still regularly circulated. Within the realm of paper money, twenty-dollar bills can be thought of as the common currency for daily transactions. They are high enough in value to cover a variety of purchases that a person might make throughout a day, from food to clothing to movie tickets. In this analogy, twenties may be

⁷⁹ See for example the grade definitions in the “Lingo” glossary for PCGS: Professional Coin Grading Service, <http://www.pcgs.com/Lingo/all>.

⁸⁰ *The Numismatic Chronicle* 170 (2010): 3-405. Four articles dealt with both bronze and silver.

compared to obols.⁸¹ The hundred-dollar bill, by contrast, is less frequently used for daily transactions, but is largely kept by banks, is carried by foreign travelers, is often used in foreign currency exchange, and might be the unit of choice for someone wishing to save emergency cash in the house. The hundred-dollar bill, therefore, may be compared to the Hellenistic unit of savings and exchange, the tetradrachm. Between the twenty and the hundred is the fifty-dollar bill, which rarely circulates. Perhaps the fifty is a little too large for daily purchases, and a little too small for travel or savings. It makes sense, then, that these different paper denominations would be produced in varying quantities. According to the most recent statistical report of the U.S. Bureau of Engraving and Printing, in the 2012 fiscal year, the Bureau printed 1.5 billion twenty-dollar bills.⁸² In the same year they printed 3 billion hundred-dollar bills, twice the amount of twenties. Interestingly, the medium-sized bill, the fifty, was printed in a drastically lower quantity—only 2.5 *million*. Of these three denominations, totaling 4,502,500,000 bills, fifties only comprise 5.5%. This is equivalent to the proportion of drachms in the sample of Demetrius silvers. The twenty-dollar bills make up 33% of the total, which is close to 39%, the proportion of obols in the sample. Hundred-dollar bills comprise 67%, which is higher, but still comparable to the 56% for Demetrius tetradrachms. Further, the statistics are somewhat similar for United States bills that are currently in circulation. As of December 2013, there were 1.15 trillion twenties, fifties, and hundreds in circulation. The largest proportion were hundreds at 924.7 billion (80%). The twenties made up the second largest segment at 155 billion (13%). The fifties came in third at 74.5 billion (6%).⁸³ This analogy suggests that in Demetriid Bactria, drachms, as a midsize denomination, were not used by

⁸¹ U.S. ones, fives, and tens are not included in this example, as in modern society they are useful only for very small purchases, and Demetrius' kingdom also circulated low-value bronze coins that would be more comparable.

⁸² "Annual Production Figures," Bureau of Engraving and Printing, U.S. Department of the Treasury, accessed June 4, 2014, <http://www.moneyfactory.gov/uscurrency/annualproductionfigures.html>.

⁸³ "Currency in Circulation: Value," Board of Governors of the Federal Reserve System, accessed June 4, 2014, http://www.federalreserve.gov/paymentsystems/coin_currircvalue.htm.

the government or the public as frequently as other denominations, and the minting authority, being cognizant of denomination usage, actually produced fewer drachms.

A researcher must remember that at 349 total specimens, the extant sample of Demetrius coins is a mere sliver of the millions that even a small kingdom would have produced. Projections of the number of coins that Demetrius' government minted will appear in Chapter 5. Besides the limitations of studying a group of coins that may only partially represent the full body, extant coins also carry the problem of provenance—the origin of individual coins. Most of the coins that are available for study, from museums and auctions, have come through several generations of collectors and dealers, among whom information could be distorted, and before that, from bazaars and traders in Central and South Asia, where the stories of excavation are not always reliable.

The first Demetrius coin ever reported was in the collection of the Baron Georges de Meyendorff, supposedly acquired in Bukhara, Uzbekistan. H.K.E. Köhler published a description of it in 1826.⁸⁴ The coin he described was apparently a tetradrachm, presenting the standard imagery of Demetrius I and a common control mark, . By the time of publication, Bactrian scholars had already found examples of coins of Demetrius' father Euthydemus, plus Eucratides I, Eucratides II, Menander, and Apollodotus.⁸⁵ Köhler claimed at first glance that the Demetrius coin was struck in Bactria, because of the imagery and overall style. He also argued that Demetrius looked aged in his portrait, and thus must have been quite old when the also aged Eucratides

⁸⁴ H.K.E. Köhler, "Description d'un médaillon rapporté de Boukharie par M. le colonel baron Georges de Meyendorff," in E.K. Meyendorff, *Voyage d'Orenbourg à Boukhara, fait en 1820 : à travers les steppes qui s'étendent à l'est de la mer d'Aral et au-delà de l'ancien Jaxartes* (Paris: Librairie Orientale de Dondey-Dupré père et fils, 1826), 321-328.

⁸⁵ Frank Holt, *Lost World of the Golden King: In Search of Ancient Afghanistan* (Berkeley: University of California Press, 2012), 25-26.

conquered him⁸⁶—thus he set a scholarly precedent that has since been strongly questioned, that Demetrius I is the same king that battled with Eucratides I in the text of Justin.⁸⁷

After this first Demetrius coin, Bactrian coins in general continued to enter Europe throughout the nineteenth century, due to Britain’s imperial activities in India and their struggle, known as the Great Game, for Afghanistan.⁸⁸ A number of Demetrius coins in the British Museum, for example, comprise the “IOC,” the India Office Collection.⁸⁹ A large portion of these coins were collected by the explorer Charles Masson during excavations around Begram; others he acquired from bazaars in Kabul and other cities.⁹⁰ His collection was divided several times and passed through various Asiatic societies and museums before ending up at the British Museum. Besides the specimens that are definitely attributed to Begram, the IOC coins do not have an exact provenance. Countless coins from this period never made it into museums, but were gathered and passed through private hands. They are still circulating the auction market today. Many auction listings provide, at best, the most recent owner.

It was not until the mid-twentieth century that archaeologists were occasionally able to manage excavations and document coins from particular hoards in the region—although by and large those coins did not remain in scholarly hands, but quickly entered the markets via the local population. At times, with plenty of toil, hoard coins can be located within databases of auction coins.⁹¹ The earliest hoard to provide Demetrius coins with certainty was found in 1946 in Khisht Tepe, Afghanistan. Raoul Curiel and Gerard Fussman published it in 1965, and called it the

⁸⁶ Köhler, “Description d’un médaillon,” 325-326.

⁸⁷ See page 4, note 5.

⁸⁸ See a summary of coin collecting during the Great Game in Holt, *Lost World*, 27-49.

⁸⁹ I observed this in my personal viewing of the British Museum collection.

⁹⁰ Elizabeth Errington and Vesta Sarkhosh Curtis, *From Persepolis to the Punjab: Exploring Ancient Iran, Afghanistan and Pakistan* (London: The British Museum Press, 2007), 13-14.

⁹¹ For this reason, certain hoard coins in this study do not appear to be listed, as they have been discovered in auction catalogues. Such coins are labelled here by their auction group code rather than hoard, as the auction images are usually clearer and easier to work with than the often older or poorer quality hoard photographs. Specifically, I have discovered many coins from the Kuliab hoard in auction databases.

Qunduz hoard, after the major city in the region.⁹² Among 627 Hellenistic silver coins, it contained 8 tetradrachms of Demetrius.

The Ai Khanoum site revealed several important coin hoards. The first of the hoards, “Ai Khanoum I,” was located in the city’s palace and contained 683 coins. There were six drachms of the Bactro-Indo-Greek king Agathocles, while all of the rest were Indian punch-marked coins.⁹³ Claire-Yvonne Petitot-Biehler published another large coin hoard found at the Ai Khanoum site in 1973.⁹⁴ This hoard, “Ai Khanoum II,” comprised 63 silver tetradrachms, 49 of which were Bactro-Indo-Greek. It contained three tetradrachms of Demetrius, which are included in this study. Also in 1973 or 1974, a local resident near Ai Khanoum dug up a hoard of approximately 141 coins. The French archaeologists at the site heard about the find, but it disappeared into the collectors market before they could publish it. Eventually a hoard that matched the original description appeared in New York City, and based on a series of photographs, Frank Holt was able to reconstruct its probable original composition.⁹⁵ After exchanging hands several times, the composition of the hoard was altered, and thus the provenance of each coin cannot be completely certain. Holt’s final count of the hoard is 139 coins, including eight tetradrachms of Demetrius.⁹⁶

The final hoard that I use in this study is a large lot originating in Kuliab, Tajikistan. It was secretly gathered over a period of time and was kept by the collector Riaz Babar. Between 1994 and 1996, the numismatic historian Osmund Bopearachchi had the opportunity to study the coins, and he published 205 of the 800-coin hoard in 1999.⁹⁷ This hoard is unusual in that it contained a large number of obols, especially of Demetrius, while most other hoards contain only tetradrachms

⁹² Curiel and Fussman, *Monétaire de Qunduz*, 17.

⁹³ Rémy Audouin and Paul Bernard, “Trésor de monnaies indiennes et indo-grecques d’Ai Khanoum (Afghanistan). 2, Les Monnaies Indo-Grecques,” *Revue numismatique* 6, no. 16 (1974): 6-41.

⁹⁴ Petitot-Biehler, “Trésor de monnaies grecques,” 23-69.

⁹⁵ Holt, “Euthydemid Coinage,” 7-44.

⁹⁶ *Ibid.*, 9-10.

⁹⁷ Bopearachchi, “La circulation et la production,” 15-121.

or other large denominations. Overall, the Kuliab hoard included 50 Demetrius coins: five tetradrachms, one drachm, and 44 obols.

There are limitations to studying any body of coinage, and a sample size will always be a small fraction of the original production quantity. Thus, there may always be coins that are not yet discovered, but which could profoundly affect an argument about history. The extremely small quantity of drachms in the sample, at fifteen, is especially problematic, as there could very well be types missing from the extant body. The problems with provenance also hinder any conclusions about mint locations, population centers, and circulation distances. The goal when working with ancient Bactrian coins must be to carefully make conclusions when the evidence is strong enough, and to vigilantly avoid speculation about history that simply does not appear in the numismatic evidence.

Chapter 2: Administrative Structure - Tetradrachms

The most important criterion with which to measure the political power of Demetrius I of Bactria, is an administrative system both complex and efficient. Stuart Kaufman called this criterion “social technology.”⁹⁸ He argued that the greater the capability to administer large areas, the more likely an entity was to expand. The states that were most successful at administration were those with a hierarchical bureaucracy, in which workers adhered to the structure and leaders could assess the costs and benefits of imperial expansion.⁹⁹ Therefore, measuring administrative control should reveal whether Demetrius had a complex government that was well-planned and managed.

Victoria Tin-bor Hui also argued for the importance of bureaucracy for ancient hegemons, but she emphasized their ability to implement direct rule.¹⁰⁰ She gave an example of a successful ancient Chinese monarchical administration that was able to access and mobilize its whole empire by creating hierarchical layers of rule, from the center, to townships, to households.¹⁰¹ Coins were a major medium through which an ancient king communicated with his subjects; thus, measuring the administration and minting of coins will demonstrate direct rule, by revealing whether mint officials and workers all the way down the chain were following and passing down orders from above. That would ensure that the message that originated with the king would be the same, unaltered message that the subjects received.

⁹⁸ Kaufman, “Fragmentation and Consolidation,” 173-208.

⁹⁹ *Ibid.*, 174, 183-184.

¹⁰⁰ Hui, “Toward a Dynamic Theory,” 175-205. The arguments of both Kaufman and Hui are restated in the article to which they both contributed, William C. Wohlforth et al., “Testing Balance-of-Power,” 155-185.

¹⁰¹ Hui, “Toward a Dynamic Theory,” 188.

Barry Buzan and Richard Little focused on centralization as the key to a king's power.¹⁰² An empire is defined by how much of one's territory was completely controlled, and how much was merely influenced. Thus, the measurement of administration through coins will demonstrate how centralized Demetrius' government was, by showing whether it effectively standardized the government output and maintained that standard in both the imperial core and the periphery.

In order to examine administrative control in coins, one has to identify the aspects of coins that would have been controlled by bureaucrats. This means, basically, consistency in the coin designs and consistency in weights. The latter will be the focus of Chapter 5. We do not know a lot about the personnel structure of Hellenistic mints. As Pseudo-Aristotle stated in the *Oikonomika*, the decision to mint coins lay with the king.¹⁰³ There were certainly upper-level government officials in charge of minting, there were probably subordinate officers inside the mints, and there were certainly the artists—the die engravers. Of course there were also people who melted metal into blank flans and actually struck the coins using dies.¹⁰⁴ The key to assessing how much obedience or independence was practiced by the various production groups, whether the supervisors or the artists, is in the consistency of the coin designs. The greater the degree of consistency among Demetrius' coins, the more evidence there is that minting was centrally organized and controlled.

To begin analyzing the body of Demetrius' coins, I first had to determine if they had any natural divisions that would indicate separate minting groups or production streams. This would allow for initial comparisons. Besides the obvious division into silver and bronze, and the various

¹⁰² Buzan and Little, *International Systems*, 177. B. Oded also emphasized the importance of centralization in his article "Observations on Methods of Assyrian Rule in Transjordan after the Palestinian Campaign of Tiglath-Pileser III," *Journal of Near Eastern Studies* 29, no. 3 (1970): 177-186. He argued that the most successful ancient Assyrian rulers were able to maintain efficient correspondence between the central government and the provincial representatives (p. 181).

¹⁰³ Pseudo-Aristotle, *Oikonomika* 2.1.3.

¹⁰⁴ Cornelius Vermeule explained that in early Roman imperial mints, there would have been a whole group involved in striking a coin, including one to place the new flan, one to hold the lower die, and one to wield the hammer. See "Minting Greek and Roman Coins," *Archaeology* 10, no. 2 (1957): 107.

denominations, the coins do carry a feature that allows for grouping. Numismatists call them control marks. On the reverse of each Demetrius coin is a small mark, that is part of the die engraving. They are symbols made up of lines that sometimes take the form of Greek letter-combinations, and sometimes take unique, seemingly meaningless forms. Although the exact meaning of Bactrian control marks is not known for certain, there are several viable theories. Early Bactrian scholars tried to resolve the control marks into dates or place-names.¹⁰⁵ They were followed by scholars who associated the control marks more closely with the mints or the people tied to them—such as mint-city magistrates or mint masters.¹⁰⁶ Modern scholars such as Osmund Bopearachchi realized that there are too many control marks to signify mints, so he sought to compromise; he suggested they were “officines,” or workshops.¹⁰⁷ While the marks may represent different things for different kings, it is clear that for Demetrius’ administration, the marks represent production streams, made up of small groups of design engravers and coin strikers, separated within the central mint or located outside of the central mint. As the marks signify separate operations, they are subject to variation. By comparing coins within and between control marks for consistency, I was able to observe whether the central government controlled the various production groups tightly, to ensure a standard, or loosely, allowing the workers to make certain design choices.

Demetrius’ coins display thirteen distinct control marks.¹⁰⁸ Three of them clearly signify the central, or most important, minting groups. This does not necessarily mean that they were located

¹⁰⁵ Theophilus Bayer originally suggested dates, until it became clear that kings repeated predecessor’s control marks, in *Historia Regni Graecorum Bactriani*, 100. The possibility of control marks as locations was argued by Alexander Cunningham, *Coins of Alexander’s Successors in the East* (1884; reprint, Chicago: Argonaut, Inc., 1969), 45-55.

¹⁰⁶ Richard B. Whitehead argued that control marks were either the local magistrature or the mint, in “The Pre-Mohammedan Coinage of Northwestern India,” *Numismatic Notes and Monographs* 13 (1922): 26-27. Tarn believed control marks represented city magistrates or mint-masters, the latter being a hereditary position that lasted generations: *The Greeks in Bactria and India*, 438.

¹⁰⁷ Bopearachchi, *Monnaies gréco-bactriennes*, 33. He also argued that they may represent private corporations or guilds of minters or artists.

¹⁰⁸ This indicates those identified and listed as discrete by Bopearachchi, *Monnaies gréco-bactriennes*.

in his capital city, but they must have been placed in a prime location that was defensible, near metal resources, or logistically convenient. Two of the three are shaped like  and , and are certainly related to each other. The other is . These three marks must represent the main mint-operations for Demetrius because they encompass the largest number of his coins and three of his four coin types. None of his control marks cover all four types. The above three appear on the king's silvers, with his portrait and patron god, Heracles. Two of the marks,  and  also occur on his most prevalent and smallest-size bronze, the Heracles/Artemis type, and his second most prevalent, medium-size bronze, the Elephant/Caduceus type.¹⁰⁹ The silver coins, besides , , and , display five other control marks, for a total of eight: , , , , and .¹¹⁰ The most prevalent bronze, the Heracles/Artemis type, has six control marks: , , , , , and , with the most common one again being . The next bronze, the Elephant/Caduceus type, has seven control marks, , , , , , , and . The third type of Demetrius' bronze, Shield/Trident sextuple-unit, displays a “single unique monogram.” In other words, its control mark, , is the only control mark for this coin type; it is not used by Demetrius for any other coin type; nor is it used by any other king.¹¹¹ This means that the sextuple production team was the only one to make this denomination, and they also did not make any other coins.

¹⁰⁹Their “prevalence” is based on their comparative numbers in museums, private collections, and hoards.

¹¹⁰ One that Bopearachchi included, but I have omitted, is “N.” The only coin that he listed for such a monogram is a drachm at the Danish National Museum, but the catalogue of that museum shows that coin to be , albeit with very tiny Kappa legs.

¹¹¹ This control mark's occurrence is based on the control mark identifications of Bopearachchi, *Monnaies gréco-bactriennes*, 53, 392.

The Ɱ and Ɱ Tetradrachms

The first coins under examination are the tetradrachms. They are the largest and most abundant of Demetrius' silver denominations. There are 155 tetradrachms in my sample.¹¹² The sample includes all the specimens that are individually, firmly distinct, and are accessible for viewing or have accessible, clear images. The designs on Demetrius' tetradrachms are quite detailed. They show care and planning to give the portrait an individualized face, to include specific symbolic elements, and to make Heracles recognizable. On the obverse is a portrait of Demetrius looking right. He has a projecting brow and a frowning mouth. His face ranges from youthful on some coins to middle-aged on others. Curls of hair are visible under his headpiece, and his full ear overlaps the headpiece. He wears a diadem, which is visible at the bottom of his headpiece, with two ends appearing behind his head. The lower ribbon is straight and hangs downward, while the upper ribbon curves and points generally left. The king's headpiece is the head of an elephant. The elephant's ear hangs in the back over the king's hair. Its tusk points right above his brow. Its trunk points upward in a S-shape, and its eye is open. It has no lower jaw. The king wears a cloak, with folds, clasped at the shoulder and ringed around the neck.

The reverse design, like the obverse, also contains a standard set of elements. It depicts a nude Heracles, standing frontally. One hip juts slightly to his right, while the opposing leg extends to his left. His right arm reaches upward, placing a wreath upon his head. The wreath is composed of detached leaves that usually float in a circle around the head. His left arm points downward. In the left arm is cradled a long club, with knobs spaced along it, pointing up into the right field. Draped over the forearm is a lionskin. The lion's head is seen from the top, with the snout pointing downward. Lion legs appear on both sides of the skin. The lion tail hangs down to

¹¹² The full sample is illustrated in the catalogue, Appendix 1.

Heracles' feet, and the god stands upon a ground line. Of the 155 tetradrachms in the sample, all follow this design exactly, which suggests a well-controlled standard throughout Demetrius' minting operation.

The first coins that I examined were those with the control marks  and . I examined these simultaneously because, for one, they are so similar that a close connection was likely—whether they signaled two sections of one mint, two supervisors, etc. Bopearachchi, for example, placed them together with others in a “famille.”¹¹³ Secondly, their similarity has led a number of those with the mark  to be incorrectly identified in catalogues as .¹¹⁴ Indeed for some coins, it is difficult to discern with the naked eye which of the two is present. Thirdly, my analysis reveals that dies from both series were, on rare occasions, present in the same striking area, and thus the control mark “makers” were certainly in proximity. There are 87 coins carrying one of these two control marks in the sample.

I spent many weeks exhaustively inspecting the minute details of all of the design components of the 87 coins with these two control marks. Of course, as die engravers carved the coin designs by hand, there are countless, subtle variations in the style of each image feature. Significantly, however, it is evident that all of the design variations clustered into two distinct groups. Beginning with the obverses, there is one obverse style¹¹⁵ that I term “X,” and which appears on 42 coins in the sample. The X obverses always present the following components: a bead border; a triangular elephant ear that varies in roundness; widely-spaced wrinkles on the elephant trunk; a short length of skin covering the base of the tusk; a smooth elephant head with two gentle domes; and an almond-shaped elephant eye with narrow lids. Style “Y” obverses,

¹¹³ Bopearachchi, *Monnaies gréco-bactriennes*, 31.

¹¹⁴ Michael Mitchiner does not acknowledge that  exists, in *Indo-Greek Coinage*, 57-59. In the publication of the Qunduz hoard, certain tetradrachms of Demetrius are visually discernible as , but are labelled as . See Curiel and Fussman, *Monétaire de Qunduz*, 17, Pl. 3, coins 28 and 29.

¹¹⁵ This is called a “style” rather than a “type” to avoid confusion with numismatic term “type.”

comprising 44 coins, always have a wavy, amorphous elephant ear; narrowly-spaced wrinkles on the elephant trunk; a longer skin cover on the tusk; a high, angular brow bone above a tiny elephant eye; and three distinct bumps on the elephant's cranium.¹¹⁶ Coins of obverse style Y also usually have a bead border, but sometimes they show a bead-and-reel border.¹¹⁷ In the king's face, the style differences between X and Y are less noticeable. Coins of both groups show a large projecting forehead; a long straight nose; a deep-set eye; a short, frowning mouth-line; a small chin over a soft, hanging jaw; a thick neck; realistic locks of hair; and a thick ear. Differences include, for the Y coins, a rounder king's forehead; a frown that is more horizontal than curving; a less prominent chin; at times a somewhat shorter neck; and a differently cut earlobe.¹¹⁸



Figure 1: An X-style tetradrachm (left) and a Y-style tetradrachm (right).

The two style-groups that divide the Demetrius tetradrachm obverses also correspond to two individual die-engraving artists, who can be termed Artist X and Artist Y. Certain designs, while not die-linked, are obviously by the same artist, such as these three Artist X obverses: C1, C2, and C3. The artist's hand is identifiable in details such as the shape of the elephant's trunk; the length of the king's brow; the bridge of the nose and the nostrils; the size and shape of the mouth; and the curve of the king's cheek. There are some notable differences in the features of these three coins as well. The elephant ear on C2 is sharply triangular. On C1, the inner corner is slightly rounded. On C4, the ear is much more rounded. The upper diadem ribbon on C1 is more

¹¹⁶ Compare the coins in Figure 1, for example.

¹¹⁷ See for example coins C20 and C25.

¹¹⁸ The differences may be noted by comparing paradigmatic X coins, such as C1 and W3, with paradigmatic Y coins, such as B2 and W4.

vertical than horizontal in design. This is most likely because the portrait is somewhat large within its border of dots, and thus the ribbon had to be squeezed to fit. This also means that the engraver cut the border before cutting the portrait. Once the border was cut, it could have served as a handy sizing guide for the rest of the image. Some Artist X coins seem altogether different in style; see for example N1 and N2. Most notably, on these the king appears aged. At first these may seem to be the work of another artist, yet certain other coins can be seen as transitional, and clearly link the former and latter styles. P1 and C6 are good examples. They share features with both the ‘younger’ portraits of C1 and C4, and the ‘aged’ portraits of N1 and N2. What all of these variations show is that Artist X was simply human, and could not engrave every feature exactly alike with each new die. His style also changed over time, to gradually portray an older king. While minor variations were permitted at his workstation, he also made an effort to maintain consistency in the overall composition, especially in the details of the king’s face. The ‘aging’ of the king is gradual and consistent, and reveals intention. This is evidence that the numismatic portrait was a true likeness, that changed in real time, and that its engraving was carefully supervised or approved.¹¹⁹



Figure 2: These three coins, C1, C6, and N1 reveal the steadily evolving, yet distinctive work of a single artist.

¹¹⁹ The tetradrachms of Euthydemus also show clear aging within the portrait faces. See Frank Holt, “Euthydemid Coinage,” 22-23.

Figure 3: A Y-Assistant Obverse, C35.



The Artist Y coins do not depict aging in the likeness of the king as Artist X coins do. In the portraits, the king appears middle-aged and matches the age of the earlier Artist X portraits. There are also a few coins in this sample of 45 that may have been done by a second “Y” artist. Three obverses in particular stand out, C25, C32, and C35.¹²⁰ While almost identical to the other Y-Artist coins in every way, they simply seem to be the work of a different hand. The nose is more prominent, for example. The brow juts out a little farther. The elephant ear is longer and droopier. The engraver of these obverses was clearly working directly alongside the primary Artist Y, or else attempted to model his dies exactly. The former explanation is likelier, as the coins of this other artist remain few in number. Thus, I label this engraver “Y-Assistant.” One Y-coin, P2, is a lone outlier in design. While the features fit the standard, the elephant head is so poorly done, it reveals an artist that is inexperienced or unfamiliar with the design. The elephant’s eyebrow-bone is swollen and shapeless, rendering the eye below more or less nonexistent. Where there should be three gentle cranial bumps are deep, unnatural cut-lines. The elephant ear is also quite large relative to others. This may be the work of a temporary artist, or an assistant who was not ready to work alone. The possibility that it is an imitation Demetrius coin produced by a different society is not likely, as the portrait maintains the usual standard of detail, and there are no other deformities in the obverse image.

An examination of the reverses of the \mathbb{R} and \mathbb{R} tetradrachms reveals that Artist X and Artist Y carved most, but not all of them. In general, X-style and Y-style reverses can be distinguished by the body of Heracles. On the X coins, Heracles is thin and narrow-shouldered. On the Y coins, Heracles is noticeably broad-shouldered with more defined musculature. Within

¹²⁰ Two coins are not mentioned here because they are die-linked with two of the above coins. W5 is die-linked with C32, and C24 is die-linked with C35.

the set of X-style reverses, the hand of an individual engraver is identifiable by his letter-formation within the legend ΒΑΣΙΛΕΩΣ ΔΗΜΗΤΡΙΟΥ.¹²¹ Stephen Tracy provided a methodology for identifying hands in stonework that is also applicable to engraved dies.¹²² It entails looking at repeating letters in a sample to find a standard of letter-cutting, and then searching for groups of idiosyncrasies that indicate individual artists. Following this method is not difficult for coins, as all of the coins of a certain type have the same legend—so there are many examples of repeated letters. The monogram  also contains a “P” shape, which is often carved in the same manner as the P in the king’s name. Moreover, die-engravers used finer tools than stone-cutters, and individual letter shapes are quite apparent. Distinctive letters on X coins include the Σ’s, which are wide; the loops of the Β, which are separated, the upper lines of the Δ, which are slightly curved inward, the Μ, whose connector-point extends quite low, and most importantly, the Η’s, whose vertical arms tend to bend inward.¹²³ This cluster of letter formations does not exist on all X reverses. On coins C6, C8, C13, and H4, for example, the curves on the Δ and Η’s are much less clear, and the Σ’s on C6 and H4 are not quite so wide. The overall look, however, is similar to the standard style. It is possible that a number of reverses were engraved by a secondary “X” artist, who used the original reverses as models. Some X reverses were undoubtedly engraved by other artists. Four coins in particular, B1, C2, C9, and H6, show distinct differences in the legend. On the first three, the Β’s do not have separate loops and the Μ connector-points are high. On all four, the Σ’s are narrower, the Δ’s are more equilateral, the Η’s are straight, and the Ο’s are

¹²¹ Although “hand” may not be the best word to describe engraving, Stephen V. Tracy sets a precedent by using the word “hand” to identify individual stone-cutting epigraphists in “Identifying Epigraphical Hands,” *Greek, Roman and Byzantine Studies* 11, no. 4 (Winter 1970): 321-333.

¹²² *Ibid.*, 326-327.

¹²³ These features can be seen distinctly in X-style coins such as H1, H2, C3 and N1. In some issues, the Eta arms are so short and bent inward that they almost resemble the letter Chi (see coins P1, C11). In other coins, this set of letter-features is not readily obvious. See the slightly straighter Eta arms on coin H4, for example. A close perusal, however, reveals that the letters do subtly follow the same shapes.

smaller. On B1 and C2, the B drops below the line of text. Just as with the aberrant Y-obverses, these coins can be considered the work of an X-Assistant.



Figure 4: The standard letter forms on the reverse of C3 (left) versus C2, a reverse likely engraved by an assistant.

The Y reverses also give evidence of a primary artist and an assistant. As mentioned, the Y reverses in general depict a broad-shouldered Heracles. Further, the god's face is larger and turned to his left, while on X's he gazes to the front. The letter-engraving of the legend is distinctive. The top arm of the Σ is very slightly longer than the bottom one. The vertical sides of the Ω are quite straight. The bottom line of the Δ can be slightly convex. At times, the ends up the T-bar curve upward. The most defining feature of this reverse artist's hand, however, is his M. One can always observe that the connector is not a point, but is instead a high, hanging U-shape.¹²⁴ Also noticeable about this engraver is that sometimes his upper legend, ΒΑΣΙΛΕΥΣ, is not parallel with the lower legend, but instead follows the line of Heracles' figure.¹²⁵ This is clear evidence that the images were carved first, and the legends afterwards. Just as with the X-reverses, there are Y-reverses that were not done by the primary artist. Coins H11 and Q6 are examples. The legends do not contain the characteristic M-connector—their M's have a straight point. I describe these once again as the work of Y-Assistant. Whether the reverse Y-Assistant and the obverse Y-Assistant were the same person, and indeed the total number of assistants, is irrelevant. When it came to striking, the obverses of

¹²⁴ See C22 and C32 for defining examples.

¹²⁵ This is evident on coins C24 and C35.

the primary artist could be mixed with the reverses of an assistant and vice versa. What is an essential fact is that X and Y dies, whether obverse or reverse, were almost never cross-paired.

If there were assistants engraving Y obverses, Y reverses, and X reverses, we must consider why there are no assistants apparent in the X obverses. This leads to a second question: did the same primary Artist X engrave both obverses and reverses, and likewise for Artist Y? It is possible that assistants were employed to engrave X reverse dies only, as more reverses were needed than obverses. Otto Mørkholm explained that reverse dies did not last as long as obverse dies and thus were produced in greater numbers.¹²⁶ The ratio is, at a minimum, twenty to one.¹²⁷ If, therefore, separate artists were employed to engrave obverses and reverses, respectively, the obverse artist would experience long periods of boredom while the reverse artist was busy. A more likely situation is that Artist X was continuously employed carving both obverses and reverses, and the mint brought on the X-Assistant to work alongside Artist X, but creating only reverses, in order to meet the demand. Artist Y had an assistant (or two) for both obverses and reverses, which suggests that, again, a primary artist made both obverses and reverses, and the assistant relieved the workload. In the case of Y, the assistant was given both sides as tasks.

The strongest argument that there was only one primary X artist for both obverses and reverse and the same for the Y's is the evidence that X obverses were generally paired with X reverses in the striking room, and Y obverses were generally paired with Y reverses. On top of that, the X-Assistant's dies were only paired with other X dies, and the Y-Assistant(s)' dies were only paired with other Y dies. Not only that, but there is a strict correlation of artist teams with the two

¹²⁶ Otto Mørkholm, *Early Hellenistic Coinage*, 16.

¹²⁷ *Ibid.*

distinct monograms, \mathbb{R} and \mathbb{R} .¹²⁸ As the control mark only appears on the reverse side, it ties the reverse design to a specific group; if the obverse designers were separate from the reverse designers, then they would have had no symbol to represent themselves. All of the broad-shouldered Artist Y designs, except for a few, correspond to the \mathbb{R} control mark. At times the crossbar on the control mark is very small and almost invisible—some of them have been mislabeled as \mathbb{R} ,¹²⁹ but a close inspection reveals that a crossbar is indeed present on Y coins. The X's, likewise, carry the \mathbb{R} control mark. There are a few exceptions. A small number of coins with clear Y obverses and reverses carry a \mathbb{R} mark. Only one coin with an X obverse carries a \mathbb{R} mark. Returning to the misfits momentarily, in this 87-coin sample, there appears to be a very strong correlation between the obverse design and the reverse design. I identified obverses as either X or Y. I also identified reverses as either X or Y. When paired, there are four possible combinations: XX, YY, XY, YX. Out of the 86, 41 are XX pairs. 38 out of 87 are YY pairs. Thus, 79 out of the 86 coins, 92%, have connected obverse and reverse styles, which is strong evidence that one artist, with his assistants, produced both obverse and reverse X coins, while another team produced both obverse and reverse Y coins. The standard separation of \mathbb{R} with X coins and \mathbb{R} with Y coins demonstrates something very important about Demetrius' bureaucratic organization. The fact that the two engraving teams display corresponding control marks shows that each production team or supervisor closely controlled its own engravers. In other words, an artist's die would not be sent to just any striking room, any mint-wing, and certainly not any mint. It shows that artists were definitely attached to particular departments and produced designs only for those respective departments.

¹²⁸ This directly contradicts de Callatay, who stated that "As a rule, differences of style do not correspond to new control marks or symbols," in "Control Marks," 44. It is supported however, by Holt, who in "Euthydemid Coinage," 22, noted stylistic similarities between Euthydemus and Demetrius coins containing the same control mark.

¹²⁹ Examples include Q5 and Q6.

As for the 8% of coin-pairs which are misfits, there are hints that they belong to a phase of Artist Y's career. Firstly, Demetrius' predecessors did not use \mathbb{R} , nor did his immediate successors continue it.¹³⁰ This suggests that the king created it as a new and possibly temporary production



Figure 5: Coin C20 is one of six that has all the design features of Artist Y, except for the monogram. Also shows bead-and-reel border.

stream. There are six broad-shoulder designs with \mathbb{R} control marks.¹³¹ These could be a window into the initial employment of Artist Y, when the mint had not yet created a separate department for him. Thus, at first he worked under the \mathbb{R} symbol, and then a new team was created for him later to improve efficiency or workload. Alternatively, Artist Y might have temporarily moved back to the \mathbb{R} department at some later time, to assist or relieve Artist X. It is also notable, though, that some of the \mathbb{R} reverse designs depict a Heracles who is not quite as broad-shouldered as the standard.¹³² This suggests that Artist Y began using the \mathbb{R} mark immediately upon his employment and his Heracles' design simply evolved to become more broad-shouldered over time. The single coin with an X obverse and Y reverse, N2, is the most anomalous. The obverse is a standard, later-issue die engraving from Artist X. The reverse is the work of Y-Assistant, as evident by the lettering. Cases such as these do not always require complex explanations though. It could be something as simple as a die accidentally, or out of necessity, being used in its non-regulation striking area.

Sometime during the operation of the \mathbb{R} production line, there was an experimental design with a bead-and-reel border, first on the obverse, and then on both sides. The bead-and-reel borders must be viewed as a conscious decision by someone in power, if not the king, then at least

¹³⁰ According to Bopearachchi, *Monnaies gréco-bactriennes*, 395.

¹³¹ See coins C20; C27; C31; M1; M3; and W7.

¹³² See coins N3; H10; P2; P3; F2; and Q5.

a mint supervisor. These borders do not appear on the coins of Demetrius' predecessors, Diodotus I, Diodotus II, and his own father, Euthydemus I.¹³³ Moreover, even Demetrius' standard non-bordered reverse is a break from his predecessors, all three of whom used a simple bead border on both obverse and reverse. Interestingly, the early Seleucid emperors, Bactria's neighbors, also only used a bead border on their coins, whether obverse only or both sides, until the reign of Antiochus III, Demetrius' contemporary.¹³⁴ One is hard-put to conceive of any reason beyond the aesthetic to introduce a fancier border on royal coins. Whether Demetrius' government did it to copy Antiochus, or simply on a spontaneous whim, the mint was assuredly not manufacturing coins in a continuous, disinterested stream from one reign to the next. Design changes were clearly deliberate. Government officials must have approved of the result, because the new border ended up on the majority of Y coins. In this sample, they appear on 26 of 44 Y-obverses.¹³⁵ Of those 26, five also have a bead-and-reel border on the reverse.¹³⁶ It is predictable that more obverses than reverses show the new border because Demetrius' standard tetradrachms in general only have an obverse border—plain bead. Thus, first the type of border was changed from bead to bead-and-reel. Reverses were normally blank, so adding any border at all was experimental, and the fact that all reverse borders are bead-and-reel and paired with bead-and-reel obverses shows that it was attempted as a later step. The Y coins display a mixture of border types throughout Artist Y's career, in relation of the evolution in Heracles' body type. Thin Heracles can be unbordered or bead-and-reeled;¹³⁷ burly Heracles can be unbordered or bead-and-reeled.¹³⁸

¹³³ Bopearachchi, *Monnaies gréco-bactriennes*, Pl. 1-4.

¹³⁴ Arthur Houghton and Catharine Lorber, *Seleucid Coins: A Comprehensive Catalogue, Part I: Seleucus I through Antiochus III*, 2 vols. (New York: American Numismatic Society; Lancaster, PA: Classical Numismatic Group, 2002), Pl. 1-50. Tarn, in *The Greeks in Bactria and India*, 157, 201, mistakenly called the border a "Seleucid bead and reel edging." He used it date Bactrian kings as contemporaries of the Seleucids, but without justification.

¹³⁵ See coins N3; Q5; W5; F2; C20; C34; C35; C38; and C39 (die-linked with previous coin).

¹³⁶ See coins C38; C39; F2; K4; and Q5.

¹³⁷ See coins N3 and Q5.

¹³⁸ See coins C39 and C40.

Therefore, the border innovations were not introduced at once or categorically, but sporadically. This shows deliberation within the mint, probably by officials, as there is no evidence that engravers made significant design choices. It is not clear why the bead-and-reel was not introduced across the board, but the most direct answer is simple experimentation. Those who chose to introduce it wished to see if people liked it—maybe especially if the king or elites liked it, or perhaps if it lasted well through normal wear. The X tetradrachms never received the bead-and-reel border, and their portraits showing a much-aged king demonstrate that they outlasted the Y tetradrachms. Thus the bead-and-reel border was ultimately rejected.

Overall, it appears that the two minting operations, \mathbb{P} and \mathbb{R} , were well-controlled and organized. Most of the coins produced were standard XX or YY pairs. The evidence of occasional transference of artists or sharing of dies between the two control marks also shows that the two departments must have been in the same location, and were not physically separated mints. There are two possibilities for how die design was controlled. The first possibility is that within the mint, there were two distinct branches or departments that kept separate artist-design teams, each with its own supervisor. Each team was made up of a primary artist and his assistant(s). Each supervisor-artist team then created a design, but the two teams conferred and agreed to conform to a particular design. The second possibility is that Artists X and Y, working in either separate departments or the same department, received the same strict instructions or a single model from which to copy their designs. The artists were expected to follow the official model rather than their own imagination, but were allowed some flexibility in features such as the elephant ear. The first scenario, in which the two design teams operated independently, is less likely. It is clear that X and Y, although distinctly identifiable, followed the same overall style, and that the overwhelming consistency in the details of the portrait shows the necessity to conform to the king's true likeness. There would be much more variation in the two styles if their artists were working independently.

In the second scenario, the groups did not have independence in designing the coins. They had to conform to the same directions or official model. This is more likely and provides evidence that the \mathbb{R}/\mathbb{R} minting operation was well-organized and tightly supervised. It was part of a complex bureaucracy.

This example of Demetrius' bureaucratic organization solidifies the meaning of control marks for this particular king. They are associated with the separate production lines of a mint, with their own design teams and strikers. Most scholars have dismissed the idea that the control marks symbolize artists, usually because the same control marks last through numerous kings and it would be impossible for one artist or even a family to work through several reigns.¹³⁹ Yet, just because a mark lasts through several kings, it does not mean that the workers have to. Demetrius could have employed new minting personnel for his reign, but assigned them the same control marks that his predecessors used. Although the marks *represented* people, they did not *belong* to those people; they belonged to the bureaucrats. The mint officials could have employed workers or removed them, and created or dissolved whole teams, assigned new control marks, or allowed the same mark to persist through worker turnovers. Control marks in Demetrius' system were definitely administrative marks and would have been useful for quality control, production tracking, and even circulation data. Bopearachchi suggested that control marks could signify guilds or corporations of artists or minters,¹⁴⁰ but there is no reason to believe that the Bactro-Indo-Greeks outsourced their work. Demetrius clearly had a strong, strictly-controlled, bureaucratic organization, so die design could easily have been an in-house function.

¹³⁹ De Callatay, "Control Marks," 43-44.

¹⁴⁰ Bopearachchi, *Monnaies gréco-bactriennes*, 33.

The Tetradrachms

The second most common control mark on tetradrachms of Demetrius is . This control mark is definitely an earlier coin production operation than , as the portraits of the king on  coins clearly depict a younger face than those of .¹⁴¹ This may provide evidence for a co-rulership of Demetrius with his father, Euthydemus I. There is certainly evidence that Euthydemus allowed his son Demetrius to pursue his own conquests and gain individual fame. The Kuliab inscription, a stone monument dedicated to Hestia near Kuliab, Tajikistan, asks the goddess for protection of the king, Euthydemus, and his son Demetrius, “καλλινικον,” the “glorious victor.”¹⁴² That means that people already widely recognized Demetrius as a victor while his father was the king. Further, Strabo wrote that Demetrius subdued nations in India, but called him the son of King Euthydemus instead of simply “King Demetrius.”¹⁴³ Holt argued that Demetrius must have conquered India before his independent reign, as his earliest coins already show the telltale elephant scalp, but he does not conclude that he acceded as a co-ruler.¹⁴⁴ It is also possible, though, that Demetrius conquered India as a young man, and was *then* raised to co-rulership with his father and allowed to mint coins. The evidence of the control marks and design features is supportive. Euthydemus used the control mark .¹⁴⁵ Demetrius also used it, but only with coins that show him with a middle-aged portrait face. If Demetrius did not become a ruler

¹⁴¹ This same chronology is inferred by Holt, “Euthydemid Coinage,” 24.

¹⁴² Bernard, Pinault, and Rougemont, “Deux nouvelles inscriptions,” 333.

¹⁴³ Strabo, *Geography*, 11.11.1.

¹⁴⁴ Holt, *Lost World*, 157.

¹⁴⁵ Bopearachchi, *Monnaies gréco-bactriennes*, 394.

with coining rights until after his father died, he could have begun using this control mark immediately, in his first production line. Yet, the  coins are certainly an earlier production line, as they depict an obviously youthful portrait. This suggests that Demetrius began using the  control mark after his father's death, but that he had already been minting his own coins before then as a co-ruler. Moreover, Demetrius was the first Bactrian king to use the  monogram. His father Euthydemus did not use it at all. Demetrius would have needed his own unique production group while co-ruling with his father, and thus he may have initiated the  operation to distinguish his administration. Demetrius had his own production operation as a co-ruler, and then rebranded it when he acceded to sole rulership upon his father's death. Significantly, this evidence goes against scholars who argued that father and son shared their minting practice while co-ruling.¹⁴⁶ Further, it is apparent that when Demetrius took over the  symbol from his father, he did not also co-opt his father's die engravers. Examples of Euthydemus tetradrachms carrying the  control mark reveal the letter-forms of one particular individual, but not Artist X or Artist Y. A random sample of Euthydemus  reverses shows, for example, Σ's that are tall and narrow, rather than short and wide. The Ω's on the former are tall and straight, instead of short and obtuse. The Δ's are large with straight lines, instead of small and curved, and the O is smaller than Artist X's. Finally, the Euthydemus legends do not contain Artist X's signature concave Chi-like H's.¹⁴⁷

The control mark  does not take any other forms,¹⁴⁸ unlike  and . Thus, one cannot expect to find two clear design groups. Rather, it appears that two primary artists, with several

¹⁴⁶ Bivar, "Bactria Coinage," 30-31. Bivar's argument rests on a flawed foundation though, in that the coins he saw as coming from a shared father-and-son mint are actually coins that are now generally attributed to Demetrius II, not I. Also see Mielczarek, "Coinage of Euthydemus," 300.

¹⁴⁷ See examples from Bopearachchi, *Sylloge Nummorum Graecorum*, Pl 7, nos. 122-127.

¹⁴⁸ Bopearachchi, *Monnaies gréco-bactriennes*, 164-165.

assistants, worked in a single team, and overlapped in time. The Artists' distinct engravings are visible by their individual variations in the features of the main design. There is also evidence of the primary artists' designs evolving over time. There are 48 coins in my sample with the  control mark.¹⁴⁹ The overall obverse design is characterized by an elephant scalp that always has narrow wrinkles on the trunk, a very small trunk that points right or down instead of upward, and a thin tusk with a long skin cover. Also, even though Demetrius appears to age in the portraits of this control mark, these coins show him as generally younger than on the  coins: the back of his neck and shoulders are straight, not hunched, and his jaw and brow are sharper. The king even appears to smile in some of them. On  coins, the portrait shows a heavy cheek with a soft jawline, a brow that sags to nearly cover the eye, and a deep frown.¹⁵⁰



Figure 6: An Artist Z1 coin showing the youthful portrait, Coin B4.

In the first series of  obverses, the portraits show

Demetrius as extremely youthful. His face has a thin, tight cheek, a small brow, a wide eye, a beaky nose, and a thin neck. The king's mouth is a small, straight, and tight-lipped. His hair is made up of three rows of curls. The elephant ear is folded on top, there is an

arched brow-line around the elephant's eye, and the elephant skull is composed of large frontal and rear bumps, with a tiny bump between them. The upper diadem ribbon wiggles down and leftward. The stylistic features show that this first series of coins was engraved by one artist. I have named him "Artist Z1."¹⁵¹

¹⁴⁹ See these coins illustrated in Appendix 1, pages 236-245 .

¹⁵⁰ Scholars tend to agree that aging in portraits is a valid indication of a king's age and numismatic chronology. See Bivar, "Bactria Coinage;" Frank Holt, "Did King Euthydemus II Really Exist?" *Numismatic Chronicle* 160 (2000): 81-91; Mielczarek, "Coinage of Euthydemus," 300.

¹⁵¹ See coins A3; B4; C65; D1; H14; N4; N5; and U2. Coin H14 is reverse die linked with B4. B4 and U2 are obverse die linked.

Another series of early  coins shares the general layout of the first, but several different lines and shapes in the facial features depict a king that is slightly more mature—a man rather than a boy. Small details in areas such as the lips, chin, and openness of the eye, however, indicate that this second series is still the work of Artist Z1.¹⁵² In these versions, the elephant’s frontal cranial bump is larger than before. The elephant’s trunk, while retaining its “S” shape, is more horizontal than vertical in structure. The tusk is longer and points higher upward. The elephant ear is similar to the previous, but with rounded edges. The king’s eye is more recessed with a large surrounding socket; the nose projects less; and the mouth frowns dramatically—almost vertically. The king’s earlobe is slightly longer now, but the hair is similar.

There is one notable way in which the Z coins are different than those of Artists X and Y. The latter changed their styles over time, and introduced various ways of engraving certain features. The changes are all slight though, and there are many features that seem transitional. Thus their coins cannot easily be grouped into phases. Among the Z artists, style changes occur more abruptly, as can be seen in the next rendition of coins by Artist Z1. On these, the engraver maintained all of the features of the portrait and elephant scalp, but he obviously altered the diadem ribbon.¹⁵³ The standard for Demetrius coins is a lower diadem ribbon that hangs straight down, while the upper ribbon waves or flutters out behind the head. Z1’s third phase shows a lower diadem ribbon that also flutters outward, making a sideways question-mark shape, roughly parallel to the upper ribbon. This was not a one-time aberration, but a deliberate style used on a whole series. In the sample, there are six coins showing such a ribbon, of which none is die-linked. The design of this diadem ribbon, though seemingly trivial, is surprising. On all the tetradrachms examined so far, the design components have appeared uniform, with the only differences arising

¹⁵² See coins H13; H20; and Q7. Q7 and H13 are obverse die linked. A comparison of H13 and H14 shows that it is likely the same artist.

¹⁵³ See coins C45; C50; C67; H17; H18; U3; and W8. C45 and H18 are die linked.

in the slight line and shape changes caused by individual hands. The most flexible features were the shape of the elephant ear and the border. This fluttering lower ribbon, however, is an instance of a feature that is noticeably different than the standard.

Figure 7:
The
different
phases of
Artist Z1.



A fourth series further demonstrates how Artist Z1 would alter a specific feature and then produce several dies containing that feature.¹⁵⁴ His next group of five coins, displaying five separate dies, returns to the original standard of the downward-hanging diadem ribbon. The new feature is the shape of the elephant ear, which was previously large, tattered, and draping, and is now a smaller square shape. Another barely perceptible change is a slightly wider cheek on the portrait. This gives the impression that the king is a little more aged, in comparison to the first portraits of this control mark. The final series by Artist Z1 displays yet another style of elephant ear.¹⁵⁵ This time it is a rounded triangle. The elephant head is a little flatter on these; the elephant's brow bone is more rounded; and the upper diadem ribbon is unusually small. The king's frown is much less pronounced. The remarkable thing about the six coins in this series is that they are almost identical. Many of them appear obverse die-linked even under close scrutiny, and only miniscule measurements of facial features reveal that they are all, in fact, separate dies. This reveals a high level of skill on the part of the artist. Further, it emphasizes the idea that when Artist Z1 made a change, such as a new ear-style, it was deliberate, and he maintained it for a long period of time.

¹⁵⁴ See coins C44; C52; C55; Q8; and H21.

¹⁵⁵ See coins C46; C51; C53; C59; H19; and H15. C51 and C53 are reverse die linked.

The next set of coins, while containing many features that are similar to those of the Artist Z1 portraits, appear to be the work of another artist, whom I call Z2. This artist must have begun working at a slightly later date, as all of his obverse designs depict the king as relatively mature.¹⁵⁶ In these the king has a medium-heavy cheek, a sharp brow, and a medium-thick neck. The eye is small. The new artist, Z2, introduced several new features to the obverse image. His elephant ear is very different. It does not attempt realism; but uses a simple border outline to form a bell-shape, with a bottom-center arc for the clapper. There are distinct vein-lines inside the ear. He also introduced a smooth elephant head, with two gentle domes, very like Artist X of the \mathbb{R} operation. Artist Z2 also did away with the angular brow-bone, and introduced the Artist X-style elephant eye, a squinting almond shape surrounded by tiny lashes or wrinkles. He further introduced a new type of hair, a realistic row of long locks with some tiny supporting locks below. Artists X and Y later continued the realistic hair design. He brought back the short, straight, non-frowning mouth that Artist Z1 preferred in his earliest designs—indeed the new portraits almost smile.¹⁵⁷ One of the coins, C58, carries a small frown. Finally, Z2 introduced a unique wavy double-line in the king's cloak, trailing behind his shoulder.¹⁵⁸ The diadem ribbon is the common up-down style.

The new features introduced by Artist Z2 also evolve within his own work. In one design,¹⁵⁹ the bell-ear has a point at the bottom instead of a clapper. In a third version, the bell-ear is replaced by a more realistic ear, with a rough bottom edge, that resembles a downward-hanging

¹⁵⁶ See coins C43; C54; C57; C58; C62; C66; and N6.

¹⁵⁷ Some of the early Z1 coins, when compared with certain Z2 coins, look as though they may actually be the work of one person. Compare C65 with C64, and N5 with N6. Ultimately it does not matter if Z1 and Z2 are one person or two. If two, they were both experienced and prolific. If one, it only means that he was even more so, and that he was the royal resident artist for a very long time, producing hundreds of dies.

¹⁵⁸ This is only visible on unworn coins, including C58, C62, and C66.

¹⁵⁹ See coins B5; C47; and C56.

tulip.¹⁶⁰ The rest of the features are unchanged: the smooth elephant head, realistic hair, thick cheek, small eye, big brow, thick neck, and up-down ribbon.

Figure 8: The phases of Artist Z2.



The reverses of the Φ tetradrachms do not show the same level of diversity as the obverses. They are quite consistent across both artists. They all display a Heracles that is muscular, but not broad. He is usually somewhat short. His wreath is smaller than on \mathcal{R} coins, and composed of dots or chevrons. He has a large forehead. His tapered club has very small, dotted knobs along it. The lion skin hangs down, giving a top-view of the head. The paws hang down below the head, and the tail hangs to the ground. Most of the lion skins are narrow and long, with lines on the back, perhaps indicating ribs or fur, but tending to look more like scales. Some of the lion skins have a large head on a very narrow body, while others have an equally narrow head.

Despite the lack of phase variations in the reverse image, one can identify different engravers by their lettering. Within this sample containing two main obverse artists, there are at least five reverse engravers. The distribution of these obverse-reverse artist pairings reveals three significant points. Firstly, there is a rough correlation between each obverse artist, and a particular reverse lettering. This suggests that the obverse artists were indeed the primary artists at the mint, and thus they also engraved the majority of reverse dies. The presence of dominant pairings also suggests that the two artists were not working simultaneously, but successively. If they were working simultaneously, and sent their dies to a shared striking area, then the obverse and reverse pairs

¹⁶⁰ See coins B3; C42; C48; C60; C61; C63; C64; and H16. C42 and C60 are die-linked.

would have become thoroughly mixed, and one would not expect dominant pairs to arise. The chronology of the artists is further supported by the fact that Z2 did not engrave any youthful portraits. The majority of Artist Z1's coins match a particular reverse style that shows a tall B with slightly separated loops, a wide Ω, a short Δ, a round, hanging connector on the M, and a P-loop that does not connect all the way.¹⁶¹ The Z2 obverses also correlate to unique style of lettering, in which the crossbar of the A is diagonal and connected to the bottom left A-leg, the Ω is large, the O is large, and all the letters in general have concave lines, especially the A, Σ's, Λ, E, Δ, H's, and M.¹⁶²

The second significant point about the pairings is that there are also incidences of mixing and overlap between styles. For example, the reverse that matches the majority of Z1 obverses is also occasionally paired with Z2 obverses.¹⁶³ This means that while the two artists were successive, there was also a period of overlap in their work. Z2 joined the mint before Z1 left. This mixing also is definitive evidence that in the  operation, all the dies were used in a single striking area. There were not separate branches for the main artists like there were in the  operations. The single form of the  control mark reflects that situation. Also, if the artists were for the most part successive, no separate branches would have been necessary. During their period of overlap, the mint officials must have decided that a single striking room could handle the work of two die-makers. Maybe they knew that Z1 was leaving the mint, and he stayed on to train his replacement. The later separation into two branches,  and , speaks to an increased workload, and thus an enlarged population or economy.

¹⁶¹ See coins H20; C44; C45; and C59.

¹⁶² See coins C43; C48; C56; and C58.

¹⁶³ See coins A3; C54; C61; and N5.

The third point is that with five distinct reverse engravers, there are three who are not represented among the primary artists. It is probable that they were assistants who handled the extra reverse-making load, just as there were for the previous control marks. All three of these, Z-Assistant-1,¹⁶⁴ Z-Assistant-2,¹⁶⁵ and Z-Assistant-3,¹⁶⁶ are paired randomly with the obverses of Artist Z1 and Artist Z2. Significantly, unlike the assistants for the previous control marks, these are not tied to a particular primary artist. They may have simply continued working through the leaving and joining of the primary artists. The engraving work of one of the Z-Assistants can actually be seen directly in an extant reverse die. This die was sold at auction, but scholars believed that it originated at the archaeological site of Ai Khanoum, Afghanistan.¹⁶⁷ The die clearly carries the  control mark, and thanks to a die impression made by Osmund Bopearachchi,¹⁶⁸ I am able to identify the individual lettering-hand. The engraving on the die does not belong to one of the two primary artists; instead it matches with one of the three Z-Assistants. On the die's upper legend, only the letters ΣΙΑ are legible, while the full lower legend is clear. The lettering features include a short Σ-point, a low M-point, an almost invisible P-loop, and a Y with a short leg and long upper arms. The engraving on the die is most similar to the hand visible on coin D1, and also fits with that of H18 and W8. It is therefore the work of the one I called Z-Assistant-3. Unfortunately, there are no coins available that match with the extant die. If the die was indeed from Ai Khanoum, it supplies evidence that the  operation, and by extension Demetrius' main mint, was located in the city.

¹⁶⁴ See his reverses on B4; C57; N4; and N6.

¹⁶⁵ See his reverses on C50; C42; H13; and H16.

¹⁶⁶ See his reverses on B5; C66; H17; and H18.

¹⁶⁷ The die was sold for \$9000 by Classical Numismatic Group, in mail auction 91, lot 423. See <http://www.cngcoins.com/Coin.aspx?CoinID=215690>. It was also published by Bopearachchi, "Deux documents exceptionnels," 4-6.

¹⁶⁸ *Ibid.*, 5.

The general picture of the  minting operation is of one small design group, with one primary artist replacing another after a short overlap. The evolution of the portrait shows that Demetrius' government required a gradually older looking king over this period. The king either demanded up-to-date portraits as he aged, or he was unhappy with the youthful look and ordered that his official representations looked mature. It is more likely that he required accuracy in his portraits, as the later portraits from the  operation show a much older, less robust king.¹⁶⁹

Besides the gradual aging in the portraits, the style of the  obverses changed bit by bit in minor features. The artists mostly experimented with the design of the elephant's cranium and ear. These are features with little importance from a governmental point of view. The coins of the  operation are slightly less consistent than the  and  coins, perhaps because they were the new, co-ruling king's first issue of coinage. He would have still been learning how to administer a bureaucracy at that stage. The aberrations are trivial though, and do not affect the recognizability of the portrait, the elephant head, the god Heracles, the legend, or the coin as a whole package. The difference in the king's apparent age on  coins and  coins indicates that once he began the latter operation, the former ceased production. Therefore, it is likely that Demetrius did not control the two minting operations at the same time. This is further supported by the fact that Demetrius first used an original mark, and later used his father's mark. Consequently, both operations could have been located at the same, central mint. The size of his bureaucracy was therefore somewhat modest, but it was very strictly organized.

It is difficult to say exactly why Demetrius switched from the first control mark to the second, and why the same artists did not continue their employment through the transition. The

¹⁶⁹ Holt made the same point about true likeness for aged portraits of Euthydemus and Demetrius in "Euthydemid Coinage," 24.

occasion for the change is reasonable, if indeed he was a co-ruler with his father and adopted the new mark upon gaining sole rule. Nevertheless, it is not apparent why his first control mark, , would not have been suitable for continued use at his main mint. One possibility is that maintaining a coin symbol that was used by his father was important to the new king. Another issue, however, is that Demetrius did not utilize the die artists from his father's operation. Instead, the main artist for the new control mark was Artist X, who, as I will shortly demonstrate, previously worked in another of Demetrius' smaller minting operations. Using his father's control mark was a deliberate choice for Demetrius, and must have been rationally beneficial, but continuity in the mint personnel was not equally so.

The Tetradrachms with Control Marks , , and

Three other control marks exist for Demetrius tetradrachms. They are , , and . Unlike the previous control marks, each of these occurs on an extremely small sample of coins. Even after extensive searching in museum, hoard, and marketplace collections, the first control mark has a sample of only eleven, the second a sample of seven, and the third a sample of three.¹⁷⁰ Perhaps the limited number of extant coins is due to burial distribution—maybe these control marks were concentrated in locales that archaeologists have yet to discover. The existence of die linkage within these small samples, however, gives evidence that the government in fact produced a low quantity of coins with these control marks. Otto Mørkholm explained that die linkage can provide estimates regarding the size of a body of coinage. Obverse dies lasted longer than reverse dies and thus were fewer in number. Therefore, the greater “the number of specimens per obverse

¹⁷⁰ These coins are pictured in the catalogue, pages 246-251.

die, the probability of a complete representation of obverse dies increases.”¹⁷¹ In other words, if all of the coins in one of these very small samples linked to the same obverse die, then it would be likely that it was the only obverse die for that issue. It would simply be too coincidental that an extremely tiny random sample would contain die-linked obverses. Each obverse die could produce around 20,000 coins.¹⁷² These quantifications are important for understanding these three rare control marks. Combined with evidence of the coin designs, I was able to determine that these control marks represent small, peripheral or temporary minting operations, which Demetrius utilized only for auxiliary coin production.

The eleven tetradrachms with the control mark , are generally uniform in design.¹⁷³ The portrait shows a middle-aged king, quite like the later issues of the  control mark. The king’s head is wide, making the elephant scalp appear tight-fitting. He has a protruding brow, deep frown, and heavy jaw, though not the sagging jaw of the later  line. The diadem ribbon points up and to the left. The elephant ear is folded and somewhat tulip shaped, recalling Artist Z2 of the  coins. The elephant trunk is thick with deep wrinkles. The king’s hair is made up of realistic locks, also in the style of  Artist Z2. Certain obverses in this series, because of the short mouth-line, the wide face, and the king’s hair, lead one to speculate that these coins do indeed display the work of Artist Z2. A few specimens even have the wavy line in the cloak that is his hallmark. The reverse designs, especially the lettering of the legend, clinch the matter. The artist who engraved the majority of dies for the  coins is indeed Artist Z2.

¹⁷¹ Mørkholm, *Early Hellenistic Coinage*, 17.

¹⁷² *Ibid.*, 16.

¹⁷³ See coins C68; C69; C70; C71; H22; H23; H24; H25; H26; N7; and U4.



Figure 9: The portraits, lettering, and lionskin reveal the work of Artist Z2 on both of these coins, C70 (left) and C58.

Most of the \uparrow reverses bear the telltale lettering of Z2's hand. They show concave lines on the Σ 's, H's, E, M, and T. The arms on the E are equal in length. The loop of the P is very small, and in some cases, disconnected. The O is large, and the Y has a short leg and long arms. The control mark itself is very large, relative to the letters; the same is true of the \oplus mark. One of the reverses, C69, does not carry the same alphabetic features; it has a rounded M-connector, for example. This suggests another person helping to make reverses in this minting operation, just like in the central operation. The design of the lionskin on Heracles' arm also stands out and ties both control marks to Artist Z2. The lionskins from both groups are narrow, with lines on the back suggesting ribs. They also often have detailed rear legs, positioned above the animal's forelegs.

Two of the eleven obverses are die-linked. This may not seem like much, but what is especially notable is that they are also die-linked on the reverse.¹⁷⁴ Mørkholm stated that one obverse die could be paired with twelve or more reverse dies.¹⁷⁵ Thus, having two coins with the same obverse dies *and* the same reverse dies is extremely unusual for such a small sample, and means that this was definitely a small operation. It is also a momentary window into the mint, revealing two coins that were struck very near in time to each other. Also significant is that another pair of reverse die-links is present in the sample.¹⁷⁶ Again, reverse dies had to be replaced much more often than obverses and so there were many more of them. Reverse die links are much rarer

¹⁷⁴ See coins C68 and C70.

¹⁷⁵ Mørkholm, *Early Hellenistic Coinage*, 16.

¹⁷⁶ See coins U4 and H25.

than obverse die links. The presence of another reverse die link in the sample thus is further evidence of the limited size of the operation.

Among these eleven coins of the  production stream, there is one primary artist, Z2, and one secondary or assistant artist. In general the designs of the  coins, especially the portraits, are more similar to each other than they are to any of Z2's  designs; thus the artist cannot have been engraving for both operations at the same time. The  designs are definitely from a different phase in his career. It is certain that the  minting operation was running at the beginning of Demetrius' kingship; his portraits depict him at a very young age, and then show a gradual evolution in aging. Artist Z2 was not there at the beginning, though. He joined the operation halfway through and replaced Artist Z1. The coins of the  production group are not from the beginning of the king's reign, as they do not include particularly youthful portraits. Moreover, Demetrius' father Euthydemus used the control mark , so applying the same logic that I did to  and , Demetrius probably did not initiate the  operation until his father died. The fact that the  coins represent a small-scale, short-term minting operation, and that it began midway through Demetrius' reign leads to the probability that this was an emergency or auxiliary support mint during a phase of war, specifically the period of transition from co-rule with Euthydemus to sole monarchy. In the first half of his reign, Demetrius only had one coin producing team, Z1's group, under the banner of the  mark. It is conceivable that one production group could not meet the demand for coined money that would have arisen if his accession to lone kingship was tricky. Another crucial point, which I will explore further in Chapter 4, is that the  control mark is the main mark that appears on Demetrius' bronze coins. It clearly represents a major, long-term bronze-producing department or mint. Therefore, to create a supply of auxiliary silver

tetradrachms, Demetrius did not need to set up a whole new silver operation. Instead, he or his officials implemented the resourceful step of instituting a bronze minting operation, and having it produce a short-term series of auxiliary tetradrachms. Although it is a speculation, one possible scenario regarding Artist Z2 is that the mint officials liked his work, and so during the transition period, they sent him to make auxiliary silvers, and some bronzes for the new production group. Thus occupied, the officials brought in Artist X to become the primary engraver for the main group.

In assessing Demetrius' power through his control of his mints, it is important to note that a temporary, auxiliary coin series, as shown here, exhibits the same level of design consistency, artistic skill, and lack of errors as that of the main branch. The administration's use of an experienced engraver and perhaps even existing facilities, for the extra tetradrachms further shows governmental resourcefulness, efficiency, and interest in their official output.

There are seven tetradrachms with the next control mark: \mathcal{A} .¹⁷⁷ The obverse designs display remarkable consistency. The portrait of Demetrius shows a middle-aged king, close to the portraits of the \mathcal{R} series. In these portraits, the king has a small, pointed nose, with defined nostrils, a short, frowning mouth, and a small eye under a heavy, shading brow. The ear is also small and surrounded by tiny, wavy locks of hair. The only aspect of the king's face that is large is the jawline, which is prominent. The elephant scalp likewise has a very small ear that is triangular in shape. This ear has a very thin outline, a sharp point, and interior wrinkle-lines. The elephant face is smooth, with a soft rear dome, the eye is squinting and almond-shaped, and the trunk projects straight upward in a perfect S-shape. The upper diadem ribbon points left with a slight downward curve. Despite some image features taking slightly different forms, this is the work of an artist

¹⁷⁷ See coins B6; C72; C73; C74; H27; H28; and U5.

whom we have already encountered—he is none other than Artist X of the \mathcal{R} control mark. Artist X’s style gradually transformed throughout his time with the \mathcal{R} branch, so the connection between the two monograms is not always obvious if looking at a random X sample. Yet if one compares the Artist X obverse of coin H4 or C2, for example, with a clear specimen of a \mathcal{A} coin, such as obverse C72, then the engraver’s hand is beyond a doubt. It is especially noticeable in details such as the king’s nostrils, brow, lips, and chin, and the elephant’s inner ear, skull, and eye. From there one can make the connection to other Artist X coins.



Figure 10: Both of these coins, C72 and C2, are obviously the work of Artist X, despite the different control marks.

Of the seven \mathcal{A} tetradrachms, six show the work of Artist X. Further, it is almost certain that four of the obverse specimens were struck with the same die. The other two coins are too worn to determine die linkage, but out of all six there are no more than two or three obverse dies present.¹⁷⁸ Two of these six coins share a reverse die,¹⁷⁹ and the other four respective reverse dies, though not linked, were also all made by the same artist. This is especially apparent in the lettering. The E has very short arms, the M has a noticeably shallow, but pointed connector, and the loop of the P is almost nonexistent. The images of Heracles on the six coins also appear to come from a single artist. In all of them, the god has a large face, a relatively short body, a short club, and a narrow, bony lion skin. Are these reverses also the work of Artist X? It is quite probable. Artist X and the reverse \mathcal{A} artist both designed a thin, muscled Heracles with a long, narrow lion skin. The

¹⁷⁸ Coins C72, C74, H27, and H28 are obverse die-linked. Coins B6 and U5 are unclear.

¹⁷⁹ See coins C72 and H28.

long arms of the Σ 's, the short Δ , the tiny P-loop, and the short Y-leg are also similar, although there are some differences in the lettering—the H's on the \mathcal{A} series are not so curved, and the M point is higher than on the \mathcal{P} legends. Yet, if the two control marks are from different periods in the artist's career, then his style for certain letters may have changed.



Figure 11: Coins C72 and H28 are die-linked on both obverse and reverse.

The above analysis of the main control marks verified that single artists created both obverse and reverse dies, and thus it may have been a standard practice. If the same is true for this control mark, then it means that six randomly compiled coins show the work of only one artist and two or three obverse dies. The appearance of so few dies in such a small sample indicates that these comprise a large proportion, if not all, of the artists and dies.¹⁸⁰

The low quantity and die count of the \mathcal{A} mintage shows that, like \mathcal{A} , it was a small-scale operation. Moreover, the extreme design consistency among the images that are not die-linked indicates that the dies must have been engraved over a very short period of time. This was therefore a temporary operation. The \mathcal{A} operation began sometime midway through Demetrius' reign. Artist X engraved the dies, yet he also began working under the \mathcal{P} mark midway through the king's reign. If Artist X worked in the \mathcal{A} branch *before* working in the \mathcal{P} branch, then it could not have been much before, as the portraits of both show a similarly middle-aged king. He could not have worked in the \mathcal{A} branch *after* working in the \mathcal{P} branch, as certain issues of the latter depict a

¹⁸⁰ See above the reasoning of Otto Mørkholm.

significantly aged king. Artist X could have temporarily worked on this side-branch during his employment at the main branch, but that presumably would have caused an inconvenient interruption in his output. The first situation is the easiest to imagine, as X might have begun his career at a temporary, auxiliary mint, possibly set up for emergency wartime production, and then quickly gone on to become the primary artist at the main mint. What that also means is that



Figure 12: Coin C73, an ancient imitation of a Demetrius coin.

Demetrius required extra coins during, or immediately before, his transition to sole rulership. It is very possible that there was political instability, or the threat of it, upon Euthydemus' death. If so, Demetrius confronted the situation head on, by first producing an auxiliary supply of tetradrachms with which to pay his military, and then

instituting a new minting operation with his father's primary control mark, \mathcal{R} .

There is a seventh coin, C73, which appears to have a \mathcal{A} monogram. The dealer that sold the coin, Classical Numismatic Group, listed it as a genuine Demetrius-issued \mathcal{A} specimen.¹⁸¹ It is in fact an example of an imitation. At first glance the coin sets off warning signals that it did not emerge from an official royal mint. In the same vein as the instincts of Osmund Bopearachchi, it is noticeably crude and “grossièrement frappée.”¹⁸² More specifically, the imagery contains broad outlines rather than finely shaded details, especially noticeable on Heracles' body and the elephant ear. Further, although it matches the size and weight of a genuine Demetrius tetradrachm, the flan has an unusual beveled edge. An especially significant factor is that there is an error in the legend. The final Sigma is missing from Βασιλεως. While the lower right section of the reverse is worn

¹⁸¹ Details of the coin and its sale are available on CNG's online database of sold items, at <http://www.cngcoins.com/Coin.aspx?CoinID=116841>. It was bought for \$825.

¹⁸² Bopearachchi used this phrase to describe a different Demetrius tetradrachm, but it is applicable here also. *Monnaies gréco-bactriennes*, 165.

away, it is not likely that the Sigma is also simply worn away, as the letters are rather close together and not even a beginning edge of a Sigma is visible after the Omega. This is notable because no other tetradrachm, among all 155 in my sample, has a spelling error. Legends were well controlled. Another irregular feature on this coin is the control mark. A close look shows that it is not carved as \mathfrak{A} . A second loop is visible on the right side of the A, making the monogram an A-B combination rather than A-P. This second loop is slight and almost invisible, suggesting that the imitator attempted to copy the \mathfrak{A} control mark, but made an error. Even if the maker intended to carve the A-B shape, it still suggests imitation, as no such monogram appears on any other Demetrius coins, or even any other Bactro-Indo-Greek coins.¹⁸³

One would expect the reverse image to conform to the reverses on the \mathfrak{A} dies, as it seems the engraver attempted to copy that control mark. Yet, the imitator did not do so. The \mathfrak{A} reverses depict a Heracles that is somewhat short and finely detailed. The reverse of C73, by contrast, shows a tall, thin body, without fine lines; the musculature is oddly shaped in some places, such as the chest and the knees. The eyes also seem too large and low for a realistic face. The letters carved by Artist X are small and thin, while these are large and thick. One may seek to attribute some of the style differences to wear, but it is clear that much of the imagery, especially the king's face, the trunk wrinkles, and the text, are sharp and intact.

The unique artistic style and the errors are sufficient to declare coin C73 a probable imitation, yet there is even more evidence. The obverse image also contains features that suggest the engraver based his design on the work of another artist. The portrait resembles the obverses of the \mathfrak{A} series, with a thick elephant trunk, a tulip-shaped elephant ear, and a similarly-shaped face

¹⁸³ Bopearachchi, *Monnaies gréco-bactriennes*, 450-451. Many of the unusual, nameless, Alexander coins known as the “elephant medallions” carry an A-B control mark, although there is no evidence that they are related to Bactria. See Frank Holt, *Alexander the Great and the Mystery of the Elephant Medallions* (Berkeley: University of California Press, 2003), 144-146.

on the king, with a prominent brow, a nasolabial fold, and a wide cheek. Therefore, whoever made this obverse was apparently using a die or coin from Demetrius' A series as a model.

There are six other A tetradrachms in my sample, and all of them carry the work of Artist X. There is no reason to think that Artist X would make a series of consistent, finely detailed dies, and then use a die from the small, auxiliary A operation as a model. It is also not convincing that the A segment had a second artist that was unable to carve the control mark correctly, and even if there was, it is also not logical that he would use another group's die as a model. Artist X's dies would have been readily available. It is therefore almost certain that C73 is not a genuine coin of the A production stream.

It is worth exploring the possible ways in which a die engraver imitated a Demetrius type. The person engraving the dies for this imitation coin was probably not looking at another coin, because it is not likely that he would have possessed a coin with a A obverse and A reverse. If there was such a genuine coin, and the dearth of extant coins allows for that possibility, it is curious how it came about. Instead, the imitator was probably copying from two dies that were no longer in use, one from A mint-branch and one from A mint-branch. Why would the imitator have two dies from two different production lines? Either the imitators took over both minting locations during conquest or occupation, and the dies became mixed in a single loot haul, or the dies were placed in a single storage space after decommissioning. Frank Holt pointed out that old dies, if not destroyed, were sometimes stored in temples.¹⁸⁴ If the dies of two temporary mint operations were stored, it affirms the idea that they were indeed temporary, as they might have been needed again and thus were not destroyed. Moreover, if they were stored together, it suggests that the mint-branches were proximal, or even mobile, with one temple being the convenient storage choice. As

¹⁸⁴ Holt, *Lost World*, 165.

the imitator used Demetrius dies rather than coins as a model, it suggests interaction via military activity rather than simple trade or travel.

The final control mark that appears on tetradrachms of Demetrius is NK . This mark has the smallest sample size of all, with only three coins.¹⁸⁵ Two of the obverses, while not die-linked, share a design style and were made by the same artist.¹⁸⁶ With the wide cheek, small mouth, and telltale ‘drooping tulip’ elephant ear, one can quickly and easily identify this engraver as Artist Z2 of the ⚡ and ⚡ series.¹⁸⁷ As discussed above, it was possible for an engraver to work for more than one production group, though probably not at the same time. Yet there is reason to believe



Figure 13: This obverse clearly shows a die of Artist Z2.

that Z2 did not physically attend the NK operation. The key is in the reverses. The same artist carved all three of the NK reverses, and in fact, two of them are die-linked.¹⁸⁸ The reverses were *not*, however, carved by Artist Z2. The characteristics of

the NK reverses are that Heracles’ head is positioned well above the beginning of the legend, the oblique muscles are more defined than on Z2 reverses, the lionskin is somewhat wider and shorter, and the lettering is considerably different. The word Βασιλεως is not symmetrical with the name Δημητριου. The standard for Demetrius reverses is that the two words, regardless of the differing letter count, are spaced out such that they appear to be the same length. Moreover, on the NK reverses, the letters of both words are extremely close together and touch at most points. If Artist Z2 did not engrave the reverse dies for this segment, then perhaps he was not there. Instead, the main mint could have sent out a few of his obverse dies for use in another location.

¹⁸⁵ These three coins are P4; C76; and C77.

¹⁸⁶ See coins P4 and C77.

¹⁸⁷ Compare C77 and P4 with Z2 obverses, such as C60; C61; and C63.

¹⁸⁸ See reverses C76 and C77.

There is one more artist, who must have engraved the \aleph reverses and the third obverse on coin C76. His is clearly not the work of anyone previously examined. The portrait shows an average middle-aged face.¹⁸⁹ The king's eye is larger than that on other types, and the brow and under-eye line form a wide triangle. The nose is long; the nasolabial line is vertical and long; indeed, the entire face is long. The frown is so deeply cut that the mouth appears open. The king's cloak-collar is angled much more steeply than other types. The elephant ear copies the three-lobed tulip style, but lacks definite form. The trunk is short and very thick, with very wide wrinkles. The tusk is also short. The king's hair occurs in two rows of short curls. The diadem on this piece is strange. It appears to contain three ribbons rather than two. A narrow upper ribbon points up and left as usual. There is a wide lower ribbon hanging straight down; then, there is a third, narrow, lower strip behind the main lower ribbon, that reaches the king's neck. All other tetradrachm types show only two ribbons, and they are certainly part of the standard design. A real diadem ribbon, when tied, would also naturally have two ends. Artist Ω made a mistake here. The third ribbon is narrow like the upper one, and thus maybe was carved first, but since it touches the neck instead of hanging straight, the artist corrected it by adding the wide, straight lower ribbon.

The use of external dies ($Z2$'s) for this control mark provides important information about the \aleph minting operation. Someone hired Artist Ω to make obverse and reverse dies. Perhaps a supervisor or mint official considered him mildly unskilled—his reverse legends are untidy, for example—and to ensure quality standards someone delivered several obverse dies made by the experienced, skilled $Z2$. This scenario would also indicate that the portrait was more important to the government than the text or the deity. Alternatively, the \aleph production stream could have been set up so suddenly and urgently, that one artist could not handle the workload, and rather

¹⁸⁹ See coin C76.

than waste time finding or training new engravers, officials supplied a batch of extra Z2 obverse dies. We do not know which scenario is more realistic, but either one would be an example of the administration taking steps to improve the efficiency of the minting system.

It is evident that the \aleph group, like the previous two small-batch mints, represents an auxiliary operation. The small size of this production line is without question. Two of the reverses are die-linked, and in a random sample of only three coins, the chance of finding two coins made with the same reverse die is extremely low. This was most likely a temporary, peripheral or mobile mint used to accommodate a sudden deployment of soldiers for expansion or defense. While it does not demonstrate a high level of investment on the part of the king, it does display efficiency and resourcefulness combined with a strong concern for maintaining standards, especially in the portrait. It reveals that even in a wartime emergency, government officials still ensured that the coins that would fund the military conformed in royal likeness and overall design to the standard tetradrachms. Such a concern is evidence of centralized power.

Something was certainly special about Artist Z2. He produced silver tetradrachm dies under the \uparrow control mark. Within the \oplus mint-branch he was definitely productive.¹⁹⁰ Officials chose his die for the auxiliary \aleph minting operation. Even the conquerors' artist who made the \mathcal{A} mark imitation followed Z2's aesthetic. The salience of this one artist indicates something about King Demetrius' administrative investment. Initially, one might conclude that the king avoided investing in his minting program—that he made do with only a handful of artists, and encouraged the use of old dies instead of paying to train new artists. The contrary argument is stronger though—that the government was greatly invested in coin design, and took an interest in quality and kingdom-wide standardization. The evidence shows that artists were trained, whether by using

¹⁹⁰ The sample of 48 contains 18 of his obverse dies.

models or working with their predecessors. All of Demetrius' artists were also skilled enough to create detailed and evolving likenesses of their king, and to spell the legends correctly. Artists Z2 and X were experienced and reliable. Placing them in several minting operations enforced consistency over time. Artist X was, of course, the most prolific, with 39 dies under two control marks within the sample. He most likely began his career at an auxiliary mint, and then transferred to the main mint as the primary artist when the \mathbb{P} production line was inherited from Euthydemus.

Conclusions about Tetradrachm Design

The three samples with control marks \mathbb{A} , \mathbb{R} , and \mathbb{NK} , are unfortunately very limited in the quantity of their specimens. The small sample sizes, however, also speak to the organization of Demetrius' minting administration. There are fewer of these coins in public and private collections, because the king's bureaucracy produced fewer of them. They represent three minor minting operations that the king initiated midway through his reign, just before or immediately after his father died and left him with sole rule. This chronology is apparent both by the middle-aged features on the king's portraits and the connections to Artists Z2 and X. The limited production of these coins and the low number of dies indicate that these operations were temporary. Thus, they must have been initiated to support a sudden need, such as war, rather than gradual, long-term population increase. There is no evidence for the location of these auxiliary facilities. They could have been attached to the main mint, or they could have been individual mints in peripheral locations. Operation \mathbb{A} was likely central, as it was also the primary bronze group. The other two could have been peripheral. If the \mathbb{NK} auxiliary mint was attached to a main mint, a primary artist from the main mint could have trained Artist Ω , or even worked there

himself. Further, Artist Ω would have had access to numerous main-mint dies for models, which he clearly did not use. It is highly probable that the $\mathbb{N}\kappa$ auxiliary mint was located in the periphery. A need for wartime production would support that conclusion, as expansion or borderland fighting would have taken place in the periphery, and the newly minted coins would have needed to be readily available. The temporary operation may even have been mobile. In the case of the auxiliary operations, $\mathbb{N}\kappa$ and \mathbb{A} , the monograms can be said to represent not only design teams, but entire mints.

The presence of the three auxiliary mints, combined with information about the structure of the large-scale operations, creates a clear picture of Demetrius' tetradrachm minting program. Firstly, Demetrius minted an abundance of tetradrachms. They are his largest denomination and they constitute the majority of his extant coinage. Out of a total of 277 silver coins under examination, 155 (56%) are tetradrachms. Thus, his government had access to plenty of silver resources, and allocated a substantial proportion of them to military expenses. While a young co-ruler with his father Euthydemus, Demetrius operated one large-scale minting operation. These coins bore the \oplus control mark to distinguish them from his father's operations. The evidence does not indicate whether his mint was located in his father's capital city, or in a major stronghold in his own territory. If the provenance of the extant die is indeed Ai Khanoum, it means that Demetrius' main mint, and perhaps his capital city, was located in northern Bactria. This would indicate that he likely co-ruled from his father's capital rather than a separate city. Sometime in the middle of his reign, while still a co-ruler, Demetrius initiated two peripheral auxiliary mints under the signs of \mathbb{A} , and $\mathbb{N}\kappa$. He was the first king to use these marks, suggesting that he had to

distinguish his operations from his father's.¹⁹¹ Moreover, Artist X designed coins for \mathcal{A} operation before working in the \mathcal{R} group, thus validating the above chronology. This was likely a time of expansion, or defense against rebels or invaders in his assigned territory, a part of India.

When Demetrius became sole ruler after Euthydemus, he ceased production of the \mathcal{A} line, and initiated production of the \mathcal{R} line, a control mark his father had used. It is not clear if Demetrius moved his main mint in the transition from \mathcal{A} to \mathcal{R} from his own base of co-rule to his father's central capital. These mint operations were, however, serial, not simultaneous, and thus he did not require separate, large mints for each region of his empire.¹⁹² His constituent population must have increased somewhat, though, after his father's death and if his wars were successful. At one point, the government increased production by dividing his primary mint into two departments, each with its own die-cutting team and striking area. The new department identified itself by the \mathcal{R} control mark. When the new department was first established, there was an experiment with a bead-and-reel border on coins. At the beginning of his sole rule, or during the transition, Demetrius also established his third auxiliary mint, with the \mathcal{A} control mark. This mark was used by his father Euthydemus,¹⁹³ and thus following the same logic as above, Demetrius would have waited until his father was gone before adopting this mark as his own. The mint officials moved Artist Z2 from the original central group, to this new auxiliary group. Because this set shows signs of being temporary, although it also became a long-term bronze coining group.

When arranged in such stark minting phases, Demetrius' overall coin production may seem small and localized. One may expect a powerful Hellenistic ruler to have many large mints

¹⁹¹ Bopearachchi, *Monnaies gréco-bactriennes*, 391, 396.

¹⁹² This contrasts with the Seleucid Antiochus I. As a co-ruler with his father, he set up mints in his own regions of responsibility (Bactra and Ai Khanoum). Later, when a sole ruler, and through the reigns of his successors, several mints remained to serve separate regions. See Aperghis, *Seleukid Royal Economy*, 214-215.

¹⁹³ Bopearachchi, *Monnaies gréco-bactriennes*, 393.

spread throughout a vast territory. For example, Demetrius' neighbor, the Seleucid emperor Antiochus III, had at least eighteen mints located throughout his territory.¹⁹⁴ Another Hellenistic king, the Attalid Eumenes II of Pergamum, initiated an increase in his number of mints, from one to three or four.¹⁹⁵ Yet, I am not measuring Demetrius' power by his number of mints, but by his level of control over them. My analysis of his tetradrachms demonstrates that he did exert a great deal of control, and that his mint officials and supervisors carried out the royal standards to an exacting degree. All of Demetrius' tetradrachms comprise one type—one obverse-reverse image pair. The images contain consistent features. Each image component, from the elephant trunk to Heracles' club, has a standard layout position. No additional "accessories" appear in the images. The greatest change was the introduction of the bead-and-reel border. Earlier kings were not so consistent—Euthydemus, for example, whose patron god was also Heracles, has tetradrachm reverses in which the god's seat and club position both change.¹⁹⁶ The Bactrian founder Diodotus I added a wreath to his coins at a specific point in his career.¹⁹⁷ Finally, silver tetradrachm reverses of the Seleucid king Antiochus I show the god Apollo, usually holding one arrow, but sometimes holding two.¹⁹⁸

The variations present in the coin designs are found only in the lines and shapes that individual engravers used in order to create the standard features. The elephant ear, one of the largest and most prominent of the component images, shows the most variation in shape. The body of Heracles, although a large component, shows the least variation. Perhaps this version of Heracles was commonly propagated, and thus standardized, within the kingdom. The bronze

¹⁹⁴ Houghton and Lorber, *Seleucid Coins*, 363-365. They listed eighteen with confidence, but an additional thirteen locations are listed as uncertain, possible mints.

¹⁹⁵ Peter Thonemann, "The Attalid State," in *Attalid Asia Minor: Money, International Relations, and the State*, ed. Peter Thonemann (Oxford: Oxford University Press, 2013), 31.

¹⁹⁶ Holt pointed this out in "Euthydemid Coinage," 22. It is visible in the image plates in Bopearachchi, *Sylloge Nummorum Graecorum*, Pl. 7-8.

¹⁹⁷ Holt, *Thundering Zeus*, 97-99.

¹⁹⁸ Houghton and Lorber, *Seleucid Coins*, vol. 2, 139.

statuette from the Ai Khanoum temple, for example, presents Heracles in an identical position to that of the coins, except the statuette lacks a lionskin.¹⁹⁹ Although individual components vary by artist, overall styles tend to cluster according to design teams, as represented by their control marks. Whether artists worked as part of a large mint, a mint segment, or a small auxiliary mint, the evidence shows that they worked towards conformity. This could be the result of strict supervision, or artist apprenticeship. While some personal flair was permissible, Demetrius or his mint officials strove to ensure that coins from certain production streams tended to look the same. While the  group has the most variation, it appears to be variation over time, and not a matter of artist incompetence. The style changes for that segment mostly reflect the gradual aging of the king, via the shape of his facial features. This only provides further support for royal control over mints, as the government was instigating change according to the king's actual looks. It shows that the artists were not making personal choices regarding the royal portrait, but were required to create realistic, time-sensitive likenesses.

The tetradrachms of Demetrius as a body demonstrate that the king's administration engaged in policy to ensure that the royal portrait, divine imagery, name, and title entered the population through the medium of coinage in a carefully controlled, deliberately designed, and standardized way, in both the central and peripheral territories. Therefore, Demetrius had the will, the resources, and the power to implement this assertion policy.

¹⁹⁹ Bernard, "The Greek Colony at Ai Khanum," 113.

Chapter 3: Administrative Structure - Drachms and Obols

I explained in Chapter 1 that while tetradrachms survive to the modern day in greater quantities than lower denominations, King Demetrius' mints also *produced* denominations in varying quantities. Drachms, in particular, were produced in low numbers. It follows that drachms, from the palace's perspective, were not as essential to the economy as tetradrachms, and therefore they did not need to invest much in their production. To continue, then, in the measurement of royal power through coin manufacture, it will be crucial to ascertain how much administrative control Demetrius exerted over the design and quality of these differently-purposed units of currency. Demetrius' government minted obols in large quantities; they held a very low value and are small in size. They changed hands frequently. When it came to obol production, one may question why a royal government would exert any interest in a daily-use coin beyond providing it with legal status. The government could have entrusted the lowest-order mint workers with a simple obol design. If drachms and obols exhibit a level of standardization and accuracy comparable to that of tetradrachms, it will support the argument that Demetrius had the power and will to engage in direct rule—to become involved in and control the lower levels of society and economy. It will also demonstrate that his kingdom was centrally organized, with very little independence along the social or geographical periphery.

The Drachms

My full sample of Demetrius drachms contains fifteen coins, comprising 5% of the 277-coin silver sample.²⁰⁰ Two of the control marks from the tetradrachm-producing streams are represented among drachms:  and . There are five specimens of the first, and four of the second. Of the six remaining drachms, one has the double control mark  and two have a difficult to define mark that appears roughly as . Three have obliterated, unreadable marks. Drachms with the control mark  are conspicuously absent from this sample, though the symbol is prevalent on tetradrachms and, as will be shown, obols and bronze coins. The possibility always lurks that specimens with this monogram have simply not turned up in modern collections and excavations. One must nevertheless strive to make tentative conclusions about the coins that are extant, and what an absence might reveal.

The previous evidence of the tetradrachms illustrated that Demetrius ran a coin-making operation under the  mark during the early part of his reign, while he was probably a co-ruler with his father and busy securing territory in India. To understand what kinds of coins Demetrius was minting at that time, it will be useful to understand how co-rulership worked and what his subjects' obligations to him were. In Bactria's closest Hellenistic neighbor, the Seleucid Empire, Antiochus I set a precedent for co-rulership by reigning alongside his father, Seleucus I, for ten years.²⁰¹ Antiochus I was responsible for several "Eastern territories," including Bactria, which was under Seleucid control at that time. According to G.G. Aperghis, as a co-ruler, Antiochus behaved basically as a sole king in his own region. He founded cities, built mints and temples, and contracted treaties.²⁰² He also issued coins bearing his name, but not his portrait.²⁰³ Princely co-

²⁰⁰ They are A4; B7; B8; BI2; BI3; C78; C79; C80; C81; D2; K6; M4; P6; and W9.

²⁰¹ Aperghis, *Seleucid Royal Economy*, 20. According to Houghton and Lorber, he was co-ruler for thirteen years; see *Seleucid Coins*, vol. 1, 111.

²⁰² *Ibid.*, 20, 214, 293-294.

rulership was also common among the Ptolemies of Egypt, with fathers giving their heirs territories to govern and wars to fight.²⁰⁴ If Bactrian kingship was in any way analogous to that of the Seleucids or Ptolemies, Demetrius as a young co-ruler would have controlled his own troops, and thus, logically, he would have paid them in his own tetradrachms. Tetradrachms were too high in value for daily spending, however, and so, according to Aperghis, Hellenistic soldiers had to exchange them for smaller silvers and bronze units before making purchases in the marketplace.²⁰⁵ Kings had an interest in paying out coins that declared their own rule, but when the royal had to pay their taxes back, it mattered less which king was portrayed on them.²⁰⁶ Demetrius, as a co-ruler with the right to mint coins, would certainly have paid his soldiers in his own tetradrachms, but when those soldiers in turn spent smaller denominations on their purchases, and then people paid their taxes back, his father's coinage would have been equally acceptable.²⁰⁷ If young Demetrius was a co-ruler, creating the denomination needed to pay his soldiers would have been more important than creating a diversity of denominations for public use. This may explain why there are no extant drachms with the  control mark, which represents his earliest phase. On the other hand, there is a strong presence of the  mark on obols and bronzes. Thus while Demetrius was active in bringing his political status to the public from the beginning, but also did not overproduce, by making every possible denomination.

The first thing to note about the drachms is that they maintain the same type and design features as those present on all of the king's tetradrachms. The obverse shows a portrait of

²⁰³ Houghton and Lorber, *Seleucid Coins*, vol. 1, 114. The authors attribute a series of Alexander obverse/Antiochus reverses to the co-regency, although they concede that there is still much uncertainty regarding their place in the coin chronology.

²⁰⁴ Daniel Ogden, *Polygamy, Prostitutes and Death: The Hellenistic Dynasties* (Swansea: The Classical Press of Wales, 1999), 70, 86.

²⁰⁵ Aperghis, *Seleucid Royal Economy*, 220-221.

²⁰⁶ *Ibid.*, 221.

²⁰⁷ Coins from other dynasties most likely circulated openly as well, and it was up to the king to flood the market with his own face by minting new coins or counterstriking old ones. See Aperghis, *Seleucid Royal Economy*, 221.

Demetrius with diadem and elephant scalp; the reverse shows nude Heracles, standing, crowning himself, and carrying a club and lion skin. I begin my analysis of drachms with the NK control mark, representing an auxiliary mint. The four drachms with the NK control mark are C80, C81, D2, and P6. Tetradrachms from this stream carried the work of two die engravers: Artist Z2, whose dies were sent to this auxiliary mint from the central mint, and another, Artist Ω , with his long-faced portrait.²⁰⁸ The drachms, by contrast, depict a youthful king, reminiscent of the earliest few ϕ dies—the face is small under a relatively large elephant scalp, the jawline is high and defined, the mouth is small and tight, the brow is angled above a wide eye, and the hair is made up of small curls. The drachms also have their own unique features, including an eye that is set far back in the king’s face, a high-curving nostril, a nose that projects well beyond the mouth, a thin, forwardly placed elephant trunk, and an elephant ear that is made up of three thick lines, resembling a chicken’s foot. A close inspection of these drachms reveals the engraving hand of Artist Ω .²⁰⁹ Although there are substantial differences between the Artist Ω tetradrachms and drachms, including the age of the king, the elephant ear, and the king’s mouth, a number of subtle details give away his work. The king’s eye, for instance, shows a curved, angled brow. The nose, though longer on the tetradrachms, displays the same straight bridge and rising nostril. Both include a nasolabial line and a withdrawn chin. Both show hair in two rows of curls. The elephant’s trunk, on both drachms and tetradrachms, is placed overly forward and somewhat awkwardly. Since the portrait on the drachm is small and proportional, and the tetradrachm portrait has a strangely “long” face, it appears that the artist was unsure about making a larger portrait for the larger flan, and the resulting face is mildly distorted. The artist also attempted a more realistic ear

²⁰⁸ Again, the three tetradrachms of this monogram are P4; C76; and C77.

²⁰⁹ Compare drachm C81 with tetradrachm C76, for example.

for the tetradrachm—perhaps someone higher in the chain of command, such as a supervisor, criticized the chicken foot-style of the drachm.



Figure 14: The drachm, C81 (left) and the tetradrachm, C76, despite differences in style, show the work of one engraver, Artist Omega.

The work of Artist Ω is also visible in the drachm reverses. The letters on the drachms, like the tetradrachms, are large and close together, with especially large Σ 's, E's, and M's. The body of Heracles is also similar to the tetradrachms, in that the muscles are over-accentuated and sloppy, and the lionskin has many rib-lines on its back. On all four drachms, however, Heracles and the lionskin show a number of irregularities and mistakes. The untidiness of the reverses, and the inconsistency between the drachm and tetradrachm obverses, further supports the notion that Artist Ω was not experienced, and that his employment was due to mint necessity rather than his skill. This also explains why the mint used obverse tetradrachm dies from the experienced main mint engraver, Artist Z2.

Because the drachms depict a youthful portrait of Demetrius, one may jump to the conclusion that the mint produced them early in the king's reign. It has already been established, however, that $\aleph\kappa$ represented a temporary mint. Further, it is an illogical deduction that an auxiliary mint was making only drachms at an early period and then only tetradrachms at a later period, especially if the mint was set up for military purposes. As this was a temporary and maybe even mobile mint, then it is probable that it produced drachms and tetradrachms at the same time. This operation was not early in Demetrius' reign, as the use of Z2's "middle-aged" portrait dies

provides it with a terminus post quem—the mint could not use Z2 dies until after he designed and engraved a series of them. A more probable explanation is that Artist Ω used an early coin or die as a model for his drachms, or else he did not receive proper instruction for the drachm designs and he chose to make the portrait youthful. This also means that the artist did not interact with any of the primary engravers. Such a conclusion further confirms the peripheral nature of the ΝΚ operation, as the government allowed these new drachms, without consistency in likeness, to enter circulation. Importantly, this is the first time that we observe Demetrius’ administration lacking interest in, or power over, the standards of a minting operation.

As for the individual ΝΚ drachms themselves, they are not obverse-die linked, but are so similar as to suggest they were engraved in quick succession. Two are especially similar. Coins C81 and D2 both have a relatively short Heracles surrounded by proportionally larger words. The Δ in the king’s name lies even with Heracles’ face. The lionskins are also similar. On C81, it is so short as to have almost no body, and what little body there is forms a mashed blob. Coin D2 also has a

very short, but neater lionskin. The other two reverses, C80 and P6, share a style with smaller words and a tall Heracles. On these, the Δ meets the god’s elbow, with the head reaching higher. Their lion skins are long and ribbed. On all the reverses, the club lies even with the base of the Β, which must have been



Figure 15: The Ν drachm reverses, such as C80, reveal that the designs were not sized for their flans. Also see blotted monogram.

a guide point for the engraver.

Interestingly, there are a variety of elements that reveal an overall carelessness in the quality control of the drachms. Firstly, on three specimens, the reverse images, especially the words, are too large for their flans. On D2, the final Σ in ΒΑΣΙΛΕΩΣ and the final Υ in ΔΗΜΗΤΡΙΟΥ are

cut off. On C80 the fronts of the Β and Δ are cut off, as is the top of the god's head. Normally this would simply be an issue with alignment while striking, but on these coins, while some letters are beyond the edge, the other ends of the words reach the opposite edge. The image and words on P6 fit the flan, but just barely. The god's head-wreath meets the upper flan edge, while on the lower edge, the IOY at the end of the name is shrunken and squeezed. On C81, the ends of the words were cut off while striking, but regardless of position, the words and image are clearly quite large. In general, the artist certainly had difficulty sizing all of the components for the small drachm flans. As it turns out, text-fitting is a common problem among drachms of other Bactro-Indo-Greek kings as well, including Diodotus II, Euthydemus I, Agathocles, and Antimachus.²¹⁰ As the text-squeezing does not occur as frequently on tetradrachms or obols, the problem must stem from the general rarity of drachms. If few drachms were produced, then the workers must not have been used to its unusual flan size, and simply did not have a lot of practice in correctly fitting the design.

Also present in the drachms are two occurrences of letter deformity; they are not spelling errors per se, and do not indicate imitation,²¹¹ but simply show careless, unpracticed work. In the king's name on D2, the M is shaped somewhat like an H. Rather than the connector forming a small "v," it is a straight horizontal line, at a higher level than the bars on the adjacent Etas. On coin C81, the P and I are deformed. On many of Demetrius' coins, the two are close together, and the Rho-loop is often tiny, but in this case, the Rho-loop actually extends into a thick connector with the I, making the pair "PI" actually appear as "M." Another mistake in a die occurs on the

²¹⁰ See Bopearachchi, *Sylloge Nummorum Graecorum*, Pl. 6, nos. 92, 93; Pl. 7, no. 121, Pl. 8, no. 144; Pl. 13, no. 233, Pl. 15, nos. 280, 282. Interestingly, the text-fitting problem does not occur on square, Indian-standard bilingual coins. Eucratides seems to have eliminated the problem as his Attic-standard silvers contain a horizontal, rather than vertical, legend, and then switch to an arched upper legend with a horizontal lower legend. Eucratides II completed the transition on his Attic-standard silvers, by having the full legend curve around the obverse edges. The Indian coins of Eucratides and others have legends that generally follow the shape of the coin, whether curved or square.

²¹¹ On an imitated coin, one would expect clear misspellings or letter omission, indicating that the imitator was not literate in Greek. In this case, there are not misspellings, but the letters are shaped incorrectly. This may also indicate an unfamiliarity with Greek, but the presence of several drachms with consistency in artistic features and style shows that these are part of a genuine Demetrius operation.

reverse of C80. On all four coins, the NK monogram lines up with “PIO” on the left and Heracles’ calf on the right. On C80, a monogram was carved lower and was then blotted out. The correct monogram then appears higher up. It seems strange that a monogram would be blotted out simply for being a little low on the flan, especially as its position is still perfectly visible, and the blotted blob is unsightly and distracting. While erasing this mark, the die cutter could have made cuts of any shape, yet the shape of the resulting blob does not appear to relate to NK . It is possible that the mark was not only in the wrong position, but may have been the wrong mark altogether. If the latter is true, it shows extreme inexperience on the part of the die artist, as he was not even conditioned to his control mark. These mistakes mean that the mint used NK dies even if they were not perfect or aesthetically pleasing. There was not the time or interest to make a lot of new dies. Equally, the striking was not as careful. Even if the words and images were large, it does not appear that the strikers attempted to line them up and fit them as closely as possible. This suggests unfamiliarity with drachm size on the part of the strikers as well, and also adds to the sense of hurry within this operation.

In summary, the drachms of the NK peripheral mint show the least amount of investment, concern, and control by Demetrius, relative to his tetradrachms. As stated previously, this was a temporary, auxiliary operation, most likely established for military support. With that in mind, one can expect that the king would permit more laxity than he did for his main, permanent mint. The tetradrachms of the NK auxiliary mint are not as sloppy as the drachms. Although obverse dies from the main mint were brought in, Artist Ω ’s tetradrachms are error-free. This demonstrates that even at an auxiliary mint, it was easier, and more worthwhile, to control tetradrachms than drachms. The above tetradrachm study unveils a king who had the means and willpower to standardize and ensure quality in his coins—those vital carriers of his policy. The lesser control

over the auxiliary drachms, on the contrary, points to greater complexity in how Demetrius allocated his power. Tetradrachms were more important to his government than drachms. A continued examination of the smaller denominations will further illuminate this complexity.

The main minting operation, represented in part by the \mathbb{P} control mark, came later in Demetrius' life, replacing his  production stream. The \mathbb{P} control mark appears on five drachms in the sample.²¹² In my analysis of tetradrachms I established that a primary engraver labelled Artist X designed the \mathbb{P} coins. The breakaway design team, under Artist Y, used the \mathbb{P} control mark.

Three of the drachms, B7, C5, and C79, are very close in design. They clearly contain design features that conform to the X style. The elephant ear is triangular, the elephant head is smooth, the king has a long nose, heavy cheek, and frowning mouth, and Heracles is thin. The reverses of all three appear to be die-linked. Even without die-linkage, though, the obverses and reverses of all three are so similar that they must have been made very near in time. The lettering on their reverses, with its short Chi-shaped H's, stands out, and confirms another significant point. The same hand that engraved the dies for these three drachms engraved the X tetradrachm dies. The reverses of the other two drachms, C78 and K6, show H's that are only slightly curved, but nevertheless conform to the same overall lettering style, including the wide Σ 's and the low-reaching M-connector. These features, combined with the portrait features on all five drachm obverses, indicates that the drachm dies are indeed the work Artist X. Under the \mathbb{P} control mark, he was simultaneously producing dies for tetradrachms and drachms.

One of the \mathbb{P} drachms, C78, carries the standard Artist X features, but also a few other features that are normally found among the Y coins. First, the control mark seems to in fact be \mathbb{P} ,

²¹² See coins B7; C5; C78; C79; and K6.

but it is unfortunately not clear enough to say absolutely. Secondly, there is a bead-and-reel border on the obverse. Thirdly, Heracles is somewhat broad-shouldered, especially noticeable on the neck. If the monogram is in fact \mathbb{R} , then it is possible that Artist Y or Y-Assistant could have helped the \mathbb{R} department with an extra reverse, keeping his own style for the image of Heracles. If the control mark is \mathbb{R} , then it is a simple case of mismatch—an X obverse with a Y reverse. As the obverse clearly bears an X design, then the bead-and-reel border must have been intentional. Perhaps the mint officials were pleased with the bead-and-reel designs on the Y coins, and ordered the X group to make some, on drachms only though.

Drachm C78 contains another anomaly as well; its lower diadem ribbon does not hang downward, but points to the left behind the upper, curved ribbon. The only other artist so far to have designed a raised lower diadem ribbon is Artist Z1 of the \oplus team. Beyond that, Artist Z1's design has very little in common with X and Y's.²¹³ The diadem ribbons of the former are separate and distinct, and both follow the same curve, unlike the drachm's lower ribbon, which is hidden and undefined. The small lower ribbon on the \mathbb{R} drachm must simply be an aberration, which further confirms the notion that a degree of laxity existed in drachm production that is not observable among tetradrachms.

The image of drachm K6 is not very clear, but its control mark is definitely \mathbb{R} . It carries the features of an Artist X in the obverse portrait and reverse legend—the image of Heracles is quite worn and difficult to assess. Drachm K6 is also not ordinary, however. Just like the above drachm, C78, the obverse border is a bead-and-reel. Only five drachms with a \mathbb{R} control mark is already an very small set. As three of their reverses may be die-linked, the odds are that this coinage issue was

²¹³ Compare drachm C78 with tetradrachms H17 and H18.

also extremely limited. For a bead-and-reel border to appear on two of these five cannot be a mere coincidence. None of the X tetradrachms have that kind of border, so the mint officials must have decided to experiment with it on drachms only. Of course they also tried it on a number of Y tetradrachms. Maybe they actually ordered the border for drachms first, as they were a less important denomination. The bead-and-reels also could have come out on X drachms and Y tetradrachms around the same time—perhaps it was Artist Y’s idea. Either way, the new border never made it the X tetradrachms, which lasted longer than the Y’s. I do not think it was rejected due to looks, but probably because the bead-and-reel would have required more time and effort to engrave than the simple bead.

The drachms of the auxiliary mint and those of the main mint have one significant point in common. In both minting operations, the primary artists who engraved tetradrachm dies also made drachm dies. The benefit of using the same artists for drachms and tetradrachms ensured consistency in design. At least, it was probably *supposed to* ensure consistency. The drachms actually do have a few mistakes—the erased control mark on the \aleph drachm, and the aberrant diadem ribbon on the ρ specimen. The auxiliary \aleph mint had more of an excuse to permit mistakes. Since an auxiliary mint was already small and short-lived, there would have been no logic to hiring a separate artist for drachms. Its lone artist was probably hired suddenly, and for the purpose of a temporary job. His untidy lettering and sizing difficulties were acceptable for drachms, but for the king’s dominant currency—the soldier-paying tetradrachm—he had to produce better engravings. If he struggled, the extra Z2 tetradrachm dies from the main mint were a simple solution.

Three of the Demetrius drachms have control marks that do not appear on any other Demetrius coins, neither tetradrachms, nor obols, nor bronzes. One is a double control mark,

☒☉, and occurs on coin B8. The other, on A4 and W9, is difficult to read, but is interpretable as ☒ⁿ, or something very close to it. There are several possible ways to explain control marks that do not appear on any other Demetrius coins. One possibility is the existence of a mint-branch, separate from the other mint-branches, that only produced drachms, perhaps as an overflow operation. Secondly, the king may have ordered the opening of a peripheral, auxiliary mint that only made drachms—there may have been a location that needed drachms more than any other denomination. Thirdly, the unique monograms may indicate imitation coins, rather than genuine Demetrius coins.

The drachm with the double control mark, ☒☉, shows signs of being a foreign imitation. The portrait on this drachm shows a very youthful, thin face, and a square-shaped elephant ear. It does not noticeably resemble the style of either the ☒ drachms or the ☒ⁿs. If it is based on a model, it does not seem to have been copied very carefully. Both the obverse and reverse images contain deformed features. Unlike the standard Demetrius portraits, the elephant scalp on this coin is tilted sharply upward and rests far back and low on the king's head. The elephant ear has an unnaturally straight bottom edge and an eye placed directly behind the base of the tusk. The king's portrait has only a small section of hair, no ear, a hidden neck, and an ultra-sharp chin. The engraver also cut a mistake at the upper curve of the elephant's trunk. The reverse of the drachm reveals more signs of imitation. The body of Heracles is not a smooth, detailed figure, but is made up of overly defined muscles, with deeply-cut edges. The lion skin has no tail or legs, and is made up of a swath of scale-like dots. The god's club-holding arm has no forearm or hand. The head has an extremely large nose, with no room for eyes. The legend does not contain mistakes, but it is sloppily done, similar to the ☒ⁿ drachm legends. It is too large for the flan, and disproportionate

to the image. The loop on the P is a drooping oval instead of circular, and the O is as large as the other letters—usually it is much smaller.

The most significant aberration on B8 is the double monogram. The left-hand mark is very large, and it gets in the way of the legend and image. The right-hand monogram is small, thin-lined and unclear, not thick and bold like the left-hand one. It is an afterthought that was squeezed onto the die. Besides the imagery, the metal of the coin is also suspect. Sometimes ancient coins, after millennia of burial in certain chemical conditions, take on various hues, known as patinas. On the drachm, however, there is not an overall coloration, but small, rough patches of brown, especially on the sections with the highest relief, where the coin would have eroded fastest. This suggests that the coin may be a *fouillée*, a bronze coin plated with silver in order to overvalue it.²¹⁴ Finally, the coin is low in weight. The standard weight for Hellenistic drachms for this period was 4.2 grams. Extant coins are usually lower than this figure due to erosion from both handling and natural forces. Thus, the average weight of the 15 drachms in the sample is 3.78 grams, and the median is 3.83 grams. The suspect drachm weighs only 3.57 grams, below the average, and well below the standard. I will discuss the weights of all of Demetrius' coins in Chapter 5. All of the above factors contribute to classifying drachm B8 as an imitation.

The two drachms with the  mark, A4 and W9, are not so obviously imitations, and thus may represent a small design group heretofore unseen. Just as a number of previously discussed tetradrachm obverses were inspired by  Artist Z2 designs, the  coins also copy an Artist Z2 die, in this case, one similar to that visible on coin C56. The noticeably shared features are the bell-

²¹⁴ Another example of a plated coin, not included in this study, is coin 124 in the collection of Aman Ur Rahman, published in Osmund Boppearachchi and Aman Ur Rahman, *Pre-Kushana Coins in Pakistan* (Karachi: Ifikhar Rasul IRM Associates Ltd., 1995), 90. The coin is a Demetrius-type tetradrachm from Mir Zakah hoard II. Sections of the silver surface have worn away, revealing the bronze underneath it. The control mark is  and the design corresponds to the engraving work of Artist Z1. There is no reason to think that Demetrius had a silver shortage at this time, and thus such coins are likely counterfeits. Since the counterfeiter had access to a Z1 die, it may reveal an inside job.

shaped elephant ear with a pointed bottom, the heavily lidded and lashed elephant eye, the thick elephant trunk, the king's large ear, the long straight brow, and the hair locks. The biggest difference between the drachm and the Z2 tetradrachm portrait is that the face on the former appears more youthful, but a close inspection shows that it is only the effect of the mouth and nose, which are smaller than on the tetradrachm. One could argue that this is a genuine Demetrius coin rather than an imitation, because there is no distortion of the face or carelessness in the details. I have already discussed the prevalence of Z2's dies. It would not be impossible that yet another small, temporary operation would use a Z2 die as an engraving guide.

This possibility notwithstanding, the control mark is an outlier and demands explanation. This mark, , belongs to a large family of monograms that share the H shape and include a variety of horizontal, vertical, and diagonal lines.²¹⁵ In general, monograms of this family do not appear until the reigns of later kings, including Eucratides the Great, Eucratides II, and



Figure 16: Coins A4 and W9 appear to be identical, cast-made imitations.

Menander.²¹⁶ If Demetrius in fact initiated a  mint-branch, it is strange that there are no other extant specimens showing this mark, nor is it used by his immediate successor kings. Rather, it is probable that Eucratides I or a contemporary of his developed the group of monograms, harking back to a few shapes used by Euthydemus I.²¹⁷

There is a further argument to support the classification of these drachms as imitations. The two coins, while unique within the body of coinage, are not unique in comparison to each other. They

²¹⁵ Bopearachchi, *Monnaies gréco-bactriennes*, 451. See monograms 159-196. The monogram in question is 191.

²¹⁶ *Ibid.*, 400-401.

²¹⁷ *Ibid.*, Pl. 2, coins 2, 7, and 8.

are almost exactly alike. Drachm A4 is in the Ashmolean Museum collection, and the other, W9, was sold at auction.²¹⁸ A few extremely minute differences hinder automatic die-linkage, but otherwise they are near-identical. The contours of the flan, in particular, create the same imperfect circles. There are the same rough patches in the coin fields. Further, the two coins share the same dark patina. It is clear that these coins were cast, not struck, and thus were made later. There are slight differences in the elephant ear and lettering, but that may be the result of retooling. Casting was a technique that certain other contemporary and later kingdoms used;²¹⁹ however if it is an ancient cast imitation, one would expect to find distorted features, spelling errors, etc. The faithfulness to Demetrius' imagery implies that the coins are instead modern cast forgeries. The person who created them made a mistake in choosing the monogram.

With the three previous drachms declared to be imitations, the total number of genuine Demetrius drachms in the sample decreases to twelve.

The remaining three drachms have worn, indiscernible control marks. On two of these, the mark is invisible because the coins are countermarked on the obverse.²²⁰

Perhaps because of these countermarks, or perhaps because of a perception of "crudeness" and thickness

in the image lines, the British Museum classed them as imitations.²²¹ They are worn, and BI2 carries a classic Artist X elephant ear, but otherwise they clearly lack any detail. The elephant heads on both coins are small and shapeless, without eyes or wrinkles. The portrait-noses are overly large and bulbous, and the chins overly prominent. The reverse image is positioned the

Figure 17: BI2, one of the countermarked coins.



²¹⁸ The first was available for personal viewing and handling; the second only via photograph published by CNG.

²¹⁹ Contemporary Indian kingdoms, for example, produced cast coins. See Osmund Bopearachchi and Wilfried Pieper, *Ancient Indian Coins* (Turnhout: Brepols Publishers, 1998).

²²⁰ See coins BI2 and BI3.

²²¹ I personally viewed these two coins. They were located in a section of their tray labelled "imitations."

same way on both coins—Heracles is too high on the flan and his head is cut off. On both also, the legend is large for the flan. On BI2 the B is cut off, and on BI3 the word Βασιλεως appears misspelled. The visible letters are ΣΛΕΩΣ, without an I, and the Ω appears almost as a Λ. Both coins also have an unusual marking below the lionskin. On BI2 it is a solid oval, while on the latter it is a rounded Δ shape.²²² The former also faintly shows a small solid circle next to Heracles’ right hip. There is an impression of a monogram, but it has been obliterated. With or without the countermarks, the designs on these two coins ensures their continued classification as imitations.

The countermarks on the obverses of BI2 and BI3 are not indicators of imitation, although they are interesting in themselves. Imitated coins were circulated by their own societies as legal tender; they could have transferred to other societies through trade or conquest, and a later society or ruler could have countermarked them. The most common purpose of countermarks was to convert coins that a leader did not mint into legal tender.²²³ At times they were used by private merchants and bankers to guarantee a coin’s value.²²⁴ The countermarks are especially intriguing because of their imagery. Both of them are very miniature copies of the image present on their own reverses—they show a tiny standing Heracles reaching up to his head with one hand and holding a club and lionskin in the other. Next to the images are three letters, unclear in BI3, but obvious in BI2. They are †ΑΥ or ΦΑΡ. Michael Mitchiner argued that they stand for a Persian name “Phar,” who may have been “a local dignitary who acquired increased power.”²²⁵ Mitchiner

²²² Mitchiner called this Δ the control mark, but on no other silver Demetrius coins does the mark appear on the right side of Heracles. It is always on the left. Even imitators often place it on the left. Also, there are no other Demetrius silvers with a Δ mark. Therefore, Mitchiner’s assertion that the drachms are genuine Demetrius coins is likely false. It is convenient that this mark appears on the side that is not obliterated by the countermark, but that has to be coincidence. Otherwise, it would imply that the maker knew the other side was going to be countermarked, and if the countermark was planned, engraving a whole die would be pointless. See *Indo-Greek Coinage*, 64.

²²³ Mørkholm, *Early Hellenistic Coinage*, 19-20.

²²⁴ *Ibid.*, 19.

²²⁵ *Ibid.*

does not present any other evidence for this argument, however. It is not definite that the letters, especially the third one, are even Greek. Thus, their meaning remains unknown.

The third drachm without a visible monogram, also published by Mitchiner, is from the collection of the late Adrian Hollis.²²⁶ The coin is severely worn. On the reverse, the ends of the legends, the monogram, and Heracles' feet are invisible. The visible parts are also smoothed and somewhat unclear. There is a long piece broken off of the coin, near the Δ of the name. The obverse portrait is clearer and unaffected by the break except for the tip of the tusk. Based on the elephant ear and general facial features, the portrait resembles Artist Y's \mathbb{R} tetradrachms.²²⁷ The difference is that the portrait appears more youthful, with an upward-tilted nose, narrow cheek, and small ear. The Heracles on the drachm's reverse is thin, and the lettering does not stand out. If the die does come from the \mathbb{R} team, it is the only example of a drachm that production group. It would mean that that segment minted drachms along with the \mathbb{R} branch. Unfortunately, the coin is not intact enough to reveal such a fact with any certainty. There is nothing about the coin or its imagery that is suspect though, and therefore it can be considered genuine.

As the two countermarked coins are also imitations, then the number of drachms in the sample decreases again to ten, or only 3.6% of the silver total. Why did Demetrius make so few drachms? Returning to the analogy with U.S. fifty-dollar bills, the government not only produced them in the lowest quantity, but did not even produce them every year. In a recent span of twenty years, from fiscal year 1993 through 2012, there were six years in which fifties were not printed at all. At one point they were not printed for three years in a row.²²⁸ If modern countries produce uncommon denominations only when needed, it is reasonable that ancient kingdoms also

²²⁶ Ibid., 58, Type 104-c. See coin M4.

²²⁷ Compare with tetradrachms C21; C22; and W7.

²²⁸ "Annual Production Figures," Bureau of Engraving and Printing, U.S. Department of the Treasury, accessed July 7, 2014, <http://www.moneyfactory.gov/uscurrency/annualproductionfigures.html>

produced various denominations based on need, whether state expenses or circulation supply. Assuredly, the main purpose of the massive amount of coin production in the Hellenistic period was itself based on need—the economic demands of professional militaries fluctuated with wars and expansion.²²⁹ Otto Mørkholm stated that, “the prime motivating factor regulating the volume of coinage was the rise and fall in public expenses.”²³⁰ The fluctuation in Demetrius’ drachm production does not seem to a change in his overall money production—drachms were apparently produced alongside an uninterrupted stream of tetradrachms. Drachms, therefore, must be seen as supplemental money, coined to meet temporary needs of military expansion and empire-building. Demetrius’ administration certainly created auxiliary tetradrachm operations for that purpose, and one of those supplemental mints was making drachms as well. Thus Demetrius’ expansion activities may have introduced new categories of expenses that did not exist early in his reign (hence no  drachms), and which required a mid-level denomination. In the Seleucid Empire, a soldier received around seven or eight tetradrachms per month, and a single tetradrachm could afford five and half months’ worth of barley.²³¹ If amounts in Bactria were comparable, then a soldier’s wages could easily have been reduced in emergency situations, or could have been paid out in drachms for various reasons of convenience.²³² It is possible that Demetrius introduced a few batches of drachms to increase the presence of his coins in the marketplace, or stimulate the economy, although many scholars have agreed that “output and circulation were largely

²²⁹ De Callatay argued that war was the prime factor behind money production in “Guerres et monnayages,” 29, 35.

²³⁰ Mørkholm, *Early Hellenistic Coinage*, 24.

²³¹ Aperghis, *Seleucid Royal Economy*, 220-221. Aperghis further pointed out that “drachms were also a suitable denomination for the administrative-payments—tax-collection cycle,” *Ibid.*, 223.

²³² Otto Mørkholm argued that drachms were indeed more practical for soldiers’ use than tetradrachms, in “The Monetary System in the Seleucid Empire after 187 B.C.,” in *Ancient Coins of the Graeco-Roman World: The Nickle Numismatic Papers*, ed. Waldemar Heckel and Richard Sullivan (Waterloo, ON: Wilfrid Laurier University Press, 1984), 96.

separated.”²³³ It is not evident at this point that Demetrius’ government controlled circulation much more than other Hellenistic rulers.

Demetrius invested less in the supervision and consistency of his drachm manufacture, compared to tetradrachms. This raises questions about his power, as the main criterion being measured is administrative control. On one hand it shows a lack of power; as the king did not implement the extra employees or facilities needed to ensure perfection in his drachms. The existence of limited, need-based drachm production, however, also demonstrates a different type of power for the king. It shows that he and his ministers were conscious of coin production rates and royal expenses, and had the analytical abilities to determine how different denominations can meet different situations. Whether it was Demetrius himself or his ministers who held this knowledge, it was certainly a crucial part of royal decision-making. The king’s interest and investment in such deliberate policy demonstrates a high level of power and an strong command of silver resources. It follows then, that his laxity in drachm design was also deliberate. The government must have intended the drachm-minting operations to be small-batch or temporary, and thus they deprioritized them.

The Obols

The obols comprise the smallest of Demetrius’ silver denominations. Obols weigh approximately .7 grams and measure ten to thirteen millimeters in diameter. Extant obols tend to be much more worn than larger silvers, and are rarely found in savings hoards.²³⁴ This indicates a

²³³ Bresson, “Coinage and Money,” 50. Howgego, in “Ancient States,” 25, disagreed and asserted that economic stimulation was a possible reason to mint coins.

²³⁴ The Kuliab hoard, which contained around 800 coins, was unusual in that it included many small denominations, most notably 44 obols of Demetrius. It was published in Osmund Bopearachchi, “La circulation et la production,” 15-121. It is not apparent if it was a savings hoard, an emergency hoard, or a hoard compiled by more than one family.

higher velocity in the marketplace. At 1/24th the weight of a tetradrachm, obols served as the “small change” for government expenditure, and a large denomination for daily transactions. Demetrius’ mints certainly produced in high numbers. If any fractional amount beyond whole drachms or tetradrachms was necessary for payment or receipt, obols were small enough to meet the requirement. For example, one and a half drachms could be paid with one drachm and twelve obols. This would necessitate, of course, a larger quantity of obols than drachms. In the sample of 277 Demetrius silvers, obols account for 107, or 39%. This approaches 159, the number of tetradrachms. Unlike drachms, obols were produced at Demetrius’ main mint throughout his entire reign, including the early years. In this sample, 98 of the 107 obols are from the main mint, with 72 showing the  control mark, and 26 showing the  control mark. The remaining nine carry the  mark, representing the largest of the auxiliary operations.

Just as with tetradrachms, obols carrying the control mark  are the most abundant, and are the first set that I will examine. The “type” that appears on Demetrius obols is the same as that of the tetradrachms and drachms. Their small size notwithstanding, the images are just as finely detailed as on the larger coins. The obverse portrait of Demetrius ranges from middle to older age, matching the range of the  tetradrachms. The elephant skull has two smooth domes, its eye is lidded and almondine, and the elephant ear is a rounded triangle, generally in the shape of a bird’s wing. The king’s brow-line is long, although it can be straight or wavy. The nose is small but sharp, and the mouth is a short, downward-bending line. There is a bead border on the obverse. The reverse Heracles tends to appear short and thin; although he is muscled, the shapes are less defined than on the larger denominations. The lionskin is also short and not very detailed. There is no border on the reverse. There is one way in which the obols of this set vary. Many of the

portraits only depict the head and neck, instead of a full bust with shoulders and a cloak. Thus the \mathbb{R} obols can be divided into two groups: heads and busts.²³⁵

All of the obverse and reverse components continue through both “head” and “bust” phases, with the notable difference being that the portrait in the “head” series appears thin and young, while the portrait in the “bust” issues is heavier and matured.²³⁶ Further, in the “head” coins, the king’s neck is long and angled, so the that the portrait appears to be stretched somewhat forward and upward. Interestingly, one coin in particular, N11, reveals the transition from head to bust. It depicts the long angled neck of the king, but at the bottom of the neck, there is a distinct collar. It is not a full shoulder, there are no cloak lines, and no chest is present, but it is the beginning of a bust. The profound consistency in the features of the \mathbb{R} obols, plus the telltale shapes of the features themselves, confirms that most of these 71 obol-dies are the work of Artist X, the primary engraver of the \mathbb{R} production stream.



Figure 18: From left to right are a "head" obverse, N10, a transitional obverse, N11, and a "bust" obverse, N12.

There are nevertheless a handful of coins whose dies do not seem to belong to Artist X’s body of work.²³⁷ A single artist, but not Artist X, definitely engraved three of these, A5, B12, and C92. They show only the head on a long neck, but a neck that is straighter than the standard. The chin is small and receding, and the jaw undefined. The most noticeably different feature is the

²³⁵ This distinction and terminology is also made by Osmund Bopearachchi in, for example, “La circulation et la production,” 43-44.

²³⁶ See for example “head” coin C83 and “bust” coin C82.

²³⁷ See coins A5; B13; C92; and H31.

elephant ear, which is an irregular rectangle that projects backward, like a tattered flag. The artist who engraved these obverses is difficult to identify. It could be the X-Assistant who contributed reverse dies for tetradrachms. There have been no obverses

definitively attributed to him, and so his portrait style is uncertain.

His work is visible on only three out of 71 obols, however, so he

cannot have been another primary artist. There is nothing vastly

different about the reverses of these three coins, to suggest that they



Figure 19: This obol, C92, has the X monogram, but the portrait is definitely not the work of Artist X.

were struck separately from other \mathcal{R} reverses, although more than one reverse-engraver is likely.

Two reverse features stand out. On A5, the club, which is usually broader at the top, instead has an arrow-tip. On C92, the lionskin is deformed; it does not have a clear body and is made up of dots

and curved lines. Everything else about these reverses is conformist, however. The body of

Heracles is normal and carefully done; the text of the legend is even and correctly formed. These

small aberrations, whether the work of the main artist or an assistant, are perhaps the result of the

pressures of obol die-engraving. The flan is the smallest of Demetrius' coins, including the

bronzes, which would have been difficult to engrave. Plus, reverse dies broke much sooner than

obverses. Thus, the demand for obol reverses must have been high, and imperfections were

inevitable.

The fourth non-X obol in the \mathcal{R} sample, H31, contains features that qualify it as an

imitation. It has several strange components. The elephant scalp in particular stands out; it

contains a trunk and a tusk, but otherwise does not resemble an elephant. Its head is a formless

mass that curves around the back of the king's head, without a discernible eye, ear, or forehead.

Unless the artist was extremely unskilled, it seems that he was not aware that the headpiece on the

portrait was supposed to be an elephant, and he simply engraved a complex hat. Further, there is

no diadem around the portrait head, and the only hint of a ribbon is a single vertical line. The king's hair is made up of small dots. On the reverse, the artist must have imitated a Demetrius obol without understanding what Heracles holds in his left arm. Rather than a club tucked into the god's elbow, there is a single limb protruding from the shoulder; the lion skin is not attached to this club/arm, but hovers below it, with a short vertical line between them. There is a thin line in place of Heracles' neck, and his head is V-shaped. The monogram is also unnatural. The  mark can be viewed as a combination of the Greek letters Rho and Kappa, as the arms always come together in a point. On this imitated obol design, the arms are separated, making more of an "F" shape. The monogram, as the official mark of a mint-branch and its designers, cannot be reliable without a consistent form. The letters of the legend were also not carefully engraved. While there are no obvious spelling errors, many of the letters are mashed together and unevenly shaped. Although this obol was sold at auction as a genuine Demetrius obol, it is most likely an imitation.²³⁸

In the early part of Demetrius' reign, when his central mint was operating under the  control mark, the government did not produce drachm-weight coins. They produced a great many tetradrachms, and also many obols. Obols may have been used for small-scale royal expenditures, but their denomination was also suitable for circulation directly into money-changing or merchant businesses. This may lend support to Christopher Howgego's argument that ancient monarchs did not mint coins only for the purpose of state payments, as Demetrius' early production of obols could have been intended to stimulate the economy in his territories.²³⁹

²³⁸ It was offered in a mail-bid catalogue by Harlan Bank, Auction 86, Lot 323, on July 11th, 1995.

²³⁹ Howgego, "Ancient States," 20-22.

Among the obols carrying the  control mark, it is possible to attribute 19 out of 26 of them to a single artist.²⁴⁰ This artist progressed through phases, just as the  tetradrachm artists did. Certain coins depict a very youthful Demetrius, with a small face under a large headpiece. Other coins show a full cheek, a heavier brow, and a deeper nasolabial line, and presumably were made later. The diadem ribbon is short in the early coins, and longer in the later ones. The elephant head makes a significant transition. The early phase shows two large domes, with a third small dome between them, and an arched eyebrow. The later versions show the small third dome withdrawing into one large rear dome, and the eyebrow giving way to an eyelid.²⁴¹ The evolution of this artist's design, and a confirmation that it is indeed one artist, can be seen by viewing these representative coins in the following order: C106, C107, B14, N14, C111, C105. Notably, all of the obols show a full bust with a cloak, unlike the obols of the  stream.

Figure 20: From left to right, obverses C106, B14, and C105 show the evolution of this engraver's style, along with a maturing in the portrait.



At the central mint during production of the  line, there were two primary engravers working on tetradrachm dies, Artist Z1 and Artist Z2. The obols currently under examination appear to be most closely associated with Artist Z1. The obols and the Z1 tetradrachms both often contain large, shaded eye sockets, small, almost puckered lips, and long upper elephant trunks. Both tetradrachms and obols also show an evolution in the elephant skull towards an emphasized

²⁴⁰ They are the following coins: A8; B14; C102; C104; C105; C106; C107; C108; C111; C113; K40; K42; K43; K44; N14; N15; P9; W12; and W13.

²⁴¹ Interestingly, this change in elephant head-shape also happens in the transition from Artist Z1 to Z2. This reawakens the possibility that Z1 and Z2 are, in fact, the same person. See note 157.

rear dome. One cannot say with absolute certainty that Artist Z1 engraved the obol dies, however, because none of the obol designs exactly copies any of the tetradrachm designs. In the  line, Artist X used the same facial and elephant feature-shapes for tetradrachms, drachms, and obols. Artists Z1 and Z2 do not even use the same forms within their tetradrachm designs. Artist Z1, especially, issued tetradrachm dies in phases, with each phase presenting slight stylistic differences in features such as the elephant ear. His obol dies, if they are his, similarly show different design phases, and the obol phases are further distinct and separate from any of the tetradrachm phases. If one imagines Artist Z1 working, one must see him as engraving several tetradrachm dies in one style, and then, when moving onto obol dies, mentally switching to a different portrait style for the next batch. Some obols, such as N14, contain forms that hint of Artist Z2. The distinction is not imperative. Rather, it is important to note that in Demetrius' central mint during the first half of his reign, one of his two primary artists was designing both tetradrachms and obols. This speaks to administrative effort towards efficiency and experience. On the other hand, the wide flexibility apparent in the designs of all  coins compared to the utter conformity in the designs of all  coins demonstrates that, without a doubt, Demetrius' government insisted upon greater consistency in coinage in the latter part of his reign, when he was a sole ruler. This may be related to the nature of sole rulership and a perceived need to more strongly establish the king's likeness, or it could be related to the increase in population and territory that Demetrius gained later in his reign.

There are still seven obols whose designs are not attributable to the same artist as above.²⁴² Three of these, B15, C103, and V1, are all the work of the same artist, but not the one who engraved dies for the previous 19 obols. There are certain features which make them stand apart. For example, the nose is particularly long and pointed, the chin is too round, the elephant ear is an

²⁴² These seven coins are B15; C103; C109; C110; C112; H32; and V1.

odd bisected bell, and the elephant skull seems to contain only one large dome. Two of them, B15 and V1, are reverse die-linked, which would be an unusual coincidence if these were standard issues made by an assistant—the reverses should have been thoroughly mixed with the primary artist obverses in the striking room. These linked reverses, along with the third reverse, are strange anyway, in that the lettering is messier than usual. The letters on the third coin, C103, have unusually large guide dots, and the monogram is oversized. If these three coins are imitations, then the portraits are very carefully done. They attempt to capture the likeness present in obols such as C111 and N14. It is conceivable that they are ancient counterfeits rather than ancient imitations.²⁴³ Imitations were generally made by societies that interacted with or lived shortly after the reign in question, and they copied a king's coins for monetary prestige value. A counterfeit, on the other hand, would have been a coin made outside of an official mint, and introduced into circulation in order to pass unnoticed. If the silver content was correct, a counterfeit would have been acceptable, and maybe not even illegal. Counterfeiters in general, though, made such coins in order to reduce the silver content.

One must use caution when declaring obols imitations, for, as I briefly mentioned above, obols were subject to more flaws than larger coins. The government, even though deeply invested in coin quality, may have been hindered by the nature of obols from maintaining detail and consistency. The obol flans were smaller. Besides the difficulty of working on a tiny canvas, it is evident that the same-sized engraving tools were used for both the small and large coins. This is especially visible in the border of dots. On the obols, the dots appear very large in relation to the

²⁴³Peter G. van Alfen distinguished between Anonymous Imitations and Counterfeits, among other kinds of coins. The former had a full standard silver content and weight and legally blended into circulation. Counterfeits were illegal and made to deceive and thus had a low silver content. See “Problems in Ancient Imitative and Counterfeit Coinage,” in *Making, Moving and Managing the New World of Ancient Economies, 323-31 BC*, ed. Zofia H. Archibald, John K. Davies, and Vincent Gabrielsen (Oxford: Oxbow Books, 2005), 329, 333,337.

portrait, but in actuality they are the same size as those on tetradrachms.²⁴⁴ Other features on the obols also have thicker lines due to the size of the tool on the small obol surface—the lips, ear edges, cloak wrinkles, Heracles’ wreath dots, and the lion paws, for example.²⁴⁵ This fact of engraving mechanics gives the obols an overall coarser appearance, similar to imitation coins. Further, obol dies, being smaller, may have broken more easily. The obols themselves may also have worn out and become unusable more rapidly, requiring replacement production.²⁴⁶ A faster turnover for obol dies or obols themselves would have led to a high demand in the mint workshop. This explains why Demetrius’ administration could not ensure the same level of detail and consistency on obols as they did on tetradrachms. The obols are also evidence that crude engraving is not sufficient to identify an imitation; their sometimes coarse appearance notwithstanding, the obols from the main mint display regularity in features, form, proportion, spelling, and control marks.

After all the aforementioned precautions, I must classify an additional four obols from the  group as imitations. They are C109, C110, C112, and H32. That they do not belong to Demetrius’ issue is immediately apparent by the control marks. As the obol has a small surface area, the control mark understandably cannot be as well-defined as it is on tetradrachms and drachms. Still, it is remarkable how the obol engravers managed to ensure a large, readable mark on every die, at times making the control mark clearer than the letters.²⁴⁷ The control marks on the four imitations are not so clear. On the contrary, they are small, undefined, and appear as though they were made



Figure 21: Obol C110 is likely an imitation. Note the underdeveloped control mark, poorly formed letters, and strange elephant ear.

²⁴⁴ See for example coins C102 and C105, compared to tetradrachm C43.

²⁴⁵ See for example coin C102.

²⁴⁶ Margaret Thompson pointed out that smaller denominations wear faster due to smaller surface area and frequent use, in “Athens Again,” *The Numismatic Chronicle and Journal of the Royal Numismatic Society* 2 (1962): 310.

²⁴⁷ See for example obols C105 and C106.

without knowledge of the  symbol's shape. C109, for example, shows a vertical line with an opaque dot in the center, while C110 shows a vertical line with a flattened triangle in the center. H32 carries a line with a circle, like the standard control mark, but it is small and underdeveloped. The circle also does not clearly contain its interior lines. The fourth specimen, C112, only has a hint of a control mark between the letters and Heracles' leg, which are unusually close together. Besides the malformed control marks, the lettering on all four coins contributes to their identification as imitations. The lettering is not only uneven and messy, but contains formation and spelling errors. The first coin, C109, does not have a fully formed B—it is rather shaped like a P with a triangular loop. The A does not have a crossbar, and thus is a Λ. The final Σ does not contain a clear central point, and the T has a lower foot. Finally, the O is missing; there is not even a small dot, which passes for an O on many coins. On the second coin, C110, all of the letters are there, but they are unusually shaped and run into each other. The B again is problematic; it only has dots in place of loops. The A does not have a crossbar. The Σ's are shaped thus: . The Λ looks like , with hardly an opening, and it overlaps with the E. In the king's name, the M is an N, and the letters TPI are three vertical lines with scattered bulbs. The legend on coin C112 is worse yet. There is a B with only dots and an A without a crossbar, but then instead of the letters EΩΣ in the title, the word ends with a possible P and H or N. The name begins with ΔHM, but then it devolves into a few lines which could be IIO. The final coin, H32, has the most illegible legend of the four. The title letters are mostly in place, but there appears to be an open space with a mere smudge where the Ω is supposed to sit. On the lower legend, there appears to be a blob instead of a Δ, and after the HMH, there is a scattering of lines which do not resemble anything like TPIOY. Even though obols were probably made quickly, and the mint supervisors did not demand the

same level of consistency that they did for larger denominations, one thing can be said about all of Demetrius' silver coins. His title and name are correctly spelled. It is clear from the grievous lettering errors on these four obols that the engravers did not read the original legend, and probably did not understand the correct forms of Greek letters. That is not to say that Demetrius' official mint artists were Greek-speakers, but their consistent correctness means that they must at least have been required to learn the necessary letters for their dies.

The control mark and legend errors are sufficient to classify the previous four obols as imitations. As the artistic style of the imagery varies more among obols, and by itself it is not a sufficient criterion of imitation, an analysis of the portraits is not necessary. Nevertheless, a brief description of their aberrant style, when combined with the above discussion of control marks and letters, will further support their status as imitations. All of the genuine silver coins, while varying widely in portrait style, all display a consistency that suggests an attempt at the king's likeness. These four obols contain features that stray drastically from that standard. For one, three of them have elephant ears that do not resemble any mainstream ones.²⁴⁸ Two of the ears are a sharp, downward point, and one is shaped like a ladder. On the same three, the elephant head is flattened and does not have a clear eye, and both diadem ribbons are thin, downward-hanging threads. On the fourth, the facial features of the portrait are very small and close together, while the elephant head is disproportionately tall. The king's neck is unnaturally curved. Also on all four, the body of Heracles does not conform to natural human proportions. On one, his arms are far too long, and on the others, the torso is unnaturally angled.²⁴⁹ All of the factors discussed add up to these four obols definitely being imitations.

²⁴⁸ Coins C109, C110, and C112.

²⁴⁹ See coin C110. See coins C109; C112; and H32.

There are nine obols with the control mark .²⁵⁰ In the previous chapter, I explained that this mark represented an auxiliary tetradrachm-minting operation, as part of a long-term bronze segment. It seems that  also produced obols, although not drachms. Eight of the nine obols with this control mark appear to be made with dies by a single artist. There are certain style components in common, including an elephant ear that is rectangular with an upper fold and a bisection line. The elephant skull is two-domed, with a large, high, rear dome. The elephant eye is almond-shaped, without a brow bone, but it bulges, at times over the skull-line. The king's hair is made up of a cluster of dots behind the ear, and only one or two dots before the ear. The king's brow is long and deep. His eye is set back, and a large nose projects well beyond it. The mouth is short, straight, and thick-lipped, and his cheek is fairly wide. The back of the king's cloak is high and reaches his hairline. The body of Heracles on all eight reverses is long and lean, with a sharply jutting hip. The lionskin does not have a defined body, but is made up of two long vertical lines, with shorter lines below for the legs.



Figure 22: This obol, C115, shows the standard style for this artist and control mark.

The lettering on the eight obols under discussion is not as consistent as the imagery. On the tetradrachms and even some drachms, individual engraving hands were identifiable via their letter-forms. That is not the case for obols. As I discussed in the previous chapter, Stephen Tracy's methodology for identifying engraving hands included locating clusters of letter-shape idiosyncrasies.²⁵¹ While a sound method for the larger surfaces, on the obols, at little more than

²⁵⁰ They are A9; B16; B17; C114; C115; C116; K47; K50; and P10.

²⁵¹ Tracy, *Hands*, 326.

one centimeter in diameter, the same consistency in lettering is simply not possible. Instead, one finds the idiosyncrasies, but not in clusters. Rather, they occur individually on some coins, and severally on others. For example, four of six readable legends contain an unusual T, with bars that curve upward like an Y.²⁵² Those four also show small Δ's. Four have a short Ω, while the other two depict a tall, hive-shaped Ω.²⁵³ All six legible obols do have some letter features in common; they all show a narrow, elongated B, straight H-arms, a tiny P-loop, and a highly placed O. These consistent features suggest that the reverses represent the work of a single artist. It is hard to say who this artist is. The most likely answer is Artist Z2, as he engraved the tetradrachms for this control mark. A comparison of tetradrachm C69 with obol B17, shows a similarity in the portrait face, suggesting the same hand. It is not certain though. A secondary artist at this minting operation could have been working on obols.

The ninth  obol, P10, is, like many previously discussed coins, an imitation. The criteria for identifying an imitation are now familiar. The reverse image and legend are too large for the flan. There is a spelling error in the legend—a N where there should be a M. The portrait shows a strange face that does not fit with the rest of Demetrius' many likenesses. The elephant head appears deformed, with a trunk base that is unnaturally thick, and a very short tusk. The king's face is turned sharply upward in relation to his neck. The lionskin on the reverse lacks a body, and is a strange arrangement of lines. It does not show evidence of being connected to the other obols of this control mark series, and generally makes sense as an imitation.

Demetrius' government produced vast amounts of tetradrachms. It produced drachms on a small scale, most likely on a short-term need basis, at certain times throughout the reign. The

²⁵² See coins B16; B17; C114; and C116. Two of the obols from the Kuliab hoard, K47 and K50, have illegible letters due to poor image quality.

²⁵³ See coins A9; B16; C114; and C116. Then see coins B17 and C115.

government also produced obols on a large scale, continuously throughout the reign, at both the main mint and an auxiliary branch. The mint officials allowed drachms made from slightly flawed dies to pass through, which is logical as they were apparently produced for sudden purposes. Obols, due to their small size and fast turnover rate, also display a lower level of consistency than tetradrachms, and minor flaws also passed. It is remarkable, though, that despite not only the difficulties in manufacturing obols, but the rather mundane lives of obols, they still manage to contain a high enough level of consistency that die-artists can be identified, control marks can be easily read, and imitations can be rooted out. This demonstrates administrative interest and control on a massive scale. While some laxity existed in drachm and obol production, the result is a full body of silver coinage that is easily attributable to production lines and artists. All the silver coins carry a reasonable likeness of the king, a clear control mark, and a legible, correctly spelled legend. Demetrius or his administrators exerted a degree of power that was capable of, and sought to, control not only the official state payments, but the daily currency of his subjects as well.

To revive a familiar, but crucial point, tetradrachms and drachms were of high value, and Hellenistic monarchs issued them as royal payments to armies, builders, and other government employees.²⁵⁴ Smaller denominations, i.e. obols and bronzes, existed for everyday circulation, and moneychangers and merchants exchanged them for tetradrachms. Governments issued new obols when old ones wore out, to restandardize highly mixed or manipulated coinage, for simple royal pride and politics, or even to inflate the currency.²⁵⁵

Royal pride and politics stand out from that list. In regards to all of the other possible reasons why a Hellenistic government might mint small-denomination, non-state-expenditure money, the question still looms of why anyone bothered to ensure that it carried conformist,

²⁵⁴ Again, see Aperghis, *Seleucid Royal Economy*, 220-222.

²⁵⁵ Howgego, *Ancient States*, 16-22.

correct, detailed images and legends, designed by royal artists. Silver obols were not fiduciary; their value was based on their weight in silver. They did not need to look a certain way to have value, nor is there evidence that Hellenistic Bactria kept closed economies—hoard evidence shows that international silver was allowed in circulation.²⁵⁶ The most salient reason for producing obols like these, therefore, is that someone in the royal administration, Demetrius or his ministers, deliberately chose to implement a policy in which obols carried the same royal images and words as the state-payment coins, for reasons of power politics. Obols are at once a result and an indicator of administrative power and control; they are centralizing, by unifying different levels of currency; and finally, they establish direct rule. By presenting his numismatic policy package to common subjects through a small denomination, Demetrius established his power on a microcosmic level, and thus exerted his authority through several levels of society. After all the discussion of his carefully controlled tetradrachms, his resourcefulness in emergency operations, and his centralized production, the loudest signal of his power is the presence of so many conformist obols carrying the king's likeness, imagery, title and name. His power undoubtedly had a long reach.

²⁵⁶ Ai Khanoum Hoard II, for example, was a single burial containing coins of Alexander, five Seleucid kings, and nine Bactrian kings. Since they were buried at one time, presumably all the inclusive coins were legally in circulation. See Petitot-Biehler, "Tresor de monnaies grecques," 52-57.

Chapter 4: Administrative Structure - Bronze

The majority of daily transactions in the Bactrian world occurred in the medium of bronze coinage. Bronze by definition is a metal alloy composed primarily of copper and lesser parts of tin or another base metal. Here the term “bronze” will be use in the broadest possible sense of any part-copper alloy. Unlike silver coins, bronze coins were fiduciary. Their worth was not based on intrinsic metal value, but was represented by their denominations.²⁵⁷ The value of fiduciary money can fluctuate via natural market forces or imposed government standards. Scholars do not know the exact currency exchange rates between silver and bronze in the Hellenistic period²⁵⁸—only the weights and sizes of the latter are measurable. Hellenistic governments could easily have changed the bronze denomination value whenever there was an economic need. Governments certainly overvalued bronze compared to its metal worth, and at times their purpose in minting it was not to supply their subjects with currency, but rather to profit from it. The government gained revenue when they exchanged low-value bronze into the market for a set price.²⁵⁹ Bronze was also different from silver in that it usually only held worth within its kingdom of issue; external traders sought silver, which, being weight-based, had international value.²⁶⁰ Perhaps, then, another benefit of minting bronze was that it conserved silver resources, so that the supply for traders, mercenaries, and other state payees did not run low. Bronze was worth little, but it was useful for a public currency; thus scholars agree that it generally circulated among the non-elite subject populations,

²⁵⁷ Van Alfen argued that bronze was not fiduciary, as it had some low intrinsic value that could come close to its denomination value. See “Imitative and Counterfeit Coinage,” 347, note 24.

²⁵⁸ Holt, *Thundering Zeus*, 116. Alexander Cunningham proposed that bronzes on the Attic standard equaled 48 units per 1 silver drachm. In *Alexander's Successors*, 311.

²⁵⁹ Van Alfen, “Imitative and Counterfeit Coinage,” 326-327.

²⁶⁰ Bresson, “Coinage and Money,” 65.

who never saw or handled silver.²⁶¹ Indeed for many locals in eastern territories like Bactria, the bronze coinage introduced by Hellenistic monarchs was their first engagement with money.²⁶² There were certainly two economies in any given Hellenistic kingdom: an upper-class silver economy, and a lower-class bronze economy.

Considering bronze's lowly function, the amount of information that a bronze coin of Demetrius I contained is surprising. His bronzes reveal a minting policy that was markedly different from the policies for silver coins, yet it was still carefully controlled. This study of bronze Demetrius coins includes 72 specimens in three denominations. Unlike the silver coins, which presented a single type (Portrait/Heracles) through all three denominations, the bronze coins carry a different type for each denomination. Although scholars cannot say with certainty the value of given bronze denominations, the coins do conform to the Attic weight standard. A single "unit" bronze coin weighs approximately 4.2 grams. Heavier bronzes appear in multiples of this unit. There are no known unit-weight bronzes for Demetrius I. His smallest and most abundant bronze coins are double-units, averaging 8.4 grams. The double-unit type shows Heracles' head on the obverse, and a standing figure of Artemis on the reverse. There are 33 double-units in this sample, comprising 46%. The next largest Demetrius bronze denomination is also the second most abundant. It is the triple-unit, weighing 12.6 grams, and showing an elephant's head on the obverse and a caduceus on the reverse. The sample contains 28 triple-units, or 39%. The largest bronze coins issued by Demetrius are also the rarest. They are sextuple-units, at a whopping 25.2 grams. Their obverse shows Athena's gorgon-headed shield, and the reverse has a trident. There are only 11 of these sextuples in the sample, making 15%.

²⁶¹ Holt, *Thundering Zeus*, 117-119.

²⁶² *Ibid.*, 116-117.

Although there are significantly fewer bronze than silver specimens in the whole sample, that does not mean they were minted in a lower quantity. Bronze coins suffer even more than small-denomination silvers from environmental and human factors, both ancient and modern. Since their purpose was for daily purchasing and they did not have much intrinsic value, ancient people did not usually store bronze coins in savings hoards. Modern archaeologists often have a difficult time, or lack of interest, in recovering bronzes because they usually occur as stray finds, meaning they are individually scattered rather than grouped in a site. They are also brown in color, and more subject to corrosion than the precious metals, so they are not as visible as other coins. Further, modern museums and private collectors have limited interest in bronze coins, perhaps because of their lesser aesthetic value, their lesser intrinsic value, or because they are often in poor condition. Besides natural corrosion, the high circulation velocity of bronze coins exposes them to frequent handling and thus surface erosion. Auction houses often sell bronzes as nondescript bundles without any photographs.²⁶³

The Double-Unit Bronzes

Just like the silver coins, all of the bronzes bear control marks, and quite a diverse array of them at that. Four of the control marks from the silver operations also appear on bronze. They are the two associated with Demetrius' central mint,  and , plus  and . The remaining control marks appear only on the bronzes. The 33 double-unit bronzes in the sample present six distinct control marks. They are , , , , , and .

²⁶³ For example, in the catalogue for *Public and Mail Bid Sale 54* (London: Classical Numismatic Group, Inc., 2000), 255-256, there is a listing for "Oriental Lots." These include Lot 2258, a lot of 40 Bactrian bronzes, with one belonging to Demetrius. The denominations are not listed. Another is Lot 2260, with 42 Bactrian bronzes. Six belong to Demetrius, but there are no specifications. Both include the note "Lot sold as is, no returns."

All of the double-unit bronzes are of the Heracles/Artemis type. On the obverse is the bust of Heracles, recognizable by a tiny club behind his neck. In general, the god has a somewhat aged, stern face. A large beard covers his entire chin and side of his face. On top of his head are short locks of hair. Around the god's head is a wreath with leaves that resemble ivy. Below his neck is his collar, which has lion paws knotted in the front. There is an obverse bead border. The reverses of the double-units depict the goddess Artemis, standing and facing front. Interestingly, although the coins do not show the king, they maintain the format of a bust on the obverse and a full figure on the reverse. Artemis wears a knee-length chiton dress, and surrounding her head are rays. Her left arm hangs down and holds a bow, while her right arm, bent outward and up, pulls an arrow from a quiver (not visible) behind her back. The legend on the reverse is identical to that of the silvers: ΒΑΣΙΛΕΩΣ ΔΗΜΗΤΡΙΟΥ. The control marks on these coins can appear in either the left or right field, but each particular mark always has a consistent side.

Although the central-mint marks were the most common among silver coins, that is not the case with bronze. For double-units, the most common mark is . This symbol also appeared on auxiliary silver tetradrachms and obols, discussed in Chapters 2 and 3. For bronze coins, the mark does not represent an auxiliary operation, but indeed the primary one.

An initial major difference between silvers and bronzes carrying this control mark is that the latter coins carry the mark in the right field of the reverse, while the silvers carry it in the left field. This is interesting, as it appears on the left for all silvers, of all control marks and denominations. The shape of the reverse image can impact the position of a monogram; for example, on silver coins of the Diodotids, Demetrius' predecessors, this same mark is wedged on the left, between the outstretched, aegis-draped arm of Zeus, and the eagle at his feet.²⁶⁴ On Euthydemus silvers, the club and legs of seated Heracles fill the left field, and the mark appears on

²⁶⁴ See for example, Bopearachchi, *Sylloge Nummorum Graecorum*, Pl.5, nos. 76-79.

the lower right, behind the pile of rocks that make up the god's seat.²⁶⁵ There is no spacing issue on the double-unit bronzes, as the standing Artemis takes on a similar form and use of space as the standing Heracles of the silvers. This therefore initiates doubt that a single artist produced dies for both  silvers and  bronzes.

There are nine double-unit bronzes with the control mark .²⁶⁶ Two of the nine, A13 and A14, are die-linked on both the obverse and the reverse. As usual, I will begin my analysis with the obverse image, the portrait of Heracles. Due to frequent handling, metal corrosion, and at times poor image quality, the details on bronzes are generally not as visible as on the silver coins. Among the set, however, there are certain portrait features that are common. On most of them, the face is tilted slightly upward. The nose on all of them is prominently aquiline, and the eyes are always deep-set under a brow that forms an obtuse angle. The mouth of Heracles is very small and frowning, but with thick lips. The beard is large and made up of two rows of roughly circular shapes, some like thick crescents. The beard also points up and to the right from the chin. The ear is large and, when not worn, shows an inner rim. The hair appears as a mass of tousled locks. The thin line of the wreath is visible through the hair, but the leaves blend in. Behind the head, the small club appears in three variations. It can be a single-shafted shape, such as on D4; it can have two distinct, round knobs on the sides, such as on B19; or it can have two small arms, resembling a cactus, as on A14. Heracles' collar is made up of three distinct lines, that move closer together towards the front of the neck. The tied lion paws are not detailed.

Of the nine obverses, seven are similar enough that they seem to be the work of an individual artist. Two of the remaining seem to be the work of a second artist.²⁶⁷ On these, the portrait gazes straight ahead instead of slightly upward. The portrait shows a taller face than the

²⁶⁵ Ibid., Pls. 7-8.

²⁶⁶ They are A13; A14; A15; A16; B19; C117; D4; N17; and W14.

²⁶⁷ See C117 and D4.

others. This is especially noticeable in the height of the forehead and the cheek above the beard. The ear of Heracles is also more detailed on obverse C117. The club is large and thick, and appears knobbly, but without appendages. It is perfectly reasonable that two artists made die engravings for the main bronze producing operation. One could have been the primary artist, and another the assistant. It remains to be seen if Artist Z2, who engraved the auxiliary silvers for this operation also engraved the dies for any of these bronzes.

The reverse images of the  double-units have several common features. The head on the figure of Artemis tends to be rather lightbulb-shaped. Her hip juts out to her right just where her dress ruffles at the waist. Her legs are mostly straight, but her left leg extends slightly to her left. There are visible boot-tops at her knees. On five of the nine coins, these features are quite worn and not distinctive enough to identify a single artist.²⁶⁸ One of these coins, A16, does not seem to fit, as the goddess' legs do not stand straight but curve somewhat toward her left. An engraver's individual hand can also be detected in the letter-formation of the legend. Most of the coins in this batch show letters that are somewhat tall and thin, especially the Λ, Δ, and Η's. The Δ is also slightly convex, the T-bar is wide, and the Y has long arms on a short leg. These features are apparent on all the coins that have a visible legend, except perhaps D4, and show up enough to be declared the work of the primary artist. There is not enough variation in the design of the control mark to single out any hands. So far, there appears to be one primary artist for the obverse, who engraved seven of the present dies, and one (probably the same) for reverse. The work of one extra artist, who engraved two obverses and possibly one reverse, is also present.

²⁶⁸ These are A14; A15; A16; D4; and W14.



Figure 23: Compare the lettering on tetradrachm C68 (top left) with bronze B19 (top right). Also compare the lettering on tetradrachm H26 (bottom left) with bronze W14 (bottom right). It appears to be the work of a single engraver.

A comparison of the ⚡ bronze coins and the ⚡ silver coins shows that the engraver for the silvers, Artist Z2, also engraved the reverses for the ⚡ bronzes. The key to the connection is the lettering. When viewed side by side, the idiomatic letter-carving features of Artist Z2, from his ⚡ phase, are apparent. They share B's with a larger lower loop, A's with low bars, short Ω's, and the traits mentioned above: tall and narrow Λ's, Δ's, and H's, the convex Δ-side, and the long-armed Y. As the imagery is different, it is not as easy to pick out the work of Artist Z2 in the portrait of Heracles or the figure of Artemis. One similarity between the silver and bronze portraits is in the defined lips and downturn of the mouth. Artist Z2 certainly had a heavy workload. After transferring from the central silver operation, represented by the ⚡ mark, he worked on auxiliary silver tetradrachm dies, at least some obol dies, and also the majority of the double-unit bronze dies. Why Artist Z2 felt the monogram would fit better in the right field of the bronze flans must remain his secret.

The ⚡ operation made an abundance of bronze coins, at least equal to if not greater than the quantity from other bronze coin workshops. There is no reason to believe that this bronze operation was temporary, as its mark is common, considering the small number of bronzes in the

total sample. It also cannot be called ‘auxiliary’ in the sense that the silver was auxiliary, as bronze was not the currency for paying soldiers. There is no indication that the bronze coins are anything other than the product of a well-established major mint-branch. Therefore, the mark must represent a mainstream operation, just as \mathbb{R} and \mathbb{P} did, except that \mathbb{A} focused on bronze rather than silver. It is not clear if this bronze mint was centrally located, alongside or even in the same building as the main tetradrachm mint. It could have been located in another of Demetrius’ strongholds. As the two forms of currency served different functions, they would have moved through different distribution channels. The possibility of a non-central location is more likely, as there are also bronzes that carry the \mathbb{R} and \mathbb{P} marks—the symbols of the central mint. Thus, the main production lines must have also been turning out bronze coins. Another bronze operation next door would not have been necessary. As the \mathbb{A} segment also produced auxiliary silvers, its location might have been convenient to a military base, or area of military passage. Such would have been a practical choice for a workshop to make auxiliary tetradrachms.

In the sample of 33 double-units, seven coins carry the control mark \mathbb{R} .²⁶⁹ The previous control mark had nine specimens, and in such a small sample, the difference between seven and nine is not enough to imply that \mathbb{R} bronzes were produced in lower quantities. They could easily have been minted in equal or greater quantities than \mathbb{A} bronzes. The portraits on all seven \mathbb{R} coins appear similar. The face of Heracles gazes straight, not tilted upward like those of the previous set. The nose is also larger and more dramatically aquiline than the previous. The beard is fuller, with a small third row of curls at the bottom. The hair is also in locks, but smooth, not tousled. There also is no leaf sticking out of the back of the head, which the previous design had. The club on all seven obverses is thick and knobby, and the god’s neck is relatively long. Several of the coins in

²⁶⁹ They are A10; A11; B18; N16; P11; P12; and P13.

this set are quite worn, and thus die-linkage is not possible. All seven of the portraits appear to be the work of a single artist.

The goddess Artemis on the reverses of the \mathbb{R} double-units is consistent across all seven coins, although A11 is so worn that only an outline of the figure is visible. Compared to the previous coins, the goddess' legs are a little shorter, and they do not appear to have defined boot-tops. Instead, the legs become slightly narrower below the knee. The rays surrounding her head are shorter. The text of the legend also appears consistent across these coins. In general, they show letters that are quite close together. The B's, Σ's, and T's are very narrow, the M-point is short, and the Y's have a long vertical leg. Just as letter forms were the key to connecting \mathbb{A} -marked bronze and silver via Artist Z2, one naturally seeks the hand of Artist X in the legends of the \mathbb{R} bronze. Alas, Artist X's telltale letter-features are not present on the bronze, most notably his Chi-shaped H's. The bronze legends do bear some resemblance to the legends on \mathbb{R} tetradrachms that I deemed to be the work of X-Assistant.²⁷⁰ It is not a certain link, yet all of Demetrius' coins

analyzed so far have come out of very small design groups, so there is a good chance that these do too. None of X-Assistant's silver obverses are in the sample, and may not exist.

Thus one cannot compare the bronze Heracles

portraits against other portrait work of his. The Heracles portraits are most

likely not the work of the primary Artist X, as the eyebrow shapes on the king

and the god are quite different. Of course, these bronze double-units may carry the die engravings

of an artist that we have not yet seen. It is not impossible. The Z team had several assistants; the X



Figure 24: Compare the legend on the bronze P13 (left) with that of the X-Assistant tetradrachm Q4.

²⁷⁰ Compare bronze P13 with tetradrachms C6; C9; and Q4.

group could have had a second assistant whose job was only to engrave dies for the double-unit bronzes. Artist X was extremely skilled, and he already X-Assistant helping him, but Demetrius' territory and minting structure had expanded by the time of the \mathbb{R} group, and so Artist X's workload may have increased drastically. Not everyone can be as hard a worker as Z2. Whether it was X-Assistant or X-Assistant-2 who engraved the double-unit dies, it is not really fair to think of him only as an assistant. He had his own major area of responsibility, and only assisted Artist X when it came to the silver dies. Thus the picture of Demetrius' minting system becomes a little clearer. The most skilled artists were tasked with the highest number of engravings, and widest variety. The other member or members of these very small teams were assigned to a variety of other engraving assignments, some more than others, depending on skill or demand. It appears that in this way, the minting bureaucracy was not so different than a modern place of employment.

While the focus is on the central mint, let us take a moment to examine the one coin in the sample of 33 that carries the symbol \oplus . The fact that this coin is the only one of its kind does not mean that it was rare or part of a small batch. The sample of 33 is small for an entire denomination, which must have included many thousands of coins, but for its limited size it is quite diverse. There are not many clear die links among the double-unit bronzes, and thus the situation is not the same as it was for the small-sample silvers. For silvers, the high frequency of die-linkage among the small samples indicated that the actual production quantities were also low.

Without die-linkages, no such statement can apply to the bronzes. Thus, the \oplus coin may represent a batch of coins that was equal to or even larger than the batches from the other control marks.

I examined this coin, A12, at the Ashmolean Museum. It is unfortunately very worn on both sides. The obverse is heavily eroded and partially green with oxidation. Only the raised shape

of the portrait, with the hint of an ear and an eye, is discernible. The reverse is not oxidized, but only the outline of Artemis is visible—there are no fine surface details. Some of the letters on the legend are also worn away. The control mark appears in the right field of the reverse, while the same mark for silvers appears in the left field. Most of the legend can be made out, and a careful examination of the letter formations is possible. This die engraving does not represent the work of any of the silver-coin artists for the  production group, nor does it reveal the work of any other artist seen so far, for any other control mark, silver or bronze. This is strange, as only a handful of artists managed massive workloads in several denominations. The primary artist for  double-units also assisted Artist X with tetradrachms. Artist Z2 was prolific in silver and bronze, and while he and Z1 were part of the  group, they had three assistants helping them with reverses. Further, the unique coin A12 does not seem to show the same hand as the one that appears on the larger, triple-unit  bronzes.

Such a lone engraver is curious, and maybe this coin is the only example of its kind for a reason. It may not, in fact, belong to the body of genuine Demetrius-issued coinage. It would be easy to call this specimen an imitation and declare that Demetrius simply did not issue bronze coins during his co-regent years. It is not that simple though. There are eighteen specimens of  marked triple-unit bronzes that do not merit suspicion. I will discuss them in detail shortly, but as they are genuine, why would the young co-ruler Demetrius issue triple-unit bronzes, but not double-units? Two points add to the suspicion upon the lone double-unit. For one, Artemis' hip juts out more sharply than usual. Though the details of the goddess are smoothed away, the outline of the figure is clear, and the hip is angled enough to look unnatural. Secondly, the monogram is very faint. On the reverse, the edges of the coin are worn down to utter smoothness, but this wear

only affects the final Σ in the title, part of the O and the full Y in the name, and the top of Artemis' radiate crown. The monogram is not affected by any wear. Normally on coins, the control mark is engraved to the same depth as the letters of the legend, so the fact that it is much lighter is odd. Plus, the shape of the monogram is not as rounded as is usual. Overall, there is not enough evidence to conclude whether this double-unit is part of the king's coinage or not, or if so, why its die does not belong to a known engraver.

There is another lone specimen of a double-unit bronze, M7, to which Michael Mitchiner ascribed the control mark NK . The coin is from a private collection that no longer exists, and Mitchiner's image of the coin is not very clear. It is impossible to confirm that the control mark reading is indeed correct. No other bronze coins carry the NK mark, but a comparison with NK silvers may give some insight. On both tetradrachms and drachms, one thing that characterizes the work of the NK engraver, Artist Ω , is an unevenness in the lettering of the legend. The letters vary in height, they are not in straight lines, and most importantly, the beginnings and ends of the two words, BAΣΙΑΕΩΣ and ΔΗΜΗΤΡΙΟΥ , do not line up. These same features are present in the lettering of coin M7.²⁷¹ The king's name is shifted to the right in relation to the title. Both words are also not in a straight line, but rise up to the right. The final Σ is quite tall, which is also noticeable on some of the silvers. Another strange feature of Artist Ω 's designs is that on the silvers, the muscles on Heracles' right torso side are very defined, even exaggerated.²⁷² On the bronze M7, the figure of Artemis, though clothed, also shows a series of ridges on her right side. Artemis' left leg projects far to the left, while the Heracles designs also show poses that are more angled than usual. Finally, on the obverse, the portraits of Demetrius show a brow that curves over the eye. The portrait of Heracles on the bronze shows a similar curve—a wide, gentle S-shape above the eye. All

²⁷¹ Compare M7 with silvers C76; C81; and P6.

²⁷² This is especially noticeable on C76; C80; and C81.

of the features combined make it likely that bronze coin M7 does indeed fit in, not only with Demetrius' body of coinage and the NK control mark, but even into the body of engravings by Artist Ω . I previously designated NK as an auxiliary mint that was situated away from the imperial center. It is certainly possible that a small, auxiliary silver-making operation was also making a limited quantity of bronze coins. It especially makes sense as small bronze batches could have easily served particular regions rather than being transported from the center.

The next set of seven bronze double-units carries a control mark that is heretofore unseen. It looks like AP .²⁷³ Demetrius was the first of the Bactrians to issue coins with this monogram, although he was not the first Hellenistic king to do so. Seleucus II ruled the neighboring Seleucid Empire about one generation (20-40 years) before Demetrius ruled Bactria. There is one known silver drachm of Seleucus II that bears the same mark. It does not seem to have represented a major series, but merely a small batch, and it was combined with two other marks.²⁷⁴ This 'borrowing' suggests something about control mark use. Because of their resemblance to Greek letters, early scholars looked for spelling-based meanings in control marks.²⁷⁵ Alternatively, however, kings, ministers, or mint officials may have simply taken ideas for control marks from other kingdoms. In this case, for example, one could view the mark as the two letters Δ and P , but that would mean that Demetrius spontaneously thought of the same exact design for two letters that a neighboring monarch also came up with. Instead, the letters do not have to mean anything. Someone in the Demetrius administration could have been seeking a distinctive, "new" control mark, encountered the Seleucid AP drachm in circulation, and then have chosen the symbol for a new production line. The person's choice might have been nothing more than a liking for the

²⁷³ See coins A17; B20; B21; C118; N18; N19; and N20.

²⁷⁴ Houghton and Lorber, *Seleucid Coins: Part I, Vol. 1*, 288.

²⁷⁵ As discussed previously, Cunningham, for example, resolved the monograms into names of cities. See *Alexander's Successors*, 45-55.

shape. One more point about the mark which suggests that it does not intentionally represent Greek letters is that its components, Δ and P, are carved differently than the Δ and P in the legend. The Δ in the monogram is large and wide, while in the legend it is smaller and narrower. Likewise, the P in the monogram is quite tall, and its loop is very round; the vertical line and loop are a single stroke. In the legend, the P is small, with a squeezed loop made from a second stroke.

Interestingly, on all previously discussed coins—tetradrachms, drachms, obols, and the relevant bronzes—the control mark components match the shapes of the corresponding legend letters.

Therefore it seems that from the point of view of the die engravers, the  mark is not made up of letters, but is an unrelated standalone symbol. Certainly the mark must have originally been designed as Greek letters, perhaps by the Seleucid king, but it appears to have lost such a meaning for the Bactrian Demetrius, or else that meaning was not conveyed to his mint workers.

Significantly, it may also mean that the engraver for this batch was not literate in Greek, as he did not notice the similarity between his assigned mark and the letters of the Greek legend. Thus he did not understand it as a monogram made of letters.



Figure 25: Coin B21, a bronze double-unit with the Delta-Rho control mark.

All seven of the  double-units are clearly done by a single artist, though none are definitely die-linked. One distinctive feature in the obverse portrait is the hair, which is composed of thin semi-

circular lines to look like a woven mat or waves. The beard is also relatively thin, with only two rows of curls, and the ends projects from the chin in a sharp point. The leaves of the wreath are very tiny and almost unnoticeable. The nose is large and slightly crooked, while the eyes and mouth are small. The club is thick with approximately six tiny

knobs on its edges. The reverse image is equally distinctive and consistent. Its outstanding feature is the body of the goddess Artemis, which is mostly straight, and does not bend at the hip like the figures on the previous double-units. Also, some of the coins depict lines on Artemis' skirt.²⁷⁶ She has boot-tops and her left leg curves outward.

So far, this control mark appears to represent a case of a separate bronze minting stream that is not tied to any other known mint. Before making conclusions, however, I will turn to the final group of double-unit bronzes, which includes six specimens bearing the control mark ²⁷⁷. Just as with the previous mark, Demetrius was the first of the Bactro-Indo-Greeks to use this one. The mark was also not used by any of the neighboring Seleucids, and appears to be original. Cunningham suggested that the monogram is a combination of the Greek letters O and Ξ, and therefore could represent a place-name such as Alexandria Oxiane, a city near the Bactrian kingdom's major river, the Oxus.²⁷⁸ As no other control marks are clearly linked to any places, such a specific explanation for the  control mark would be out of place. Nevertheless, there is evidence that in Bactria, personal names that used the letters "Ox" and reflect the Oxus river were indeed common. For example, in the treasury at the Ai Khanoum archaeological site, inscriptions on jars mention the names of two local workers, Oxyboakes and Oxybazus. I argue that bronzes were minted regionally in small operations, and therefore it is conceivable that mint officials chose the control mark  to reflect common local names and words. Not only does this support the idea that bronzes were regionally produced, but it gives an indication of the minting location of the  coins. They likely originate from the northern half of the kingdom in Bactria, perhaps from the city of Bactra or even the city at Ai Khanoum.

²⁷⁶ See coins B20 and N20.

²⁷⁷ See coins A18; B22; B23; N21; N22 and N23.

²⁷⁸ Cunningham, *Alexander's Successors*, 66.

In the set of O bronzes, the hands of two distinct obverse artists are visible. Five of the obverses seem to belong to one artist, and one to another. The first five²⁷⁹ are characterized by a rounded head of Heracles, with a nose that projects very little. The beard is also narrow, the locks of hair are somewhat flattened against the head, the ear is large and thick, and the club is short and pulled close to the head. The other coin²⁸⁰ shows the work of a different artist, apparent by its longer, thinner nose, shorter mouth, slightly rougher hair, and longer, thinner club. The reverse designs are not as clear on all six coins. The legend and image on N23 are almost obliterated. The reverses, however, all appear to be the work of one artist. The legends show similarity in their tall and somewhat narrow, closely-spaced letters. The Δ and Λ especially tend to be tall. Of course there is no way of knowing which of the two obverse artists also engraved the present reverses, although it was most likely one of them.

The batch of O double-units is similar to the A pieces mentioned above. They are relatively small operations with their own artists. They help form a clear picture of Demetrius' entire bronze minting operation. The main mint certainly made bronze double-units under the P control mark. There was also a major double-unit producing operation under the A mark, which also had occasion to make auxiliary silver coins. The short-term N operation that made limited edition silvers and small-batch bronzes. Finally, there are two other double-unit making groups, represented the marks A and O . Unlike the extra tetradrachm-making groups, these cannot be classified as "auxiliary." The classification makes sense for the silvers, as they were short-term, low in quantity, and hurriedly manufactured, as would be expected for emergency military conditions. Bronze, as a public currency and not a state-payment currency, would not have been in demand

²⁷⁹ See coins B22; B23; N21; N22; and N23.

²⁸⁰ See coin A18.

for short sudden peaks like the tetradrachms were. Increases in bronze production could have been slow and steady.

It is logical that several bronze mints (Α, Ν, Κ, Α, Ο) were located away from the main mint. A daily-use currency would have been in frequent high demand, and mints that were spread around the empire would have alleviated the burden of constant transportation from the center. Regional bronze mints could have produced coins in small quantities, as they only served their immediate vicinities. Of course the central mint would have needed to issue batches of bronze as well, to serve its own area.²⁸¹ If the various control marks on the double-units do indeed represent regional operations with their own artists, then it is certainly remarkable that all of these coins exhibit an extremely high level of standardization. There is virtually no variation in the imagery beyond the natural slight changes in shape and detail that come from a worker's individual hand. Further, unlike the auxiliary silver coins, none of the bronzes shows any sloppiness in design, or mistakes in the images and legends. Demetrius' government was therefore able to administer a series of bronze operations all to the same exacting degree.

The Triple-Unit Bronzes

The next largest denomination for Demetrius I's bronze coins is the triple-unit, weighing an average of 12.6 grams. There are fewer triple-unit pieces in the sample than double-units—28 opposed to 33. Interestingly, the triple-units are much simpler in design than the double-units and the silvers. They do not contain a portrait, neither human nor divine, nor is there any full-figured depiction of a god. Instead, the obverse carries the head of an elephant, and the reverse shows only

²⁸¹ The batches from the regional bronze mints need not have been "small." There could have been quite large outputs of bronze, but as mentioned earlier, bronzes are more easily lost to time than silver coins.

a simple attribute of a god—the caduceus of Hermes. The simplicity of the design seems counterintuitive for two reasons. Firstly, the coin has a larger surface area than the double-unit, and could easily accommodate a complex design. Secondly, one might argue that the simplest designs would be found on the lowest-value coins, as the people who regularly used the lowest denominations would be the poorest, and thus the least politically literate subjects. They should therefore receive the simplest coin-messages. In this case, however, the simpler design is on the higher-value bronze, rather than the lowest of Demetrius' coins.

Six control marks appear on the triple units. They are , , , , and . Unlike the double-units, these coins are not distributed evenly among the various control marks. The control mark , which corresponds to the main mint during Demetrius' period of joint rule, appears on eighteen of the 28 triple-unit specimens.

As the  coins are the most abundant, they are a good place to begin analysis.²⁸² The elephant head on the obverse faces right, but in three-quarters rather than full profile. The edge of the animal's opposite ear is visible in front of the face. In many ways, the head is comparable to the elephant scalp that the king wears in the portraits on his silver coins. The trunk points upward and curves in an S-shape. The ear is large and amorphous. The cranium is bumpy, like some of the silver coin heads. On these, there is a large rear bump, a smaller frontal bump, and a line separating the cranial bumps from the forehead. There is also a sharply pointed brow above the eye. Unlike the elephant scalps on the silvers, this head is complete with a lower jaw and folds of neck skin. Below the head is a rope with a bell, positioned to appear to be hanging on the animal's neck. All eighteen elephant obverses appear to be done by the same engraver, especially because

²⁸² They are coins A19; A20; B24; B25; C119; D5; N24; N25; N26; P14; P15; P16; V3; V4; W16; W17; W18; and W19.

of the shape of the large elephant ear, and the specific shape of the cranial bumps. The ear has an upper fold, and two drooping lobes, with the lower lobe hanging to the bottom of or below the elephant's face. None of the obverses appears to be die-linked with another, which is remarkable considering the high number in the sample.

The important question is whether this bronze engraver is one of the Z artists—those who engraved the dies for all of the  silver coins. The bronze coins that we have seen so far often shared a die-engraving artist with their silver counterparts. The exception is the lone  double-unit, whose engraver was unrecognizable. One may recall that Artist Z1's tetradrachm die engravings passed through several phases, delineated by distinctive elephant ear shapes. In one of Z1's phases, the “double-ribbon” phase, the elephant scalp on the tetradrachm obverses bears a remarkable similarity the elephant head on the bronze obverses. Not only is the ragged ear-shape similar, but the tetradrachm elephant also has the cranial domes—two rear bumps and a forehead bump—and the pointed brow bone. It is possible, therefore, that a single person, Artist Z1, engraved triple-unit bronze dies alongside the hundreds of tetradrachm and obol dies that he also engraved. This would make him nearly as prolific as his successor, Z2.

Figure 26:
Compare the
elephant on
Artist Z1's
tetradrachm,
C50 (left)
with the bronze
triple-unit W19.



The reverse image on the triple-unit does not lend itself to much stylistic analysis. The design of the caduceus is quite simple. The staff is straight with a two-tiered pedestal and a matching capital. The two snakes are not wrapped around the staff, but sit atop it, tied in a bowline

knot and facing each other. The frontal knot-loop is on the left. There do not appear to be any variations in the caduceus among these eighteen coins, yet the design is simple enough that their uniformity does not necessarily indicate a single artist. There is, however, some variation in the legends. The letters tend to fit into two groups. Some are very narrow, straight, and tightly packed. The Δ is tall and the M-connector is low and pointy.²⁸³ In the other group, the letters are less even and more loosely spaced, and the M-connector is a hanging curve. The letter-formation of the second group can definitely be matched to the legends on some of the  tetradrachms. It is especially noticeable in the shortness of the Σ-points, the small size of the Ω, the hanging M, the slight curve on the H-sides, and the unconnected P.²⁸⁴ In Chapter 1, I labelled the legend on tetradrachm A3 as the work of Artist Z1.

The legend on the bronze triple-units C119, N25, and W18 likewise appear to be the hand of Artist Z1, which conforms to his identification as the engraver of the



Figure 27: Compare the legends on tetradrachm A3 (left) and bronze C119.

obverse dies as well. The other group of bronze legends, with their narrow letters, pointed M, and Y-like T, are harder to identify. They may match the work of the one of Z-assistants, although the T, which has two separate upper arms, is a new feature. They may also show the work of a separate Z-assistant, as yet unknown, who worked only on bronze. It is clear however from the Z1 obverses and some of the reverses that these bronze triple-unit dies were indeed produced in the same workshop as the  silvers. Incidentally, the lone double-unit with this control mark does not match the lettering of either the bronze triple-units or the silvers, and so it remains suspicious. The

²⁸³ See for example B24; P15; V3; and W19.

²⁸⁴ Compare tetradrachm A3 with triple-unit C119.

mint need not have produced all denominations. It probably did not issue any drachms either. Nevertheless, the main mint in the early part of Demetrius' reign was producing both silver and bronze coins in abundance.

My sample contains ten more bronze triple-units that represent six different control marks. Some of these are familiar. Two coins carry the \mathbb{R} control mark, which so far has produced all of the king's denominations. Both of these coins are from private sales and are quite worn.²⁸⁵ The elephant head on the obverses is similar in design to the above-mentioned \oplus elephants. The elephant ear maintains its ragged shape, but the rear cranial bump is larger, while the frontal cranial bump is smaller, and the opposite ear is slightly more prominent. Also, the eyebrow here is rounded instead of pointed. The \mathbb{R} branch at the main mint kept to the previous design quite closely.

Figure 28: Note the similar letter forms for the triple-unit V5 (left) and double-unit B21. Also note the position of the control mark.



The caduceus on the reverse of the two \mathbb{R} coins is somewhat different than the previous design. Notably, the knot is reversed—the frontal loop is on the right instead of the left. Also, the column of the staff has a single large foot, rather than a two-tiered foot. Further, instead of a matching two-tiered capital, the shaft simply widens at the top. The two share a lettering-style in the legend, although the letter-forms are not characteristic enough to tie them to a particular engraver. They most closely match the work of Z-Assistant-2, one of the reverse engravers for

²⁸⁵ See coins E1 and V2.

tetradrachms under the  segment.²⁸⁶ Perhaps that assistant engraver continued his career carving dies for triple-unit bronzes when the central mint transferred to the control mark.

The next control mark, , occurs on three triple-units.²⁸⁷ One of the coins does not have an accessible obverse, as it was sold privately on eBay and only a reverse image exists.²⁸⁸ The obverses on the other two conform to the elephant design seen on previous coins. The rear cranial bump dominates the head more than on others, and more of the opposing ear is visible. On the reverses of the  coins, the caduceus design follows that of the above-mentioned  design, with a right-sided knot and a single-footed staff. The legend on the reverse is distinctive, in that its letters are very close together, and the Ω is tall, narrow, and hairpin-like.

One should expect that the same person engraved the dies for the  triple-units and  double-units. In one case, the lettering on the two denominations does seem to be the work of a single hand.²⁸⁹ If that is true, though, there is something strange about it. On the  double-units, the control mark appears in the right field of the reverse. On the triple-units, it appears in the more common left field. This is the same discrepancy seen in the  coins between their silvers and their double-unit bronzes. The silvers bore the control mark on the left, the bronzes on the right, even though one primary artist worked on both denominations. The shift for the  bronzes is equally unexplainable. Considering that the double-units and triple-units are both bronze, and both have simple reverse designs that do not require special positioning, there is no clear reason why a die engraver would place the control mark in two different areas. There cannot be any administrative

²⁸⁶ Compare the legend on these bronzes to tetradrachms C42; C50; H13; and H16.

²⁸⁷ See coins E2; V5; and W20.

²⁸⁸ See coin E2.

²⁸⁹ See, for example, the reverses of triple-unit V5 and double-unit B21.

reason, as the monogram is no more visible on one particular side. It must have been the personal choice of the engraver's supervisor or the engraver himself.

There is another coin, P17, that I did not include in the above group, as its control mark is technically different. Rather than a Delta with a Rho inside it, it lacks a lower crossbar and thus looks like a Lambda with a Rho inside it.²⁹⁰ Also, on the former, the Rho sticks up quite high out of the triangle, but on P17, the Rho-loop begins immediately where the Lambda comes to a point. One cannot instantly write this coin off, however, as the product of a separate minting group. For one, the formation of the legend could easily be the work of the Δ triple-unit engraver. It shows the same narrow letters and a similar Ω -shape. The design of the Σ 's and M's is also comparable. The images, unfortunately, are very worn and marred by a pierced hole in the center of the coin, so it is not possible to identify a particular artist's image-style. On the caduceus, for example, one cannot say with certainty which side the frontal knot-loop is on, although it does hint at the right side, like its Δ counterparts. The caduceus bears a single-tier foot, which is the standard on all triple-units besides the early Δ batch. The elephant does indicate some differences from the Δ triple-units. The upper fold on the ear, for example, is somewhat thick, as is the upper trunk. Rather than a nice, round cranial bump, there is an aberrant rough shape above the bump. The opposing ear is very small, while the opposing tusk is longer and more visible than usual. Finally, the lines separating the cranial bumps and the forehead are cut more deeply than they need to be. The bell is almost completely worn away.



Figure 29:
Coin P17
with its
suspicious
control mark.

²⁹⁰ Bopearachchi listed it as a separate monogram, but he also acknowledged its connection to the Delta-Rho variety, and even hinted that it was intended to be the latter: “Sur le monogramme la barre horizontale inférieure du delta n’est pas visible.” *Monnaies gréco-bactriennes*, 167.

It is difficult to conclude what the nature of coin P17 is. Its Lambda-Rho monogram is singular and does not seem to fit with Demetrius' body of coinage. Instead, it appears to be a mistaken attempt or an imitation of the  mark. The legend, however, looks as though it could have been done by the  engraver, while its obverse image seems to stand alone. When analyzing Demetrius' silver coins, I identified many as imitations. This has not been the case with bronzes. In fact, there have been zero definite bronze imitations, and only one other unaccountable coin so far, the lone  double-unit.

It is worth considering whether bronzes were subject to the same rate of imitation in the ancient world as silvers were. Silver coins had intrinsic value and were traded regularly to foreign kingdoms. Bronze had use as a local currency, but was rarely acceptable to long-distance merchants.²⁹¹ Thus, foreign kings probably would not have encountered bronzes often enough to imitate them. Further, while the reasons that monarchs and states imitated others' coins are diverse and often unclear, many scholars point to the economic reason of "trust."²⁹² This means that imitating another state's coins stimulated one's economy because the coin users trusted the value and standard of an imitated coin, either because it held another society's prestige, or it alluded to an economic affiliation with a strong state, or the users believed it *was* the genuine coinage of another, trusted state. Importantly, this means that if people were trusting a currency, they were trusting its value—trusting that its precious metal content was high. Imitation currency thus only makes sense for gold and silver, not bronze. Bronze monetary value was set by the state and did not have an inherent worth that people needed to trust.

There could have been other, non-economic reasons that a government minted

²⁹¹ Bresson, "Coinage and Money," 65.

²⁹² Van Alfen, "Imitative and Counterfeit Coinage," 341-343.

imitation bronzes. A monarch or minister could have seen a Demetrius bronze, and wished to copy the design for purely artistic, aesthetic reasons.²⁹³ Secondly, a foreign ruler could have imitated another's bronzes to propagate to his or her people a political connection with the other state, such as an alliance or honors owed. Van Alfen argued, however, that this was unlikely unless the connection was formal.²⁹⁴ Mørkholm argued that the opposite could be indicated; an imperial subject state with hopes of breaking away could mint its own coins that appeared royal but contained minor differences or new symbols to begin to identify its independence.²⁹⁵ Considering all of the possibilities, there is a good chance that P17 is not an imitation, but is in fact a  coin, made by someone other than the primary artist, that simply contains a mistake in the control mark. This would be the first of its kind among Demetrius' coins, though, and a faulty mark passing muster is certainly unprecedented.

There are two bronze triple-units that carry the control mark ²⁹⁶. This mark does not appear on any other Demetrius denominations. While similar to , it is certainly distinctive. Like ,  was originated by Demetrius, and then used by his successors Euthydemus II and Agathocles.²⁹⁷ Demetrius' predecessors, the Diodotids and Euthydemus I, did not use any control marks based on the Greek letter A, except for one double mark, , used by Euthydemus I.²⁹⁸ Demetrius certainly introduced many of his own control marks, and quite a number of them were solely for bronze, so yet another new mark is not surprising.

Both coins, A21 and W21, show considerable wear. A21 is riddled with scratches, and the legend is almost smoothed away. W21 is clearer, but with significant erosion on the edges. Both of

²⁹³ Ibid., 341.

²⁹⁴ Ibid., 341.

²⁹⁵ Mørkholm, *Early Hellenistic Coinage*, 36. This is similar to the process that the Diodotids undertook in breaking away from the Seleucid Empire. See Holt, *Thundering Zeus*.

²⁹⁶ See coins A21 and W21.

²⁹⁷  was also used by Pantaleon and Heliocles, contemporaries of Agathocles.

²⁹⁸ Bopearachchi, *Monnaies gréco-bactriennes*, 147-163.

the elephant heads retain a lot of detail, and seem to conform to the standard design seen on the other triple units. The ears are large and ragged, and generally the same shape on both coins. There is a small triangle of an opposite ear sticking out from the head. The rear cranial bump is large and bulbous. One discrepancy between the two is the shape of the bell around the elephant's neck. Coin A21's bell fits the standard shape—a round arch. The bell on W21, on the other hand, forms a triangle. W21 is also strange in that all of the trunk wrinkles are deeply cut and visible, while none of the bronze elephant heads so far had more than faint or scattered trunk wrinkles. The caduceus knot on W21 is also not standard. It is small and asymmetrical, lacking the figure-eight shape that appears on the others. The legend on A21 is too eroded to compare to W21, but based on the image discrepancies, the two do not appear to be the work of a single engraver. The small image aberrations notwithstanding, there are no indications that either of these coins might be other than genuine Demetrius issues. Besides, another small bronze batch with its own control mark fits into the scheme described above in which Demetrius' government minted bronze coins regionally through numerous small operations.

Finally, among the triple-units in the sample there are two specimens with two unique control marks that do not seem to fit in with Demetrius' body of coinage. The first is N27. The coin is extremely worn. Only parts of the images and very little of the legend are visible. The control mark is just discernible as  or .²⁹⁹ The problem with this mark is the same that I pointed out among two strange Demetrius drachms bearing the control mark . The mark , just like , appears on coins of Eucratides the Great and his contemporaries. Specifically,  appears on a Eucratides tetradrachm, a Eucratides bronze half-unit, and drachms of Antimachus II. While Demetrius' father Euthydemus used a few monograms with an H-shape, they did not

²⁹⁹ This is also the interpretation of Bopearachchi in *Sylloge Nummorum Graecorum*, no. 212.

become popular until Eucratides' time, approximately twenty years after Demetrius. Further, this control mark was not used by Demetrius' immediate successors, Euthydemus II, Agathocles, and Pantaleon.

While it is true that Demetrius created numerous original control marks, including ones that only appear on one denomination, like  for double-units, it is unusual to find a control mark represented by only a single specimen. There were seven of the  coins, for example. One must be cautious of course. Bronze coins are more difficult to find than silvers, and there is less interest in them. Overall, public collections and private dealers carry more silvers than bronzes. Plus, there are countless coins in private collections that are not available for inclusion in the sample. Nevertheless, the few single-specimen coins encountered so far turned out to be certain imitations.

There are other features in the design of the coin that can give insight. The legend is partially obliterated. Most of the title is visible: ΒΑΣΙΛΕΩ. The length and positioning of the letters of the name, however, suggest that several letters are missing, or else the name is not positioned in line with the title, which is rare. For example, on an average triple-unit, the T in ΔΗΜΗΤΡΙΟΥ lines up with the E in ΒΑΣΙΛΕΩΣ. On this questionable coin N27, however, the T lines up with the ΣΙ in the title. Also, there is not clearly an H before the T, although an H appears earlier in the word. Subtleties in the imagery also deserve comment. The knot on the caduceus, for example, is not symmetrical, but different than the knot on the  coin mentioned above, W21. The frontal knot-loop is on the right, but it is very small and round, while the rear loop is longer and larger. The elephant also contains some aberrant details. The ear, for example, while forming a multi-lobed, drooping shape on every other triple-unit, is quite rounded in this case. The rear cranial bump, which should project above the head, instead lies low and in line with the rest of the head. Unfortunately, the rest of the image is too worn to judge. The combination of the unusual

control mark and the design flaws, however, add up to make coin N27 a probable imitation. Why another ancient kingdom would have imitated a bronze is not clear. It may also be a modern forgery.

The next lone coin with a unique monogram is V6. Its control mark is a simple “N.” The mark \aleph is present among Demetrius coins, but not N. What stands out immediately about this coin is the difference between the obverse and reverse sides. The obverse is very worn, while the reverse is contrastingly clean and clear. Although this is not the usual condition in which one finds an ancient coin, it is not actually suspicious. It is not possible to know the particular way in which a coin was handled or stored, and as V6 is a private market coin without a provenance, its burial conditions are also not knowable. On the other hand, bronze objects tend to corrode more than gold and silver, and any clean bronze coins are rare. The control mark is, once again, an anomaly. Demetrius issued no other control marks made up of a single Greek letter. Further, when two control marks are very similar, they are usually connected in the minting process, like \aleph and \aleph . The mark N is close to \aleph , but does not seem to come from the same or a proximal operation, as \aleph does not appear on any triple units. \aleph is on bronze double-units, silver tetradrachms, and silver drachms, but none of those denominations carry a simple N. The N was used by Demetrius’ father’s predecessors, Diodotus I and II. His father Euthydemus used it as part of a double control mark, in combination with \uparrow . Eucratides also used it later. The monogram itself does not seem to be an impossibility, but it is unusual enough that the coin is suspicious. If one takes any consideration for the lack of corrosion and erosion on the reverse, especially paired with a normal, worn obverse, it might indicate a modern forgery.

Without counting the final two single-specimen triple-units, this denomination presents four control marks: \mathbb{R} , \oplus , \mathbb{A} , \mathbb{A} . The first two signify the central mint, which largely churned out the royal silvers. The third mark occurs on bronze double-units as well, and seems to herald a regional bronze-only operation. The last mark is unique to this denomination, and likely also represents a regional small-batch production stream—it may have issued only triple-units, or it may have issued double-units that are not extant. The production makeup of the triple-units follows that of the double-units. The double-units carried five control marks: \mathbb{R} , \mathbb{A} , \mathbb{N} , \mathbb{A} , and $\underline{\underline{\mathbb{O}}}$ (and possibly also \oplus). The first mark is from the central mint. The second two represent regional mints that also produced auxiliary silver coins. The last two were probably small, regional, bronze-only operations.

In summary, the two main bronze denominations shed new light on Demetrius' mint system. Silver coins were mainly for state payments, and mostly came out of the large central mint. This would have also been a convenient and secure way to manage the kingdom's silver, by processing it through one central facility. The central mint also made bronzes in two denominations to supply local currency. Throughout the rest of the empire, the monarchy established bronze minting operations to issue low-value currency for the daily circulation needs of its subjects. Although the bronze was not the primary currency for state payments, it may at times have been acceptable for small tax payments or occasional fees.³⁰⁰ Its purpose notwithstanding, bronze was still issued by the king and thus the bronze-mint officials ensured the same standard of design and quality as with the silver coins. When Demetrius needed auxiliary silver tetradrachms

³⁰⁰ There exists one government payment receipt from Bactria that lists a specific amount. It is incomplete but seems to list monies paid to forty Scythian mercenaries, in the quantity of "one hundred drachmas of coined silver." See Willy Clarysse and Dorothy J. Thompson, "Two Greek Texts on Skin from Hellenistic Bactria," *Zeitschrift für Papyrologie und Epigraphik* 159 (2007): 276. Not only is the amount high enough to demand silver currency, but silver itself is specified. This works out to 2.5 drachms per soldier, and the half-drachm could have been supplied by twelve obols. Using obols to support fractions of drachms would also explain why there are many more extant obols than drachms.

and drachms to supply the military, he did not always set up a new temporary or mobile mint, but in two cases used regional bronze mints. This would have been a resourceful and efficient move, as the same engravers who made bronze dies, and presumably the other mint workers as well, simply added small, temporary batches of silver coins to their output. Demetrius or his administrators clearly demonstrated broad planning in these cases.

The Sextuple-Unit Bronzes

The sample of bronze Demetrius coins includes eleven large, heavy pieces that weigh an average of 25.2 grams.³⁰¹ At six times the weight of the Attic-standard bronze unit, they are called sextuple-units. These eleven coins follow a different minting pattern than the double-units and triple-units described above. The sextuples are the second largest denomination of bronze or other base metal coins among the total body of Bactro-Indo-Greek money. They are outdone only by a bronze denomination of Menander, a later Indo-Greek, who issued a series weighing 40 grams.³⁰² The sextuples are thick and heavy in the hand, making for an odd daily-use currency. Their design is also very simple; it seems that for Demetrius, the larger the bronze, the simpler the design. Perhaps this is because bronze, as an alloy, is harder than pure gold and silver, and thus striking small details into its surface was not possible. Larger, thicker, bronzes would have been harder still, so maybe simple designs were the only efficient option. The obverse depicts a shield, formed by a double-lined ring following the curvature of the coin, and surrounded by a bead border. In the center of the shield is a small head of Medusa, identifying the image as Athena's shield.³⁰³ The

³⁰¹ See coins A22; A23; A24; A25; B26; B27; B28; M10; N28; N29; and N30.

³⁰² Bopearachchi, *Monnaies gréco-bactriennes*, 240. Other bronzes of Menander come close to the sextuple at around 20 grams.

³⁰³ On none of the specimens is the face detailed enough to identify Medusa or any other personage, yet there is a consensus among scholars that it is her head, most likely due to its placement upon the shield-like shape.

reverse shows a simple trident, an accessory of the god Poseidon, along with the legend and control mark.

The eleven sextuple-units maintain the high standard of conformity in design that one finds among all of Demetrius' coins. One main difference is that the obverse design is not an elaborate face like that of the royal portrait, the head of Heracles, and the elephant head on the other denominations. On all eleven specimens the face of Medusa in the center of the shield is worn beyond any definite recognition. On four of the coins, no face is visible at all; at most there is a disruption in the smooth surface which suggests that *something* was engraved.³⁰⁴ On six specimens there is a raised, rounded shape in the center of the flan that hints at a face, usually because there are indentions about halfway up to indicate eyes, and some lines around the edge where hair would belong. Only one of the eleven coins presents any detail in the face.³⁰⁵ It shows a pointed chin, a nose, cuts for eyes, a rounded forehead, and clear, thick loops of hair that could easily be a gorgon's snakes. The edge of the shield, made of two concentric circles, is perfectly circular on all the coins, more so than the flans. On several coins that I inspected in person, the circles were of different sizes, so the engraver did not use a ring or stencil to aid him, but must have taken much time and concentration. The individual beads of the border are only visible on four of the coins.

The reverses of the sextuple-units bear a resemblance to the reverses of the triple-units, the caducei of the latter being similar in shape to the tridents of the former. In particular, the trident shafts have two-tiered pedestals and capitals, very like the caducei of the  triple-units. The three tines of the trident approach the edge of the flan on nine of the eleven coins and are thus worn away, but it is still clear that all three tines are of the same height and tipped with triangles. The two outer tines project horizontally from the center and then upward at right angles. The designs are

³⁰⁴ See coins A23; B27; N28; and N30.

³⁰⁵ See coin B26.

too simplistic to determine if they are the work of a single engraver. The legends do, however, present distinctive features. For one, the letters are noticeably large and wide, which is not surprising considering the large size of the flan.³⁰⁶ The letter formations are also consistent. The loops of the B's are formed by a single wavy line, which barely touches the left shaft. The central points of the Σ's are very short and hardly project at all. The E-arms are long and equal in length, and the Ω is tall with wide, outward-curving legs. The Δ is large and wide, as is the M. The point of the M is a shallow hanging arc. The O is high in position, and the Y is both long-legged and long-armed. The lettering is thus evidence that the eleven sextuple-units depict the die engravings of one individual artist.

The control mark on the sextuples is their most important feature. It looks like $\overline{\overline{\overline{\text{A}}}}$ and is what I call a “single unique monogram.” For one, the mark is not used by Demetrius on any other denomination. It also does not appear on the coins of any preceding or succeeding monarch. And most significantly, it is the only control mark that appears on this entire denomination. That means that not only did the $\overline{\overline{\overline{\text{A}}}}$ operation limit itself to sextuples, but it was the *only* operation tasked with making sextuples. Many of the two other bronze denominations were issued from regional mints with low-quantity outputs. If the $\overline{\overline{\overline{\text{A}}}}$ operation was also regional, then it means that it was issuing the sextuple denomination to only one part of Demetrius' empire. Research by D.W. MacDowall supports this conclusion.³⁰⁷ He studied a sample of Demetrius bronzes with known provenances, in all three denominations. He then discovered that the majority of the double-units and triple-units came from locations in the region of Bactria, while all but one of seven sextuple-unit coins came from sites south of the Hindu Kush mountains, in Demetrius' Indian territory. Such a geographical

³⁰⁶ The flans average 33 mm in diameter.

³⁰⁷ MacDowall, “Copper Coinage of Demetrius,” 31.

separation of the sextuple-units, and the lack of evidence that any were minted in the imperial center or any other major minting locale, suggests that the sextuples indeed did not circulate regularly with the other two bronze denominations.

Returning to the assumption that silver tetradrachms and drachms were too large for use by most of the common-class subjects, and soldiers and others usually changed them before spending, then the average transactor in Bactria only had three currency options: silver obols, which may have been too expensive for some, double-unit bronzes, and triple-unit bronzes. This would have severely limited pricing options. Logic would argue, therefore, that there must have been smaller, fractional bronzes that circulated as small change. If so, there are two possible forms this small change might have taken. Either Demetrius minted fractional bronzes, that have yet to enter scholarly sights, or else Demetrius allowed low-value bronzes of other kings and kingdoms to circulate alongside his official coinage. MacDowall argued for the latter case, suggesting that Indian coins stood in for fractions of the sextuple units. As the sextuples did not circulate with the other bronzes, they would not have been very useful as such large, lonesome units. According to MacDowall, “the reason for the choice of this awkward multiple [sextuple] for circulation in India seems to have been the fact that 24 gm was also a multiple of the standard Mauryan copper coins of 11 to 13 gm currently circulating in the Paropamisidae; and the issue of Demetrius can be regarded as an early attempt by the new Greek rulers to co-ordinate the earlier Mauryan coppers with the Bactrian copper denominations.”³⁰⁸ Further, Demetrius’ predecessors issued lesser bronzes that could have remained in circulation. The Diodotids issued bronze units, half-units, and quarter-units, and Euthydemus issued units, half-units, and quarter-units.³⁰⁹

³⁰⁸ MacDowall, “Copper Coinage of Demetrius,” 32.

³⁰⁹ Bopearachchi, *Monnaies gréco-bactriennes*, 151-153, 160-163.

If a local currency and early Bactrian currency was already circulating in Demetrius' territory, he would not have needed to issue any bronze fiduciary money at all. The fact that he did, beginning with the large units, demonstrates that he attempted to expand his hegemony by implementing direct rule. The fact that he did not issue fractional bronze, however, is the first real evidence of a lack of Demetrius' power. He conquered territory in India, he built a complex minting bureaucracy, he employed and shifted around the best available die-engravers to ensure exactitude and standardization in his full body of coinage, and his government made deliberate decisions about when and how much money to mint in accordance with military and economic needs. His minting system was centralized, and he implemented a level of direct rule with his standardized obols and large bronzes. As a measurement of his power, Demetrius passes the criterion of administrative sophistication with flying colors. His power nevertheless had limits. Managing two territories, in Bactria and India, was a large job. Perhaps extending his minting system to accommodate fractional bronzes—which would have required massive quantities to flood the market—was simply more than his resources could bear.

Chapter 5: Metal Resource Management

The government of Demetrius I exercised a high degree of control over the minting bureaucracy by enforcing strict standards for coin design. Thus, Demetrius fulfilled a major criterion for hegemonic power: a centralized, complex administration. Examining the weight standards and metal usage of Demetrius' coins will both contribute to the criterion of administrative development and test another criterion, that of military capability. Coin weights, like coin designs, are another manifestation of the complex bureaucracy, direct rule, and centralized government required to maintain or expand power, as established by Stuart Kaufman, Victoria Tin-bor Hui, Barry Buzan and Richard Little.³¹⁰ Standardized coin weights reveal control over minting practices in the same way that coin design does. Coins that conform closely to a logical system of weight multiples indicate a strong chain of supervision and accountability over the mint workers who were responsible for weighing and pouring the metal for blank coin flans. Therefore, evaluating coin weights not only as a whole body of coinage, but by individual control marks, which represent minting production streams, provides insight into Demetrius' control over metal usage in both central and peripheral mints.

Two additional criteria for hegemonic power are economic capability and military capability. Hui argued that for a state to increase its economic or military capability is a "self-strengthening reform," which can contribute to that state's hegemonic rule.³¹¹ Coin production and weight standards provide evidence for the criterion of military capability. While at first one might assume that coinage gives insight into economic capability, that criterion actually requires

³¹⁰ Kaufman, "Fragmentation and Consolidation," 183-184; Hui, "Toward a Dynamic Theory," 188; Buzan and Little, *International Systems*, 177.

³¹¹ Hui, "Toward a Dynamic Theory," 180-183.

measurement of control over trade, and the development of a taxation system.³¹² The limited evidence of the Bactrian kingdoms unfortunately does not allow for direct measurement of trade or taxation quantities. Hui, Buzan, and Little agreed that another indicator of state success is military capability, including conquest, militarization and increases in military strength.³¹³ Hui viewed military capability as the mobilization of human and material resources for conquest, the establishment of standing armies, a reduction in mercenary troops, and rewards for victory.³¹⁴ Buzan and Little defined it as an increase in military numbers, warrior skills, training and leadership.³¹⁵

Measuring coin weights can give insight into several factors influencing military capacity: mobilization of resources, establishment of large armies, and rewards for victory. Hellenistic coin production, especially of tetradrachms, was a direct consequence of military activity. As François de Callataÿ argued, “on peut tenir pour certain que l’émission de monnaies à du régulièrement être motivée par la nécessité de payer la guerre.”³¹⁶ Thus an increase in coin production is evidence for the expansion and mobilization of armies. Coins that maintained a standard weight or increased in weight at certain times also demonstrate military capability. It shows that a government allocated generous amounts of silver for minting, a move that only makes sense in a military context. Peter van Alfen argued that rulers formulated their currency policies with the intent of incentivizing a population sector.³¹⁷ The group that benefitted from particular weight standards or metal content would in turn, likely support that policymaker. Heavier coins would not have benefitted a state in

³¹² Ibid., 181-182.

³¹³ Ibid., 182-183, 196; Buzan and Little, *International Systems*, 217-218.

³¹⁴ Hui, “Toward a Dynamic Theory,” 182-183, 188.

³¹⁵ Buzan and Little, *International Systems*, 217-218.

³¹⁶ De Callataÿ, “Guerres et monnayages,” 28.

³¹⁷ Peter van Alfen, “Who Benefits? Incentive and coercion in the selection of Greek monetary standards,” (talk for the Archaeological Institute of America, Jan. 8, 2016), https://www.academia.edu/20367218/Who_benefits_Incentive_and_coercion_in_the_selection_of_Greek_monetary_standards

trade. As their value came from weight, an increased or decreased weight had no effect on a coin's purchasing power. If for some reason another government or a merchant exchanged coins by denomination, regardless of weight, then exchanging away a heavy tetradrachm would lose money. The ones who benefitted most from heavy coins were those who received them as wages, i.e. military personnel, assuming their wage amounts did not change. In other words, if a soldier always received seven tetradrachms per month, than he would benefit if those tetradrachms were always high in weight, or even increased in weight. He could then exchange those coins for their weight value, not numerical value. Therefore, keeping the weights of silver coins high would have been a good way for a state to incentivize or reward its army. The military was likewise the most important population sector for a king to maintain his position. Only loyal soldiers could protect a monarch from usurpers during the bellicose Hellenistic period.

A different situation existed in the Roman world. Over time, aspiring Roman emperors, dependent on their armies for power, increasingly debased the value of their coins, as a way to save money and hire more troops.³¹⁸ Of course, this ultimately resulted in disastrous weakening of the Empire. Unlike Roman currency, coins of the Hellenistic empires were never debased in metal content. Alain Bresson argued that this difference was due to the multi-state, competitive nature of the Hellenistic world. Inter-empire trade was so dependent on silver, that monarchs could not afford to alter the metal content of their coins.³¹⁹ Further, Bresson argued that the Hellenistic period saw an overall shortage in silver resources, and thus Attic-standard currency actually deflated over time.³²⁰

In light of the need to keep one's military well-paid, combined with the need to remain competitive while silver was limited, Demetrius' coin weights give insight into the king's level of

³¹⁸ Alaric Watson, *Aurelian and the Third Century* (London: Routledge, 1999), 13.

³¹⁹ Bresson, "Coinage and Money," 64-65.

³²⁰ *Ibid.*, 60-62.

military investment. By examining the average weights of Demetrius' coins over time, and by comparing them to the coin weights of other near-contemporary kings one may obtain a sense of Demetrius' overall military capacity. Higher coin weights suggest the ability to maintain a larger, better-trained army, and rewards for victorious troops. They would also suggest, however, a need to attract mercenary soldiers with competitive wages, and thus would fail to meet the criterion of a professional, standing army. The political theorist Hui differentiated between armies made up of nationally conscripted troops, and hired military entrepreneurs, or mercenaries. She viewed mercenaries as problematic as they are a temporary means to boost power, or an "intermediate resource-holder," and not a reliable source of long-term power.³²¹ She argued that ultimately, mercenary armies were expensive, undisciplined, and difficult to command through a centralized structure.³²² These problems are not necessarily applicable to the Hellenistic kingdoms, however. Finally, it will be useful to estimate the quantity of total coinage Demetrius I produced during the course of his reign. When compared with scholarly estimates for other Hellenistic kings, one can conclude whether Demetrius commanded a relatively high or a low quantity of metals, or at least whether he chose to invest more of his silver into coinage than other kings.

Throughout the Hellenistic world, except for Egypt and a few locales in and around Greece, kingdoms measured coins on the Attic standard.³²³ The baseline weights for this system decreased slightly throughout the Hellenistic period.³²⁴ Around the beginning of the reigns of Alexander's successors, c. 300 BCE, a tetradrachm weighed 17.2 g. After 130 years, around 172

³²¹ Hui, "Toward a Dynamic Theory," 182-183.

³²² *Ibid.*

³²³ The Ptolemaic Empire of Egypt did not follow the Attic standard, but maintained its own, lighter standard. It kept that standard by being a closed currency system; the kingdom did not circulate foreign coins. External merchants, for example, had to exchange their Attic silver for Ptolemaic silver. See Claire Préaux, *L'économie royale des Lagides* (Brussels: Edition de la fondation égyptologique Reine Elisabeth, 1939) 269-279.

³²⁴ Mørkholm, *Early Hellenistic Coinage*, 8-9.

BCE, the standard weight of a tetradrachm was 16.8 g.³²⁵ This latter value corresponds to the time period of Demetrius I's reign and thus is the Attic standard with which I evaluate his coins.

Drachms likewise decreased approximately 2.3%, from 4.3 g to 4.2 g. Following the same reduction, therefore, obols would have decreased from .72 g to .7 g.

The weight of a coin depended on the measurement and care that went into manufacturing of the blank flans. They were produced using molds made of stone or clay in the shape of disc.³²⁶ Workers poured molten metal into the molds by hand. The size of the mold ensured consistency in the weights of the resultant flans, yet one can imagine that even slight variations in the amount of metal poured, plus instances of spillage, could result in weight inconsistency.

There is not enough evidence to determine whether molds were produced at the same mints where the coins were struck, or if they were all produced centrally and then sent out to various mints for striking. One source of evidence for this question is the coin diameters. If there were a correlation between coin diameters and control marks, it would suggest that particular flan molds, with their own particular diameters, belonged to certain minting groups. After all, molds made of stone or clay would have been subject to human creation and error, and variations in size and shape would be present. Such evidence is moreover not especially informative, as both the diameter and shape of a coin were affected by how hard a worker struck it. Unfortunately, there is not enough data on coin diameters available to make such an assessment. The majority of coins in the sample come from the catalogues and websites of private auction houses; these coins are not physically accessible to scholars, and many do not include diameter information. Among the coins that do have available diameters, the tetradrachms from the three control marks representing the central mint, , , and , have respective diameter averages of 33.07 mm, 33.15 mm, and 32.38

³²⁵ Ibid. Mørkholm argued that this change was measured for coins from Antioch in Syria, but that the trend occurred at the same rate throughout the other Hellenistic kingdoms.

³²⁶ Ibid., 12-13.

mm. These are strikingly similar, yet there is not enough data from for the peripheral mint tetradrachms to effectively compare. The A coins only have two available diameters, which average 31.5 mm. The B coins have three available diameters, which average 34.33 mm. Only one of the three C tetradrachms in the sample has an available diameter: 31 mm. Although the numbers for the peripheral coins are different than for the central mint—two are on the low side and one is on the high side—they are not conclusive, as the diameters of the central mint coins range all the way from 29 to 36 mm. The diameter issues notwithstanding, if there exist distinct patterns in coin weight among the central and peripheral mints, it will support the idea that flans, though maybe not the molds, were indeed produced at the same mints in which they were struck.

Coin weight data has its own set of obstacles with which one must contend. Of course, erosion from human handling and natural forces decreases the weight of a coin somewhat. No ancient coin exists in mint condition, as even a static burial would have subjected a piece to the elements within the surrounding air or soil. Otto Mørkholm suggested that one can estimate the original minting weight of a series of coins by adding 1-1.5% to the most frequently occurring coin weights in a set, thereby excluding light coins with more than normal wear.³²⁷ This adds to most tetradrachms one- to two-tenths of a gram. For the smaller silvers, its impact only reaches the hundredths of a gram, and thus is not useful for analysis. To avoid endangering the entire data set by incorrectly skewing the data, I will maintain the weights as they are, while keeping in mind that in some cases, for the tetradrachms, there may have been more coins reaching or exceeding the Attic standard than those that are counted. Another issue with weight measures is that each modern museum, private dealer, or publisher, individually weighed the coins the coins in their own collections. Each establishment naturally has its own scale, and different scales may have small

³²⁷ Ibid., 7-8.

discrepancies in accuracy. The weights as listed by their owners and sellers are, however, the only available data, and one must make the best of it.

Silver was the most important metal for hegemonic power. It was much more common than gold, especially in the ancient Near East and Central Asia.³²⁸ As a precious metal it resists corrosion and is durable. As its value in the ancient world was dependent on weight, silver currency could be used in interregional and long-distance trade, in diplomatic gifts, and in the payment of foreign mercenaries. There is direct evidence from early second-century Bactria, in the form of a leather document, of a payment during the reign of King Antimachus (a successor of Demetrius) to Scythian mercenaries in the amount of “one hundred drachmas of coined silver.”³²⁹ Further, coins, with their governmental markings, were guarantees of the value of silver they contained, and thus they fostered the flow of silver as a commodity.³³⁰ This stimulated economies and created wealth. For silver coins to bear the burden of so much trust in an international system, it was certainly in a monarch’s interest to ensure the accurate measurement of the metal for his or her coinage. One may also hypothesize that silver coins were, indeed, better-controlled than base-metal bronze coins.

The sample of silver Demetrius coins contains three denominations: tetradrachms, drachms, and obols. The tetradrachms make up the largest sample, and represent the heaviest and best-standardized of Demetrius’ silvers. There are 155 tetradrachms in the study sample, and weights are available for 146 of them.³³¹ The nominal weight of a tetradrachm on the Attic standard is equal to 16.8 g. Out of the 146 tetradrachms, the median weight is 16.73 g, which is a negligible .07 g below the standard. The average is slightly less, at 16.54 g, because of some low-weight

³²⁸ Michael Ivanovitch Rostovtzeff, *The Social and Economic History of the Hellenistic World*, Vol. 1 (Oxford: Clarendon Press, 1941), 447.

³²⁹ Clarysse and Thompson, “Two Greek Texts,” 276.

³³⁰ Katerina Panagopoulou, “Between Necessity and Extravagance: Silver as a Commodity in the Hellenistic Period,” *The Annual of the British School at Athens* 102 (2007): 317-318.

³³¹ See chart of coin weights in Appendix 4.

outliers. It is natural that in all sets of coins, the average will be lower than the median because there will always be more low-weight outliers than high-weight outliers. Low-weight outliers are often due to erosion or damage, while high-weight outliers would have to be in pristine condition. The heaviest coin of the group weighs 17.13 g, which is higher than the Attic standard of Demetrius' time, although it is still below the original Attic standard of 17.2g. There are no coins in the sample that are heavier than 17.2. Out of the 146 tetradrachms, 61 of them are equal to or greater than the standard of 16.8, weighing between 16.8 and 17.1 g. This means that 42% of the coins are at or above the standard, while 58% are underweight. The percentage of heavier coins would be a little higher if we discounted wear and erosion. The lightest coin weighs in at 14.26 g, 2.54 g lighter than the standard, and 2.47 below the median. The standard deviation for tetradrachm weights is .51, which means that the majority of the coins in the set, 68%, are only $\frac{1}{2}$ g above or below the average, and thus fall within only 1 gram of variance. Two standard deviations of the set, or 95% of the coins, are 1 gram above or below the average.

Turning to silver drachms, weights are available for eleven out of the fifteen coins in the sample. Not surprisingly for such a small sample, the median and average weights are quite close, 3.83 g and 3.78 g, respectively. In this case, the median weight is further below the Attic standard than it was for tetradrachms—.37 g below the standard 4.2. The heaviest of the eleven drachms weighs 4.1 g, making all eleven lighter than the standard. The lightest drachm is 3.32 g, which shows that the range of variation for the drachms is much less than it is for tetradrachms. This is confirmed by the standard deviation, which returns a variation of only $\pm .26$ g for 68% of the coins.

Obols are perhaps harder to weigh with as much accuracy as the larger silvers, as they are very small and not all scales are sensitive to such small increments. Many obol weights are recorded with only one decimal place. Nevertheless, their weights appear to be reasonably consistent. Weights are available for 94 out of the 107 obols in the sample. The median value is

.68 g and the average is .67 g, an immaterial difference, and both mere hundredths of a gram below the Attic standard of .7. The heaviest obol weighs .95 g, and is the only one with such a weight, although nine other coins in the set are also higher than the standard. Thus, about 10% of the obols are overweight. The mode weight, the most common value, is exactly .7 g, encompassing 22 out of 94 coins, or 23%. The second most common obol weight is .68 g, with 16 such coins. The lightest of the obols is .46 g, which is noticeable on such a small scale, with a difference of .24 g, but it is quite insignificant when compared with the tetradrachms, of which the lightest coin is 2 ½ g underweight. The standard deviation for the obols is only .08 g, meaning that the majority of the obols are less than a tenth of a gram above or below the mean.

To summarize the weight statistics for Demetrius silvers, the rule seems to be the larger the denomination, the greater the range of variation in weight. Tetradrachm weights vary by as much as 2 g. The medium-sized drachms vary by up to 1 gram, and obols only vary by up to 1/3 of a gram. Perhaps it was the case that in minting the smaller coins, there was less room for inaccuracy, while the large tetradrachm flans could have had aberrations in silver pouring but still been large enough for effective manufacture. While the coin weights do show some variation, tetradrachms and obols are definitely centered around the Attic standard of the early second century. Thus, Demetrius' government clearly attempted to match the currency system of the larger Hellenistic world. The drachms tend to be slightly below the standard. There may be a connection between this and the low rate of drachm production throughout Demetrius' reign; for some reason the government did not choose invest much effort or much silver in drachms. Overall, the body of silver coinage does not reveal any limiting of weights, which would have suggested pressure on the king's silver assets.

Just as with coin design, it is necessary to examine coin weights in terms of individual minting operations, as determined by control marks. This will show the level of control exerted by

the government over its separate operations, and whether this varies between the central and the auxiliary mints.

The most abundant Demetrius coins are the X and Y tetradrachms from his central mint, carrying the  and  control marks. As such, their weight data quite closely match the figures for the body of tetradrachms as a whole. The X tetradrachms have a slightly higher average weight compared to the full set: 16.63 g versus 16.54 g. The average weight of the Y tetradrachms is virtually the same as that of the full set, at 16.51 g. The medians for the X and Y sets are slightly higher than the averages at 16.70 and 16.66, respectively. The  and  coins do not have many outlier specimens with unusually high or low weights. Therefore, the  and  coins are significant in that they show a lesser standard deviation than the tetradrachms as a whole. The standard deviation of the X coins is only .36 and for the Y coins it is .41. The standard deviation for all of the tetradrachms is .51. Overall, this shows that Demetrius' primary coins from his central mint do not vary significantly in weight, and that their weights are extremely close to the Attic standard. The central government and the minting bureaucracy certainly exerted careful control over tetradrachm weights at the main mint during Demetrius' sole reign.

The next major set of Demetrius tetradrachms are those with the  control mark. These coins also come from the central mint, but are a product of the early part of Demetrius' reign, while he was a co-ruler with his father Euthydemus. There are 48 coins in this group, of which 44 have available weights. The average weight of the  tetradrachms is ever so slightly higher than the averages of the  and  sets, and also slightly higher than the average for tetradrachms as a whole. Their average weight is 16.64 g, compared to 16.63, 16.51, and 16.54, respectively. The medians show the same pattern. For the  coins the median is 16.86; for the others it is 16.70

and 16.66, and for all tetradrachms, 16.73. Although the difference is minor, it is notable that the median coin weighs more than the Attic standard of 16.8. Additionally, the  tetradrachms have a higher standard deviation than the previous two groups and the general body of tetradrachms. That means that the  specimens vary more in weight than the others. For all three of the central control marks, this group contains both the heaviest and the lightest coin. In general, the low-weight outliers should bring the average of the group down, yet the average of the  group is still high, which suggests that the coins of this control mark are indeed heavier in absolute terms. If one removes the lowest-weight coin of 14.26 g from the calculation, the standard deviation still remains a little bit higher than that of the other two control marks, showing that without the 14-gram coin, the range of weights for the  coins is still wider, and the average is still higher. Further, the  group only contains three coins weighing 17 g or above, with the highest being 17.04. The  group does not have any coins weighing 17 g; its heaviest weighs 16.99. By contrast, there are nine  coins weighing 17 g or above, and two of those specimens hold the maximum weight of 17.13, a full tenth of a gram higher than the maximum for each of the other two sets. The 17.13 g coins are in fact the heaviest in the entire body of tetradrachms.

These several different measures indicate that Demetrius'  coins contained more silver per unit than his later  and  batches, although they all came from his central mint. One may only speculate why this might be. The  control mark represents the period during which Demetrius was a joint ruler with his father Euthydemus. Although he was sharing power, it was nevertheless the period when Demetrius established his reign in territories south of Bactria, in

India, as shown by literary evidence and the elephant imagery on his coins.³³² Euthydemus allowed his son independence in pursuing his conquests and minting his own coins. Those early conquests in India would have required a large and skillful army. Euthydemus may have provided his son with an army, or Demetrius might have raised his own troops; in either case, to maintain that army and reward their victory, Demetrius needed to invest in it and make himself more powerful in terms of military capacity. His higher-weighted  coins demonstrate that investment. Perhaps also, without the responsibility of sole reign, he could have exercised a degree of generosity in minting his coins and paying the soldiers who achieved those conquests. In a continued speculation, Demetrius as a sole ruler, while very powerful, may have found it wise to limit the scope of his expansion and so did not increase his level of military investment. Moreover, with the burden of sole responsibility, he might have exerted a greater strictness in his minting, keeping his later tetradrachm weights slightly lower, but also closer to the Attic standard.

The three small-scale tetradrachm lines of Demetrius, represented by the control marks , , and , all produced silver coins on a temporary, auxiliary basis, most likely to bolster military campaigns. Although these coins come from outside the central mint, their designs proved to conform very well to the overall standards of quality and accuracy that one sees in the main coins. While the small sample sizes may skew the data, a careful examination reveals that the weight standards of the auxiliary tetradrachms, like their designs, also conform very closely to each other and to the Attic standard.

There are eleven specimens with the  control mark, and nine of those have available weights. There are no drastically low-weighted outliers among the nine, and they vary by less than a gram. The heaviest of them is 17.04 g, while the lightest is 16.12. The median coin weighs 16.82,

³³² See Chapter 2, pgs. 50-51.

which is right on the nose of the Attic standard. The average, being always somewhat lower, is negligibly different, at 16.64 g. The numbers for this batch are similar to, and even a bit closer to the Attic standard than the main-mint tetradrachms. Of course, the A tetradrachms do not actually come from a truly auxiliary mint. While they are auxiliary as a line of silver, they in fact come from a large, maybe even centralized, operation that specialized in making royal bronze coins. It was a long-term operation, and the workers may have been quite experienced in pouring molten metal.

There are seven specimens in the sample with the A control mark, and of these only four have available weights. Three of these are close in weight and hover around the Attic standard, at 16.73, 16.88, and 16.95 g. The last of these three, C73, I have already classed as a foreign imitation. The fourth is a low outlier at 14.64 g. Outliers tend to be low due to coin erosion, which is likely a contributing factor in this case. Coin B6, while containing no large breaks or mutilations, is noticeably smooth on the obverse portrait, so much so that no details are discernible around the mouth, neck, or collar, and the bead border only appears as a faint line. One cannot say if the erosion on this coin amounts to two grams of metal, but the other two genuine specimens, C72 at 16.73 g and C74 at 16.88 g, are by comparison very finely detailed with few signs of wear. Without the imitation coin there are three specimens in the sample, and their average weight is 16.08 g. This is of course brought low by the outlier. Without counting the outlier, the two remaining specimens average almost exactly the Attic standard, at 6.81 g. Two specimens are not enough to say whether the coins at this auxiliary operation were always so close to the standard. The erosion on coin B6 is not extreme, and probably does not totally account for its lower weight. It is also reasonable that an operation set up for immediate military purposes would have to work quickly to meet demand and thus might frequently produce coins with inconsistent weights. What can be said, however, is that Demetrius' government certainly aimed at the Attic standard for its auxiliary

coins just as much as it did for its central minting operation. It is notable that the imitation coin, C73, also meets the Attic standard for Demetrius' time. This increases the probability that the producer of this coin was contemporary with Demetrius. While there were many reasons for kingdoms to imitate coins, this specimen reinforces the idea that the weight of silver was a coin's most important feature. Whether the design was supposed to pass off or simply pay homage to Demetrius' coins, the universal weight standard meant that silver coins could trade freely from place to place.

There are three tetradrachms with the \aleph control mark, and they present the same situation as those with the \mathcal{A} mark. Two have normal weights: C76 at 16.55 g and C77 at 16.22 g. There is one low-weighted outlier at 14.71 g. The two heavier coins, however, are not as close to the Attic standard as the coins of the previous control marks; they are noticeably below it. Therefore, the average of all three is only 15.83 g. Again, the low outlier, P4, has observable erosion. The obverse portrait is pocked and worn rather than sharp and detailed. The reverse is worn at both the top and bottom, obliterating the first and final letters of the king's title. The two heavier coins do not show as much wear. This must account for at least some of the difference in weight. Overall, though, the \aleph coins are a little too light. This may be because the \aleph coins were the most peripheral of the three auxiliary tetradrachm groups. The \mathcal{A} tetradrachms, although not from the central mint, did employ as its engraver Artist X, who later became the primary artist at the central mint. The fact that a temporary mint employed a talented and consistent artist, and that someone noticed him enough to propel his career, suggests that the government put some planning and care into setting up the \mathcal{A} operation, and that perhaps it was somewhat proximal to a royal capital. The \aleph operation, by contrast, was set up and run with less investment. Many flans were struck with extra obverse dies from the central mint's \oplus line, and the engraver, Artist Ω , did

not conform perfectly to the standard. It is not surprising then, that an operation with such an apparent emergency purpose would also have produced coins with a slightly lower weight than usual.

One does not discern unique weight profiles for each of the minting operations, yet this aberration among the NK coins supports the idea that flans were produced at their striking locales rather than a central molding and weighing facility. This also brings forth the question, however, of why peripheral coins would have been minted in the periphery, rather than minted in the center and simply sent to areas of need. Why would the king send bullion to a border region, instead of ready-made tetradrachms or blank flans? This may have been because the king did not wish to predict how long or how expensive military operations might become in a certain location. Rather than risk coming up short in coinage, he may have decided it was prudent to mint coins as required by a campaign's progress. By sending bullion to the location, he could stock extra silver, or even mint coins that were slightly underweight if silver began to run low, which would not have been an option if he only brought a supply of coins or flans. In a sudden military emergency, Demetrius could have gotten away with some laxity in coin weights.

Demetrius minted very few silver drachms overall, as they may not have been a particularly useful denomination.³³³ There are only ten genuine Demetrius drachms in the sample, and of those, five were minted via the R operation using Artist X's dies. Like the tetradrachms of the same production line, the drachm weights show a very low standard deviation of only .11, thus varying in overall weight no more than half of a gram. Also like the tetradrachms, the average, at 3.97 g, falls short of the Attic standard by approximately .2 g. Two of the drachms weigh 4.1 g, which comes close, yet still does not exceed the Attic standard. In general, the weight features of

³³³ See Chapter 3, pgs. 94-96.

these drachms affirm they that are indeed part of the same operation as the \mathbb{R} tetradrachms, and were made to the same level of quality.

Of the \mathbb{N} drachms, only three of the four have available weights. They, too, average below the Attic standard, at 3.98 g, but not by as much as their tetradrachm counterparts, which averaged 15.83, a full gram below the standard. The sample size of the \mathbb{N} drachms is simply too small, however, to make conclusions about measurement patterns. One more Demetrius drachm does not have a visible control mark, nor an available weight. The final five drachms in the sample, based on design features, are most likely imitations. Coins B8, BI2, and BI3 are hand-struck and seem to be near-contemporary, or at least ancient, imitations. Coins A4 and W9 are cast copies and are likely from a later period. Significantly, the imitation coins are noticeably lower in weight than the Demetrius coins. The three struck coins have weights of 3.57 g, 3.32 g, and 3.42 g, giving an average weight of 3.44 g. The fact that they are all more than half a gram below the standard is telling. Van Alfen, in his analysis of imitations, would have placed these in the category of “Perfunctory Imitations,” coins made to copy the design of another ruler or state, but that circulated in a distant enough location that they were not actually intended to blend in with the official coins. Instead they simply recalled the official designs for reasons of political or economic trust.³³⁴ Besides crudeness or mistakes in design, Van Alfen pointed out that perfunctory imitations often fall below standard in both weight and metallic content.³³⁵ The lower weights of these three struck imitations, therefore, further support their status as imitations. Such is not always the case though, as the imitated tetradrachm discussed above matched the weight of its genuine counterparts. This suggests regional variations; some imitator governments were more concerned with weight adherence than others. There is reason to believe that the two cast coins are not

³³⁴ Van Alfen, “Imitative and Counterfeit Coinage,” 336, 341-342.

³³⁵ *Ibid.*, 329, 336.

ancient.³³⁶ Only one of them has an available weight, at 3.54 g, which is comparable to the low weights of the other imitations. If these cast copies were indeed made in modern times, then their purpose was not to circulate at all, but to attract collectors. In such a case, their weight would not have mattered, as long as they weighed enough to feel genuine. Their maker could thus easily have skimmed on metal. Although Demetrius issued a very small quantity of drachms relative to tetradrachms, the sample indicates that the batches he did produce met the same weight standard as the tetradrachms. The low average weights of the sample are clearly impacted by the presence of imitations.

Obols are very small and lightweight coins, and thus one does not expect to find a great degree of variation in their weight. Their flan molds would have been quite tiny, so it would have been difficult for a manufacturer to pour substantially less or more silver than was needed into the mold. After all, the standard weight, .7 g, is just over half a gram. Pouring half a gram too little silver would not result in a coin, but a mere droplet. Also, as discussed above, modern measurers of obols do not use more refined scales for obols than they do for larger coins; they still only provide at most two decimal places, precluding a micro-scale analysis. A general comparison of control marks is nevertheless possible. Silver Demetrius obols occur in three control marks. The vast majority carry the  mark, from the king's main mint during his independent reign. A large portion also carry the  mark, from the main mint during Demetrius' co-ruling conquest period. Finally, there is a small quantity of obols from the  operation, which primarily made bronzes, but also made supplementary silvers.

The 66 obols with available weights from the  group do not provide any unexpected data. The average and the median are an identical .68 g. The heaviest obol weighs .95 g, and the lightest

³³⁶ See Chapter 3, pgs. 90-92.

is .5 g. This is an overall range of less than half of a gram, which would not require very great mistakes in silver-pouring. The average is also slightly less than the Attic standard, which so far is the norm for silver coins of the \mathcal{R} stream. There are 22 obols from the \mathcal{D} operation. Their weight statistics present slightly different results. The average weight is .65 g, and the median is .67 g. Although the difference between these numbers and those for the \mathcal{R} obols is negligible in absolute terms, in comparison, it is important to note that the former are lower. Further, the heaviest \mathcal{D} obol weighs .8 g and the lightest is .46 g; both are lower than the respective maximum and minimum for the \mathcal{R} obols. In the case of tetradrachms, the \mathcal{D} weights were *higher* than the \mathcal{R} weights. An explanation for this difference presents itself. It is understandable that Demetrius' tetradrachm weights would be highest during the period that he conquered India, as the extra-value coinage would have been an excellent way to attract, keep, and reward his troops. Tetradrachms in particular were the primary denomination used for military expenditure.³³⁷ It is possible that Demetrius directed more silver towards tetradrachm production, to ensure an effective army, and by consequence, allowed the obols to go with a little less silver. Yet, Demetrius' simultaneous production of obols during this early period shows that along with military payments, the king wanted to ensure a supply of coins for various other state payments or economic stimulation. The obols are close enough to the Attic standard that they would have been successfully exchanged and circulated. The fact that Demetrius chose to mint large quantities of obols at this time, along with military tetradrachms, demonstrates firstly that the king had access to abundant silver resources, and secondly that he used planning and deliberation in the allocation of that silver.

Demetrius' bronze coins, issued for everyday circulation by his subjects, appear in three denominations based on the Attic standard. As fiduciary money, bronze coins held value due to

³³⁷ See Chapter 1, pgs. 25.

the government establishing them as legal currency. They did not carry significant metallic value, and thus their weight did not matter. It is curious, therefore, that bronze coins needed to be based on the Attic weight standard at all, as coins of any size would function equally well. The main benefit of the standard is that it would have allowed merchants and moneychangers to use a single set of balance-weights for both silver and bronze coins. If large piles of coins were transacted, a payee may have found it easier to weigh a batch of bronzes rather than count them by denomination. Moreover, the Attic standard provided a convenient set of multipliable numbers, and it created a regularized pattern for minting the bronzes, so that they turned out to be recognizable in size. While the standard provided a framework, however, one would expect that the minting bureaucracy did not enforce weight standards for fiduciary bronze as much as they did for weight-based silver.

The weight statistics for Demetrius' bronze coins are indeed true to such expectations. Firstly, the average weights for each of the three bronze denominations are below the Attic standard. The double unit bronzes are based on a standard of 8.4 g. For 27 specimens with available weights, the average is 7.59 g. There are also 27 triple units with available weights. Against a standard of 12.6 g, the triples average 11.17 g. The large sextuples are based on a standard of 25.2 g, and seven specimens provide an average of 23.61. Respectively, the differences between the averages and the standards are .81 g, 1.43 g, and 1.59 g. The averages for the silver coins are not so much lower than the standard. Tetradrachms average only .26 g below; drachms are .42 below; and obols only .03 below. One may argue that the bronze coins have lower averages because they are generally in worse condition than the silvers; they changed hands more frequently, and were often buried outside the relative safety of hoards. The metallic makeup of bronze is also harder than pure silver, however, and although subject to surface erosion, bronzes do not necessarily endure more weight-reducing damage than their silver counterparts. Further, the average weights

and median weights are very close to each other for all three bronze denominations, showing that there are not many extremely low outliers bringing down the averages. It is logical that bronzes would be generally lower in weight, in respect to their standards, than silvers. Silvers had to meet international standards in order to be exchangeable. Bronzes did not have to conform so closely, yet they still required resources to produce. Tin and copper may not have had the commodity value of silver, but a king nevertheless needed access to tin and copper to make a bronze currency for public use. It was in Demetrius' interest to limit his use of these base metals. Of course that does not explain why Demetrius used such large sizes for his bronze currency in the first place, except that they were perhaps distinctive, and may have fit with local Indian denominations.³³⁸

Even more significant than the low averages of the bronze specimens is their overall inconsistency in weight. This is most obvious when calculating the standard deviations for the three bronze groups. The standard deviation for the double units is 1.08. This means that 68% of the coins in the sample range from more than a gram above to more than gram below the average weight. Likewise, 98% of the doubles fall within a range of 2 g above or below the average, or a full range of 4 g. When including the outliers, the heaviest coin (9.84 g) and the lightest coin (4.26 g) are separated by a difference of 5.58 g. The standard deviation for doubles, 1.08, is significantly higher than the deviation ranges for silver coins. It is twice as much as the standard deviation for tetradrachms, which is .51. The deviations for drachms and obols, at .26 and .08 show much tighter ranges, and thus greater consistency, than that of bronze double units. The standard deviation for triple units is even greater than that for double units, at 1.26. The lightest triple unit weighs only 8.14 g, which is less than 8.4 g, the standard weight for the smaller, double unit denomination. Between the lightest and heaviest triple unit, at 13.32 g, is a difference of 5.18 g. Finally, the standard deviation for sextuple units is 1.11, also greater than 1 g above or below the

³³⁸ See Chapter 4, pgs. 143-144.

average. These figures clearly demonstrate that it was not a government priority to make sure that bronzes of a particular denomination were all the same weight. The weight system for Demetrius bronzes was thus merely a guideline; it provided rough approximations for sizing the different denominations. As these were not consistently followed, however, the various design types with their simple but distinctive imagery were crucial to effectively identifying and using the bronze currency.

Overall, the weights of Demetrius' silver coins show a high standard of consistency, and thus investment in controlling them. This speaks to his administrative sophistication, and therefore, according to our criteria, demonstrates a high level of power. An ancient text further supports the notion that a king controlling one's coin weights was something that other monarchs could notice and respect. In his Latin work, *The Natural History*, Pliny the Elder described a king of Taprobane (Sri Lanka), who encountered a Roman wayfarer, and was so impressed by the weight standards of Roman coins, even coins from diverse emperors, that he sought to form an alliance with Rome.³³⁹ One may wonder why, following a strict weight standard would be so important for a king. When it came to coin designs, an artistic standard could enhance a king's power by making his coinage recognizable, reputable, and reliable. The same is true for weight standards. Merchants and moneychangers could develop trust in Demetrius' currency, which would have increased the economic reputation of the king himself.

It will be further useful to assess whether average people, not only merchants and moneychangers, might have been able to sense weight consistency in their daily handling of coins. If the king was generous or stingy in his silver allocation, would anyone of his subjects even notice? I conducted a simple experiment to find out. I began with six Hellenistic coins: three tetradrachms

³³⁹ Pliny the Elder, *Natural History*, 6.85.

and three drachms,³⁴⁰ and I personally weighed them. The heaviest was a tetradrachm of Alexander the Great, weighing 16.85 g. The other two tetradrachms were approximately one gram lighter than the Alexander. There was a tetradrachm of Diodotus weighing 15.74 g, and a tetradrachm of Eucratides I weighing 15.64. These two only had a difference of .10 g. The three drachms were similarly distributed, but this time the two heavier coins were closer in weight. The heaviest was again a coin of Alexander the Great, this one weighing 4.12 g. The next was a drachm of Diodotus weighing 3.99 g. The final coin was a modern forgery of a Demetrius drachm, weighing 3.44. Between the latter and the two heavier drachms there was a difference of just over half a gram: .68 between the forgery and the Alexander, and .55 between the forgery and the Diodotus. For the experiment, I asked five subjects³⁴¹ to hold two coins simultaneously, with palms flat and eyes closed, and state which one felt heavier. They were not allowed to feel the edges of the coins for size or texture.

First I asked the subjects to blindly compare the Alexander tetradrachm with the Diodotus tetradrachm, a difference of just over one gram, and what should have been a relatively large difference. Only two out of the five subject guessed correctly that the Alexander coin was heavier. Also, all five subjects were right-handed, so as their left hands were weaker, when in doubt the coin in the left hand should have felt heavier. Even alternated which coin was in the left and which in the right, four of the five subjects chose the coin in their left hand. Both who chose the Alexander coin correctly also had the Alexander in their left hands, which would have made it feel heavier anyway. Next I had the test subjects compare the Diodotus tetradrachm with the Eucratides tetradrachm, which was a difference of only .10 g. Interestingly, again only two subjects guessed

³⁴⁰ Thanks to Frank Holt for lending these coins from his personal collection.

³⁴¹ Thanks to my subjects Eric Ryburn, Donald Hackler, Matthew Fimmie, Travis Lee Kane, and Kristina Neumann.

correctly that the Diodotus was heavier. Again, the two who chose correctly were holding the Diodotus in their left hands, which likely triggered their guesses.

For the drachms I first compared the heaviest, the Alexander, with the lightest, the Demetrius forgery. Between the two is a difference of .68 g. In this case, only one of the five test subjects guessed correctly in favor of the Alexander drachm. There is not even a correlation to the left hand in this case, which implies that the smaller the coin, the more difficult it is to even sense in the hand. Finally, I had my assistants test the Diodotus drachm against the light Demetrius forgery. These coins have a difference of .55 g. True to form, the last round again only brought two correct answers out of five. There was no correlation to the left hand. Overall, even the large difference of one gram between the Alexander tetradrachm and the Diodotus tetradrachm was not discernible to a mixed group of people.

In order to extend the experiment to find how much difference in weight is necessary for a person to “feel” it, I created a test with a diverse group of international modern coins manufactured to a variety of weight standards. The modern coins, being factory produced, eliminate the variable of imperfect coin shape, which might affect one’s perception of a coin. Plus, their relatively new condition eliminates the variable of erosion. I used the following modern coins in this experiment: US 1 dollar, US quarter, British 1 shilling, British 2 shillings, British 10 new pence, 1 euro, 2 euros, Norwegian 10 kroner, Norwegian 5 kroner, Danish 20 kroner, Danish 10 kroner, Greek 50 drachmas, Belgian 20 francs, Peruvian 1 sol, Peruvian 2 soles, UAE 50 fils, and UAE 1 dirham. I personally weighed all of these coins, some with more than one specimen. These coins range in weight from about 5.6 g (US quarter, 1 shilling, 1 sol) to 11.5 g (2 shillings, 10 new pence, 1 dirham large-size).³⁴²

³⁴² See Appendix 5 for full weight chart.

For this experiment, I had one test subject,³⁴³ and the same rules applied. The result was that the subject could easily differentiate weight if the coins were more than 4 g apart. For example, the 1 shilling at 5.67 g and the 1 dirham at 11.52 g are almost 6 g apart and were instantly discernible. The same was true for the 50 filsa at 6.43 g against the 1 dirham, which are about 5 g apart. The Danish 10 kroner at 6.84 g and the 2 shilling at 11.1 are 4.26 g apart and had the same result. If the difference between the two coins was approximately 4 g, 3 g, or 2.5 g, the subject thought that the coins seemed the same in weight, but after much hand-bouncing he was eventually able to guess correctly. This was true for the 1 euro vs. the 2 shillings, the Norwegian 5 kroner vs. the 2 shillings, and the 2 euros vs. the 2 shillings. When the difference between the two coins was 2 g or less, however, the subject was not able to guess correctly. The Danish 20 kroner is 9.28 g, and was not correctly identifiable against the denominations which are heavier than 11 g: the 2 shillings, 10 new pence, and 1 dirham. Finally, if the difference in weight was only a matter of tenths of a gram, the subject could never guess correctly (he always chose as heavier the coin in his left hand, which is weaker than his right hand). This last result was the same whether the coins were of different denominations, or of the same denomination. For example, I tested seven different 2-shilling pieces, and ten different 10-pence pieces, all of which ranged between 11.09 and 11.52 g.³⁴⁴

Demetrius' silver tetradrachms differ in weight by no more than 2.87 g. His heaviest in the sample is 17.13, and his lightest is 14.26. The drachms in the sample differ by only .78 g, and the obols by only .49 g. It unlikely therefore that anyone besides perhaps an experienced moneychanger could feel the weight differences among drachms or obols. Average people in Demetrius' kingdom were probably much more experienced than my modern-day subjects in the daily, frequent handling of coins, and so probably had a keener sense of weight. Again, however,

³⁴³ Thanks to my husband, Jijo Joseph.

³⁴⁴ One might expect that since these modern coins are machine manufactured, specimens of the same denomination would weigh almost exactly the same, but in fact they varied in weight by as much as .5 g.

the tetradrachms only vary by 2.87 g, which falls in the range in which my subject had difficulty choosing the heavier coin. It is near to the two-gram mark, at which my subject could not tell weight differences at all. This suggests that Demetrius and his minting administration controlled their coin weights to the point that the average people transacting coins in his kingdom perceived the coins as more or less consistent in weight. Someone would only know a coin's true weight when the transaction included a scale, and thus at other times, such consistency in "feel" would inspire confidence and trust for King Demetrius and his economy. That is not to say that the king especially cared what common people thought about him, but it would have helped his military cause if soldiers never felt shortchanged.

The weight consistency of Demetrius' coins, and therefore his administrative capability, is beyond a doubt. Next, an evaluation of Demetrius' overall military investment and capability may begin by comparing his coin weights with the coins issued by several other kings. Demetrius' father Euthydemus also issued silver tetradrachms as his primary denomination. Gathering the same amount of data from other kings that I gathered for Demetrius is not practical within the scope of this work. However, a small sample of sixteen Euthydemus tetradrachms from the American Numismatic Society does show somewhat different statistics than the body of Demetrius tetradrachms.³⁴⁵ Another small sample of thirteen Euthydemus coins from the Bibliothèque Nationale shows the same results.³⁴⁶ The weights of the Euthydemus coins from both collections are overall lower than those in the full body of Demetrius coins. The average tetradrachm weights from the ANS and the BN, respectively, are 16.12 g and 16.02 g. The average weight of the Demetrius tetradrachms is 16.54 g. Similarly, the median weights of the Euthydemus sets are 16 g and 16.07 g, while the median Demetrius weight is 16.73 g. The maximum weight for a Demetrius

³⁴⁵ Bopearachchi, *Sylloge Nummorum Graecorum*, 122-132, 136-138, 141-142.

³⁴⁶ Bopearachchi, *Monnaies gréco-bactriennes*, 154-159.

coin is 17.13, which surpasses the Attic standard. The heaviest coins from the two Euthydemus sets are 16.64 and 16.56—both below the Attic standard. Such small samples of Euthydemus coins cannot provide the final word, but both sets are made up of randomly gathered coins with diverse provenances. Further, the Euthydemus coins are lower in weight than the Demetrius coins from the same collections. The ANS collection contains seven Demetrius coins. Compared to the sixteen Euthydemus coins, which average 16.12 g, the seven Demetriids average 16.45 g. The BN collection contains four Demetrius coins. Interestingly, both the Euthydemids and the Demetriids from the BN include low-weighted outliers: a 14.92 Euthydemus and a 14.71 Demetrius. Comparing the two sets, the four Demetrius coins average 16.08 g against the Euthydemids at 16.02 g. Even if one supposed that these museums gathered the best-quality, least-eroded coins for their collections, then one should expect to find coins with overall higher weights, as they are closer to mint condition. This factor only adds to the evidence that Euthydemus minted tetradrachms of slightly lower weight than his son Demetrius.

The same pattern occurs when looking at the full available body of coins issued by Diodotus I and his son Diodotus II, the predecessors to Euthydemus and founders of the independent Bactrian kingdom. Frank Holt, in *Thundering Zeus* studied and catalogued all of the extant and accessible Diodotid coins.³⁴⁷ The Diodotid sample contains 166 tetradrachms with available weights, even more than the 146 Demetrius tetradrachms. Like the Euthydemus coins, the Diodotids present weights that are lower than those of the Demetriids. The Diodotids average 16.12 g and have a median of 16.3 g. Again, both statistics are below the Demetrius average of 16.54 and median of 16.73. The heaviest Diodotid coin is 16.94 g, higher than the Euthydemus maximum, and the Attic standard, but below the heavy 17.13 Demetrius coin.

³⁴⁷ Holt, *Thundering Zeus*, 139-163.

Literary evidence shows that Diodotus I, first a satrap, seceded from the Seleucid Empire.³⁴⁸ The Seleucids may not have put up much of a fight, as they were dealing with another group of rebels, the Arsacids, at the same time.³⁴⁹ Holt corroborated this scenario in *Thundering Zeus* by demonstrating that Diodotus and his son gradually seceded by altering their issued coinage to reflect the change from satrap to king.³⁵⁰ It makes sense then that the Diodotids, although warlike, did not invest as much in their military, or the coinage to pay for it, as Demetrius later did. Demetrius' father Euthydemus was also a warring king; literature describes his major battle with and long siege under Antiochus III the Great.³⁵¹ Euthydemus was militarily weaker than the Seleucid, as the only way he was able to get out of the siege and retain his kingdom was through the diplomacy and treaty made by his son Demetrius. Euthydemus' lesser military capacity is thus also reflected in his lower-weighted coins.

Antiochus III the Great continued his reign as a powerful Seleucid emperor while Demetrius, his neighbor, was ruling in Bactria and northwest India. Ancient literature describes Antiochus as powerful in that he reconquered previously lost dynastic territories and enlarged his empire.³⁵² A sample of 25 random Antiochus III tetradrachms from various past private auctions³⁵³ can serve as a useful set for comparing coin weights with Demetrius tetradrachms. Seleucid tetradrachms, like Bactrian tetradrachms, were made of silver and based on the Attic standard. In this set of 25, the average weight is 16.81 g, slightly higher than the average of 16.54 for Demetrius. The median Antiochus coin weighs 16.83 g, one-tenth of a gram above the median Demetrius coin at 16.73 g. The heaviest of these Antiochus coins weighs 17.15 g, almost identical to the top

³⁴⁸ Strabo, *Geography*, 11.9.2; Justin, *Epitome of Pompeius Trogus*, 41.4.1-20.

³⁴⁹ Ibid.; Ibid.

³⁵⁰ Holt, *Thundering Zeus*, 87-106.

³⁵¹ Polybius, *Histories*, 10.49, 11.34.

³⁵² Appian, *History of Rome*, 11.1.

³⁵³ These sold auction coins have been gathered and published by the online database Wildwinds. See the first 25 listed tetradrachms, in order, at http://www.wildwinds.com/coins/greece/seleucia/antiochos_III/i.html.

Demetrius coin weighing 17.13 g. Significantly, both the average and median weights of this sample of Antiochus III coins fall above the Attic standard of 16.8 g. The fact that Antiochus' tetradrachms appear to be very similar and even somewhat higher in weight than Demetrius' supports the history of Antiochus' success, and bolsters the use of coin weights as a criterion for power. It also shows that Demetrius was strong enough to remain competitive with this enormous neighbor of his.³⁵⁴

A final way to quantify Demetrius' military capacity and in turn assess his power is to attempt to measure his overall output of coinage. In this case, I will calculate the total number of tetradrachms, as such a process requires die-linkage, and drachms, obols, and bronzes are rarely clear or detailed enough to satisfactorily confirm any die links. Scholars have long debated both the methods and usefulness of quantifying original coinage numbers from limited extant samples. François de Callataÿ has made a convincing argument that numerous estimations of coinage from various kingdoms and hoards have shown consistent enough results, that such a task is indeed informative.³⁵⁵ He also stressed that no sample can be completely representative, but attempting such quantification adds to the overall body of numismatic, historical, and economic knowledge.³⁵⁶ In order to calculate the quantity of a coinage, one must first count the number of obverse dies present in a sample of tetradrachms (as obverse dies lasted longer and produced more coins than reverses) and then extrapolate the total number of obverse dies. De Callataÿ argued that the best methods for estimating total dies are the one derived by G.F. Carter, and Warren W. Esty's

³⁵⁴ Of course, Polybius (*Historics*, 11.34) recounted that Antiochus met Demetrius when the latter was a young man negotiating for the independence of his father's kingdom. The story is that Antiochus was so impressed with Demetrius' appearance and personality that he allowed Euthydemus to keep his kingdom. It follows that Antiochus would have later allowed Demetrius to keep an independent kingdom as well, but Demetrius' own formidable command of his resources and subjects may have helped keep Antiochus away.

³⁵⁵ François de Callataÿ, "Calculating Ancient Coin Production: Seeking a Balance," *The Numismatic Chronicle* (1966) 155 (1995): 290-294.

³⁵⁶ François de Callataÿ, "Quantifying Monetary Production in Greco-Roman Times: A General Frame" in *Quantifying Monetary Supplies in Greco-Roman Times. Proceedings of the Third Francqui Conference Held at the Academia Belgica, Rome, 29-30 Sept 2008*, ed. François de Callataÿ (Bari: Edipuglia, 2011), 17-23.

application of I.J. Good’s method.³⁵⁷ Then, one may multiply the number of dies by the number of coins an average die could produce; de Callataÿ provided an estimate of 20,000 coins per die, or a range of 10,000 to 40,000.³⁵⁸ Carter’s and Esty’s methods use very different mathematical formulae. The first is simpler and provides a range of total number of dies. The second is more complex, but provides an exact number. Neither result is necessarily more accurate, but together they create a reasonable estimate, as the results of the two are similar.

Carter’s method uses the following formula: $D = \frac{n*d}{1.214n-1.197d}$.³⁵⁹ D equals the total estimated number of dies that a state produced, where n is the total number of specimens, and d is the number of dies observed in the sample. Using the extant sample of tetradrachms, from five control-mark based minting operations,³⁶⁰ the figures for d and n are as follows: \mathcal{R} shows 36 dies among 42 coins; \mathcal{R} shows 41 dies for 44 coins; \mathcal{P} shows 44 dies for 48 coins; \mathcal{A} shows 10 dies for 11 coins; and \mathcal{A} shows 3 dies for 7 coins. When the separate n and d values are plugged into the formula for each control mark, the total numbers of estimated dies are as follows: \mathcal{R} produced 191.49 dies; \mathcal{R} produced 415.76 dies; \mathcal{P} produced 376.87 dies; \mathcal{A} produced 79.48 dies; and \mathcal{A} produced 4.36 dies.³⁶¹ When these total die estimations are added together, the result is 1,067.96 total tetradrachm dies. At 20,000 coins per die, this results in a total coinage size of 21,359,273 tetradrachms. Carter further provided an equation to calculate the possible deviation from the total

³⁵⁷ G. F. Carter, “A Simplified Method for Calculating the Original Number of Dies from Die-link Statistics” *ANSMN* 28 (1983): 195-206; Warren W. Esty, “Estimation of the Size of a Coinage: a Survey and Comparison of Methods,” *The Numismatic Chronicle (1966-)* 146 (1986): 208.

³⁵⁸ Callataÿ, “Quantifying Monetary Production,” 9.

³⁵⁹ Carter, “A Simplified Method,” 202.

³⁶⁰ The three tetradrachms with the \mathcal{N} control mark were not included. There are no die links among the three coins, and Carter’s formula does not function properly for a very tiny sample without any die links. Inputting these three coins causes the results to be wildly skewed and obviously incorrect. Perhaps this is because if one has only a handful of specimens, and they show no die links, there is simply no way of knowing how much of the full sample one has collected.

³⁶¹ For the last control mark, Carter’s method requires a slightly altered formula, as the set presents more than two times as many specimens as dies. The only difference is that in the denominator of the equation, d is multiplied by 1.016 instead of 1.197.

number of dies, using s for standard deviation: $s = \frac{D\sqrt{D}}{n-1}$.³⁶² When the total die numbers, D , are plugged into this formula, the full ranges for each control mark are as follows: \mathbb{R} produced between 127 and 256 dies; \mathbb{R} produced between 219 and 613 dies; \mathbb{S} produced between 221 and 533 dies; \mathbb{A} produced between 9 and 150 dies; and \mathbb{A} produced between 3 and 6 dies. Adding up the minimum numbers and the maximum numbers for each group gives an overall range for all tetradrachms. The result tells us that Demetrius' mints produced between 578 and 1,558 dies, for a total number of tetradrachms ranging from 11,560,000 to 31,160,000.

Esty's method, based on an equation derived by Good, is slightly different. It calculates the probability that undiscovered coins will match the dies already extant in the sample, and thereby one may determine how much of the total number of dies one's sample contains. The equation is as follows, where C is "coverage" or the probability stated above: $C = 1 - \left(\frac{N_1}{n}\right) + \frac{2N_2}{n(n-1)}$.³⁶³ In this case, N_1 represents the number of dies in the sample appearing on only one specimen, and N_2 is the number of dies in the sample with two specimens. The total number of N_1 s for all six control mark groups³⁶⁴ is 120 dies with only one specimen. There are 16 N_2 s, dies with two specimens. The letter n in the equation still represents the number of specimens overall. Following this equation, the result is a probability that my sample contains 22.7% of the total number of tetradrachm dies made under Demetrius. The number of observed dies in the sample is 137, which, if it is 22.7% of the total, means that there are 603 total dies. Multiplying the 603 dies by 20,000 coins per die, there were an estimated 12,062,670 total tetradrachms, which falls into the range resulting from Carter's formulae (between 11,560,000 to 31,160,000).

³⁶² Carter, "A Simplified Method," 202.

³⁶³ Esty, "Estimation of the Size," 208.

³⁶⁴ The mark \mathbb{N} may now be included, as it does not cause a problem for the formula.

G.G. Aperghis used the same methods to calculate the number of tetradrachm dies for two of the Seleucid monarchs at several of their important mints.³⁶⁵ For Antiochus III, who was contemporary with Demetrius, Aperghis estimated 521.5 total tetradrachm dies for four major mints, three in Mesopotamia and one at Ecbatana.³⁶⁶ This is comparable to the estimate of 603 Demetrius dies, but in fact should be higher considering that Aperghis only looked at a handful of Seleucid mints. Houghton and Lorber, who catalogued all extant Seleucid coins and assigned them to mints, identified at least eighteen mints (and possibly more—up to 31) during Antiochus III's reign.³⁶⁷ Therefore, as Aperghis did not calculate output from all of Antiochus' mints, one must assume that his total number of dies was significantly higher than 521.5. This is logical in comparison to Demetrius, as Antiochus' empire was much larger in both territory and population. The output of four mints for Antiochus and six minting operations for Demetrius thus fit together, at 521.5 dies and 603 dies respectively. This suggests also that Demetrius was indeed equally powerful to the Seleucid, proportional to the smaller size of Demetrius' kingdom. Both his central and auxiliary mints produced around the same number of tetradrachms as four of Antiochus' mints, and thus Demetrius was able to be competitive in the wages for his troops.

Aperghis' estimate for Seleucus IV at the same four mints is drastically lower. His results show only 67.2 dies compared to Antiochus' 521.5.³⁶⁸ Although this number still does not reflect all of the mints that Seleucus IV commanded, this relative weakness in output corresponds to the portrayal of the king in ancient literature. Appian described Seleucus' career as very short-lived; he

³⁶⁵ Aperghis, *Seleucid Royal Economy*, 239-242.

³⁶⁶ *Ibid.*, 240. François de Callataÿ calculated a lower overall number of tetradrachm dies for Antiochus III: 400. His calculations for other kings, including Alexander the Great, Seleucus IV, and the Attalids are also on the low side. See "A Quantitative Survey of Hellenistic Coinages," in *Making Moving and Managing: The New World of Ancient Economies, 323-31 BC*, eds. Zofia H. Archibald, John K. Davies, and Vincent Gabrielsen (Oxford: Oxbow Books, 2005), 73-91. This is not to say that Demetrius' output was so much higher, but rather that the Demetriid sample, because of its great die diversity, perhaps sheds light on higher mint outputs for Hellenistic states in general.

³⁶⁷ Houghton and Lorber, *Seleucid Coins*, 363-365.

³⁶⁸ Aperghis, *Seleucid Royal Economy*, 240.

said that the king was quickly replaced by his brother.³⁶⁹ Appian also stated that he reigned “feebly and without success.”³⁷⁰ One may safely maintain, therefore, that Demetrius was by comparison, much more powerful and militarily capable than Seleucus IV.

All of the measures of Demetrius’ coin weights and quantities are consistent with the previous criterion of administrative power. The measurement and weighing of coins at his mints was clearly highly controlled, and as expected, slightly more lax in at least one of the peripheral mints. His coins were not debased, they used more metal than the coins of his predecessors, and were competitive with those of his Seleucid neighbor. Demetrius’ peak phase in metal allocation for coins also correlates to the timeline of his supposed conquest and expansion into India. Further, it appears that he produced a high quantity of tetradrachms, relative to the size of his kingdom, which also points to aggressive military investment. All of these factors create a picture of Demetrius as a king with a strong military capability. In the Hellenistic world, where armies were largely mercenary and required payment in tradeable silver, Demetrius produced quality, high-value coinage that was both attractive to new soldiers and rewarding to veterans. These abilities to control his metal resources and correctly play the mercenary game affirm that Demetrius was powerful, both in absolute terms, and relative to other kings in his political system. He has thus appeared strong in two criteria for power: administrative capability and military capability. While trade and taxation cannot be measured so systematically, and thus economic capability is more obscure, it can also be said with certainty that Demetrius was wealthy, as is evident from his high coin weights and high estimation of coinage quantity.

The one aspect of military capability, as established by Hui, that Demetrius did not meet, is the replacement of mercenary troops with a standing army. Indeed all of the Hellenistic monarchs

³⁶⁹ Appian, *History of Rome*, 11.45.

³⁷⁰ *Ibid.*, 11.66.

tended to remain reliant on mercenaries. One solution for this situation may be found in the ethnic nature of the Hellenistic world. The case studies of Hui, Wohlforth, and the other political theorists included in this study, focus on places like ancient China and Assyria. In these cases the rulers were ethnically the same as their subject populations. In the Hellenistic kingdoms, the Greco-Macedonian monarchs, originally made up of Alexander the Great's officers, ruled over a variety of Mediterranean and Asian populations. There were many Greco-Macedonians in these populations who married the local peoples, especially the original veterans left throughout the world by Alexander the Great.³⁷¹ They would have lost their biological "Greekness" in the first generations. The Seleucid dynasty also began with a mixed marriage, as Seleucus I married the Persian woman chosen for him by Alexander, Apama.³⁷² Yet the Hellenistic monarchs mostly created dynasties by marrying other Hellenistic royals, thus preserving, to a large extent, their Greco-Macedonian ethnicity. Even if the royals had non-Greek blood, as in the case of the Seleucids mothered by Apama, the monarchs, at least for the first century, presented themselves as Greek.³⁷³ There is also evidence that in Bactria, an ethnic disparity existed between upper-level government workers and their subordinates. An inscription on a jar from the treasury at the archaeological site of Ai Khanoum reveals two workers with Bactrian names, Oxyboakes and Oxybazos, who counted money under a Greek-named supervisor, Zeno.³⁷⁴ The pure "Greekness" of the ruling class of Bactro-Indo-Greeks changed dramatically in the second Hellenistic century, shortly after the period of Demetrius, but that is another story altogether. Perhaps this ethnic

³⁷¹ Frank L. Holt, *Into the Land of Bones* (Berkeley: University of California Press, 2005), 96-98.

³⁷² *Ibid.*, 121.

³⁷³ Rachel Mairs has done much with the concepts of identity and ethnicity in the Hellenistic world. One point that she made, which is generally in agreement with other scholars, is that Greekness was associated with political authority or social prestige. See "An 'Identity Crisis'? Identity and its Discontents in Hellenistic Studies" in *Meetings between Cultures in the Ancient Mediterranean. Proceedings of the 17th International Congress of Classical Archaeology, Rome 22-26 sept. 2008*, ed. M. Dalla Riva (Rome: 2010), 5-6.

³⁷⁴ This inscription and its administrative implications is noted by Claude Rapin, in "La Trésorerie Hellénistique d'Ai Khanoum," *Revue Archéologique, Nouvelle Série* (1987): 54-55.

dissonance between rulers and ruled made it difficult for the monarchs to create standing armies, because there was a lack of inherent loyalty among the subjects. Mercenaries, therefore, may have been the only reliable option. They may have been expensive, but there is no evidence that they were undisciplined, or any more difficult to command through a central structure than national subjects. The success of Demetrius despite a possible reliance on mercenary soldiers is a further testament to his political power.

Chapter 6: Iconography and Assertion Policies

Coins are manifestations of government policy. They function, first of all, as physical pieces of policy. The examination of design control and the minting system demonstrated how Demetrius' coins are the physical result of the implementation of strict policies toward coin design and mint organization. The weights and production quantities of Demetrius' coins also show physical manifestations of policy—they represent the government's planning and implementation of currency values and the investment of silver. Coins are also pieces of policy in a second way; they are vehicles for assertion policies, the intentional messages that an administration sends in order to assert ideas about itself. The meaning of these assertion policies can be understood by decoding the iconographic content of coins.

Consider how modern coins also carry assertion policies in their iconography. A major difference is that, in a democracy, each new leader does not issue new coins. In the United States for example, a new coin design, occurring at most every few decades is the result of decisions by multiple members of government and the public, and requires Congressional authorization. For example, the design of the Sacajawea dollar coin came out of a committee including a member of Congress, a university president, the president of the American Numismatic Society, the under-secretary of the Smithsonian Institute, a sculptor, an architect, and the U.S. Mint Director. The design was then reviewed by artists, Native American leaders, numismatists, historians, and members of the public.³⁷⁵ Designs do reflect the values of the government at given points in time, such a cultural desire to recognize female and Native American figures, but they also have to be

³⁷⁵ "The Historic Design Selection Process," The United States Mint: About the Mint, accessed January 29, 2016, http://www.usmint.gov/mint_programs/golden_dollar_coin/index.cfm?action=sacHistory.

neutral enough to appeal to the widely diverse, democratically elected legislature. The presidential heads on coins are not current leaders, but long-dead, historical icons. The U.S. Mint prides itself on the fact that some things on the coins never change, such as the mottoes “E Pluribus Unum” and “Liberty.”³⁷⁶ Even though they the coin does not change often, the iconography and words on U.S. coins still impart a sense of the state’s values and priorities. Of course, modern day monarchies, whether parliamentary like Great Britain, or absolute like Saudi Arabia, do issue coins bearing a royal portrait which legitimizes and affirms the monarch’s role. Although in Britain, non-portrait design changes have to go through a process similar to the one in the U.S.³⁷⁷

In an ancient monarchies, coins did not need to pass through any public design process. It was not only a luxury, but a requirement for a king or queen to issue distinctive coin designs that gave some information, through pictures and words, about the nature of the ruler or government. King and queens did not have many forms of media with which to disseminate ideological information about themselves and their administration. Besides stone decrees and monuments, coins were the only durable source of ideology that subjects would see on a regular basis.

The content of the assertion policies presented by Demetrius via his coins gives insight into his royal power. So far, political theory has been useful to reveal the king’s power through his administrative involvement, control, and efficiency, and his level of military investment. The same theoretical framework can explain a monarch’s ideological messages. Wohlforth et al. argued that many successful hegemonies in the ancient world promulgated ideologies of militarism. The authors used the examples of ancient Assyria asserting universal authority, and the Hellenistic heavyweights, the Antigonids, the Ptolemies, and the Seleucids, using militaristic ideology to claim

³⁷⁶ The United States Mint: About the Mint, accessed January 29, 2016, http://www.usmint.gov/about_the_mint/.

³⁷⁷ “Coin Designs and Specifications,” The Royal Mint, accessed January 29, 2016, <http://www.royalmint.com/discover/uk-coins/coin-design-and-specifications>.

heirship to Alexander.³⁷⁸ Wohlforth and his fellow scholars also pointed to “ideological innovations” as a trait of successful hegemon. They used the examples of the Aztecs and the Incas, both of whom had hegemonic leaders who “bolstered their own authority and that of their newly emerging state by re-writing history and adapting established religious beliefs.”³⁷⁹ The Aztec rulers got rid of earlier written records and pushed the worship of a god supposed to be the ancestor of their dynasty. The Incas encouraged an ideology emphasizing the divinity and immortality of rulers, so their bodies, estates, and fortunes would be cared for after their death.³⁸⁰ Stuart Kaufman contributed the further point that an imperial hegemon can only be successful if its government identifies itself as an empire and presents that identity as justified and legitimate. For example, a political unit may present itself as a legitimate empire based on a divine right to rule.³⁸¹ These political theorists showed that the ideological messages a monarch sends can increase that ruler’s success as a hegemon, and thus his or her political power. As Demetrius’ coins are vehicles for his ideological messages—his assertion policies—one may examine the coins for these indicators of power: militaristic ideology, innovative ideologies that adapt history or religion, and legitimization of empire.

The informational content of Demetrius’ coins can be divided into three categories: control marks, text, and images. Control marks had an administrative use and speak to the power of the king’s bureaucracy. The text on his coins is limited. The same two words appear on all of his coins: the three silver and three bronze denominations. They are his title, ΒΑΣΙΛΕΩΣ, and his name, ΔΗΜΗΤΡΙΟΥ, both in the genitive case. Although simple, these words are nevertheless full of political meaning. The imagery on Demetrius’ coins is more complex; it includes a variety of parts

³⁷⁸ Wohlforth, et al., “Testing Balance-of-Power,” 161, 165.

³⁷⁹ Ibid., 175.

³⁸⁰ Ibid.

³⁸¹ Kaufman, “Fragmentation and Consolidation,” 181-182.

that can have multiple meanings. All three silver denominations have the same images. They contain, basically, the king's portrait, with a diadem and an elephant scalp atop the head, and the god Heracles in a standing pose, with a club and lionskin, crowning himself with a wreath. Each of the three bronze denominations has its own imagery. The double units depict Heracles in the form of a portrait head with lion paws tied around the neck. The reverse shows the goddess Artemis in a standing pose, radiate, holding a bow and drawing an arrow over her shoulder. The triple unit bronzes show an elephant's head, almost portrait-like in three-quarters profile. Around the elephant's neck is a rope with a bell hanging from it. The reverse shows simply an unadorned caduceus. Finally, the sextuple units have the simplest imagery of all. The obverse carries a circular shield. In the center is a small Medusa head, identifying the shield as an attribute of the goddess Athena. On the reverse there is a simple trident.

The text on Demetrius' coins, ΒΑΣΙΛΕΩΣ ΔΗΜΗΤΡΙΟΥ, is basic: of King Demetrius. It is not, however, a necessarily obvious format. According to Mørkholm, the name of a person or city on a coin was a mark of accountability; it told coin users who issued the currency, and so who was responsible for its value or legality.³⁸² Therefore it is reasonable for Demetrius to have put his name on his money. Inscribing the title of "King," however, does something else. It does not identify *who* is responsible for the issue—it identifies the political status of that person, a fact that is less relevant to a coin's role as currency. Of course declaring one's political role as "king" would certainly make a coin more trustworthy and legal than one issued by a person of uncertain position. It was not essential, though; city magistrates and provincial satraps also issued coins. The title of "king" does more for the person than it does for the money. Alexander the Great was the first king to include ΒΑΣΙΛΕΩΣ on coins, and then only on some of them.³⁸³ As Alexander's

³⁸² Mørkholm, *Early Hellenistic Coinage*, 29.

³⁸³ *Ibid.*

successors attempted to continue the monarchical system of government that he instituted, it makes sense that they wished to be publicly known by the same political title. Thus, while Demetrius' use of ΒΑΣΙΛΕΩΣ on his coins was not innovative, it nevertheless made a political statement. His government meant to rule as an absolute monarchy, and his coin text made sure that was widely known. Demetrius kept his title simple, however, and did not include any epithets, such as ΣΟΤΗΡ or ΕΠΙΦΑΝΗΣ, that many contemporary and successive Hellenistic kings used. Mørkholm suggested that epithet use, especially the excessive use by the later Seleucids and Indo-Greeks, is evidence of desperation in the face of waning monarchical stability.³⁸⁴

An analysis of imagery on Demetrius' coins must begin with its most outstanding features—the elephants. Demetrius' portrait on his silver coins is unique because it pictures an elephant scalp atop the king's head. A similar elephant head is repeated on the obverse of his triple-unit bronze. The elephant is not a common attribute of the Hellenistic kings, nor is it associated with the Olympian gods. The use of elephants on Demetrius coins is significant for its reference to Alexander the Great, and its association with ancient Indian religions. Alexander the Great's tetradrachms include a portrait of Heracles wearing a lion scalp; it represents the Nemean lion that the demigod killed, and thus can be seen as a symbol of conquest.³⁸⁵ When Ptolemy I, one of Alexander's bodyguards and generals, first became an independent sovereign in Egypt, he issued a series of coins depicting a portrait of Alexander wearing an elephant scalp. The style imitated the lion scalp on Alexander's Heracles heads. The elephant scalp thus likewise represents conquest. While Heracles conquered the lion, Alexander conquering an elephant refers to his invasion of

³⁸⁴ Ibid., 31.

³⁸⁵ The lion was invulnerable to weapons, but Heracles strangled it, then skinned it with its own claws and wore its hide as armor. Theocritus, *Idylls*, 25.

India, the ancient country where Asian elephants lived and where armies obtained war elephants.³⁸⁶ From this, one can easily infer the meaning of the elephant scalp on Demetrius' portrait. Seleucus I inherited part of India when he took over Alexander's eastern empire, but after a war with the Mauryan emperor Chandragupta, Seleucus ceded the Indian territories in exchange for 500 military elephants.³⁸⁷ Demetrius I, about 100 years after Seleucus I, was the first Hellenistic monarch to reconquer territory in India. Thus, Demetrius, by portraying himself wearing an elephant scalp, is paralleling his own military victories in India with those of his distant predecessor, Alexander. Here, in the elephant scalp, we can see definite ideological imagery. The elephant scalp represents military victory, and thus fulfills the criterion of "militarism" for hegemonic power. Further, the elephant scalp can be seen as an adaptation of history, the second criterion for power through iconography. By connecting himself to Alexander, Demetrius was manipulating the public narrative of history by creating continuity between the young Macedonian's empire and his own.

Besides the elephant scalp, an elephant's head, in portrait form, appears on the obverse of the triple-unit bronzes. The animal's face is designed in the same style as the elephant scalp atop the king's portrait. Below the head, where the neck would be, hangs a rope with a bell on it. This bell suggests the taming of a wild animal, and could be interpreted as a further symbol of India's subdual. The elephant imagery in general could have held religious meaning for Indian subjects. Hindu and Buddhist symbolism is rife with elephants. The most important meaning of elephant iconography, in terms of Demetrius' coins, is that it symbolizes kingship. In ancient India, only kings were allowed to own elephants. Kings rode them in royal processions and in battle, and by

³⁸⁶ Scholars including Frank Holt have considered this the most likely interpretation of the elephant scalp. See *Lost World*, 157.

³⁸⁷ Strabo, *Geography*, 15.2.9.

keeping them, were responsible for attracting the clouds (heavenly elephants) to bring rain.³⁸⁸ They represented not only royalty in general, but also the qualities of a king—sovereignty, strength, wealth, virility, gentleness, and calmness.³⁸⁹ The choice of an elephant head on a royal coin certainly, therefore, propagates the legitimacy of empire.

Besides kingship, elephants signify a variety of other deities and religious concepts, which, while not boosting Demetrius' rule per se, would have nonetheless appealed to Hindu subjects.³⁹⁰ The god Ganesa appears as a man with an elephant's head, and is supposed to bring wisdom, success, and prosperity.³⁹¹ The god Indra rode a white elephant named Airavana, the ancestor of earthly elephants, the monsoon-bringer, and mate to the female elephant Abhramu. The goddess Laxmi, the mother Earth and fertility deity, is accompanied by a pair of water-giving elephants.³⁹² Finally, ancient Indian peoples traditionally worshipped elephants to secure the welfare of their kingdoms, armies, progeny, and crops.³⁹³

The next most important imagery on Demetrius' coinage is the god Heracles. On the reverses of the silver coins, a full-body Heracles stands and crowns himself. On the obverses of the double-unit bronzes is a bearded portrait head of the same god. The iconography of Heracles on these coins serves two functions: it creates a dynastic connection, and carries a religious association. Demetrius' father Euthydemus used the god Heracles on all of his silver coins;³⁹⁴ clearly he was Euthydemus' patron deity. For Demetrius to use the same god on all of his silvers creates an automatic connection. It does not define the exact relationship between the two kings, but to any

³⁸⁸ Heinrich Zimmer, *Myths and Symbols in Indian Art and Civilization*, ed. Joseph Campbell (New York: Pantheon Books, 1946), 107.

³⁸⁹ Margaret Stutley, *The Illustrated Dictionary of Hindu Iconography* (London: Routledge & Kegan Paul, 1985), 44.

³⁹⁰ Buddhism was also popular during Demetrius' period. Asoka the Great converted to Buddhism and spread the religion not only among Indians, but even among Greeks. While a number of Demetrius' subjects would have been Buddhist, Buddhist art was not yet popular, and therefore the elephant cannot be said to hold Buddhist symbolism at this time. Later, the elephant became a common theme in Buddhist art.

³⁹¹ Stutley, *Hindu Iconography*, 47.

³⁹² Zimmer, *Myths and Symbols*, 92.

³⁹³ Zimmer, *Myths and Symbols*, 108.

³⁹⁴ Bopearachchi, *Monnaies gréco-bactriennes*, 154-159.

who doubted Demetrius' legitimacy, seeing Heracles as the patron god connected him to the same household as Euthydemus. Thus the god showed an inherent legitimacy through birthright.

Demetrius did not use exactly the same Heracles type as his father, though. Euthydemus' Heracles is seated on a pile of rocks holding a club,³⁹⁵ while Demetrius' Heracles stands, as described above. This difference presents Demetrius as separate and independent from his father, while still a legitimate king.

The predecessor to Euthydemus and Demetrius, Diodotus II, inherited Zeus as a patron god.³⁹⁶ Euthydemus usurped the throne from Diodotus.³⁹⁷ He could have tried to show a legitimate continuity with Diodotus by also claiming Zeus' endorsement, but it was not necessary; through Heracles, Euthydemus could reach farther back and create continuity with Alexander the Great. Alexander favored both Heracles and Zeus, and used both the gods on his coins. He believed himself to be a descendent of Heracles, and simultaneously the son of and incarnate Zeus-Ammon.³⁹⁸ As it was originally Alexander's territory that they were ruling, the Hellenistic kings in general wished to claim legitimacy through the Macedonian. An example of a Hellenistic monarch who created this lineage quite blatantly is the Indo-Greek Agathocles, an immediate successor of Demetrius. Agathocles issued a series of "commemorative" coins, depicting the names and types of previous kings, including Alexander, Euthydemus, and Demetrius.³⁹⁹ As Agathocles includes all of these kings in this numismatically asserted lineage, one can assume that Demetrius had no qualms about connecting himself to Alexander. The Hellenistic monarchs also believed in claiming territory in the same *way* as Alexander, which was legitimacy through military might.

³⁹⁵ Ibid.

³⁹⁶ Ibid., 147-150.

³⁹⁷ Polybius, *Histories*, 11.34.

³⁹⁸ Arrian, *Anabasis of Alexander*, 3.3.2, 4.9.9, 4.11.6; Holt, *Elephant Medallions*, 152-153.

³⁹⁹ Bopearachchi, *Monnaies gréco-bactriennes*, 177-179.

Alexander's justification for taking over Asia was that it was "spear-won."⁴⁰⁰ He thus set a precedent for the Hellenistic ruler to use military victory as their basis for rule. Demetrius in particular, via the elephant scalp, tried to follow in Alexander's footsteps as conqueror of India.⁴⁰¹ Thus for Demetrius to associate himself with the god Heracles, he was doubling up his legitimacy, through his father and Alexander. It also recalled Alexander's method of rule, through conquest. In this way the use of Heracles affirms dynastic rule and monarchy, and fits the criteria of manipulating history, imperialistic symbols, and militarism.

Heracles, the demi-god hero, also holds plenty of intrinsic symbolism outside of the context of Demetrius' lineage. The first representation of Heracles appeared in the Greek Archaic age, in the eighth century B.C., as a man in combat with a lion.⁴⁰² The idea of a hero or god who fought lions may have originated in Near Eastern societies, as similar figures existed in Assyria,⁴⁰³ Anatolia,⁴⁰⁴ and Egypt,⁴⁰⁵ and Heracles likely evolved from one or several of these. The image of Heracles, as a robust young man, invoked both the athlete and the hoplite warrior.⁴⁰⁶ He exuded strength and accomplishment. The pose in which he is depicted on Demetrius' silver reverses, standing, crowning himself with a wreath, and holding a club and lionskin, is part of the story of the Nemean lion; after killing it, Heracles crowned himself with leaves.⁴⁰⁷ C.C. Vermeule pointed out

⁴⁰⁰ Diodorus Siculus, *Library of History*, 17.17.2.

⁴⁰¹ Tarn made this argument originally, that the elephant scalp is a symbol of Demetrius modelling his political ambitions on Alexander, in *The Greeks in Bactria and India*, 131.

⁴⁰² Thomas H. Carpenter, *Art and Myth in Ancient Greece: A Handbook* (London: Thames and Hudson, 1991), 120; Evelyn Elizabeth Bell, "An Exekian Puzzle in Portland: Further Light on the Relationship between Exekias and Group E," in *Ancient Greek Art and Iconography*, ed. Warren G. Moon (Madison, WI: University of Wisconsin Press, 1983), 79.

⁴⁰³ A ninth-century Assyrian seal depicts a man fighting a lion. See Carpenter, *Art and Myth*, 138, Fig. 175.

⁴⁰⁴ Alexander H. Krappe argued that Heracles is a Greek manifestation of the Anatolian lion-god Sardan or Σαρδός, in "The Anatolian Lion God," *Journal of the American Oriental Society* 65, no. 3 (Jul.-Sep. 1945): 144.

⁴⁰⁵ Maxime Collignon, *Manual of Mythology in Relation to Greek Art*, trans. Jane E. Harrison (London: H. Grevel & Co., 1899; reprint, New Rochelle, NY: Caratzas Brothers, 1982), 314.

⁴⁰⁶ Collignon, *Manual of Mythology*, 313-317.

⁴⁰⁷ Bell, *Exekian Puzzle*, 79.

that this particular pose is based on statues of victorious Olympic athletes.⁴⁰⁸ The qualities that both an athlete and a fighter have, strength, endurance, and overcoming obstacles, are all qualities that are generally desirable in a king.

The lionskin on Heracles' arm identifies the god. It is also the most common attribute used to represent him in art.⁴⁰⁹ It is also notable, however, that lions and lion-hunting held significance in Argead and Hellenistic Macedonia. For Macedonians, hunting was an introduction to and characteristic of manhood.⁴¹⁰ While boar were the more common quarry, hunting lions was the peak of masculinity. Alexander's preference for Heracles is thus understandable in the Macedonian context. Heracles successfully hunted the most dangerous lion of all and would have made a good role model for a Macedonian man. Another of Alexander's successors, Lysimachus, also used images of leaping lions on his certain of his silver and bronze coins.⁴¹¹ He was a Hellenistic ruler in Thrace and, for a short time, in Macedonia. He also may have used the lion image for its connotation of Macedonian kingship

A lion-hunting god would further have been a suitable patron for an Eastern king, for whom hunting, especially of lions, was "a prerogative for kings and elites...[and] had received sustained and continuous representation for centuries."⁴¹² The only information about Demetrius I's ethnicity is that his father was from Magnesia.⁴¹³ Both Greeks and Persians ruled in the Ionian city of Magnesia, and in the Hellenistic period it was under the sway of Graeco-Macedonian monarchs. Demetrius' mother is a complete mystery. One cannot say if his lineage was particularly

⁴⁰⁸ Cornelius C. Vermeule, "Heracles Crowning Himself: New Greek Statuary Types and Their Place in Hellenistic and Roman Art," *The Journal of Hellenic Studies* 77, pt. 2 (1957): 283.

⁴⁰⁹ Carpenter, *Art and Myth*, 118, 120.

⁴¹⁰ Ada Cohen, *Art in the Era of Alexander the Great: Paradigms of Manhood and their Cultural Traditions* (New York: Cambridge University Press, 2010), 70-71.

⁴¹¹ See examples in Niels Breitenstein and Willy Schwabacher, *Sylloge Nummorum Graecorum. The Royal Collection of Coins and Medals, Danish National Museum: Thrace and Macedonia* (West Milford, N.J.: Sunrise Publications, 1982), coins 1149-1154.

⁴¹² Cohen, *Era of Alexander*, 83. She pointed to both Assyrian and Persian representations.

⁴¹³ Polybius, *Histories*, 11.34.

Macedonian or “Eastern.” As a king, however, Demetrius straddled both the Macedonian and Asian worlds. On one hand, he presented himself as the rightful heir to Alexander the Great’s legacy. On the other hand, many of his subjects were Asian, and he worked to expand his rule even further into the East. Therefore, the god Heracles, in his guise as lion-hunter extraordinaire, was a perfect fit for a Greek-named king of Bactria. Heracles could simultaneously symbolize Macedonian masculinity, and the Near Eastern or Persian ideology of manly kingship.

On the obverse portraits of the double-unit bronzes, Heracles is recognizable in that he is bearded and has lion paws knotted around his neck. The choice of the god is understandable considering the ideological value he could provide to the king. The double-unit bronzes were the most abundant of Demetrius’ three bronze denominations, and so their imagery reached the greatest number of people. It is logical that the primary bronze denomination would have the king’s primary imagery. The choice of a portrait for the image of Heracles is interesting, because it creates a resemblance to the portraits of the king himself on the silver coins. Heracles’ face looks nothing like the king’s, yet the layout, especially paired with a standing god on the reverse, in this case Artemis, is strikingly parallel to the silvers. Perhaps the government wanted a bronze coin that was similar to the silvers, but did not consider the king’s portrait to be appropriate. Why the early Hellenistic kings did not place royal portraits on bronze coins is unclear, but the simplest answer is evolution. Demetrius’ Bactrian predecessors also used only divine figures on bronzes; the first of his successors to use a royal portrait on bronze coins was Eucratides I. Not straying too far from the norm was important for royal coins, as it ensured that they would be viewed as reputable currency by the public.

The reverses of Demetrius’ double-unit bronzes depict the goddess Artemis, radiate, standing, holding a bow in her left hand and pulling an arrow over her shoulder with her right. In

regards to goddesses on coins, Athena and Artemis are the most common.⁴¹⁴ Artemis appears on the royal coins of the Diodotids, several of the Seleucids, Philip II and Philip V of Macedonia, various Parthian kings, and the Indo-Greek Artemidoros, to name a few.

Artemis, the sister of Apollo, is a personification of the moon, the patron of hunters, and the goddess of the wilderness and wild animals.⁴¹⁵ She also originated as a goddess of fertility, and is the especial protector of women in childbirth.⁴¹⁶ For some Greeks she was also a goddess of social and civic life.⁴¹⁷ The bow is the attribute most often seen in representations of Artemis, but she also occasionally holds a torch, or rides in a chariot drawn by deer. Besides deer, she is moreover associated with dogs and bears. She is depicted around wildlife in general, including birds and fish, and is often near water.⁴¹⁸ For a deity with so many aspects, it is easily conceivable how different people could worship and use her for their own individual purposes. For a Bactrian king, the role of the goddess as hunter makes sense. Just as Heracles represented the importance of hunting for a Greco-Macedonian-cum-Asian monarch, Artemis reiterates that kingly role as hunter. On Demetrius' double-unit bronzes, Heracles and Artemis are paired, one on the obverse and the other on the reverse. A single coin thus carried a double hunting-deity message.

Artemis was also of particular importance to the region of Bactria, where Demetrius ruled. The village in Afghanistan where the Hellenistic city was excavated is called Ai Khanoum, which translates to "Lady Moon."⁴¹⁹ This place-name may be related to the worship of a female Moon deity, who, in a place where culturally Greek people lived and worshipped, was likely Artemis. Lady Moon could have also been a local goddess that became syncretic with Artemis. One of the

⁴¹⁴ Athena appears on coins of the Ptolemies, for example. She is also the patron goddess of the Indo-Greek king Menander. See Bopearachchi, *Monnaies gréco-bactriennes*, 226-227.

⁴¹⁵ Hesiod, *Theogony*, 918-920; Strabo, *Geography*, 14.1.6; Homer, *Iliad*, 5.50-54, 21.470-485.

⁴¹⁶ Lilly Kahil, "Mythological Repertoire of Brauron," in *Ancient Greek Art and Iconography*, ed. Warren G. Moon (Madison, WI: University of Wisconsin Press, 1983), 232-233; Aeschylus, *Suppliant Women*, 675.

⁴¹⁷ Kahil, "Mythological Repertoire," 232-233.

⁴¹⁸ *Ibid.*, 233-238.

⁴¹⁹ Bernard, "Greek Colony at Ai Khanum," 83.

major religious consequences of the globalization of the Hellenistic period was that Greek gods and goddesses were joined to multiple Near Eastern and Asian deities who possessed similar characteristics or responsibilities. A local Persian-Bactrian deity who was probably syncretic with Artemis was the Zoroastrian wilderness goddess, Anahita.⁴²⁰ The ancient city at Ai Khanoum is situated at the confluence of two rivers, and the Bactrian civilization in general was dependent on the Oxus river (the modern Amu Darya). Anahita was primarily a goddess of water,⁴²¹ and thus was suited to the Bactrian environment. She was also, like Artemis, a goddess of the wilderness generally, plus fertility and childbirth.⁴²² Descriptions of Anahita further mention that she drove a chariot.⁴²³ The goddess Artemis, in her syncretic form as Artemis-Anahita is appropriate for a Hellenistic king ruling in Central Asia, as she would have been recognizable to both the Greek and native Bactrian or Persian subjects. Anahita herself was in some periods worshipped as a goddess of war, and even legitimate kingship; some of the Achaemenid Persians were inaugurated in her temple.⁴²⁴ When handling a bronze coin bearing her image, the Greeks would have recognized Artemis, while the Bactrians and Persians could have seen her as their Anahita. As the majority of Demetrius' population was not Greek, but local Bactrian and Persian, a goddess of royal legitimacy on the most common currency denomination used by the populace, would have benefitted the king's standing. Thus, Artemis fit well in Demetrius' culturally mixed kingdom, just as Heracles did.

The use of the gods Heracles and Artemis on Demetrius' primary bronze coinage fits two of the criteria for power-generating assertion policies: imperial legitimacy and the adaptation of

⁴²⁰ Narain, *The Indo-Greeks*, 19. Holt, *Thundering Zeus*, 121.

⁴²¹ James Hope Moulton, *Early Zoroastrianism: Lectures Delivered at Oxford and in London, February to May 1912* (London: Williams and Norgate, 1913), 66.

⁴²² William L. Hanaway, Jr., "Anāhitā and Alexander," *Journal of the American Oriental Society* 102, no. 2 (Apr.-Jun. 1982): 289.

⁴²³ *Ibid.*, 290.

⁴²⁴ *Ibid.*, 291.

history and religion. Heracles not only creates a dynastic connection with Euthydemus, but recalls the empire of Alexander, and thus legitimizes the continuance of that empire as the best form of government. Heracles also presents qualities of legitimate kingship in his role as a hunter and lion-killer. Artemis, as goddess of the hunt, likewise represents legitimate kingship. Demetrius' use of Heracles is an adaptation of history in the same way that the elephant scalp is. It creates the semblance of a historical relationship between Alexander and Demetrius, even though the kings were not actually related. Finally, one can view the use of Heracles and Artemis as an adaptation of religion. While each has a variety of traits and meanings in the Greek religion, their pairing on the bronze double-units highlights what they have in common—the fact of being hunters. This is also a role that held meaning for both Greeks and Central Asians. The prominence of Artemis in a region where wilderness goddesses in general, and Anahita in particular, were popular would have helped to syncretize the two, and create a religious figure that was pleasing to all of Demetrius' subjects. The images of these deities therefore seem less a matter of whim, and more the result of deliberate policy.

Demetrius' bronze coin imagery includes three attributes of Greek gods without figures of the gods themselves. The reverses of his triple-unit bronzes show the caduceus, or staff, of Hermes. The sextuple units show Athena's shield on the obverse, and Poseidon's trident on the reverse. As the gods are not depicted with their devices, a coin-user could only have understood the images if he or she had a knowledge of the Greek pantheon, or else interpreted the images as locally meaningful.

Hermes was a god of many things. He represented pastoralism, the gymnasium, thievery, and bargaining.⁴²⁵ Demetrius may have been partial to Hermes because of the bargaining quality.

⁴²⁵ Hesiod, *Theogony*, 444; Aeschylus, *Seven against Thebes*, 507-510; Homer, *Odyssey*, 19.396; *Orphic Hymns*, 27; *Homeric Hymns*, 4.

After all, we can assume that Demetrius was good at making deals—he convinced Antiochus III to release his father from a siege and award Euthydemus his independence.⁴²⁶ Hermes also acted as the guide for souls to, and occasionally from, the underworld, and his most important function was as the herald and messenger for the gods.⁴²⁷ His caduceus, called a kerykeion in Greek, is the symbol of that latter function. In early representations, the staff appeared with a cleft tip; it later evolved to a figure-eight that was open at the top, and then one with two snakes.⁴²⁸ The caducei that appear on Demetrius’ coins are in the “figure-eight with two snakes” form. The snakes are tied in the center in a bowline knot and face each other at the top. A staff made of snakes is not a symbol that a Zoroastrian populace would have received very well, as the snake is considered an evil incarnation in that religion.⁴²⁹ Demetrius also ruled over part of India, however, where Hinduism and Buddhism were the main religions. Snakes held ample symbolism in Hinduism and Buddhism. Some of the earliest cults in India, even from pre-Aryan times, involved snake-worship.⁴³⁰ Snakes primarily represented water—lakes, rivers, and oceans—as the sustenance of life. Like Anahita in Bactria, snakes would have been suitable for northwest India, as it was dependent on the Indus River. The serpent Ananta, an animal of the god Vishnu, represented eternity, the imperishable cosmos, and the energy of all life.⁴³¹ Indian statues of both Vishnu and Buddha depict coiled snakes.⁴³² Some stone carvings from South India, called *nagasils*, and set up by women wanting children, show two snakes crossing and facing each other,



Figure 30: Snake statues in India.
Wikipedia: Nag Panchami

⁴²⁶ Polybius, *Histories*, 11.34.

⁴²⁷ Homer, *Odyssey*, 24.1-5; *Homeric Hymns*, 4; Aeschylus, *Agamemnon*, 515.

⁴²⁸ Carpenter, *Art and Myth*, 35.

⁴²⁹ Moulton, *Early Zoroastrianism*, 70, 307.

⁴³⁰ Jitendra Nath Banerjea, *The Development of Hindu Iconography* (Calcutta: Calcutta University Press, 1956), 345.

⁴³¹ Zimmer, *Myths and Symbols*, 37, 59-66.

⁴³² *Ibid.*, figs. 3, 4, 7.

very much resembling Hermes' caduceus.⁴³³ One must be careful, however, not to read symbolism where the issuer did not intend it. There is no evidence that Demetrius placed the caduceus on his bronze coins for any other reason than that it was an attribute of a Greek god and he wanted Greek religious symbols on his coins. It is also notable, though, that the caduceus on the triple-unit reverses is paired with an elephant wearing a bell, which is most definitely held meaning for the ancient Indians.

The two Greek symbols on the sextuple-units are Athena's shield and Poseidon's trident. As a coin design, Athena's shield is not very effective. Its shape is simply two concentric circles that follow the edge of the coin, and it is not obvious that it is in fact a shield. The aspect of the design that identifies it as the device of Athena is the small Medusa head in the center. In the myth, Perseus gave the Gorgon's head to Athena because she helped him to kill it.⁴³⁴ The Medusa head has the highest relief on the coin, however, and is the first part of the design to wear away. On many of the sextuples in my sample, in fact, the Medusa head is completely obliterated.⁴³⁵ The image would have been difficult for handlers to discern. If subjects familiar with Greek religion did recognize the image, then the shield would recall the militaristic nature of Athena. She was a warrior goddess, whose shield, along with aegis and spear, was a regular part of her armor.⁴³⁶ For those coin-users who did not understand the shield's association with Athena, the object still represents militarism, and thus propagated the notion of military victory on behalf of King Demetrius.

The pairing of Athena's device with Poseidon's fits with the myth of their contest for control of Attica. Both wished to claim the country, but the Olympian gods arbitrated and decided

⁴³³ Stutley, *Hindu Iconography*, 97.

⁴³⁴ Pseudo-Apollodorus, *Bibliotheca*, 2.4.

⁴³⁵ See coins A22; A23; B27; and N28.

⁴³⁶ Hesiod, *Theogony*, 924-925; *Homeric Hymns*, 11, 28.

that Attica would be Athena's domain as she planted the first olive tree there.⁴³⁷ Poseidon is otherwise not a deity that appears often on Greek coins. He makes an occasional appearance on coins from various Greek poleis, and is the patron deity of Demetrius Poliorcetes,⁴³⁸ a Hellenistic king of Macedonia who reigned 306-283 BCE. He is also patron deity of Antimachus I, a successor of Demetrius. Poseidon was the god of the sea, earthquakes, and horses.⁴³⁹ The god's association with the sea does not make much sense in the Bactrian context, as the kingdom was in landlocked Central Asia. The latter two aspects are understandable. Holt pointed out that Afghanistan is particularly a region that endures a lot of earthquakes. Further, many warhorses came out of Central Asia, and the Hellenistic armies depended on their cavalry for military success.⁴⁴⁰ Worshipping the god Poseidon through the trident symbol on coins adapts religion to suit the geographical needs of his kingdom, and asserts militarism via horses.

What is interesting about the choice of iconography for the bronze coins is that the sextuples, carrying only Greek religious symbols, evidently circulated only in the southern, Indian portion of Demetrius' territory.⁴⁴¹ The young king conquered this territory and added it to the Bactrian kingdom; his new subjects had not been under the control of a Greek since Seleucus I ceded the territory to Chandragupta Maurya a century before. Therefore, they were less likely than the local Bactrians to recognize Greek religious symbols. What this reveals about Demetrius and his administration is that they did not attempt to appease, via religion, their newly conquered Hindu and Buddhist subjects. This is interpretable as an act of dominance and power. The triple-unit bronzes, bearing the Indian elephant-with-bell image, by contrast, circulated in Bactria, where

⁴³⁷ Pseudo-Apollodorus, *Bibliotheca*, 3.14.

⁴³⁸ See for example, *Sylloge Nummorum Graecorum*, Vol. III: The Lockett Collection, I-IV (1938-49), coins 1518-1523.

⁴³⁹ Homer, *Iliad*, 15.190, 23.277, 23.307.

⁴⁴⁰ Frank Holt, "Poseidon: in Bactria," *Encyclopedia Iranica* (online edition: June 19, 2013), accessed February 2, 2016, <http://www.iranicaonline.org/articles/poseidon-in-bactria>.

⁴⁴¹ See Chapter 4, pgs. 142-143.

the rulers were continuously Greek since Alexander the Great's invasion. This situation offers the outline of a possible shrewd policy by Demetrius. The iconography on the bronze coins that circulated in Bactria exudes power, according to my established criteria, which helped Demetrius uphold legitimacy. Yet the populace was also already familiar with Hellenistic rule, so Demetrius had to *maintain* power rather than establish it. Therefore he had to engage in some policies of appeasement, especially as his hold in the North could become tenuous if he spent much time and resources in the South. Thus in Bactria, he had to move beyond simply establishing Greek dominance and focus on asserting himself in particular as the appropriate ruler, by catering to multiple religions. In the newly conquered Indian territory, establishing individual legitimacy was perhaps less important than the basic assertion of a Greek takeover of the region, as seen by the sparse imagery on the sextuple-unit bronzes. Along these lines, I would propose that the subsequent Indo-Greek monarchs, who used explicit multicultural imagery and bilingual legends had to practice overt appeasement, as their reigns were comparatively weak.

Finally, the image on Demetrius' coins that seems the most obvious, yet still reveals governmental intention, is the portrait of the king. The use of a royal portrait on a coin is a natural choice—if someone is ruling an empire, he or she would want his or her head to be on the currency. Yet, portrait use cannot be taken for granted. Indeed, political figures did not even begin placing their faces on coins until the Hellenistic era, and the man who set so many precedents for the period, Alexander the Great, did not even use his own portrait on his millions of coins.⁴⁴² Further, just because portraits appeared in the era when Demetrius reigned, one cannot jump to the conclusion that they held symbolic meaning for him or anyone else. The nineteenth-century scholar C.F. Keary argued that coin morphology—shapes, imagery, etc.—are the result of natural

⁴⁴² A large gold medallion showing a deified portrait of Alexander may have been issued by him, but scholars debate it. See Frank Holt and Osmund Bopearachchi, *The Alexander Medallion: Exploring the Origins of a Unique Artifact* (Rouqueyroux: Imago Lattara, 2011).

selection by their users. Coins could only be currency if people accepted their validity, and rather than weighing every coin, every time, they relied on a coin's appearance to know its value.⁴⁴³ Thus, coin appearance evolved based on human acceptance of changes, always following the path of least resistance. New types of coins generally had to retain aspects of previous issues to thrive as acceptable currency.⁴⁴⁴ The royal coin portraiture that Ptolemy I and Seleucus I initiated was, according to Keary, a natural outgrowth of the posthumous Alexander the Great coins, which combined his facial features with his standard Heracles head.⁴⁴⁵ Frank Holt, in a neo-Darwinian view, also looked at the natural selection of coins, but from the perspective of coins and how they survive by evading humans, rather than how they become the currency chosen by humans. Coins that survived, argued Holt, were more likely to be imitated with the addition of new memes.⁴⁴⁶ Once again, Alexander's Heracles-head coins were so successful at surviving that they led to imitation in the form of divinized royal portraits.⁴⁴⁷ Based on these arguments of evolution, the royal portrait on Demetrius' coins might not be part of an ideological message. Rather, the king may have put his image on his coins simply because his predecessors did so, and royal-portrait coins were acceptable, mainstream currency. Even if that were the case, Demetrius' use of portraits suggests some political success, as he or members of his government knew what kind of coin designs would be best.

Many scholars agree that royal portrait use did, in fact, have purposes beyond simply being acceptable currency. One practical purpose is that a portrait shows a population what its king looks like, so that he would be recognizable. Most historians of the Hellenistic world believe that coin

⁴⁴³ C.F. Keary, "The Morphology of Coins," *The Numismatic Chronicle and Journal of the Numismatic Society*, Third Series 5 (1885): 168-169.

⁴⁴⁴ *Ibid.*, 170.

⁴⁴⁵ *Ibid.*, 183.

⁴⁴⁶ Frank Holt, "Neo-Darwinian Numismatics: A Thought Experiment," (University of Houston, Houston, TX, 2015), 7.

⁴⁴⁷ *Ibid.*, 8.

portraits depict the true likenesses of the monarchs they represent. Those who analyze Hellenistic sculpture, for example, use coin portraits as references to identify royal statue heads.⁴⁴⁸ Gisela Richter pointed out that the idealism in the portrait art of the Classical Greek period gave way to ever stronger realism throughout the Hellenistic period.⁴⁴⁹ The realism in Hellenistic portraits is evident in the facial aging of certain long-reigning kings, most notably Euthydemus I.⁴⁵⁰ The portraits on Demetrius' coins clearly age, from depictions of a young man to one of at least middle age. There is no logical reason for a portrait to show detailed aging if it did not aim for some level of true likeness. Therefore it is certain that part of Demetrius' assertion policy was to show coin users what he looked like. It may not have been important for everyday subjects to recognize the king by sight, but it might have been necessary for elites, especially if there was a question of succession, to know that the person giving them orders was indeed the monarch. R.R.R. Smith argued that recognizing the king was certainly important for soldiers. As the king was their paymaster and commander, "portrait coinage kept the king to whom their loyalty was due before the soldier's eyes."⁴⁵¹ As the primary purpose of Demetrius' silver coinage was to pay soldiers, it made a perfect vehicle through which the king could spread his likeness. This also explains why bronze coins did not carry royal portraits, only religious imagery. Common-class civilians did not get paid in silver, and did not use it for daily transactions. They also did not have contact with the king the way soldier and elites did, and so had no need to recognize his face. This likeness of the king was an assertion policy directed at soldiers and at the upper classes.

⁴⁴⁸ Examples of this method are Alan J.B. Wace, "Hellenistic Royal Portraits," *The Journal of Hellenic Studies* 25 (1905): 86-104; and R.R.R. Smith, *Hellenistic Royal Portraits* (Oxford: Clarendon Press, 1988), 3-4.

⁴⁴⁹ Gisela M.A. Richter, "Late Hellenistic Portraiture," *Archaeology* 16, No. 1 (March 1963): 26-27.

⁴⁵⁰ Several scholars have brought up the example of Euthydemus, including Holt, "Euthydemid Coinage," 23-24; Jens Jakobsson, "A Possible New Indo-Greek King Zoilos III, and an Analysis of Realism on Indo-Greek Royal Portraits," *The Numismatic Chronicle (1966-)* 170 (2010): 44; Smith, *Hellenistic Royal Portraits*, 47. Smith is not quite accurate though in saying that Euthydemus' aging portrait is the exception. Demetrius' coin portrait also ages.

⁴⁵¹ Smith, *Hellenistic Royal Portraits*, 14.

Another practical reason for a monarch to place his or her portrait on coinage was simply to declare that one was indeed the monarch. Alan J.B. Wace claimed that coining money was a “royal prerogative.”⁴⁵² Thus, a portrait, along with the title ΒΑΣΙΛΕΩΣ, displayed the individual responsible for the coinage and thus functioned as a declaration of that individual’s rule. Smith reiterated this point, arguing that a monarch could depict authority in several ways, but a portrait was the most obvious and convincing.⁴⁵³ A clear message declaring independence would have been especially necessary if succession was unclear, or the new king was a usurper. For example, Diodotus I and Diodotus II strategically placed their portraits on money as a way to secede and declare independence from the Seleucid empire.⁴⁵⁴ Demetrius did not have any known succession problems, but by the time of his reign, coin portraiture had become a standard practice.

Beyond these two practical purposes for portraits, Smith made a strong argument that the goal behind a royal portrait in the Hellenistic period was to propagate the essential ideas of kingliness: military victory, ethics, and divine qualities.⁴⁵⁵ According to Smith, portraiture depended on the Greek concept of physiognomy, in which kingly traits of power and morality could be represented by handsome, fine features.⁴⁵⁶ Thus, while scholars agree that portraits depict individual likeness, some have noticed that the faces in Hellenistic coin portraits have some similarities, like furrowed brows or grim mouths.⁴⁵⁷ It is unclear exactly what kingly looks entailed, but Smith pointed to a passage of Diotogenes in which the latter described the good king as looking worthy of power, formidable, agreeable, generous, and near to the gods.⁴⁵⁸ In very general terms, the face on Demetrius’ coins bears a heavy, severe brow; a large, strong jaw; and a frowning

⁴⁵² Wace, “Hellenistic Royal Portraits,” 103.

⁴⁵³ Smith, *Hellenistic Royal Portraits*, 13.

⁴⁵⁴ Holt, *Thundering Zeus*.

⁴⁵⁵ Smith, *Hellenistic Royal Portraits*, 49-50.

⁴⁵⁶ *Ibid.*, 50-51.

⁴⁵⁷ Jens Jakobsson pointed out that the similarity in coin faces could be the result of artistic trends, or dynastic styles, through which kings could claim legitimacy by showing facial continuity. In “Analysis of Realism,” 43-44.

⁴⁵⁸ Smith, *Hellenistic Royal Portraits*, 51.

mouth, which one may describe as formidable or fearsome. Thus Demetrius' portrait may certainly be part of the kingly style, displaying military victory, as outlined by Smith. In general, however, Demetrius appears as an individual. His portraits are quite distinctive from those of his father Euthydemus, a man whom Demetrius must have resembled somewhat. It is also notable that Demetrius' early coins show him as a young wide-eyed man, and not at all grim. Overall, analyzing character traits through facial features is not reliable, especially as an ancient Greek's view of formidable features may be different than our own.

The three criteria for power through iconography once again are militaristic ideology, innovative ideologies that adapt history or religion, and legitimization of empire. Demetrius' portrait only exudes militaristic ideology in a vague, indirect sense, via facial features that are perhaps indicative of strength. The early Hellenistic kings did, however, use portraiture in an innovative adaptation of religion. Seleucus I, Demetrius Poliorcetes, and others embraced a new religious form initiated by Alexander, that of ruler cult. Hellenistic monarchs were living gods, distinct from the immortal gods, and they received worship as such.⁴⁵⁹ Ancient writers claim that Alexander considered himself a god, but that it was not well received by his subjects.⁴⁶⁰ The young king persisted in that self-identification, though, through a series of medallions that he issued presenting himself in the guise of Zeus.⁴⁶¹ Among subsequent monarchs divine status was sometimes reflected in coin portraiture. Smith argued that traits such as medium-length, "wreath-

⁴⁵⁹ The earliest textual example of Greeks worshipping a living man as a god is the "ithyphallic hymn," which honors Demetrius Poliorcetes, saying "the other gods are either far away, or they do not have ears, or they do not exist, or do not take any notice of us, but you we can see present here; you are not made of wood or stone, you are real. And so we pray to you..." Translation from M.M. Austin, *The Hellenistic World from Alexander to the Roman Conquest* (Cambridge: Cambridge University Press, 1981), no. 35. A text of Plutarch suggests that Lysander of Sparta was the first Greek to receive divine honors while living, in Plutarch, *Lysander*, 18, yet Ernst Badian convincingly argued that Plutarch's evidence is weak and Lysander was probably only worshipped after death. See Ernst Badian, "The Deification of Alexander the Great," in *Collected Papers on Alexander the Great* (London: Routledge, 2012): 432-435.

⁴⁶⁰ Arrian, *Anabasis of Alexander*, 4.11.1-7; Ernst Badian confirmed that a cult of Alexander was probably never established in the king's lifetime, although he wished it, in "Deification," 462-465.

⁴⁶¹ Holt, *Elephant Medallions*.

like,” tousled hair and beardlessness were godlike,⁴⁶² although they also follow the fashion set by Alexander. Demetrius portraits do indeed show a clean-shaven man with a wreath-like hairdo. A few Hellenistic coin portraits present more direct symbols of divinity. Large eyes, for example, indicate god-status and appear on coin portraits of Demetrius Poliorcetes, the first king of Hellenistic Macedonia.⁴⁶³ Some coin portraits bear the attributes of Olympian gods, such as the bull’s horns of Dionysus on certain portraits of Poliorcetes and Seleucus I.⁴⁶⁴ Later Hellenistic monarchs used direct words to signal their divinity. The Indo-Greek Antimachus I, for example, appended the epithet ΘΕΟΥ (“god”) to his title on coins.⁴⁶⁵ The portraits and words on the coins of Demetrius I of Bactria do not contain any such divine attributes, but the fact of having a coin portrait itself has divine implications. Before the Hellenistic period, rulers and states only placed pictures of gods on coins. Switching to the rulers’ portraits post-Alexander suggests that a king’s face served the same function as a divine image; in other words, the king was also divine. Demetrius’ use of his royal portrait was not an innovative adaptation of religion, but it was a continuation of the adaptation of religion, i.e. ruler cult, that his predecessors initiated.

In Demetrius’ coin portraits he is depicted wearing a diadem. This is not new; all the Hellenistic kings before him from the various kingdoms show diadems in their coin portraits. The diadem was a narrow strip of white cloth, tied around the head, that Alexander introduced as a symbol of kingship. Why Alexander chose this form of headgear or what inspired its meaning is not clear, but it is clear that by his wearing it, and being represented wearing it, it became an undisputed sign of imperial reign.⁴⁶⁶ The successive Hellenistic kings, by portraying themselves

⁴⁶² Smith, *Hellenistic Royal Portraits*, 40.

⁴⁶³ For examples see *Sylloge Nummorum Graecorum*, Vol. V: The Ashmolean Museum, Oxford, I-IV, IX (1951-2007), coins 3251-3255.

⁴⁶⁴ Mørkholm called the bull horns an attribute of Poseidon, *Early Hellenistic Coinage*, 79. Mørkholm argued, however, that the portrait on the Seleucus I coins is Alexander, not Seleucus, 72, Plate VIII, coins 139 and 140.

⁴⁶⁵ Bopearachchi, *Monnaies gréco-bactriennes*, 183.

⁴⁶⁶ Smith, *Hellenistic Royal Portraits*, 35-37.

wearing the diadem, were thus not only imitating the fashion statement of Alexander, but were declaring its meaning as well, that they were imperialistic sovereigns. The diadem on Demetrius' coin portraits therefore fits the criterion of iconography that legitimizes empire.

The iconography on the coins of Demetrius at first seems ordinary: a king's portrait, his patron god, and the rest filled out with Greek religion and one elephant head. This closer analysis reveals that the administration's choice of imagery is, in fact, much more subtle and deliberate. The elephant scalp in the portrait propagates military victory and adapts history by creating continuity with Alexander the Great. The scalp and the lone elephant head together declare sovereignty and justify kingship, while simultaneously adapting religion to embrace Hinduism and Buddhism. The use of Heracles as a patron god adapts history by connecting Demetrius' family with Alexander and Macedonia. It also adapts religion by placing Heracles in the service of both Graeco-Macedonian and Persian kingship. Iconography of the goddess Artemis likewise adapts religion into a Greek and Bactrian hybrid. The shield of Athena, a goddess of war, promotes militarism. The snake-headed caduceus of Hermes adapts religion to appeal to both Greeks and Hindu-Buddhists. Finally, the king's portrait continues and legitimizes the Hellenistic monarchical system.

The three criteria for political power through iconography, militarism, adapting history and religion, and legitimizing imperial rule, are all met in multiple forms on Demetrius' silver and bronze coins. While his production and implementation of currency demonstrates Demetrius' governing abilities, his use of meaningful assertion policies through coin imagery only added to his power as the ruler of a small, yet expanding, empire. At the same time, there is not a sense that Demetrius' tried to overdo it with assertion messages. He did not go out of his way to appease the multitude through extremely diverse religious imagery or languages. He did not crowd the coin flans with titular epithets or several gods together. While his iconography is meaningful, it is not

overwhelming, and thus does not suggest that the king was “grasping at straws,” to plead for his legitimacy. His assertion policies display confidence and direct rule.

Chapter 7: Conclusion

Demetrius I of Bactria is an important figure in the history of Greek Bactria and India. The limited evidence that existed for him already hinted that he was significant in the narrative of the region, but it was not enough to paint a picture, or even an outline of his reign and his success. The new information about Demetrius that I have uncovered through his coinage has substantially filled in the picture of his reign. Now we can see how he structured and ran part of his government, how he planned and apportioned some of his resources, and how he chose to present himself to the world. This new knowledge enhances his importance in Bactrian history. It reveals him to be one of the more powerful of the Bactro-Indo-Greek rulers, and secures his role as a major player in the course of imperial politics in ancient Central Asia.

Demetrius first thrusts himself into historical life in a handful of ancient writings. From a stone tablet near Kuliab, originally placed in a sacred forest, the young prince and his father are the objects of a supplication to the goddess Hestia. Here Demetrius emerges as the Καλλινικον, the “Glorious Victor,” and the son of the greatest of all kings, Euthydemus.⁴⁶⁷ This inscription tells us that Demetrius was winning battles, and maybe even conquering lands, before he was king. A lone sentence from Strabo, the Greek geographer, pinpoints India as the location of successful exploits by Demetrius, son of the king Euthydemus.⁴⁶⁸ Thus, Demetrius at least began his conquest of India, if he did not complete it, before he was a sole ruler. It is likely he was raised to co-rulership during or upon the success of this conquest. The only detailed event from the life of Demetrius

⁴⁶⁷ Bernard, Pinault, and Rougemont, “Deux nouvelles inscriptions,” 333.

⁴⁶⁸ Strabo, *Geography*, 11.11.1.

comes from the pages of Polybius.⁴⁶⁹ This time the prince is an extraordinary negotiator. He was so good, that as an envoy for his father, he convinced the superpower emperor Antiochus III the Great to withdraw from his siege and permit Euthydemus to continue as a king in Bactria. Young Demetrius impressed Antiochus not only with his speech, but also his good looks and manners, so much so that the latter promised his daughter in marriage to the prince. Whether that marriage took place is still a mystery. Interestingly, all of these texts refer to Demetrius as the son of a king, and not a king yet himself. It is natural to predict, however, that such an accomplished prince would make a strong king as well.

The only ancient text mentioning Demetrius as King is Justin's *Epitome of Pompeius Trogus*. In this case, Eucratides was the King of Bactria, while Demetrius was "King of the Indians."⁴⁷⁰ Demetrius besieged Eucratides, who with only 300 men, broke the siege, overwhelmed Demetrius and his army of sixty thousand, and even counter-subdued the territories in India. The numismatic evidence suggests, however that this Demetrius, King of the Indians, is not Demetrius I, but Demetrius II. It appears that Eucratides did not reign simultaneously to Demetrius I, but somewhat later. For one, his coins are very different in style; for example, he used bilingual legends and square flans for some coins. These features occur on the coins of most of Demetrius I's successors, but not of Demetrius I himself. Further Eucratides and Demetrius II used control marks from the same family, those based on the letter Π.⁴⁷¹ Hoard evidence also favors grouping Eucratides with the second Demetrius.⁴⁷² Finally, in Justin's tale, Eucratides was the King of Bactria. We know that Demetrius I ruled in both Bactria and India, so it is hard to see how the two kings

⁴⁶⁹ Polybius, *Histories*, 11.34.

⁴⁷⁰ Justin, *Epitome of Pompeius Trogus*, 41.6.

⁴⁷¹ Bopearachchi, *Monnaies gréco-bactriennes*, 398-399.

⁴⁷² Bopearachchi pointed this out for the Qunduz hoard and the Ai Khanoum hoards, *Monnaies gréco-bactriennes*, 50-51.

could have ruled Bactria simultaneously. Justin must have been telling a story of Eucratides fighting Demetrius II.

Another interesting reference to King Demetrius is not ancient, but medieval. He appears in “The Knight’s Tale,” by Geoffrey Chaucer. Although his name lost its initial letter, his title is similar to the one in Justin’s work; he is “The grete Emetreus, the kyng of Inde.”⁴⁷³ Because the title is again only King of India, it is possible that Chaucer, like Justin, was referring to Demetrius II. Chaucer may not have known that there was more than one Demetrius. The king he described was certainly rich and powerful, like the Demetrius that I uncovered. His cloak and saddle were gold, and he wore pearls and rubies. He was accompanied by a tame eagle and a hundred lords⁴⁷⁴ He was twenty-five, which matches the youthfulness of Demetrius when he invaded India. There are unfortunately no others clues to his identity in the context of the tale; he is simply one of several great personages coming to town with Theseus.⁴⁷⁵

A final bit of “text” referring to Demetrius I is a commemorative coin issued by Agathocles, a successor of Demetrius. The commemorative coins are replicas of previous kings’ obverse and reverse types. The legend on the obverse is the name of the king whose coin was replicated, usually with an epithet, while on the reverse, the legend reads ΒΑΣΙΛΕΥΟΝΤΟΣ ΔΙΚΑΙΟΥ ΑΓΑΘΟΚΛΕΟΥΣ, “During the reign of King Agathocles the Just.” Not many of these commemorative coins are extant, so it is not certain if all of the types have been found, but so far Agathocles has coins of Alexander the Great, Antiochus II (the Seleucid), Diodotus I, Diodotus II, Euthydemus I, Demetrius I, and Pantaleon.⁴⁷⁶ The piece of text related to Demetrius is the epithet that Agathocles gave him. On the commemorative coin his name is

⁴⁷³ Geoffrey Chaucer, “The Knight’s Tale,” in *The Canterbury Tales*, line 1298.

⁴⁷⁴ *Ibid.*, lines 1300-1323.

⁴⁷⁵ *Ibid.*, lines 1329-1338.

⁴⁷⁶ Bopearachchi, *Monnaies gréco-bactriennes*, 178-179.

followed by ANIKHTOY, “the Unconquered.”⁴⁷⁷ This is a different epithet than the one that appeared on the Kuliab monument. There he was KAAΛINIKON, “the Glorious Victor.” The sentiment is similar, but the title is different. The dedicator of the Kuliab stone included the latter epithet when Demetrius was a prince. Perhaps “the Unconquered” became his epithet when he was king and had, by then, been a “Glorious Victor” many times over.

The commemorative coins may also provide some insight into Demetrius’ descendants. His only confirmed family tie is his father Euthydemus. Among Agathocles’ commemorative coins, Demetrius is the last one, except for Pantaleon. There is reason to believe that Agathocles and Pantaleon were co-rulers, and possibly brothers or even twins, as their coin types are identical and they look alike in their coin portraits.⁴⁷⁸ If so, that leaves Demetrius as the nearest predecessor of Agathocles. Could Demetrius have been Agathocles’ and Pantaleon’s father? It is also notable that Agathocles did not make a replica coin for king Euthydemus II.⁴⁷⁹ His place in the lineage is also uncertain. Euthydemus II has his own unique coin types, and like Euthydemus I and Demetrius I, they do not include any Indian languages or gods. He must therefore come before Agathocles, whose coins, along with Pantaleon’s, are the first to include Indian languages and gods. Euthydemus II was also not Euthydemus I’s heir, as the ancient literature unequivocally lists Demetrius I as the latter’s son. Considering that the literature does not mention Euthydemus II whatsoever Euthydemus II was also probably not Euthydemus I’s younger son. Euthydemus II fits in best right after Demetrius I, and thus might have been his child.⁴⁸⁰ That leaves Demetrius’ relationship to Agathocles and Pantaleon still open. They could have been usurpers, who took India away from Euthydemus II. They could have been Demetrius’ younger sons, to whom he

⁴⁷⁷ Ibid., 179.

⁴⁷⁸ Ibid., Pl. 7, 9.

⁴⁷⁹ Holt warned against an argument from silence, as these coins are scarce and only recently discovered, in “Did King Euthydemus II Really Exist?” 85-86.

⁴⁸⁰ Ibid., 88-90. Holt argued this based on Euthydemus II’s coin design, die axes, and hoard distribution.

assigned southern territories, giving the north to Euthydemus II. They could have been Demetrius' grandsons. What is clear is that Agathocles wished to create a historical lineage with Demetrius, most likely to support his own legitimacy.

The remaining non-numismatic evidence of Demetrius I's reign consists of two artifacts from Ai Khanoum, and one from the city of Balkh. One item from Ai Khanoum is a small bronze statuette of Heracles holding a club and crowning himself.⁴⁸¹ Except that it lacks a lionskin, the figure is identical to the design of the god that appears on the reverses of Demetrius' silver coins. What this means is that the Heracles coin design may have been a prevalent format associated with the king, or even his signature design. There could have been large statues of that particular Heracles pose, of which the small figurine was a copy. The presence of the statuette at Ai Khanoum may also mean that Demetrius himself had a presence there, whether it was his capital city or simply one of his major cities. The second artifact presumed to be from Ai Khanoum is the reverse tetradrachm die.⁴⁸² It is engraved with a design that appears on Demetrius coins of the  production stream. If it does indeed come from Ai Khanoum, it would further support the possibility that Demetrius held his capital in that city. It also points to the existence of a mint there, which in this case, would have been Demetrius' central mint while a co-ruler with his father. Finally, the third artifact is a small sherd of red pottery excavated in Balkh by Daniel Schlumberger in 1947.⁴⁸³ The piece of pottery carries a king's portrait. The face is gone, but the back of the head is visible. It shows a diadem, a cloak, an ear, and the rear head-shape designed exactly in the artistic style of the early Bactrian coin portraits. The existence of the cloak creates a connection to Demetrius. His predecessors, Diodotus I, Diodotus II, and Euthydemus did not have cloaked

⁴⁸¹ Bernard, "The Greek Colony at Ai Khanoum," 113.

⁴⁸² Bopearachchi, "Deux documents exceptionnels," 4-6.

⁴⁸³ Daniel Schlumberger, "Prospection archéologique de Bactres (printemps 1947). Rapport Sommaire," *Syria* 26, no. 3-4 (1949): 186-187.

shoulders in their coin portraits, only floating necks. There is no indication of an elephant scalp on the pottery sherd, making the back of the head look more like Euthydemus II, but it could nevertheless be a depiction of Demetrius. The artifact's location in Balkh, the ancient city of Bactra, is evidence of the presence of Demetrius or his successor.

As I have shown in this work, the numismatic evidence is the richest source of information about Demetrius. Specifically, his coins reveal the range and application of the king's political power. In terms of the International Relations theory of Structural Realism, there are three prominent features that indicate hegemonic power in an ancient state. They are a sophisticated administrative structure, enhanced military capability, and the propagation of an ideology that supports imperialism. My deep analysis of the full body of extant Demetrius coins demonstrates that his government met all three of these criteria.

The criterion of administrative sophistication includes a complex bureaucracy, the centralization of governmental output, and the implementation of direct rule. Since the evidence is in Demetrius' coins, the administrative structure that I uncovered was the minting bureaucracy. I found that all the coins in the sample carry the die-engraving work of only a handful of artists. There are five primary artists, who engraved dies for the majority of Demetrius' coins, several assistants, who mostly only engraved supplementary reverse dies, and a few artists who only worked on bronze dies for small-batch operations. There is a strong correlation between the coin-making teams—made up of a primary artist, a few assistants, and the coin strikers—and the control marks. These control marks therefore represent production streams physically separated within the central mint, or whole auxiliary mints, set up for temporary military purposes. Certain control marks on bronzes represent various regional operations.

The sophistication of Demetrius' minting structure is impressive. The majority of his silver coins were made at one central mint, and struck with dies engraved by two primary artists in the

first period of his reign, and two in the second period of his reign. The auxiliary operations were clearly small and temporary, and must have been raised only when military activity required supplemental funds. The primary artists also engraved dies for the auxiliary lines, but not simultaneous to their central mint work. They were reassigned as needed. In one case, Demetrius' government sent extra dies from the central mint to an auxiliary location. The government's interest in the standardization and quality of the coinage is also apparent. While the individual artists are identifiable, the portraiture on the two larger silver denominations, the tetradrachms and drachms, is so consistent that it generally appears to depict the same man. The gradual aging of the portraits also suggests that the die-engravers were tasked with creating true likenesses of Demetrius. The obols have such small surfaces that detailed likenesses would have been difficult to achieve, yet they are remarkably consistent with the designs of the larger silvers. Even coins from the temporary peripheral mint contain zero spelling errors and only a few design errors in things like the diadem. The monarchy also established bronze minting operations to issue low-value currency for the daily circulation needs of subjects. Although the bronze was not the currency for state payments, it was still a product of the king's government and thus the bronze-mint officials ensured the same standard of design and quality as with the silver coins.

A monarch's military capability is measurable through coins because in the Hellenistic world, the main purpose of minting coins, especially silver tetradrachms, was to pay soldiers. The size and strength of a kingdom like Bactria was dependent on the size and strength of the army that a monarch could pay, especially as many of the soldiers were mercenaries. The policy decisions that Demetrius' government made, respecting how much silver to allocate to coinage, and how much each coin should weigh, provides evidence of how much planning and material the king invested in his military. As Demetrius was a successful king, his coinage reflects the need to keep one's military well-paid, combined with the need to remain competitive at a time when silver was

limited. By examining the weights of Demetrius' coins over time, and comparing them to the coin weights of other near-contemporary kings, I obtained a sense of his government's military capacity.

The statistics for coin weights and production quantities show several interesting patterns.

Firstly, the coins from the central minting operation from the early part of Demetrius' reign () have a slightly higher average weight than those from the later part of his reign, and also a slightly higher average than for tetradrachms overall. The heaviest coins also come from this group.

The  control mark represents the period during which Demetrius conquered territories in India. To maintain a strong enough army for invasion and to reward its victory, Demetrius would have needed to invest in it and increase his military capacity. His higher-weighted coins demonstrate that investment. It also demonstrates deliberation in his silver-allocation policies. In comparison to the tetradrachms of his predecessors, Diodotus I, Diodotus II, and Euthydemus, the tetradrachms of Demetrius are heavier on average. This evidence suggests that neither the Diodotids nor Euthydemus invested as much in their militaries as Demetrius did. They did not need to, as the Diodotids seceded quietly, and Euthydemus was on the defense. His son was much more warlike and aggressive. Demetrius' coin weights are slightly lower than those of his powerful neighbor Antiochus III. While Demetrius' kingdom was much smaller, he was able to channel enough silver into coinage to remain competitive, even though silver supplies were strained throughout Asia at the time. Finally, an estimate of the total quantity of coins that Demetrius produced illustrates that his single central mint and few auxiliary operations produced approximately the same number of coins as four mints of Antiochus III. This means Demetrius' rate of production was proportionally high, further underscoring his military investment and aggressive military policy.

The third criterion for political power is the propagation of assertion policies that are conducive to hegemony. These include assertions of militarism, the adaptation of history and religion, and imperialistic ideology. Coins were a primary vehicle for packaging and disbursing assertion policies, and thus those policies are visible in coin iconography. All of Demetrius' coin denominations display designs that incorporate, in varying combinations, the four types of hegemonic assertions. The most important image on his coins is the elephant—both the scalp on the king's portrait and the full head on the triple-unit bronzes. It represents militarism and imperialism by symbolizing the takeover of India, the military use of elephants, the right of kingship in India, and the right of kingship through spear-won territory, in imitation of Alexander. The elephants also propagate adapted versions of history and religion, so that Demetrius could signify a relation to Alexander, and a familiarity with Hinduism and Buddhism. The imagery of the god Heracles on the silver coins and bronze double-units is equally replete with power-generating ideology. Demetrius uses him to adapt history by again creating a connection to Alexander. Heracles in his manifestation as a lion-hunter is also an adaptation of religion that promotes a deity suitable to both Macedonian masculinity and Eastern kingship. The other Greek religious figures represented on Demetrius' bronze coinage, Artemis, Hermes, Athena, and Poseidon, serve diverse functions, appealing to practitioners of the Greek, Zoroastrian, and Hindu religions, and variously promoting military might and imperial legitimacy. The obverse and reverse image pairings on all of the denominations are logical and balanced. Each aspect of Demetrius' coin iconography is carefully arranged and intentional.

Demetrius I of Bactria, in a final assessment, was powerful in both relative terms and absolute terms. Relative to his predecessors, the founders of independent Bactria and his own father, Demetrius was substantially more powerful. He commanded a larger military, and used it to control more territory. Relative to his large Seleucid neighbors, he was competitive, and possibly

even more productive. Demetrius' minting administration was clearly more centralized, and its product more standardized, than many of his successors' operations. This is apparent in the coins of Agathocles, Antimachus, Eucratides, and others, who issued wildly diverse and even experimental coins, which lacked standardization in weight, imagery, language, and coin shape.

Demetrius also held prestige within his international system. This is evident by the number and variety of imitation Demetrius coins, produced by neighboring contemporary or near-contemporary societies. Different imitation coins are the product of different types of political relationships. They could be the result of a military encounter, trade, or even political subordination. There are various reasons why societies made imitations. They could have tried to pass their coins off as genuine Demetrius pieces. A population may have been more comfortable with their currency, or more supportive of their own government, if the design referred to a known, powerful, and legitimate king. Demetrius could have had a positive cultural or economic reputation. Perhaps other societies simply liked his aesthetic sense. Overall, no matter the nature of the imitation, they are all evidence of the regional prestige of Demetrius, his kingdom, or his coins—whether his neighbors thought highly of him as a monarch, or his Greek culture, or the value of his money.

Demetrius was also a powerful king in absolute terms. His legitimacy and acceptance are beyond doubt, based on the strong mix of assertion policies that he implemented, his dynastic connections, and the fact that ancient writers discussed him many years after his time. He also certainly changed the course of Central and South Asian history. His invasion of northwest India and maintenance of a Hellenistic kingdom there ensured that Greeks would rule that region for 150 years after him. Of all of Demetrius' 37 Bactro-Indo-Greek successors, the most influential and famous ones were all based in India. Euthydemus II, based only in Bactria, left very little impact. Heliocles, also based in Bactria, abandoned the city at Ai Khanoum and lost the northern

kingdom to nomadic invaders.⁴⁸⁴ Eucratides is known for his description in ancient literature as the ruler of “a thousand cities,”⁴⁸⁵ but he was more successful in India than Bactria. He was weakened and eventually pushed out of his northern territories by the Parthians.⁴⁸⁶ In India, Eucratides was successful in wars against Demetrius II⁴⁸⁷ and Menander.⁴⁸⁸ Menander and Antialcidas are two more important Indo-Greeks. Not only did they rule from bases in India, but they may have taken on the local Indian religions. Some scholars argue that Menander converted to Buddhism.⁴⁸⁹ Antialcidas had a Greek ambassador, Heliodoros, who practiced Hinduism. It is therefore possible that the king also practiced it.⁴⁹⁰ The presence of these Greek kings in India, initiated by Demetrius I’s invasion, certainly altered the political and cultural history of the subcontinent.

Demetrius further impacted India by contributing to the collapse of the Mauryan Empire. The renowned Mauryan Emperor Asoka the Great united most of the Indian subcontinent and ruled from 269 to 232 B.C.E., shortly before Demetrius occupied northwest India. Asoka’s reign even extended into Bactria.⁴⁹¹ Asoka’s successors were significantly weaker than him, and the last of the Mauryans, Satadhanvan and Brihadratha, ruled simultaneously to Demetrius (195-187 and 187-185, respectively).⁴⁹² The scope of Demetrius’ rule in India is not definite. He was certainly in the Paropamisidae and Arachosia.⁴⁹³ He was also likely in Gandhara, around the city of Taxila.⁴⁹⁴

⁴⁸⁴ Bopearachchi, *Monnaies gréco-bactriennes*, 74-76.

⁴⁸⁵ Strabo, *Geography*, 15.1.3.

⁴⁸⁶ *Ibid.*, 11.9.2, 11.11.2.

⁴⁸⁷ Justin, *Épitome of Pompeius Trogus*, 41.6.

⁴⁸⁸ Bopearachchi, *Monnaies gréco-bactriennes*, 68-69.

⁴⁸⁹ A Buddhist text known as the Milinda Panha is a dialogue between King Menander and a Buddhist monk, in which the monk teaches the religion to the king. See T. W. Rhys Davids, trans., *The Questions of King Milinda* (1890/1894), Sacred Texts Online, <http://www.sacred-texts.com/bud/milinda.htm>. Only later translations, however, actually mention the king’s conversion; the original text did not.

⁴⁹⁰ King Antialcidas sent his ambassador to visit another Indian king, Kāśīputra, in the city of Vidisā, in Central India. There, the ambassador Heliodoros set up a pillar in honor of the Hindu god Vishnu. See Richard Salomon, *Indian Epigraphy : A Guide to the Study of Inscriptions in Sanskrit, Prakrit, and the other Indo-Aryan Languages* (New York: Oxford University Press, 1998), 265-266.

⁴⁹¹ Romila Thapar, “The Mauryan Empire in Early India,” *Historical Research* 79, no. 205 (2006): 291-293.

⁴⁹² Romila Thapar, *Aśoka and the decline of the Mauryas*, (Oxford: Oxford University Press, 1961), 196.

⁴⁹³ Bopearachchi, *Monnaies gréco-bactriennes*, 453.

⁴⁹⁴ MacDowall, “Copper Coinage of Demetrius,” 31.

Nevertheless, if the last Mauryan kings were still in the region when Demetrius invaded, he must have pushed them out. He may have even subdued them to the point that they could not retreat and regroup, and thus their dynasty ended.

Demetrius I was an aggressive and powerful king, by any measurement. His extant body of coinage affirms and delineates his power. Further, the full analysis of his numismatic evidence shines light on this important king, who otherwise was hidden beneath the historical fog of a lost civilization.

Appendix 1

Catalogue of Coins Used in this Study

The coins illustrated below are grouped first by denomination: tetradrachms, drachms, obols, and bronzes. Within each denomination, the coins are ordered by control mark. Each coin has a letter code and a number. The letter code represents the museum, coin dealer, or other collection from which the coin originates. The coins in each collection were ordered by denomination and control mark in line with this catalog and assigned numbers accordingly. When numbers appear to be skipped, it because they represented coins that turned out to be unusable or were determined to be repeats after numbers had already been assigned.

Letter codes:

- A: Ashmolean Museum, Oxford
-Personal photographs
- B: British Museum, London
-Official museum photographs
- C: Classical Numismatic Group, online coin dealer
-Website www.cngcoins.com, and *Public and Mail Bid Sale* print catalogues
- D: Danish National Museum, Copenhagen
-Breitenstein, Neils and Willy Schwabacher. *Sylloge Nummorum Graecorum: The Royal Collection of Coins and Medals, Danish National Museum Vol. 39, Parthia-India* (Copenhagen: Einar Munksgaard, 1965)
- E: Ebay
-Website www.ebay.com
- F: Sylloge Nummorum Graecorum, public and private collections in Britain
-Website www.sylloge-nummorum-graecorum.org/
- G: German National Museum, Berlin
-Website www.smb.museum/home.html
- H: Miscellaneous coins from various older auction catalogs
- K: Kuliab Hoard, Tajikistan
-Bopearachchi, Osmund. "La circulation et la production monétaires en Asie central dans l'Inde du nord-ouest (avant et après le conquête d'Alexandre)." *Indologica Taurinensia* 25 (1999-2000): 15-121.
- L: National Museum of India, New Delhi
-Personal photographs
- M: Mitchiner's catalog of coins, excluding those located in British Museum
-Mitchiner, Michael. *Indo-Greek and Indo-Scythian Coinage*, 9 vols. London: Hawkins Publications, 1975.
- N: American Numismatic Society, New York
-Bopearachchi, Osmund. *Sylloge Nummorum Graecorum: The Collection of the American Numismatic Society, Part 9: Graeco-Bactrian and Indo-Greek Coins*. New York: The American Numismatic Society, 1998.
- P: Bibliothèque Nationale, Paris
-Bopearachchi, Osmund. *Monnaies gréco-bactriennes et indo-grecques: catalogue raisonné*. Paris: Bibliothèque Nationale, 1991.
- Q: Qunduz Hoard, Afghanistan
-Curiel, Raoul and Gerard Fussman. *Le Tresor Monétaire de Qunduz*. Paris: Librairie C. Klincksieck, 1965.
- S: National Archaeological Museum, Madrid
-Website www.man.es/man/home.html
- U: Ai Khanoum Hoard III, Afghanistan
-Holt, Frank L. "The Euthydemid Coinage of Bactria: Further Hoard Evidence from Ai Khanoum." *Revue Numismatique* 6, no. 23 (1981): 7-44.
- V: Vcoins, online conglomeration of coin dealers
-Website www.vcoins.com
- W: Wildwinds, online database of coins from various dealers
-Website www.wildwinds.com

Tetradrachms

Control Mark: 

B1

16.87 g
34 mm

Source no.: IOC 6



C1

16.59 g
35 mm

Source no.: Auction 124, Lot 149



C2

16.68 g
32 mm

Source no.: Auction 170, Lot 139



C3

16.84 g
32 mm

Source no.: Auction 256, Lot 179



C4

16.44 g
35 mm

Source no.: Auction 257, Lot 178



C6

16.75 g
31 mm

Source no.: Auction 59, Lot 83



C7

16.25 g
33 mm

Source no.: Auction 72, Lot 61



C8

16.28 g

Source no.: Auction 38, Lot 487



C9

16.55 g

Source no.: Auction 40, Lot 1126



C10

16.27 g

Source no.: Auction 45, Lot 753



C11

16.13 g

Source no.: Auction 45, Lot 754



C12

16.91 g

Source no.: Auction 46, Lot 615



C13

16.68 g

Source no.: Auction 47, Lot 747



C14

16.78 g

Source no.: Auction 66, Lot 946



C15

16.93 g

Source no.: Auction 69, Lot 798



C16

16.68 g

Source no.: Auction 73, Lot 532



C17

16.93 g
35 mm

Source no.: Auction 90, Lot 864



C18

17.04 g
32 mm

Source no.: Auction Triton 14, Lot 422



C19

16.82 g

Source no.: Auction Triton 5, Lot 1674



F1

16.92 g
32 mm

Source no.: Salting 47



G1

16.68 g
33 mm

Source no.: 18203089



H1

16.94 g

Source no.: Bank Leu 72, Lot 373



H2

16.76 g

Source no.: Freeman & Sear 55, Lot 305



H3

16.37 g

Source no.: Gorny & Mosch 113, Lot 5337



H4

15.84 g

Source no.: Harlan Berk 96, Lot 179



H5

16.17 g

Source no.: Malter 66, Lot 624



H6

16.95 g

Source no.: Num. Ars Clss. 23, Lot 1302



H7

16.89 g

Source no.: D. Markov NY 4, Lot 260



H8

15.06 g

Source no.: Pegasi 116, Lot 149



H9

Weight N/A

Source no.: Senior 1994, Lot 4



K1

16.50 g
33 mm

Source no.: 67



N1

16.85 g

Source no.: 187



N2

16.80 g

Source no.: 188



P1

16.73 g
33 mm

Source no.: Série 1, 1



Q1

16.70 g

Source no.: 30



Q2

17.02 g

Source no.: 31



Q3

16.66 g

Source no.: 32



Q4

16.59 g

Source no.: 33



S1

16.80 g
33 mm

Source no.: 2000/113/1



W1

16.37 g

Source no.: CNG 39, Lot 64445



W2

17.00 g

Source no.: CNG 58, Lot 860



W3

16.64 g

Source no.: CNG 58, Lot 861



Control Mark: 

A1

Weight N/A

Source no.: 1



A2

Weight N/A

Source no.: 2



B2

16.80 g
33 mm

Source no.: 1870.0701.1



C20

16.86 g
34 mm

Source no.: Auction 107, Lot 125



C21

16.68 g
33 mm

Source no.: Auction 179, Lot 117



C22

15.92 g
36 mm

Source no.: Auction 75, Lot 46



C23

16.26 g
31 mm

Source no.: Auction 82, Lot 28



C24

16.89 g

Source no.: Auction 30, Lot 222



C25

16.73 g

Source no.: Auction 37, Lot 799



C26

16.30 g

Source no.: Auction 38, Lot 488



C27

16.72 g

Source no.: Auction 40, Lot 1127



C28

15.48 g

Source no.: Auction 45, Lot 755



C29

16.87 g

Source no.: Auction 45, Lot 756



C30

16.81 g

Source no.: Auction 47, Lot 745



C31

16.38 g

Source no.: Auction 47, Lot 746



C32

16.45 g

Source no.: Auction 66, Lot 945



C33

16.40 g

Source no.: Auction 67, Lot 1012



C34

16.29 g

Source no.: Auction 67, Lot 1013



C35

16.43 g

Source no.: Auction 70, Lot 457



C36

16.82 g

Source no.: Auction 72, Lot 1023



C37

16.99 g

Source no.: Auction 75, Lot 620



C38

16.39 g
34 mm

Source no.: Auction 87, Lot 731



C39

16.32 g
35 mm

Source no.: Auction 93, Lot 677



C40

16.90 g

Source no.: Auction Triton 2, Lot 583



C41

16.93 g

Source no.: Auction Triton 3, Lot 687



F2

16.78 g
35 mm

Source no.: Lockett 3351



H10

16.93 g

Source no.: Bank Leu 83, Lot 430



H11

16.82 g

Source no.: Harlan Berk 96, Lot 178



H12

15.54 g

Source no.: Pegasi 114, Lot 150



K2

16.40 g
31 mm

Source no.: 68



K3

16.40 g
32 mm

Source no.: 70



K4

16.40 g
32 mm

Source no.: 71



M1

Weight N/A

Source no.: 103, d, Example 2



M2

Weight N/A

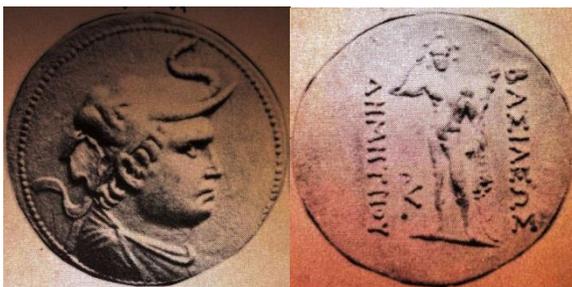
Source no.: 103, d, Example 3



M3

Weight N/A

Source no.: 103, d, Example 4



N3

16.73 g

Source no.: 189



P2

16.66 g
32 mm

Source no.: Série 1, 2



P3

16.22 g
33 mm

Source no.: Série 1, 3



Q5

15.96 g

Source no.: 28



Q6

16.66 g

Source no.: 29



W4

16.89 g

Source no.: CNG 39, Lot 64446



W5

16.91 g

Source no.: CNG 39, Lot 64447



W6

16.80 g

Source no.: CNG 58, Lot 862



W7

15.28 g

Source no.: CNG 721718



Control Mark: ⚡

A3

Weight N/A

Source no.: 3



B3

16.75 g
35 mm

Source no.: 1856.1106.19



B4

16.74 g
31 mm

Source no.: 1888.1208.83



B5

14.26 g
29 mm

Source no.: IOC 7



C42

17.03 g
31 mm

Source no.: 153744



C43

16.95 g
34 mm

Source no.: Auction 124, Lot 150



C44

16.93 g
33 mm

Source no.: Auction 150, Lot 179



C45

15.98 g
33 mm

Source no.: Auction 227, Lot 225



C46

17.13 g
34 mm

Source no.: Auction 298, Lot 80



C47

15.72 g
33 mm

Source no.: Auction 299, Lot 240



C48

16.75 g
31 mm

Source no.: Auction 301, Lot 136



C50

16.94 g

Source no.: Auction 46, Lot 614



C51

16.62 g

Source no.: Auction 47, Lot 744



C52

16.46 g

Source no.: Auction 54, Lot 936



C53

17.06 g

Source no.: Auction 66, Lot 947



C54

16.86 g

Source no.: Auction 66, Lot 948



C55

16.90 g

Source no.: Auction 69, Lot 799



C56

16.95 g

Source no.: Auction 70, Lot 458



C57

17.04 g

Source no.: Auction 73, Lot 533



C58

16.86 g
32 mm

Source no.: Auction 85, Lot 557



C59

16.71 g
34 mm

Source no.: Auction 91, Lot 422



C60

17.00 g
33 mm

Source no.: Auction 93, Lot 678



C61

17.01 g
31 mm

Source no.: Auction 93, Lot 679



C62

17.01 g
33 mm

Source no.: Auction 94, Lot 831



C63

17.13 g

Source no.: Auction Triton 1, Lot 609



C64

16.80 g

Source no.: Auction Triton 2, Lot 581



C65

16.87 g

Source no.: Auction Triton 3, Lot 688



C66

16.88 g

Source no.: Auction Triton 8, Lot 626



C67

16.89 g

Source no.: Auction Triton 9, Lot 1113



D1

16.00

Source no.: 259



H13

16.90 g

Source no.: Antiqua 6, Lot 33



H14

16.88 g

Source no.: Bank Leu 71, Lot 238



H15

16.81 g

Source no.: Hess-Leu 31, Lot 558



H16

16.53 g

Source no.: Kovacs 13, Lot 100



H17

16.89 g

Source no.: Kovacs 15, Lot 176



H18

16.82 g

Source no.: Malter 66, Lot 623



H19

16.72 g

Source no.: Num. Ars Clss. 7, Lot 1602



H20

16.91 g

Source no.: Num. Fine Arts 28, Lot 761



H21

Weight N/A

Source no.: Senior 1994, Lot 5



K5

15.90 g

31 mm

Source no.: 69



N4

16.00 g

Source no.: 190



N5

16.00 g

Source no.: 191



N6

15.99 g

Source no.: 192



Q7

17.00 g

Source no.: 26



Q8

16.71 g

Source no.: 27



U2

Weight N/A

Source no.: 110



U3

Weight N/A

Source no.: 112



W8

15.12 g

Source no.: CNG 35, Lot 63761



Control Mark: †

C68

16.82 g
31 mm

Source no.: Auction 299, Lot 238



C69

16.56 g

Source no.: Auction Triton 2, Lot 580



C70

16.82 g

Source no.: Auction Triton 8, Lot 625



C71

17.04 g
32 mm

Source no.: Auction Triton 14, Lot 421



H22

16.85 g

Source no.: Kovacs 12, Lot 149



H23

16.39 g

Source no.: Kovacs 13, Lot 99



H24

16.87 g

Source no.: Kat. Schulman 1913A, Lot 786



H25

16.12 g

Source no.: M & M 53, Lot 156



H26

16.30 g

Source no.: Num. Fine Arts 25, Lot 219



N7

16.77 g

Source no.: 186



U4

Weight N/A

Source no.: 114



Control Mark: Α

B6

14.64 g
35 mm

Source no.: 1888.1208.85



C72

16.73 g
35 mm

Source no.: 782055



C73 Imitation

16.95 g
33 mm

Source no.: Auction 179, Lot 116



C74

16.88 g

Source no.: Auction 36, Lot 2114



H27

Weight N/A

Source no.: Harlan Berk 94, Lot 221



H28

Weight N/A

Source no.: Pegasi 94, Lot 133



U5

Weight N/A

Source no.: 113



Control Mark: Ν

C76

16.55 g

Source no.: Auction 75, Lot 621



C77

16.22 g

Source no.: Auction 79, Lot 495



P4

14.71 g
31 mm

Source no.: Série 1, 4



Drachms

Control Mark: 

B7

3.94 g
20 mm

Source no.: IOC 8



C5

4.10 g

Source no.: Auction 294, Lot 419



C78

4.10 g

Source no.: Auction 45, Lot 757



C79

3.83 g

Source no.: Auction 75, Lot 622



K6

3.90 g
19 mm

Source no.: 72



Control Mark: NK

C80

3.82 g
20 mm

Source no.: Auction 72, Lot 62



C81

4.08 g
19 mm

Source no.: Auction 314, Lot 213



D2

4.05

Source no.: 260



P6

4.05 g
18 mm

Source no.: Série 2, 6



Control Mark: ☒☺

B8 Imitation

3.57 g
19 mm

Source no.: IOC 9



Control Mark: ☒☺

A4 Imitation

Weight N/A

Source no.: 4



W9 Imitation

3.54 g

Source no.: CNG 36, Lot 63956



Control Mark: Illegible

BI2 Imitation

3.32 g
19 mm

Source no.: 1888.1208.87



BI3 Imitation

3.42 g
20 mm

Source no.: IOC 10



M4

Weight N/A

Source no.: 104, e, Example 1



Obols

Control Mark: 

A5

0.68 g

Source no.: 5



A6

Weight N/A

Source no.: 6



A7

0.66 g

Source no.: 7



B9

0.68 g
11 mm

Source no.: 1888.1208.91



B10

0.68 g
11 mm

Source no.: IOC 11



B11

0.66 g
13 mm

Source no.: 1904.0407.20



B12

0.57 g
11 mm

Source no.: 1850.0412.121



B13

0.58 g
13 mm

Source no.: 1849.1122.2



C82

0.61 g

Source no.: 731863



C83

0.62 g
11 mm

Source no.: Auction 91, Lot 89



C84

0.66 g
12 mm

Source no.: Auction 122, Lot 173



C85

0.65 g
14 mm

Source no.: Auction 133, Lot 110



C86

0.66 g
13 mm

Source no.: Auction 179, Lot 118



C87

0.67 g
12 mm

Source no.: Auction 187, Lot 74



C88

0.68 g
13 mm

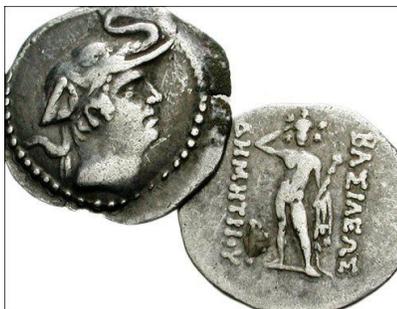
Source no.: Auction 187, Lot 75



C89a/b

Weights N/A

Source no.: Auction 189, Lot 260



C90

0.66 g
12 mm

Source no.: Auction 246, Lot 183



C91

0.69 g
13 mm

Source no.: Auction 304, Lot 187



C92

0.68 g
13 mm

Source no.: Auction 305, Lot 177



C93

0.68 g

Source no.: Auction 36, Lot 2115



C94

0.66 g

Source no.: Auction 36, Lot 2116



C95

0.68 g

Source no.: Auction 37, Lot 800



C96

0.71 g

Source no.: Auction 38, Lot 491



C97

0.70 g

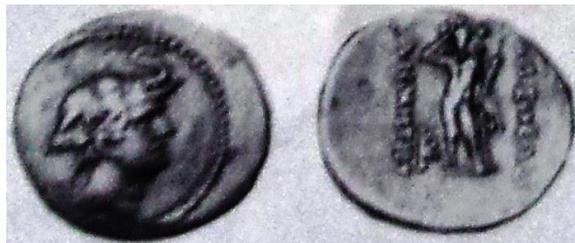
Source no.: Auction 38, Lot 492



C98

0.67 g

Source no.: Auction 38, Lot 493



C99

0.69 g

Source no.: Auction 45, Lot 758



C100

0.65 g

Source no.: Auction 61, Lot 954



C101

0.70 g
13 mm

Source no.: Auction 91, Lot 424



D3

0.66 g

Source no.: 261



F3

0.62 g
12 mm

Source no.: Lockett 3352



G2

0.67 g
13 mm

Source no.: 18202652



H29

Weight N/A

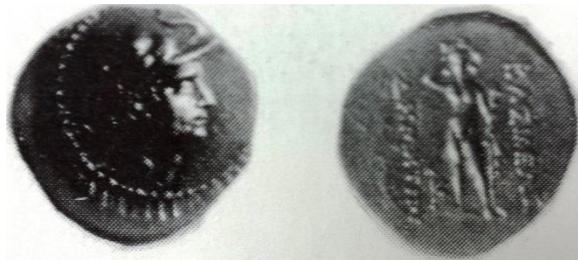
Source no.: Clss. Num. Rev. 21.1, 141



H30

0.70 g

Source no.: Kritt 28, Lot 55



H31 Imitation

Weight N/A

Source no.: Harlan Berk 86, Lot 323



K8

0.90 g
14 mm

Source no.: 74



K9

0.80 g
13 mm

Source no.: 75



K10

0.70 g
12 mm

Source no.: 76



K11

0.70 g
12 mm

Source no.: 77



K12

0.70 g
12 mm

Source no.: 78



K13

0.70 g
12 mm

Source no.: 79



K14

0.70 g
13 mm

Source no.: 80



K17

0.70 g
11 mm

Source no.: 83



K18

0.70 g
13 mm

Source no.: 84



K19

0.60 g
13 mm

Source no.: 85



K20

0.50 g
12 mm

Source no.: 86



K21

0.50 g
12 mm

Source no.: 87



K22

0.50 g
11 mm

Source no.: 88



K24

0.50 g
13 mm

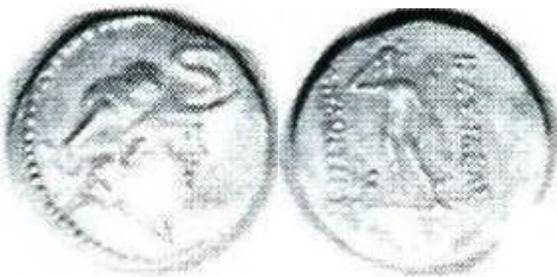
Source no.: 90



K25

0.95 g
13 mm

Source no.: 95



K26

0.90 g
12 mm

Source no.: 96



K28

0.80 g
12 mm

Source no.: 98



K30

0.80 g
11 mm

Source no.: 100



K31

0.80 g
12 mm

Source no.: 101



K32

0.70 g
12 mm

Source no.: 102



K33

0.70 g
12 mm

Source no.: 103



K34

0.70 g
13 mm

Source no.: 104



K35

0.70 g
12 mm

Source no.: 105



K36

0.70 g
12 mm

Source no.: 106



K37

0.70 g
12 mm

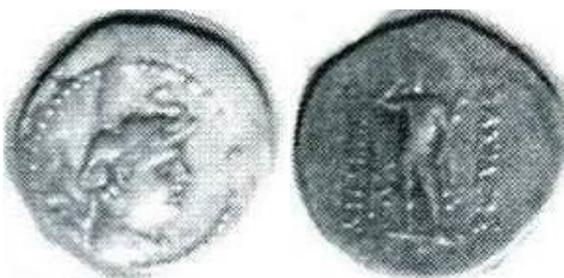
Source no.: 107



K38

0.70 g
13 mm

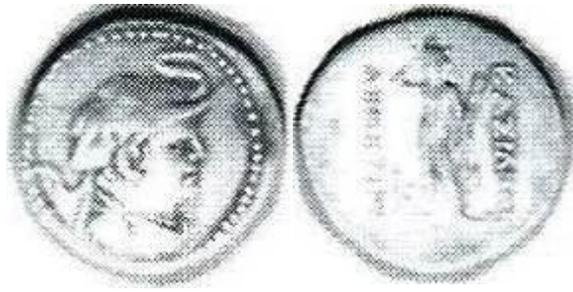
Source no.: 108



K39

0.70 g
13 mm

Source no.: 109



N8

0.69 g

Source no.: 193



N9

0.68 g

Source no.: 194



N10

0.67 g

Source no.: 195



N11

0.66 g

Source no.: 196



N12

0.64 g

Source no.: 197



N13

0.62 g

Source no.: 198



P7

0.67 g
13 mm

Source no.: Série 3, 7



P8

0.66 g
13 mm

Source no.: Série 3, 8



W10

0.68 g

Source no.: SG7531, 1



W11

0.68 g

Source no.: SG7531, 2



Control Mark: 

A8

0.70 g

Source no.: 8



B14

0.66 g
12 mm

Source no.: 1859.0301.7



B15

0.54 g
13 mm

Source no.: 1888.1208.90



C102

0.68 g
11 mm

Source no.: Auction 64, Lot 200



C103

0.66 g
14 mm

Source no.: Auction 158, Lot 65



C104

0.64 g
12 mm

Source no.: Auction 184, Lot 76



C105

0.65 g
11 mm

Source no.: Auction 213, Lot 193



C106

0.64 g
13 mm

Source no.: Auction 217, Lot 199



C107

0.64 g
10 mm

Source no.: Auction 218, Lot 327



C108

0.68 g
11 mm

Source no.: Auction 261, Lot 167



C109 Imitation

Weight N/A

Source no.: Auction 284, Lot 544



C110 Imitation

Weight N/A

Source no.: Auction 284, Lot 544



C111

0.62 g

Source no.: Auction 38, Lot 489



C112 Imitation

0.51 g

Source no.: Auction 38, Lot 490



C113

0.68 g

Source no.: Auction 61, Lot 955



H32 Imitation

Weight N/A

Source no.: Cls. Num. Rev. 21.2, 2037



K40

0.80 g
13 mm

Source no.: 110



K42

0.70 g
12 mm

Source no.: 112



K43

0.70 g
12 mm

Source no.: 113



K44

0.70 g
12 mm

Source no.: 114



N14

0.67 g

Source no.: 199



N15

0.46 g

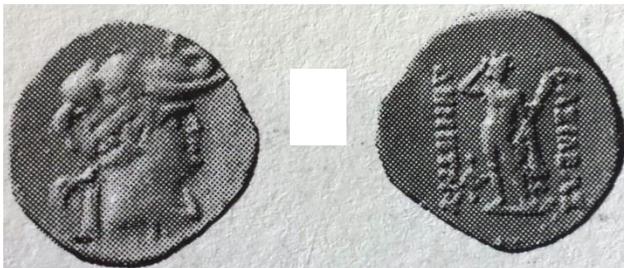
Source no.: 200



P9

0.68 g
12 mm

Source no.: Série 3, 9



V1

Weight N/A

Source no.: N/A



W12

0.67 g
11 mm

Source no.: CNG 58, Lot 69



W13

0.69 g
11 mm

Source no.: CNG 58, Lot 68



Control Mark: ⚡

A9

0.57 g

Source no.: 9



B16

0.68 g
12 mm

Source no.: 1888.1208.89



B17

0.68 g
11 mm

Source no.: 1888.1208.88



C114

0.66 g
13 mm

Source no.: Auction 107, Lot 126



C115

Weight N/A

Source no.: Auction 283, Lot 546



C116

Weight N/A

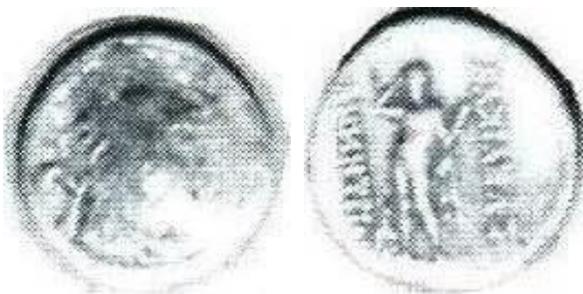
Source no.: Auction 283, Lot 546



K47

0.90 g
12 mm

Source no.: 91



K50

0.70 g
13 mm

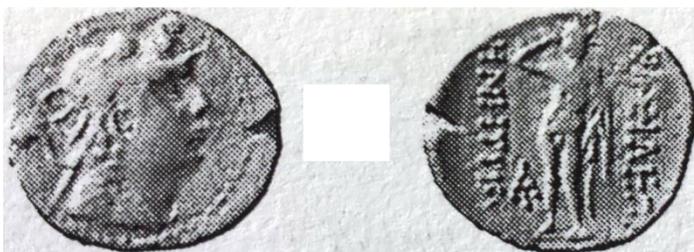
Source no.: 94



P10 Imitation

0.61 g
12 mm

Source no.: Série 3, 10



Double-units

Control Mark: 

A10

Weight N/A

Source no.: 15



A11

7.67 g

Source no.: 16



B18

7.95 g
22 mm

Source no.: 1887.0605.6



N16

7.75 g

Source no.: 205



P11

8.30 g
25 mm

Source no.: Série 4, 11



P12

7.62 g
22 mm

Source no.: Série 4, 12



P13

6.90 g
22 mm

Source no.: Série 4, 13



Control Mark: ⚡

A12

7.50 g

Source no.: 18



Control Mark: ⚡

A13

7.77 g

Source no.: 11



A14

9.84 g

Source no.: 12



A15

6.89 g

Source no.: 13



A16

Weight N/A

Source no.: 14



B19

8.34 g
29 mm

Source no.: 1922.0424.2889



C117

7.84 g

Source no.: Auction Triton 3, Lot 689



D4

6.49 g

Source no.: 262



N17

4.26 g

Source no.: 204



W14

8.08 g

Source no.: CNG Triton 5, Lot 597



Control Mark: Ν<

M7

Weight N/A

Source no.: 109, f, Example 1



Control Mark: 𐎧

A17

Weight N/A

Source no.: 10



B20

8.29 g
29 mm

Source no.: 1888.1208.94



B21

7.60 g
24 mm

Source no.: 1888.1208.93



C118

6.54 g

Source no.: 47, Lot 750



N18

8.40 g

Source no.: 201



N19

8.86 g

Source no.: 202



N20

7.11 g

Source no.: 203



Control Mark: 

A18

7.12 g

Source no.: 17



B22

7.98

25 mm

Source no.: IOC 12



B23

7.33 g

24 mm

Source no.: 1860.1220.14



N21

8.63 g

Source no.: 206



N22

7.56 g

Source no.: 207



N23

4.98

Source no.: 208



Triple-units

Control Mark: 

E1

Weight N/A

Source no.: N/A



V2

Weight N/A

Source no.: N/A



Control Mark: 

A19

Weight N/A

Source no.: 19



A20

Weight N/A

Source no.: 20



B24

11.88 g
28 mm

Source no.: 1888.1208.96



B25

11.48 g
29 mm

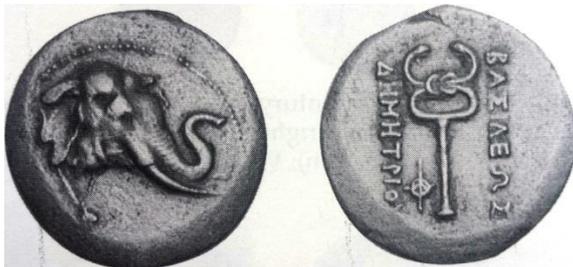
Source no.: IOC 13



C119

11.80 g

Source no.: Auction 47, Lot 749



D5

12.24 g

Source no.: 263



N24

11.78 g

Source no.: 209



N25

10.46 g

Source no.: 210



N26

8.14 g

Source no.: 211



P14

13.32 g

27 mm

Source no.: Série 5, 15



P15

11.83 g
28 mm

Source no.: Série 5, 16



P16

10.32 g
28 mm

Source no.: Série 5, 17



V3

11.96 g
29 mm

Source no.: Zuzim SKU: g262



V4

11.40 g
30 mm

Source no: Zuzim SKU: g193



W16

11.87 g

Source no.: CNG 56, Lot 44



W17

10.78 g

Source no.: CNG 59, Lot 84



W18

13.13 g

Source no.: SG7533, 2



W19

11.95 g

Source no.: CNG 58, Lot 865



Control Mark: 4

E2

Weight N/A

Source no.: N/A



P17

8.90 g
28 mm

Source no.: Série 5, 14



V5

9.98 g
28 mm

Source no.: Zuzim SKU: g511



W20

13.13 g

Source no.: SG7533, 1



Control Mark: A

A21

Weight N/A

Source no.: 21



W21

10.43 g

Source no.: CNG 61, Lot 956



Control Mark: H

N27 Imitation

9.00 g

Source no.: 212



Control Mark: N

V6 Imitation

12.08 g
30 mm

Source no.: Zuzim SKU: g301



Sextuple-units

Control Mark: 

A22

Weight N/A

Source no.: 22



A23

24.68 g

Source no.: 23



A24

Weight N/A

Source no.: 24



A25

Weight N/A

Source no.: 25



B26

25.69 g

36 mm

Source no.: 1922.0424.2911



B27

23.40 g
33 mm

Source no.: 1868.1243.2



B28

23.27 g
32 mm

Source no.: 1888.1208.95



M10

Weight N/A

Source no.: 106, b



N28

23.22 g

Source no.: 213



N29

22.92 g

Source no.: 214



N30

22.06 g

Source no.: 215



Appendix 2

Control Marks and their Associated Die-engravers

Silver coins:

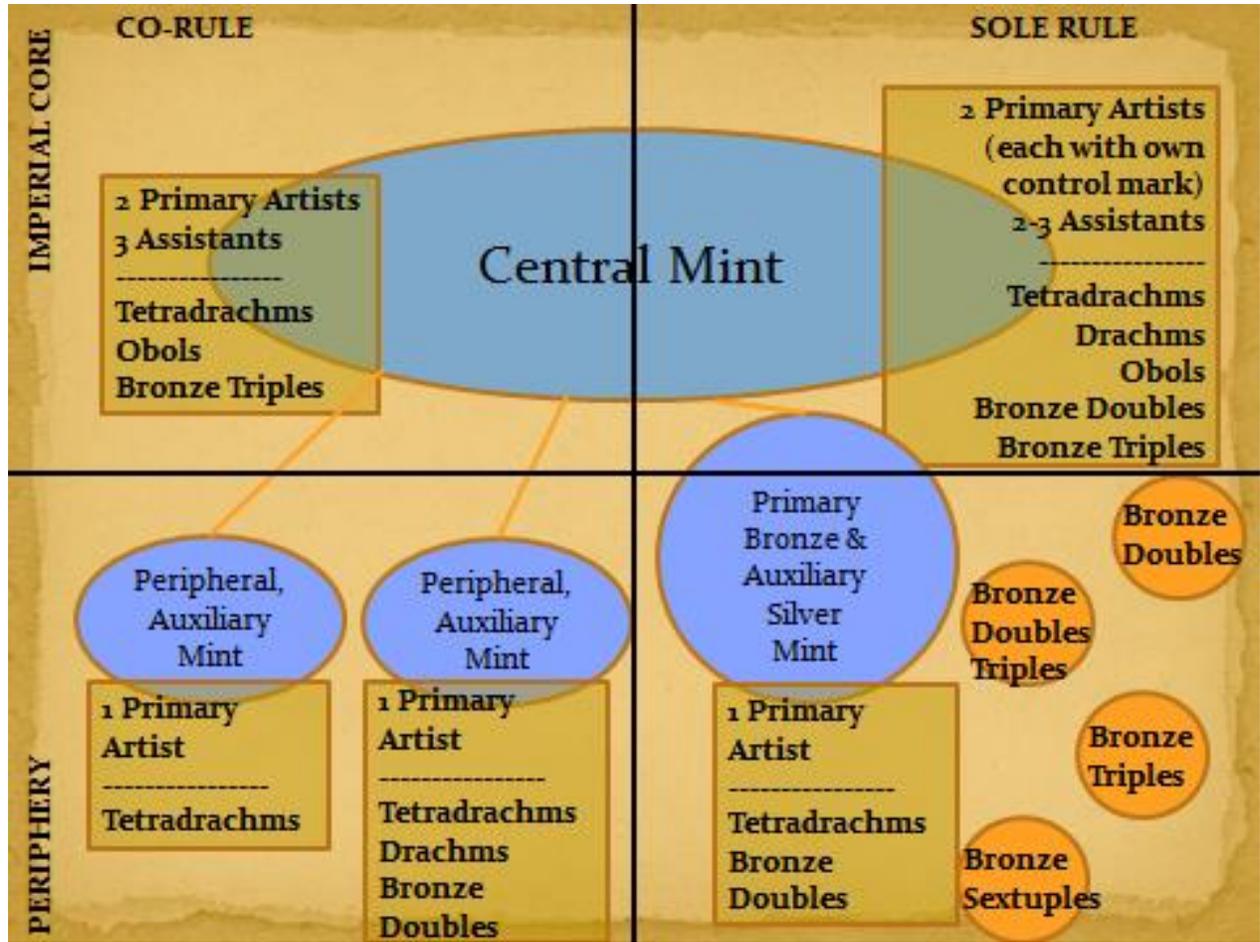
Control mark	Ⲕ and ⲕ	Ⲕ	Ⲕ	Ⲕ	ⲕ
Tetradrachm	Artist X Artist Y <i>X-Assistant</i> <i>Y-Assistant</i>	Artist Z1 Artist Z2 <i>Z-Assistant 1</i> <i>Z-Assistant 2</i> <i>Z-Assistant 3</i>	Artist Z2	Artist X	Artist Ω Artist Z2 (dies)
Drachm	Artist X <i>X- or Y-</i> <i>Assistant</i>				Artist Ω
Obol	Artist X <i>X-Assistant</i>	Artist Z1			

Bronze coins:

Control mark	Ⲕ	Ⲕ	Ⲕ	ⲕ	Ⲕ	Ⲕ	Ⲕ	Ⲕ
Double-unit	X- Assistant	?	Artist Z2 and Assistant	Artist Ω	Local Artist	2 Local Artists		
Triple-unit	Z- Assistant- 2?	Artist Z1 and Assistant			Local Artist		Local Artist	
Sextuple-unit								Local Artist

Appendix 3

Graph of Demetrius' Mint Organization



Appendix 4

Coin Weight Statistics

All weights are in grams.

Weight statistics for full body of Demetrius coins:

	Tetradrachms	Drachms	Obols	Doubles	Triples	Sextuples
Attic Standard	16.8	4.2	0.7	8.4	12.6	25.2
Average	16.54	3.78	0.67	7.59	11.17	23.61
Median	16.73	3.83	0.68	7.75	11.48	23.27
Maximum	17.13	4.1	0.95	9.84	13.32	25.69
Minimum	14.26	3.32	0.46	4.26	8.14	22.06
Standard Deviation	0.51	0.26	0.08	1.08	1.26	1.11

Weight statistics for Demetrius tetradrachms by production line:

	Ⲡ	Ⲡ	Ⲡ	Ⲡ	Ⲡ	Ⲡ
Average	16.63	16.51	16.64	16.64	16.30	15.83
Median	16.70	16.66	16.86	16.82	16.81	16.22
Maximum	17.04	16.99	17.13	17.04	16.95	16.55
Minimum	15.06	15.28	14.26	16.12	14.64	14.71
Standard Deviation	0.37	0.41	0.56	0.29	0.96	0.80

Weight statistics for tetradrachms of Demetrius compared to other Hellenistic kings:

	Demetrius I	Euthydemus ANS	Euthydemus BN	Diodotus I & II	Antiochus III
Average	16.54	16.12	16.02	16.12	16.81
Median	16.73	16.00	16.07	16.3	16.83
Maximum	17.13	16.64	16.56	16.94	17.15
Minimum	14.26	15.46	14.92	13.37	16.26
Standard Deviation	0.51	0.34	0.44	0.58	0.21

Appendix 5

Weights of Ancient and Modern Coins Used in Experiment

All weights are in grams.

Ancient coins:

Alexander the Great tetradrachm	16.85
Diodotus tetradrachm	15.74
Eucratides I tetradrachm	15.64
Alexander the Great drachm	4.12
Diodotus drachm	3.99
Demetrius I drachm forgery	3.44

Modern coins:

United Arab Emirates: 1 dirham (large)	11.52
United Kingdom: 2 shillings	11.09, 11.12, 11.14, 11.22, 11.34, 11.39, 11.52
United Kingdom: 10 new pence	11.15, 11.24, 11.27, 11.29, 11.30, 11.31, 11.34, 11.42
Denmark: 20 kroner	9.28
Greece: 50 drachmas	8.87
Belgium: 20 francs	8.49
Eurozone: 2 euros	8.49
United States: 1 dollar	7.98
Norway: 5 kroner	7.87
Eurozone: 1 euro	7.48
Peru: 1 sol	7.12, 7.16, 7.27, 7.29
Denmark: 10 kroner	6.99, 7.02
Norway: 10 kroner	6.84
United Arab Emirates: 50 fils	6.43
United Arab Emirates: 1 dirham (small)	6.39, 6.41, 6.42
United States: 1 quarter	5.62, 5.74
United Kingdom: 1 shilling	5.67, 5.71
Peru: 2 soles	5.67

Bibliography

- Agnew, John. "The Territorial Trap: The Geographical Assumptions of International Relations Theory." *Review of International Political Economy* 1, no. 1 (1994): 53-80.
- Anonymous. "A Coin of Eucratides." *American Journal of Numismatics* 14, no. 1 (July 1879): 18-20.
- Aperghis, G.G. *The Seleukid Royal Economy: The Finances and Financial Administration of the Seleukid Empire*. Cambridge: Cambridge University Press, 2004.
- Audouin, R. and Paul Bernard. "Trésor de monnaies indiennes et indo-grecques d'Aï Khanoum (Afghanistan) 2, Les Monnaies Indo-Grecques." *Revue Numismatique* 16 (1974): 7-41.
- Austin, M.M. *The Hellenistic World from Alexander to the Roman Conquest*. Cambridge: Cambridge University Press, 1981.
- Badian, Ernst. "The Deification of Alexander the Great." In *Collected Papers on Alexander the Great*, 424-486. London: Routledge, 2012.
- Banerjea, Jitendra Nath. *The Development of Hindu Iconography*. Calcutta: Calcutta University Press, 1956.
- Bayer, Theophilus Siegfried. *Historia Regni Graecorum Bactriani in Qua Simul Graecarum in India Colonialium Vetus Memoria*. St. Petersburg: Academiae Scientiarum, 1738.
- Bell, Evelyn Elizabeth. "An Exekian Puzzle in Portland: Further Light on the Relationship between Exekias and Group E." In *Ancient Greek Art and Iconography*, edited by Warren G. Moon, 75-86. Madison, WI: University of Wisconsin Press, 1983.
- Bernard, Paul. *Fouilles d'Aï Khanoum I (Campagnes 1965, 1966, 1967, 1968) Rapport préliminaire publié sous la direction de Paul Bernard*. Paris: Klincksieck, 1973.

- . *Fouilles d’Ai Khanoum IV, Les monnaies hors trésors, questions d’histoire gréco-bactrienne*. Paris: Éditions de Boccard, 1985.
- . “The Greek Colony at Ai Khanum and Hellenism in Central Asia. In *Afghanistan: Hidden Treasures from the National Museum, Kabul*, edited by Fredrik Hiebert. Washington: National Geographic Books, 2008.
- Bernard, Paul, Georges-Jean Pinault, and Georges Rougemont. “Deux nouvelles inscriptions grecques de l’Asie central.” *Journal des savants* (2004): 227-356.
- Bivar, A.D.H. “The Bactria Coinage of Euthydemus and Demetrius.” *Numismatic Chronicle* 6, no. 11 (1951): 22-39.
- Bopearachchi, Osmund. “La circulation et la production monétaires en Asie central dans l’Inde du nord-ouest (avant et après le conquête d’Alexandre),” *Indologica Taurinensia* 25 (1999-2000): 15-121.
- . “Deux documents exceptionnels en numismatique indo-grecque.” *Cahiers numismatiques* 48, no. 189 (2011): 3-6.
- . *Indo-Greek, Indo-Scythian and Indo-Parthian Coins in the Smithsonian Institution*. Washington: National Numismatic Collection, Smithsonian Institution, 1993.
- . *Monnaies gréco-bactriennes et indo-grecques: catalogue raisonné*. Paris: Bibliothèque Nationale, 1991.
- . “A New Approach to the History of the Greeks in India.” *Yavanika* 1 (1992): 6-20.
- . “Recent Coin Hoard Evidence on Pre-Kushana Chronology.” In *Coins, Art, and Chronology: Essays on the pre-Islamic History of the Indo-Iranian Borderlands*, edited by Michael Alram and Deborah E. Klimburg-Salter. Vienna: Publisher of the Austrian Academy of Sciences, 1999.

- . “Recent Discoveries: Hoards and Finds of Ancient Coins from Afghanistan and Pakistan.”
Paper presented at the Oriental Numismatic Society, British Museum, London, May 28,
1994.
- . *Sylloge Nummorum Graecorum: The Collection of the American Numismatic Society, Part
9: Graeco-Bactrian and Indo-Greek Coins*. New York: The American Numismatic Society,
1998.
- Bopearachchi, Osmund and Wilfried Pieper. *Ancient Indian Coins*. Turnhout: Brepols
Publishers, 1998.
- Bracey, Robert. “The Royal Image on Indian Coins.” *CCNB Newsletter* 44 (Summer 2008): 2.
- Breitenstein, Neils and Willy Schwabacher. *Sylloge Nummorum Graecorum: The Royal
Collection of Coins and Medals, Danish National Museum*. Copenhagen: Munksgaard,
1942.
- Bresson, Alain. “Coinage and Money Supply in the Hellenistic Age.” In *Making, Moving and
Managing the New World of Ancient Economies, 323-31 BC*, edited by Zofia H.
Archibald, John K. Davies, and Vincent Gabrielsen, 44-72. Oxford: Oxbow Books, 2005.
- Burstein, Stanley. *The Hellenistic Period in World History*. Washington: American Historical
Association, 1996.
- Buswell, Robert E. and Donald S. Lopez. *The Princeton Dictionary of Buddhism*, s.v. “Nalagiri.”
Princeton: Princeton University Press, 2014.
- Buzan, Barry and Richard Little. *International Systems in World History: Remaking the Study of
International Relations*. Oxford: Oxford University Press, 2000.
- Carpenter, Thomas H. *Art and Myth in Ancient Greece: A Handbook*. London: Thames and
Hudson, 1991.

- Carter, Giles F. "A Simplified Method for Calculating the Original Number of Dies from Die-link Statistics." *American Numismatic Society Museum Notes* 28 (1983): 195-206
- Chase, George H. "Three Hellenistic Coins." *Bulletin of the Museum of Fine Arts* 46, no. 264 (1948): 39-42.
- Clarysse, Willy and Dorothy J. Thompson. "Two Greek Texts on Skin from Hellenistic Bactria." *Zeitschrift für Papyrologie und Epigraphik* 159 (2007): 273-279.
- Cohen, Ada. *Art in the Era of Alexander the Great: Paradigms of Manhood and their Cultural Traditions*. New York: Cambridge University Press, 2010.
- Collignon, Maxime. *Manual of Mythology in Relation to Greek Art*, translated by Jane E. Harrison. London: H. Grevel & Co., 1899; reprint, New Rochelle, NY: Caratzas Brothers, 1982.
- Connor, Walker. "Beyond Reason: The Nature of the Ethnonational Bond." *Ethnic and Racial Studies* 16, no. 3 (1993): 373-389.
- Cunningham, Arthur. "Coins of Alexander's Successors in the East." *Numismatic Chronicle* 8 (1868): 181-218.
- Curiel, Raoul and Gerard Fussman. *Le Tresor Monetaire de Qunduz*. Paris: Librairie C. Klincksieck, 1965.
- Dahl, Robert A. "The Concept of Power." *Behavioral Science* 2, no. 3 (1957): 201-215.
- Davids, T. W. Rhys, trans. *The Questions of King Milinda* (1890/1894). Sacred Texts Online. <http://www.sacred-texts.com/bud/milinda.htm>.
- De Callataÿ, François. "Calculating Ancient Coin Production: Seeking a Balance." *The Numismatic Chronicle (1966)* 155 (1995): 289-312.
- . "Control Marks on Hellenistic Royal Coinages: Use, and Evolution Toward Simplification?" *Revue Belge de Numismatique et de Sigillographi* 158 (2012): 39-62.

- . “Guerres et monnayages à l’époque hellénistique.” *Dossiers d’Archéologie* 248 (1999): 28-35.
- . “Quantifying Monetary Production in Greco-Roman Times: A General Frame.” In *Quantifying Monetary Supplies in Greco-Roman Times. Proceedings of the Third Francqui Conference Held at the Academia Belgica, Rome, 29-30 Sept 2008*, edited by François de Callataÿ, 7-29. Bari: Edipuglia, 2011.
- . “A Quantitative Survey of Hellenistic Coinages.” In *Making Moving and Managing: The New World of Ancient Economies, 323-31 BC*, edited by Zofia H. Archibald, John K. Davies, and Vincent Gabrielsen, 73-91. Oxford: Oxbow Books, 2005. 73-91.
- Esty, Warren W. “Estimation of the Size of a Coinage: a Survey and Comparison of Methods,” *The Numismatic Chronicle (1966-)* 146 (1986): 185-215.
- Farber, J. Joel. “The Cyropaedia and Hellenistic Kingship.” *The American Journal of Philology* 100, no. 4 (Winter 1979): 497-514.
- Fleischer, Robert. “Hellenistic Royal Iconography on Coins.” In *Aspects of Hellenistic Kingship*, edited by Per Bilde, Troels Engberg-Pedersen, Lise Hannestand, and Jan Zahle, 28-35. Aarhus: Aarhus University Press, 1996.
- Forde, Steven. “International Realism and the Science of Politics: Thucydides, Machiavelli, and Neorealism.” *International Studies Quarterly* 39, no. 2 (1995): 141-160.
- Francfort, Henri-Paul. *Fouilles d’Aï Khanoum III, Le sanctuaire du temple à niches indentées*. Paris: Éditions de Boccard, 1984.
- Gardner, Percy. *The Coins of the Greek and Scythic Kings of Bactria and India in the British Museum*. Edited by Reginald Stuart Poole. London: British Museum, 1886.
- Goodenough, Erwin R. “The Political Philosophy of Hellenistic Kingship.” *Yale Classical Studies* 1 (1928): 55-102.

- Gosden, Chris. *Archaeology and Colonialism: Cultural Contact from 5000 B.C. to the Present*. Cambridge: Cambridge University Press, 2006.
- Guillaume, Olivier. *Graeco-Bactrian and Indian Coins from Afghanistan*. Delhi: Oxford University Press, 1991.
- Gupta, S.K. *Elephant in Indian Art and Mythology*. New Delhi: Abhinav Publications, 1983.
- Hadley, Robert Arthur. "Deified Kingship and Propaganda Coinage in the Early Hellenistic Age: 323-280 B.C." PhD Dissertation, University of Pennsylvania, 1964.
- Hanaway, Jr., William L. "Anāhitā and Alexander." *Journal of the American Oriental Society* 102, no. 2 (Apr.-Jun. 1982): 285-295.
- Hollis, Adrian S. "Laodice Mother of Eucratides of Bactria." *Zeitschrift für Papyrologie und Epigraphik* 110 (1996): 161-164.
- Holt, Frank Lee. *Alexander the Great and the Mystery of the Elephant Medallions* (Berkeley: University of California Press, 2003).
- . "Did King Euthydemus II Really Exist?" *Numismatic Chronicle* 160 (2000): 81-91.
- . "The Euthydemid Coinage of Bactria: Further Hoard Evidence from Ai Khanoum." *Revue Numismatique* 6, no. 23 (1981): 7-44.
- . *Into the Land of Bones: Alexander the Great in Afghanistan*. Berkeley: University of California Press, 2005.
- . *Lost World of the Golden King: In Search of Ancient Afghanistan*. Berkeley: University of California Press, 2012.
- . "Mimesis in Metal: The Fate of Greek Culture on Bactrian Coins." In *The Eye Expanded: Life and the Arts in Greco-Roman Antiquity*, edited by Frances B. Titchener and Richard F. Moorton, 93-104. Berkeley: University of California Press, 1999.

- . “Neo-Darwinian Numismatics: A Thought Experiment.” University of Houston, Houston, TX, 2015.
- . “Poseidon: in Bactria.” *Encyclopedia Iranica* (online edition: June 19, 2013). Accessed February 2, 2016. <http://www.iranicaonline.org/articles/poseidon-in-bactria>.
- . “The So-Called “Pedigree Coins” of the Bactrian Greeks.” In *Ancient Coins of the Graeco-Roman World: The Nickle Numismatic Papers*, edited by Waldemar Heckel and Richard Sullivan, 69-91. Waterloo, Ontario: Wilfrid Laurier University Press, 1984.
- . *Thundering Zeus: The Making of Hellenistic Bactria*. Berkeley: University of California Press, 1999.
- . “When Did the Greeks Abandon Ai Khanoum?” *Anabasis: Studia Classica et Orientalia* 3 (2012): 161-172.
- Holt, Frank and Osmund Bopearachchi. *The Alexander Medallion: Exploring the Origins of a Unique Artifact*. Rouqueyroux: Imago Lattara, 2011.
- Horner, I.B., trans. *The Book of Discipline (VINAYAPITAKAM)*. Melksham, UK: Pali Text Society, 1938; reprint, Sutta Central, 2014.
- Houghton, Arthur and Catharine Lorber. *Seleucid Coins: A Comprehensive Catalogue*. New York: The American Numismatic Society; Lancaster, PA: Classical Numismatic Group, Inc., 2002.
- Howgego, Christopher. “Why Did Ancient States Strike Coins?” *The Numismatic Chronicle* 150 (1990): 1-25.
- Hui, Victoria Tin-bor. “Toward a Dynamic Theory of International Politics: Insights from Comparing Ancient China and Early Modern Europe.” *International Organization* 58, no. 1 (Winter 2004): 175-205.
- Jakobsson, Jens. “The Greeks of Afghanistan Revisited.” *Nomismatika Khronika* 26 (2007): 51-88.

- . “A Possible New Indo-Greek King Zoilos III, and an Analysis of Realism on Indo-Greek Royal Portraits.” *The Numismatic Chronicle (1966-)* 170 (2010): 35-51.
- . “Who Founded the Indo-Greek Era of 186/5 B.C.E.?” *The Classical Quarterly* 59, no. 2 (2009): 505-510.
- Kahil, Lilly. “Mythological Repertoire of Brauron.” In *Ancient Greek Art and Iconography*, edited by Warren G. Moon, 231-244. Madison, WI: University of Wisconsin Press, 1983.
- Kaufman, Stuart J. “The Fragmentation and Consolidation of International Systems,” *International Organization* 51, no. 2 (Spring 1997): 173-208.
- Keary, C.F. “The Morphology of Coins,” *The Numismatic Chronicle and Journal of the Numismatic Society*, Third Series 5 (1885): 165-198.
- Köhler, H.K.E. “Description d'un médaillon rapporté de Boukharie par M. le colonel baron Georges de Meyendorff.” In E.K. Meyendorff, *Voyage d'Orenbourg à Boukhara, fait en 1820 : à travers les steppes qui s'étendent à l'est de la mer d'Aral et au-delà de l'ancien Jaxartes*, 321-328. Paris : Librairie Orientale de Dondey-Dupré père et fils, 1826.
- Kraay, Colin M. “Demetrios in Bactria and India.” *Numismatica e Antichita Classiche* 10 (1981): 219-233.
- . “Greek Coinage and War.” In *Ancient Coins of the Graeco-Roman World: The Nickle Numismatic Papers*, edited by Waldemar Heckel and Richard Sullivan, 3-18. Waterloo, ON: Wilfrid Laurier University Press, 1984.
- Krappe, Alexander H. “The Anatolian Lion God,” *Journal of the American Oriental Society* 65, no. 3 (Jul.-Sep. 1945): 144-154.
- Lahiri, A.N. *Corpus of Indo-Greek Coins*. Calcutta: Poddar Publications, 1965.
- Lecuyot, Guy. *Fouilles d'Aï Khanoum IX, L'habitat*. Paris: Éditions de Boccard, 2013.

- LeRiche, Pierre. "Bactria, Land of a Thousand Cities." *Proceedings of the British Academy* 133 (2007): 121-153.
- . *Fouilles d'Aï Khanoum V, Les remparts et les monuments associés*. Paris: Éditions de Boccard, 1986.
- Liger, Jean-Claude, R. de Valence, and Olivier Guillaume. *Fouilles d'Aï Khanoum II, Les propylées de la rue principale*. Paris: Éditions de Boccard, 1983.
- Liger, Jean-Claude, Serge Veuve, and Guy Lecuyot. *Fouilles d'Aï Khanoum VI, Le Gymnase, architecture, céramique*. Paris: Éditions de Boccard, 1987.
- Lo Cascio, Elio. "The Function of Gold Coinage in the Monetary Economy of the Roman Empire." In *The Monetary Systems of the Greeks and Romans*, edited by W.V. Harris, 160-173. Oxford: Oxford University Press, 2008.
- MacDowell, D.W. "The Copper Coinage of Demetrius, the Son of Euthydemus." *Journal of the Society for South Asian Studies* 5 (1989): 29-33.
- Mairs, Rachel. "Ethnicity and Funerary Practice in Hellenistic Bactria." *Oxford University School of Archaeology Monographs* 63 (2007).
- . "Hellenistic India." *New Voices in Classical Reception Studies* 1 (2006): 19-30.
- . "An 'Identity Crisis'? Identity and its Discontents in Hellenistic Studies." In *Meetings between Cultures in the Ancient Mediterranean. Proceedings of the 17th International Congress of Classical Archaeology, Rome 22-26 sept. 2008*, edited by M. Dalla Riva, 1-8. Rome: 2010.
- Manning, J.G. "Coinage as 'Code' in Ptolemaic Egypt." In *The Monetary Systems of the Greeks and Romans*, edited by W.V. Harris, 84-111. Oxford: Oxford University Press, 2008.
- McEwan, Calvin Wells. "The Oriental Origin of Hellenistic Kingship." PhD dissertation, University of Chicago, 1934.

- Meadows, Andrew. "Money, Freedom, and Empire in the Hellenistic World." In *Money and Its Uses in the Ancient Greek World*, edited by Andrew Meadows and Kirsty Shipton, 53-63. Oxford: Oxford University Press, 2001.
- Michon, Daniel Merton. "Material Matters: Archaeology, Numismatics, and Religion in Early Historic Punjab." PhD Dissertation, University of California Santa Barbara, 2007.
- Mielczarek, Mariusz. "Some Remarks About the Coinage of Euthydemus I and Demetrius, Kings of Bactria." In *Proceedings of the XIth International Numismatic Congress*, edited by Tony Hackens and Ghislaine Moucharte, 299-303. Brussels: Societe Royale de Numismatique de Belgique, 1993.
- Mitchiner, Michael. *Indo-Greek and Indo-Scythian Coinage*, 9 vols. London: Hawkins Publications, 1975.
- Monten, Jonathan. "Thucydides and Modern Realism." *International Studies Quarterly* 50, no. 1 (2006): 3-25.
- Moravcsik, Andrew. "Taking Preferences Seriously: A Liberal Theory of International Politics." *International Organization* 51, no. 4 (1997): 513-553.
- Mørkholm, Otto. in "The Monetary System in the Seleucid Empire after 187 B.C." In *Ancient Coins of the Graeco-Roman World: The Nickle Numismatic Papers*, edited by Waldemar Heckel and Richard Sullivan, 93-114. Waterloo, ON: Wilfrid Laurier University Press, 1984.
- . *Early Hellenistic Coinage: from the Accession of Alexander to the Peace of Apamea (336-188 B.C.)*. Edited by Philip Grierson and Ulla Westermark. Cambridge: Cambridge University Press, 1991.
- Morgenthau, Hans Joachim. *Politics among Nations: The Struggle for Power and Peace*. New York: A.A. Knopf, 1948.

- Moulton, James Hope. *Early Zoroastrianism: Lectures Delivered at Oxford and in London, February to May 1912*. London: Williams and Norgate, 1913.
- Murray, Oswin. "Hellenistic Royal Symposia." In *Aspects of Hellenistic Kingship*, edited by Per Bilde, Troels Engberg-Pedersen, Lise Hannestand, and Jan Zahle, 15-27. Aarhus: Aarhus University Press, 1996.
- Narain, A.K. *The Indo-Greeks*. Oxford: Clarendon Press, 1957.
- Oded, B. "Observations on Methods of Assyrian Rule in Transjordan after the Palestinian Campaign of Tiglath-Pileser III." *Journal of Near Eastern Studies* 29, no. 3 (1970): 177-186.
- Ogden, Daniel. *Polygamy, Prostitutes and Death: The Hellenistic Dynasties*. Swansea: The Classical Press of Wales, 1999.
- Panagopoulou, Katerina. "Between Necessity and Extravagance: Silver as a Commodity in the Hellenistic Period." *The Annual of the British School at Athens* 102 (2007): 315-343.
- Petitot-Biehler, Claire-Yvonne and Paul Bernard. "Trésor de Monnaies Grecques et Greco-Bactriennes Trouvé a Ai Khanoum (Afghanistan)." *Revue Numismatique* 6, no. 17 (1975): 23-57.
- Préaux, Claire. *L'économie royale des Lagides*. Brussels: Edition de la fondation égyptologique Reine Elisabeth, 1939.
- Prinsep, James. "On the Coins and Relics Delivered by M. Le Chevalier Ventura, General in the Service of Mahà Rájá Ranjit Singh, in the Tope of Manikyála." *The Journal of the Asiatic Society of Bengal* 3 (1834): 313-320.
- Rapin, Claude. "Greeks in Afghanistan: Ai Khanum." In *Greek Colonists and Native Populations: Proceedings of the First Australian Congress of Classical Archaeology*, edited by Jean-Paul Descoeudres, 329-342. Oxford: Clarendon Press, 1990.

- . “La Trésorerie Hellénistique d'Aï Khanoum.” *Revue Archéologique*, Nouvelle Série (1987): 41-70.
- Rapin, Claude, Jean-Claude Liger, and Guy Lecuyot. *Fouilles d'Aï Khanoum VIII, La trésorerie du palais hellénistique d'Aï Khanoum, l'apogée et la chute du royaume grec de Bactriane*. Paris: Éditions de Boccard, 1992.
- Rea, J.R., Robert C. Senior, and Adrian S. Hollis. “A Tax Receipt from Hellenistic Bactria.” *Zeitschrift für Papyrologie und Epigraphik* 104 (1994): 261-280.
- Richter, Gisela M.A. “Late Hellenistic Portraiture.” *Archaeology* 16, No. 1 (March 1963): 25-28.
- Rochette, Raoul. “Notice sur quelques médailles grecques inédites, appartenant à des rois inconnus de la Bactriane et de l'Inde.” *Journal des Savants* (1834): 328-344.
- Rostovtzeff, Michael Ivanovitch. *The Social and Economic History of the Hellenistic World*, Vol. 1. Oxford: Clarendon Press, 1941.
- Rtveladze, E.V. and Gerard Fussman. “La Circulation Monétaire au Nord de l'Oxus à l'Époque Grécobactrienne.” *Revue Numismatique* 6, no. 26 (1984): 61-76.
- Salomon, Richard. *Indian Epigraphy : A Guide to the Study of Inscriptions in Sanskrit, Prakrit, and the other Indo-Aryan Languages*. New York: Oxford University Press, 1998.
- Samoun, G., Axelle Rougeulle, and Oliver Guillaume. *Fouilles d'Aï Khanoum VII, Les petits objets*. Paris: Éditions de Boccard, 1987.
- Schlumberger, Daniel. “Prospection archéologique de Bactres (printemps 1947). Rapport Sommaire.” *Syria* 26, no. 3-4 (1949): 173-190.
- Seldeslachts, Erik. “The End of the Road for the Indo-Greeks?” *Iranica Antiqua* 39 (2004):249-296.
- Sherwin-White, Susan and Amélie Kuhrt. *From Samarkhand to Sardis: A New Approach to the Seleucid Empire*. Berkeley: University of California Press, 1993.

- Shipley, Graham. "Distance, Development, Decline? World-Systems Analysis and the Hellenistic World." In *Centre and Periphery in the Hellenistic World*, edited by Per Bilde, Troels Engberg-Pedersen, Lise Hannestad, Jan Zahle, and Klavs Randsborg, 271-284. Aarhus: Aarhus University Press, 1993.
- . *The Greek World after Alexander, 323-30 BC* (London: Routledge, 2000).
- Smith, R.R.R. *Hellenistic Royal Portraits*. Oxford: Clarendon Press, 1988.
- Snyder, Jack. "One World, Rival Theories." *Foreign Policy* 145 (Nov.-Dec. 2004): 52-62.
- Spellman, John W. *Political Theory of Ancient India: A Study of Kingship from the Earliest Times to Circa A.D. 300*. Oxford: Clarendon Press, 1964.
- Stutley, Margaret. *The Illustrated Dictionary of Hindu Iconography*. London: Routledge & Kegan Paul, 1985.
- Tarn, William Woodthorpe. *The Greeks in Bactria and India*. Cambridge: Cambridge University Press, 1938.
- Thapar, Romila. *Aśoka and the decline of the Mauryas*. Oxford: Oxford University Press, 1961.
- . "The Mauryan Empire in Early India." *Historical Research* 79, no. 205 (August 2006): 287-305.
- Thomas, Edward. "Bactrian Coins." *Numismatic Chronicle and Journal of the Numismatic Society* 2 (1862): 178-188, 259-267.
- Thomas, Edward. "Catalogue of Bactrian Coins." *Numismatic Chronicle* 19 (Apr. 1856-Jan. 1857): 13-45, 49-63.
- Thompson, Margaret. "Athens Again." *The Numismatic Chronicle and Journal of the Royal Numismatic Society* 2 (1962): 301-333.
- Thonemann, Peter. "The Attalid State." In *Attalid Asia Minor: Money, International Relations, and the State*, edited by Peter Thonemann, 1-48. Oxford: Oxford University Press, 2013.

- Tracy, Stephen V. "Identifying Epigraphical Hands." *Greek, Roman and Byzantine Studies* 11, no. 4 (Winter 1970): 321-333.
- Van Alfen, Peter G. "Problems in Ancient Imitative and Counterfeit Coinage." In *Making, Moving and Managing the New World of Ancient Economies, 323-31 BC*, edited by Zofia H. Archibald, John K. Davies, and Vincent Gabrielsen, 322-354. Oxford: Oxbow Books, 2005.
- . "Who Benefits? Incentive and coercion in the selection of Greek monetary standards." Talk for the Archaeological Institute of America, Jan. 8, 2016.
https://www.academia.edu/20367218/Who_benefits_Incentive_and_coercion_in_the_selection_of_Greek_monetary_standards
- Vermeule, Cornelius C. "Heracles Crowning Himself: New Greek Statuary Types and Their Place in Hellenistic and Roman Art," *The Journal of Hellenic Studies* 77, pt. 2 (1957): 283-299.
- . "Minting Greek and Roman Coins." *Archaeology* 10, no. 2 (1957): 100-107.
- Wace, Alan J.B. "Hellenistic Royal Portraits." *The Journal of Hellenic Studies* 25 (1905): 86-104.
- Wallace, Robert W. "The Origin of Electrum Coinage." *American Journal of Archaeology* 91, no. 3 (July 1987): 385-397.
- Waltz, Kenneth N. *Theory of International Politics*. New York: McGraw-Hill, 1979.
- Watson, Alaric. *Aurelian and the Third Century*. London: Routledge, 1999.
- Weltman, John J. "Systems Theory in International Relations: A Critique." *Polity* 4, no. 3 (1972): 301-329.
- West, Louis C. "Imperial Publicity on Coins of the Roman Emperors." *The Classical Journal* 45, no. 1 (1949): 19-26.
- Whitehead, Richard. "The Pre-Mohammedan Coinage of Northwestern India." *Numismatic Notes and Monographs* 13 (1922).

- Whitfield, Susan. *Life Along the Silk Road*. Berkeley: University of California Press, 1999.
- Widemann, Francois. *Les Successeurs d'Alexandre en Asie Centrale et Leur Héritage Culturel*. Paris: Riveneuve Éditions, 2009.
- Wilson, L.M. "King Demetrios of India and Eukratides of Bactria." *Oriental Numismatic Society Newsletter* 174 (2003): 17-23. King Demetrios of India and Eukratides of Bactria," *Oriental Numismatic Society Newsletter* 174 (2003): 17-23.
- Wohlforth, William C., Richard Little, Stuart J. Kaufman, David Kang, Charles A. Jones, Victoria Tin-bor Hui, Arthur Eckstein, Daniel Deudney, and William J. Brenner. "Testing Balance-of-Power Theory in World History." *European Journal of International Relations* 13, no. 2 (2007): 155-185.
- Wojtilla, Gyula. "Did the Indo-Greeks Occupy Pataliputra?" *Acta Antiqua Hungarica* 40, no. 1-4 (2000): 495-504.
- Zakaria, Fareed. "Realism and Domestic Politics: A Review Essay." *International Security* 17, no. 1 (1992): 177-198.
- Zeymal, E.V. "Coins from the Excavations at Takht-I Sangin (1976-1991)." In *Studies in Silk Road Coins and Culture: Papers in Honour of Professor Ikuo Hirayama on His 65th Birthday*, edited by Katsumi Tanabe, Joe Cribb, and Helen Wang, 89-110. Kamakura: The Institute of Silk Road Studies, 1997.
- Zimmer, Heinrich. *Myths and Symbols in Indian Art and Civilization*, edited by Joseph Campbell. New York: Pantheon Books, 1946.